Pending FEMA Approval

Final Draft

January 21, 2021

Mississippi District 3 Regional Hazard Mitigation Plan

IEM

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MISSISSIPPI EMERGENCY MANAGEMENT AGENCY

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Introduction to the Plan

SECTION 1 INTRODUCTION

This is an update to Mississippi District 3 (D3) Regional Hazard Mitigation Plan (RHMP) approved in 2015. The plan update was developed in compliance with the requirements of the Disaster Mitigation act of 2000 (DMA 2000).

Section 1 provides a general introduction to the Mississippi D3 RHMP which consists of the following five subsections:

- Background
- Purpose
- Scope
- Authority
- Summary of Plan Content

Background

The Federal Emergency Management Agency (FEMA) defines mitigation as follows:

Mitigation is the effort to reduce loss of life and property by lessening the impact of disasters. Mitigation is taking action now—before the next disaster—to reduce human and financial consequences later (analyzing risk, reducing risk, insuring against risk). Effective mitigation requires that we all understand local risks, address the hard choices, and invest in long-term community well-being. Without mitigation actions, we jeopardize our safety, financial security, and self-reliance.

Community leaders serving jurisdictions within D3 understand how disasters affect their communities.

- Disasters can happen at anytime and anyplace; their personal and financial consequences are hard to predict.
- While the number of disaster events is increasing, only a fraction of these events reach the damage threshold that triggers a federal declaration that would provide federal funding through the FEMA Public Assistance (PA), Individual Assistance (IA) and the Hazard Mitigation Grant Program (HMGP).
- FEMA's Hazard Mitigation Assistance (HMA) programs are designed to support activities which reduce the impact of events, dependence on taxpayer support, funding from the United States (U.S.) Treasury for disaster relief and to make communities more resilient.

Hazard Mitigation planning is a process in which hazards are identified and profiled; people and facilities at risk are identified and assessed for threats and potential vulnerabilities; and strategies and mitigation measures are identified. The primary goal of this process is to reduce the risk and vulnerability, in order to lessen the impacts to life, the economy and infrastructure and make a resilient community.

Hazard mitigation planning increases the ability of communities to effectively function in the face of a natural and manmade disaster. Goals developed are to be realistic with achievable actions identified through the use of short- and long-term strategies to permanently reduce or alleviate

the loss of injuries, life, and property resulting from hazardous events. In addition, policies, activities, and tools for mitigating the effects of disasters are developed. The method and subsequent plan are designed for accomplishing a systematic and participatory process using strategically scheduled events with stakeholder and government involvement. A comprehensive mitigation approach addresses hazard vulnerabilities existing today and in the foreseeable future.

As outlined in Title 44 Emergency Management and Assistance of the Code of Federal Regulations (44CFR) section §201.6 *Local Mitigation Plans*, are the hazard mitigation planning requirements. Additionally, to support planning efforts, FEMA provides oversight and guidance for hazard mitigation planning and offers sub-grant opportunities to assist in the financial aspect of Hazard Mitigation Plan (HMP) development.

In 2012, FEMA revised the review process used to measure Local Hazard Mitigation Plans (LHMP)s against Federal requirements, replacing the “crosswalk” with the *Local Mitigation Plan Review Tool*. The improved review tool provides constructive feedback and recommendations from the state and FEMA on plan sections that demonstrate program strengths and others that could be enhanced to strengthen the planning, development and implementation of an effective mitigation strategy. A copy of the completed *Local Mitigation Plan Review Tool* is provided in Appendix A along with the formal approval letter from FEMA.

The Disaster Mitigation Act (DMA 2000) and the Flood Insurance Reform Act

To reduce mounting natural disaster losses, the U.S. Congress passed the DMA 2000 amending the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Section 322 of DMA 2000 emphasizes the need for state and local government entities to closely coordinate mitigation planning activities, making the development of an HMP a specific eligibility requirement for any local government applying for federal mitigation grant funds. These funds include the HMGP and the Pre-Disaster Mitigation (PDM) program, both administered by FEMA under the Department of Homeland Security.

- HMGP: To qualify for post-disaster mitigation funds, local jurisdictions must have adopted a mitigation plan that is approved by FEMA. HMGP provides funds to states, territories, Indian tribal governments, local governments, and eligible private non-profits following a presidential disaster declaration.
- The DMA 2000 authorizes up to seven percent of HMGP funds available to a state after a disaster to be used for the development of state, tribal, and local mitigation plans.
- FMA: To qualify to receive grant funds to implement projects such as acquisition or elevation of flood-prone homes, local jurisdictions must prepare a mitigation plan. Furthermore, local jurisdictions must be participating communities in the National Flood Insurance Program (NFIP). The goal of FMA is to reduce or eliminate claims under the NFIP.
- PDM: To qualify for pre-disaster mitigation funds, local jurisdictions must adopt a mitigation plan that is approved by FEMA. PDM assists states, territories, Indian tribal governments, and local governments in implementing a sustained pre-disaster hazard mitigation program.

The Flood Insurance Reform Act of 2004 (P.L. 108-264) created two grant programs, Severe Repetitive Loss (SRL) and Repetitive Flood Claim (RFC), and modified the existing Flood Mitigation Assistance (FMA) program. This act requires completion of a FEMA-approved Hazard Mitigation Plan for communities to be eligible for these programs. Communities with an adopted

FEMA approved HMP become pre-positioned to receive available HMA funds before and after the next event strikes.

In July 2012, the U.S. Congress passed the Biggert-Waters Flood Insurance Reform Act of 2012 (BW-12), which calls for FEMA and other agencies to make a number of changes to the way the National Flood Insurance Program (NFIP) is run. Key provisions of the legislation required the NFIP to raise rates to reflect true flood risk, make the program more financially stable and change how Flood Insurance Rate Map (FIRM) updates impact policyholders.

Hazard Mitigation Planning in District 3

To streamline planning efforts by local jurisdictions, the Mississippi Emergency Management Agency (MEMA) elected to move towards developing RHMPs that are aligned with the agency's nine (9) districts as shown in Figure 1.1. This alignment served to unify mitigation planning statewide, and to also improve integration and utilization of resources (financial and other assets) efficiently. Participation Agreements were signed by local jurisdictions stating their intent to participate in the development of the District 3 Regional HMP planning process.

D3 is located in northwestern Mississippi and includes nine (9) counties: Attala, Bolivar, Carroll, Holmes, Humphreys, Leflore, Montgomery, Sunflower and Washington and the incorporated jurisdictions therein. Figure 1.2 presents a base map of the planning area. Table 1.1 provides a summary list of participating jurisdictions along with the date the final plan was adopted by that jurisdiction.

FIGURE 1.1 MEMA DISTRICT MAP

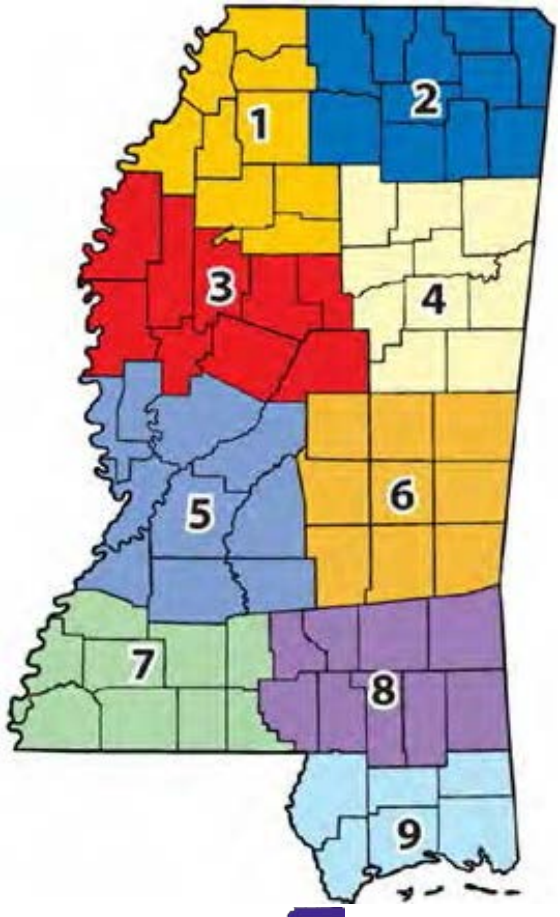


FIGURE 1.2: D3 BASE PLANNING AREA MAP

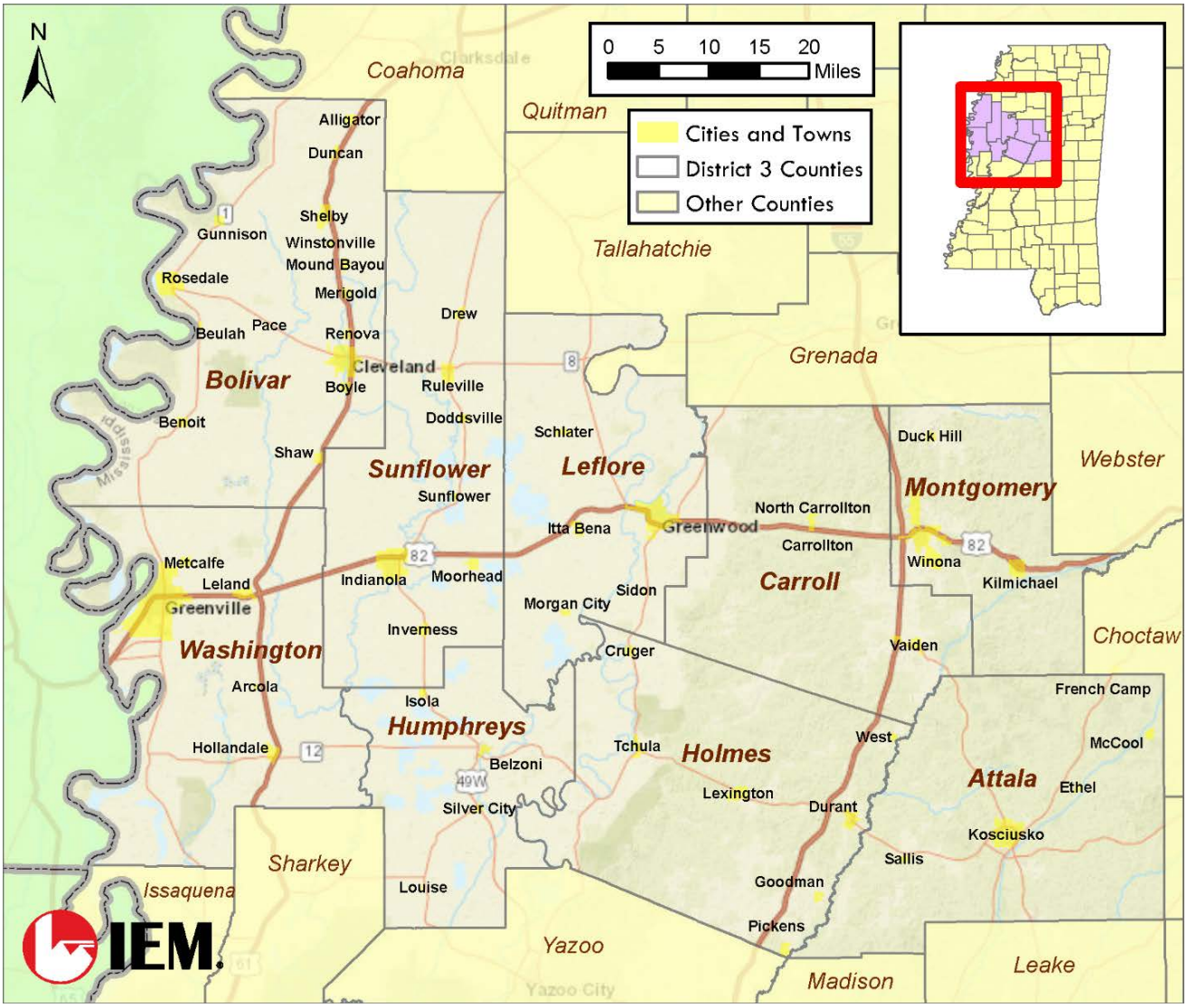


TABLE 1.1: PARTICIPATING JURISDICTION'S AND PLAN ADOPTION DATES

Jurisdiction	Participating Jurisdiction ✓	Adoption Date
Attala County	✓	
Town of Ethel	✓	
Town of Kosciusko	✓	
Town of McCool	✓	
Town of Sallis	✓	
Bolivar County	✓	
Town of Alligator	✓	
Town of Benoit	✓	
Town of Beulah	✓	
Town of Boyle	✓	
City of Cleveland	✓	
Town of Duncan	✓	
Town of Gunnison	✓	
Town of Merigold	✓	
Town of Mound Bayou	✓	
Town of Pace	✓	
Town of Renova	✓	
City of Rosedale	✓	
Town of Shaw	✓	
Town of Shelby	✓	
Town of Winstonville	✓	
Carroll County	✓	
Town of Carrollton	✓	
Town of North	✓	
Town of Vaiden	✓	
Holmes County	✓	
Town of Cruger		
City of Durant	✓	
Town of Goodman		
City of Lexington	✓	
Town of Pickens	✓	
City of Tchula	✓	
Town of West		

Jurisdiction	Participating Jurisdiction ✓	Adoption Date
Humphreys County	✓	
City of Belzoni	✓	
Town of Isola	✓	
Town of Louise	✓	
Town of Silver City		
Leflore County		
City of Greenwood	✓	
City of Itta Bena		
Town of Morgan City	✓	
Town of Schlater	✓	
Town of Sidon	✓	
Montgomery County	✓	
Town of Duck Hill	✓	
Town of Kilmichael	✓	
City of Winona	✓	
Sunflower County	✓	
Town of Doddsville	✓	
City of Drew	✓	
City of Indianola	✓	
Town of Inverness	✓	
City of Moorhead	✓	
City of Ruleville	✓	
Town of Sunflower	✓	
Washington County	✓	
Town of Arcola	✓	
City of Greenville	✓	
City of Hollandale		
City of Leland	✓	
Town of Metcalfe	✓	

Purpose of the Plan

The 2020 D3 RHMP is a cooperative and collaborative effort between the federal, state, local, and County Emergency Management agencies; citizens and private entities to eliminate or reduce the long-term risk to human life and property from potential hazards. This regional (multi) jurisdictional plan was developed to:

- Identify hazards
- Review past disaster events
- Assess county and municipal hazard risk and vulnerability
- Identify county and municipal capabilities
- Develop and promote a mitigation strategy

Scope of the Plan:

The focus of the update to the D3 RHMP is on those hazards that are determined to be of concern that present the greatest risk to the Mississippi D3 Region, as determined through a detailed hazard risk assessment and input from local officials. Those hazards that are determined to be of lesser concern will be evaluated but may not be fully profiled as part of this plan update process. The results of the updated risk assessment will assist the participating jurisdiction with updating and prioritizing mitigation actions based on those hazards which are understood to present the greatest risk to lives and property.

The geographic scope (the planning area) for this Plan includes 9 counties and 53 incorporated jurisdictions.

Authority

The D3 RHMP has been developed in accordance with current federal and state rules and regulations governing local hazard mitigation plans and has been adopted by each participating county and local jurisdiction in accordance with standard local procedures. Copies of the adoption resolutions for each participating jurisdiction are provided in Appendix B. The Plan shall be monitored on a routine basis and revised to maintain compliance with the following provisions, rules, and legislation:

- Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390)
- FEMA's Final Rule published in the Federal Register, at 44 CFR Part 201 (201.6 for local mitigation planning requirements and 201.7 for Tribal planning requirements)
- Flood Insurance Reform Act of 2004 (P.L. 108-264), Biggert-Waters Flood Insurance Reform Act of 2012 (P.L. 112-141) and the Homeowner Flood Insurance Affordability Act

Summary of Plan Contents

This Base Plan includes seven chapters that address the requirements outlined by FEMA for a complete and effective hazard mitigation plan. Appendices follow the Base Plan to provide details and supporting documentation used throughout plan development and provide an efficient process to document the annual evaluation and updates as dictated in the plan maintenance section. The 2020 D3 RHMP includes County-level annexes that provide detailed community statistics (i.e. population, demographics, employment, critical assets and infrastructure, etc.); discuss progress made on mitigation actions listed in the 2015 RHMP; identify mitigation needs at the county and municipal levels; and recommend mitigation actions based on the recently completed risk assessment and vulnerability analysis.

Section 1: Introduction provides an overview of hazard mitigation planning and describes the purpose, scope and framework of the plan.

Section 2: Planning Process summarizes the methodology implemented to develop the plan, including participants on the multi-jurisdictional planning team; summary of planning and coordination meetings and engagement activities; public and stakeholder outreach; and how existing plans, studies, reports, and technical information were incorporated in and helped to update the plan. Appendix C includes documentation of the planning process, including meeting materials such as invitations, agendas, minutes, presentations/handouts, and sign-in sheets. Also included are copies of outreach materials inviting public participation.

Section 3: Community Profile provides a general description of the MEMA District 3 participating jurisdictions and includes community demographic, geographic and economic characteristics. This section also addresses land use, housing and infrastructure for the planning area. Information unique to each county and jurisdiction is included in the respective County Annexes.

Section 4: The Hazard Identification and Risk Assessment (HIRA) covers hazards to which the planning area is prone, and the process by which the community identified hazards to be included in this plan. For each hazard, discussion includes all of the following: a hazard description, location, extent (or magnitude), historical occurrences, future probability, hazard impact, and the anticipated effects of climate change.

Section 5: Capability Assessment provides the ability of the participating jurisdictions to implement mitigation strategies and identify areas where improvements/enhancements should be considered to further advance mitigation strategies.

Section 6: The previous plan sections tie directly into the ***Mitigation Strategy*** section by gathering accomplishments and needs into a systematic approach to achieving the planning area's goals. Section 6 includes an update of the goals and actions from the previous approved plan(s) and the process used to redefine the goals into a regional approach. A status report of implemented actions is also presented in this section.

Section 7: The ***Plan Maintenance*** **section** outlines the process by which the Regional Hazard Mitigation Council (RHMC) and other identified officials will ensure the plan is carried out, updated, and integrated with other local planning initiatives, regulations and ordinances. Procedures are also defined within this section to evaluate the effectiveness of this plan through a review of the progress made towards implementation of mitigation actions, public/stakeholder involvement and identification of additional risks that may surface following the development and approval of this plan update.

County Annexes (A-I*)* are included for each of the nine counties. Discussion in each annex covers participating municipal jurisdictions. Annexes were developed to streamline material for ready use by county and municipal officials. Each Annex includes a community profile, risk assessment and vulnerability analysis, capabilities assessment, and mitigation strategy.

Plan Adoption

The *2020* D3 RHMP has been developed in accordance with 44 CFR §201.6 and was adopted by the legislatures of each participating county and its municipalities. The previously discussed Table 1.1 - *Participating Jurisdiction's Plan Adoption Process* documents the dates each county and municipality formally adopted the plan. Copies of executed adoption resolutions are included in Appendix B.

SECTION 2 PLANNING PROCESS

2.0 Planning Process Overview

This section describes the planning process used to develop/update the D3 RHMP and covers four planning elements:

- The Planning Process
- Involvement of the Planning Team and Regional Hazard Mitigation Council
- Planning Meetings
- Community Participation

The 2020 Mississippi D3 RHMP Update reflects how participating communities have embraced and adopted hazard mitigation planning as a means to identifying hazards of concern, as well as developing appropriate ways to mitigate or eliminate these hazards. The planning process has evolved over the past ten years. The table below shows how the process was managed before the 2015 HMP was developed. Until then, counties participated in a process managed by three separate entities: The North Central Planning and Development District, the South Delta Planning and Development District, and McCool Management Services. In 2015, these plans were reviewed and integrated into the 2015 Mississippi District 3 Hazard Mitigation Plan, a Regional Plan that included County Annexes to ensure community-specific information. Table 2.0 shows the original division of county plans according to the coordinating planning entity.

TABLE 2.0: ORIGINAL DIVISION OF COUNTY HMPS FOR THE 2015 HMP

Prepared by North Central Planning and Development District (2012)
Attala County Multi-Jurisdictional Hazard Mitigation Plan
Ethel Kosciusko McCool Sallis
Holmes County Multi-Jurisdictional Hazard Mitigation Plan
Cruger Goodman Pickens West Durant Lexington Tchula
Carroll County Multi-Jurisdictional Hazard Mitigation Plan
Carrollton North Carrollton Vaiden
Leflore County Multi-Jurisdictional Hazard Mitigation Plan
Greenwood Morgan City Sidon Itta Bena Schlater
Montgomery County Multi-Jurisdictional Hazard Mitigation Plan
Duck Hill Kilmichael Winona

Prepared by South Delta Planning and Development District (2009)
Humphreys County Multi-Jurisdictional Hazard Mitigation Plan
Belzoni Isola Louise Silver City
Sunflower County Multi-Jurisdictional Hazard Mitigation Plan
Doddsville Indianola Moorhead Sunflower Drew Inverness Ruleville
Washington County Multi-Jurisdictional Hazard Mitigation Plan
Arcola Hollandale Metcalfe Greenville Leland

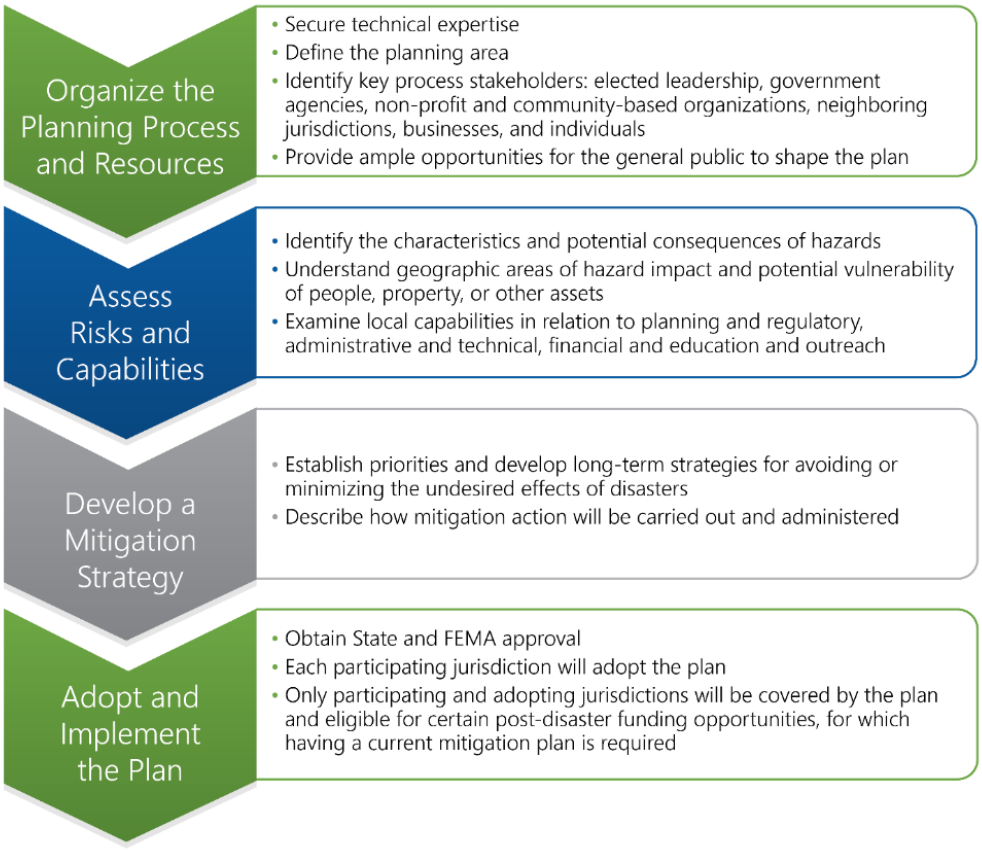
Prepared by McCool Management Services (2008)
Bolivar County Multi-Jurisdictional Hazard Mitigation Plan
Alligator Boyle Gunnison Pace Benoit Cleveland Merigold Renova Shaw Beulah Duncan Mound Bayou Rosedale Shelby Winstonville

2.1 The Planning Process

To ensure that the RHMP met the requirements of the Disaster Mitigation Act of 2000 (DMA 2000), an approach to the planning process and plan documentation was developed to achieve the following two goals:

- The RHMP will be multi-jurisdictional and consider natural hazards facing all communities located in the D3 planning area, thereby satisfying the natural hazards mitigation planning requirements specified in DMA 2000. Working with the County Emergency Management Director, the IEM Team invited all municipalities in the county to join with them in the preparation of the D3 RHMP.
- The RHMP planning process, depicted in Figure 2.1 was developed in keeping with DMA 2000, FEMA regulations, and FEMA and MEMA guidance.

FIGURE 2.1. – THE DISTRICT 3 RHMP PLANNING PROCESS



This process ensured that all federal and state requirements are met and support RHMP review. This RHMP was revised using the best available information obtained from a wide variety of sources. Throughout plan development/update, a concerted effort was made to gather information from participating municipal and county agencies and staff as well as other local organizations and utilities, federal and state agencies, and the residents of the Counties. The Planning Team solicited information from local agencies and individuals with specific knowledge of certain natural hazards and past historical events, as well as considering planning and zoning codes, ordinances, and other recent planning decisions. The natural hazard mitigation strategies identified in this plan have been developed through an extensive planning process involving county and local agencies, municipal officials and staff, and the citizens of the respective Counties.

2.2 Planning Team and Regional Hazard Mitigation Council

In 2019, MEMA solicited qualified consultants to help the D3 Regional Mitigation Planning Council (RHMC) spearhead the development of an updated RHMP. Innovative Emergency Management Inc. (DBA IEM) was selected through the competitive bid process and approved by MEMA and the RHMC.

IEM secured data and input from the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) office in Jackson, Mississippi, the State Department of Environmental Quality, the Mississippi Forestry Commission, and other technical and subject matter experts. IEM's internal Geographic Information Systems (GIS) department was particularly helpful in developing the vulnerability assessment that led to identifying community-specific mitigation strategies to mitigate against hazards of concern.

The Planning Team was also supported throughout the planning process by an advisory team that included two MEMA staff, Bureau Director, Mitigation Plans, Bill Patrick, CFM and Mitigation Planning Director Frank Hill. They and the RHMC members provided guidance to ensure the D3 RHMP met community needs and the requirements of the FEMA Mitigation Planning Process per 44CFR §201.6. They also ensured mitigation initiatives included in the 2020 D3 RHMP update are aligned with the Mississippi 2018 Standard State Hazard Mitigation Plan (SHMP) priorities and initiatives.

RHMC members identified in Table 2.2 served as county and municipal representatives in the D3 RHMP planning process. They, too, helped direct the decision-making process; supported the hazard identification process; and approved the draft plan before it was submitted to the MEMA and FEMA for state and federal approval. After FEMA Region IV designates the plan as Approval Pending Adoption (APA), RHMC members will present plan to county and municipal officials for formal adoption by each jurisdiction. As part of the plan maintenance process, RHMC members will identify ways to integrate mitigation goals, objectives, and action items with other State and local planning initiatives and activities.

All municipalities and jurisdictions were invited to attend scheduled meetings by email and a personal phone call. It should be noted that during the planning process, the entire state was affected by the Coronavirus Disease 2019 (COVID-19), which limited the degree to which meetings could take place between the consultant, the County Emergency Management (EM) Directors, and other members of the RHMC. As such, extensive outreach was conducted by telephone and e-mail. The consulting team aggressively reached out to County EM directors and other stakeholders to secure updated community data and to review the updated plan. Even with extensive outreach, COVID-19 and a severe flood event overwhelmed the staffing capacity of several communities, which were unable to provide completed participation agreements to identify a representative to participate in the planning process. Representatives chosen by each jurisdiction are listed in Table 2.2. Where indicated, the County EM Director was chosen by the municipal legislative body to represent its interests in the planning process. A final list of participants is provided in Section 1 Introduction to the plan Table 1.1.

TABLE 2.2: MEMBERS OF THE MISSISSIPPI DISTRICT 3 REGIONAL HAZARD MITIGATION COUNCIL

Jurisdiction	Designated Representative	Appointed By
Attala County	Danny Townsend, EMA Director	Steve Goss, Board of Supervisors
Town of Ethel	Danny Townsend, EMA Director	Gwen Sims, Mayor
City of Kosciusko	Danny Townsend, EMA Director	Jimmy Cockroft, Mayor
Town of McCool	Danny Townsend, EMA Director	Terri Dempsey, Alderwoman
Town of Sallis	Danny Townsend, EMA Director	Jack Ables, Mayor
Bolivar County	Michael Lamb, EMA Director	Donny Whitten, Board of Supervisors
Town of Alligator	Tommie Browne, Mayor	Tommie Brown, Mayor
Town of Benoit	Calvin E. Ward, Mayor	Calvin E. Ward, Mayor
Town of Beulah	Loretta Benson, City Clerk	Loretta Benson, City Clerk
Town of Boyle	Michael Lamb, EM Director	Thomas G. Taylor, Mayor
City of Cleveland	Ray Bell, Public Works Director	Billy Nowell, Mayor
Town of Duncan	Michael Lamb, EM Director	Charles Harvey, Mayor
Town of Gunnison	Frances Ward, Mayor	Frances Ward, Mayor
Town of Merigold	Albert Junkin	Ken McGarrh, Mayor
Town of Mound Bayou	Derek Bell, Alderman Eulah Peterson, Mayor	Eulah Peterson, Mayor
Town of Pace	Willie Evans	Robert Leflore, Sr., Mayor
Town of Renova	Harvey L. Green, Mayor	Harvey L. Green, Mayor
City of Rosedale	Carey G. Estes, Mayor	Carey G. Estes, Mayor
Town of Shaw	Roger D. Carter, Alderman	Evereth Stanton, Mayor
Town of Shelby	James Reed, Water Sewer Administrator	Peggy Mengarelli, Mayor
Town of Winstonville	Henry Perkins, Jr., Mayor	Henry Perkins, Jr., Mayor
Carroll County	Ken Strachan, EMA Director	Rickie Corley, Board of Supervisors
Town of Carrollton	Pam Lee, Mayor	Pam Lee, Mayor
Town of North Carrollton	Ken Strachan, Mayor	Ken Strachan, Mayor
Town of Vaiden	Ken Strachan, EMA Director	Mel Hawthorne, Mayor
Holmes County	Gyrone Granderson, EMA Director	James Young, Board of Supervisors
Town of Cruger		No Participation Agreement Received
City of Durant	Dr. Henry Robinson, Jr., Mayor	Dr. Henry Robinson, Jr., Mayor
Town of Goodman		No Participation Agreement Received
City of Lexington	Robin McCrory, Mayor	Robin McCrory, Mayor
Town of Pickens	William Primer, Mayor	William Primer, Mayor
City of Tchula	General Vann, Mayor	General Vann, Mayor
Town of West		No participation Agreement Received

Humphreys County	Royce Steed, EMA Director	Richard Stevens, Board of Supervisors
City of Belzoni	Walter Williams, Water & Sewer Mgr.	Joe L. Jackson, Mayor
Isola	Royce Steed, EMA Director	Dimp Powell, Mayor
Louise	Royce Steed, EMA Director	Thomas Ruffin Smith, Mayor
Silver City		No Participation Agreement Received
Leflore County		No Participation Agreement Received
City of Greenwood	Carolyn McAdams, Mayor	Carolyn McAdams, Mayor
City of Itta Bena		No Participation Agreement Received
Town of Morgan City	Martha Mullen, Mayor	Martha Mullen, Mayor
Town of Schlater	Fred Randle, EM Director	Jason Colquett, Mayor
Town of Sidon	Fred Randle, EM Director	Johnnie Mae Neal, Mayor
Montgomery County	Allan Pratt, EMA Director	James R. "Ron" Wood, Board of Supervisors
Town Duck Hill	Joey Cooley, Mayor	Joey Cooley, Mayor
Town of Kilmichael	Bobby Howell, Mayor	Bobby Howell, Mayor
City of Winona	Brad Mooneyham, Fire Chief	Jerry Flowers, Mayor
Sunflower County	Denny Evans, EMA Director	Glenn Donald, Board of Supervisors
Town of Doddsville	Denny Evans, EM Director	Torey Bell Sr., Mayord
City of Drew	Denny Evans, EM Director	Harvey E. Burchfield, Mayor
City of Indianola	Edrick Hall, Chief of Police	Steve Rosenthal, Mayor
Town of Inverness	Larry Sibley	David Smith, Mayor
City of Moorhead	Percel Moore	George Holland, Mayor
City of Ruleville	Denny Evans, EM Director	Shirley Edwards, Mayor
Town of Sunflower	Denny Evans, EM Director	Desiree Norwood, Mayor
Washington County	David Burford, EMA Director	Carl McGee, Board of Supervisors
Town of Arcola	David Burford, EMA Director	Cora Burnside, Mayor
City of Greenville	Carlon Williams, Planning Director	Erick Simmons, Mayor
City of Hollandale		
City of Leland	Robert L. Johnson, Fire Chief	Kenny Thomas, Mayor
Town of Metcalfe	James Stewart, Fire Chief	Walter McDavid, Mayor

If an invited municipality did not respond to this initial invitation process, IEM and the County Emergency Management Director continued to conduct personalized outreach to each municipality by emailing and placing phone calls to guide them through the process of developing mitigation action worksheets. This outreach was conducted for all municipalities, including those that had not participated to date.

RHMC members identified in Table 2.2. served as county and municipal representatives in the D3 RHMP planning process. They, too, helped direct the decision-making process; supported the hazard identification process; and approved the draft plan before it was submitted to the MEMA and FEMA for state and federal approval. After FEMA Region IV designates the plan as Approval Pending Adoption (APA), RHMC members will present plan to county and municipal officials for formal adoption by each jurisdiction.

Consultant: Through an open bid process, MEMA selected a planning consultant (IEM) to facilitate the plan update process. A contract between IEM and MEMA was executed in December 2019. The Consultant was tasked with:

- Assisting with the development and implementation of a public and stakeholder outreach program;
- Data collection;
- Facilitating meetings;
- Identifying the hazards of concern and performing a risk assessment;
- Assisting with the development of mitigation planning goals and objectives;
- Assisting with the screening of mitigation actions and the identification of appropriate actions;
- Assisting with the prioritization of mitigation actions; and
- Authoring of the Draft and Final HMP documents.

IEM secured data and input from the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) office in Jackson, Mississippi, the State Department of Environmental Quality, the Mississippi Forestry Commission, and other technical and subject matter experts. IEM's internal Geographic Information Systems (GIS) department was particularly helpful in developing the vulnerability assessment that led to identifying community-specific mitigation strategies to mitigate against hazards of concern.

2.3 Planning Meetings

All municipalities and jurisdictions were invited to attend scheduled meetings by email and a personal phone call. It should be noted that during the planning process, the entire state was affected by the Coronavirus Disease 2019 (COVID-19), which limited the degree to which meetings could take place between the consultant, the County Emergency Management (EM) Directors, and other members of the RHMC. As such, extensive outreach was conducted by telephone and e-mail. The consulting team aggressively reached out to County EM directors and other stakeholders to secure updated community data and to review the updated plan.

Outreach Strategy

The following revised outreach strategy was implemented part of the plan update process:

- Kick-Off Meeting: February 2020
- Risk Assessment and Capability Review virtual meeting webinar
- Community Outreach (Interviews with County Emergency Management Directors)
- Community Public Outreach Survey

The following sections summarize the outcomes of each of the planning process meetings.

Kick-Off Meeting

The District 3 Staff, members of the Regional Hazard Mitigation Council, and other stakeholders attended the 2020 Hazard Mitigation Plan Update kickoff meeting on February 18, 2020. Twenty-two people representing county offices of emergency management, local jurisdictions, and stakeholders discussed community hazards and vulnerabilities, as well as changes that have occurred in the community since the 2015 plan was written.

Based on this discussion, the Planning Team agreed the following natural hazards should be included in the plan update: dam failure, drought, extreme temperatures, expansive soil, severe storms, severe winter weather, tornado, tropical storm, flood and wildfire. Additionally, two non-natural hazards were included as part of the update: hazardous materials and pandemic /human infectious disease.

Group Breakout Sessions

At the completion of the kick-off meeting, the IEM county point of contact staff met in small groups with their counties to distribute the respective county jurisdictional annexes and discuss meetings at the county level.

The meeting minutes, sign-in sheets, and a Power Point presentation outlining the planning process are all shown to document meeting activity.

Risk Assessment and Capability Review Meeting

The Risk Assessment and Capability Review webinar was held on June 12, 2020. The Planning Team reviewed the results of the risk assessment to communicate the reason each hazard was profiled and included in the plan. This included a discussion of hazard ranking forms and the exercise conducted to rank the natural hazards based on their frequency and impacts in in each jurisdiction. Additionally, The Planning Team presented a recommendation to delete expansive soils as a hazard of concern but feedback from attendees led to the final determination that the hazard be retained but not be extensively profiled.

Planning Team members used the Jurisdictional Annex, Capability Worksheet, and other documents in the IEM Data Collection Guide to review and update the list of community assets and capability assessment information in their jurisdiction's annex. These forms and the instructions for each can be found in Appendices F (Capability Assessment Ranking System) and Appendix G (Data Collection Guide).

Community Outreach (Interviews with County Emergency Management Directors)

At the time of the Kickoff Meeting, Coronavirus Disease 2019 (COVID-2019) was just beginning to emerge as a concern nationwide and at the community level. Immediately after the kickoff, the United States, the State of Mississippi, and local jurisdictions issued warnings informing people that they should undertake only necessary travel outside their business or work community, and advisories were put into place recommending limited contact with those outside of the immediate household. Other than essential services, such as hospitals, law enforcement, the military, and people operating critical facilities, most of the workforce began telecommuting. As such, D3 creatively transitioned to conducting meetings and community outreach either by phone or virtually.

In lieu of originally planned one-on-one personal meetings with County Emergency Management Agency Directors (EMDs) and the County Working Group, the consulting team held individual phone conversations with EMDs to identify issues of concern for their jurisdictions. Complete meeting minutes are provided in Appendix C. Information provided by the county EMD has been incorporated into the respective sections of the plan.

Public Survey

In March 2020, a notice was sent to each Emergency Management Director advising them that a Community Survey was posted online at www.monkeysurvey.com. They were asked to post a link to the survey on their county web site for two reasons: to inform the general public that the 2015 Regional Hazard Mitigation Plan was being updated; and to invite the public to give input on hazards of concern and how they have been affected by recent disaster events. The results of the Community Survey have been incorporated into the respective sections of the plan. A copy of the survey monkey has been included in Appendix D.

Figures 2.3.0 shows how one county announced the survey on its web site, and Figure 2.3.1 is the county-specific flyer sent emergency management directors asking for their help disseminating information about the survey.

FIGURE 2.3.0 - SAMPLE COUNTY PUBLIC NOTICE INVITING THE PUBLIC TO PARTICIPATE IN THE 2020 RHMP UPDATE SURVEY

FIGURE 2.3.1 – COUNTY-SPECIFIC REQUESTS TO DISSEMINATE PUBLIC SURVEY INFORMATION

Copies of all flyers sent to each county and related documentation from these meetings -- including invitations, agendas, presentations, handouts, meeting notes, and sign-in sheets -- are provided in Appendix C.

Copies of all flyers sent to each county and related documentation from these meetings -- including invitations, agendas, presentations, handouts, meeting notes, and sign-in sheets -- are provided in Appendix C.

After completing this plan's update, implementation and ongoing maintenance will become a function and responsibility of the respective County Emergency Management Office through the RMC. As part of the plan maintenance process, RHMC members will identify ways to integrate mitigation goals, objectives, and action items with other State and local planning initiatives and activities.

Challenges in the 2020 Planning Process

The outset of the COVID-19 pandemic coincided with the beginning of the D3 RHMP planning process. At the same time, the District 3 counties were under flood conditions and received a Federal Disaster Declaration due to these events. As a result, both factors had an impact on the availability and level of participation to which many of the designated jurisdictional representatives were able to commit. The consultant modified the outreach strategy in response to this challenge to rely heavily on email and phone communication and coordination throughout the planning process. In addition, face-to-face meetings were not possible during this planning cycle and the consultant conducted virtual meetings to gather and present information and receive input. These methods proved to be only partially successful because many of the participants had dual obligations to manage both disasters in progress while participating in the plan update activities. Despite this challenge, the consultant and participants have confidence that the 2020 D3 RHMP update is reflective of the current hazard risks and vulnerabilities and provides a solid mitigation strategy that can be implemented in the upcoming planning cycle.

2.4 Community Participation

A variety of stakeholders participated in the different parts of this plan update process. Their participation included providing information on hazard occurrences or critical facility locations, attending meetings, updating mitigation strategy/actions, and reviewing plan drafts. The matrix below summarizes the level of participation to date.

Table 2.4: Jurisdiction Participation

Jurisdiction	Planning Process	Kick-off Meeting	Risk Assessment	Mitigation Strategy	Plan Maintenance	Draft Plan Review
Attala County	✓	✓	✓	✓	✓	✓
Town of Ethel	✓	✓	✓	✓	✓	✓
City of Kosciusko	✓	✓	✓	✓	✓	✓
Town of McCool	✓	✓	✓	✓	✓	✓
Town of Sallis	✓	✓	✓	✓	✓	✓
Bolivar County	✓	✓	✓	✓	✓	✓
Town of Alligator	✓	✓	✓	✓	✓	✓
Town of Benoit	✓	✓	✓	✓	✓	✓
Town of Beulah	✓	✓	✓	✓	✓	✓
Town of Boyle	✓	✓	✓	✓	✓	✓
City of Cleveland	✓	✓	✓	✓	✓	✓
Town of Duncan	✓	✓	✓	✓	✓	✓
Town of Gunnison	✓	✓	✓	✓	✓	✓

Jurisdiction	Planning Process	Kick-off Meeting	Risk Assessment	Mitigation Strategy	Plan Maintenance	Draft Plan Review
Town of Merigold	✓	✓	✓	✓	✓	✓
Town of Mound Bayou	✓	✓	✓	✓	✓	✓
Town of Pace	✓	✓	✓	✓	✓	✓
Town of Renova	✓	✓	✓	✓	✓	✓
City of Rosedale	✓	✓	✓	✓	✓	✓
Town of Shaw	✓	✓	✓	✓	✓	✓
Town of Shelby	✓	✓	✓	✓	✓	✓
Town of Winstonville	✓	✓	✓	✓	✓	✓
Carroll County	✓	✓	✓	✓	✓	✓
Town of Carrollton	✓	✓	✓	✓	✓	✓
Town of North Carrollton	✓	✓	✓	✓	✓	✓
Town of Vaiden	✓	✓	✓	✓	✓	✓
Holmes County	✓	✓	✓	✓	✓	✓
Town of Cruger						
City of Durant	✓	✓	✓	✓	✓	✓
Town of Goodman		✓	✓	✓	✓	✓
City of Lexington	✓	✓	✓	✓	✓	✓
Town of Pickens	✓	✓	✓	✓	✓	✓
City of Tchula	✓	✓	✓	✓	✓	✓
Town of West						
Humphreys County	✓	✓	✓	✓	✓	✓
City of Belzoni	✓	✓	✓	✓	✓	✓
Isola	✓	✓	✓	✓	✓	✓
Louise	✓	✓	✓	✓	✓	✓
Silver City						
Leflore County	✓	✓	✓			
City of Greenwood	✓	✓	✓	✓	✓	✓
City of Itta Bena						
Town of Morgan City	✓	✓	✓	✓	✓	✓
Town of Schlater	✓	✓	✓	✓	✓	✓
Town of Sidon	✓	✓	✓	✓	✓	✓
Montgomery County	✓	✓	✓	✓	✓	✓
Town Duck Hill	✓	✓	✓	✓	✓	✓
Town of Kilmichael	✓	✓	✓	✓	✓	✓
City of Winona	✓	✓	✓	✓	✓	✓
Sunflower County	✓	✓	✓	✓	✓	✓
Town of Doddsville	✓	✓	✓	✓	✓	✓
City of Drew	✓	✓	✓	✓	✓	✓
City of Indianola	✓	✓	✓	✓	✓	✓
Town of Inverness	✓	✓	✓	✓	✓	✓
City of Moorhead	✓	✓	✓	✓	✓	✓

Jurisdiction	Planning Process	Kick-off Meeting	Risk Assessment	Mitigation Strategy	Plan Maintenance	Draft Plan Review
City of Ruleville	✓	✓	✓	✓	✓	✓
Town of Sunflower	✓	✓	✓	✓	✓	✓
Washington County	✓	✓	✓	✓	✓	✓
Town of Arcola	✓	✓	✓	✓	✓	✓
City of Greenville	✓	✓	✓	✓	✓	✓
City of Hollandale						
City of Leland	✓	✓	✓	✓	✓	✓
Town of Metcalfe	✓	✓	✓	✓	✓	✓

The following table includes a list of persons within and outside the planning area that were presented with an opportunity to participate at various stages of the planning process. In some instances, repeated effort was made to reach persons or an agency by phone or email, sometimes without success. Nonetheless, the effort was made to reach a cross-section of subject matter experts and those otherwise familiar with their community to secure their input and expertise in developing the plan.

2020 Regional Hazard Mitigation Plan Community Outreach Initiative

	Last Name	First	Title	Agency	Municipality	County	Involvement
1	Ables	Jack	Mayor	Town of Sallis	Sallis	Attala	Jurisdictional Representative
2	Bell	Ray	Public Works Director	City of Cleveland	Cleveland	Bolivar	Regional Hazard Mitigation Planning Council
3	Bowser	Felicia	Meteorologist	MS National Weather Service	Jackson	Hinds	Hazards, history, documentation
4	Brown	Tommie T.	Mayor	Town of Alligator	Alligator	Bolivar	Jurisdictional Representative
5	Burford	David	EMA Director	Washington County	Greenville	Washington	Regional Hazard Mitigation Planning Council
6	Busbea	Brent	Director of Planning	City of Kosciusko	Kosciusko	Attala	Hazards and their regional impacts
7	Carerra	Shane	Engineer	Willis Engineering	Grenada	Grenada	Hazards and their Impact
8	Carlisle	Clinton	Elay Barkley Architects	City of Cleveland	Cleveland	Bolivar	Hazards and their impact
9	Carter	Rodger D.	Alderman	Town of Shaw	Shaw	Bolivar	Jurisdictional Representative
10	Cockroft	Jimmy	Mayor	City of Kosciusko	Kosciusko	Attala	Jurisdictional Representative
11	Cookston	Lisa	City Councilperson	City of Greenwood	Greenwood	Leflore	Jurisdictional Representative
12	Cooley	Joey	Mayor	Town of Duck Hill	Duck Hill	Montgomery	Jurisdictional Representative
13	Dempsey	Teri	Mayor	Town of McCool	McCool	Attala	Jurisdictional Representative
14	Dickey	Betty	Manager	City of Drew	Drew	Sunflower	Jurisdictional Representative
15	Edwards	Shirley	Mayor	City of Ruleville	Ruleville	Sunflower	Jurisdictional Representative
16	Edwards	Deborah	Comptroller	City of Belzoni	Belzoni	Humphreys	Jurisdictional Representative
17	Estes	Carey	Mayor	City of Rosedale	Rosedale	Bolivar	Jurisdictional Representative
18	Evans	Denny	Emergency Management Director	Sunflower County	Indianola	Sunflower	Regional Hazard Mitigation Planning Council
19	Fancher	Michael	Mayor	Town of West	West	Holmes	Jurisdictional Representative
20	Flowers	Jerry	Mayor	City of Winona	Winona	Montgomery	Jurisdictional Representative
21	Gardner	Christian	Engineer	Gardner Engineering	Kosciusko	Attala	Hazards and their Impact
22	Goss	Steven	President	Board of Supervisors	Kosciusko	Attala	Jurisdictional Representative
23	Granderson	Gyrone	Emergency Management Director	Holmes County	Tchula	Holmes	Regional Hazard Mitigation Planning Council
24	Green	Harvey	Mayor		Renova	Bolivar	Jurisdictional Representative
25	Greenleaf	Sonya	City Clerk	Town of Vaiden	Vaiden	Carroll	Jurisdictional Representative
26	Grennell	Darrell	Mayor	City of Natchez	Natchez	Adams	Jurisdictional Representative
27	Grubb	Kyle	Engineer	Willis Engineering	Grenada	Grenada	Hazards and their Impact
28	Harvey	Charles	Mayor	Town of Duncan	Duncan	Bolivar	Jurisdictional Representative
29	Hawthorne	Melvin	Mayor	Town of Vaiden	Vaiden	Carroll	Jurisdictional Representative
30	Hill	Frank	State Project Lead	MEMA	Pearl	Hinds	Regional Hazard Mitigation Planning Council
31	Howell	Bobby	Mayor	Town of Kilmichael	Kilmichael	Montgomery	Regional Hazard Mitigation Planning Council
32	Ivory	Dorothy	Alderwoman	City of Greenville	Greenville	Leflore	Jurisdictional Representative
33	Kilpatrick	Jefferey	Mayor	City of Drew	Drew	Sunflower	Jurisdictional Representative

	Last Name	First	Title	Agency	Municipality	County	Involvement
34	Lamb	Michael	Emergency Management Director	Bolivar County	Cleveland	Bolivar	Regional Hazard Mitigation Planning Council
35	Lawson	Marcus (Mark)	Memorial Director	North MS. Veterans Cemetery	Kilmichael	Montgomery	Hazards and their Impact
36	Lee	Pamela	Mayor	Town of Carrollton	Carrollton	Carroll	Regional Hazard Mitigation Planning Council
37	Leflore	Robert	Mayor	City of Pace	Pace	Bolivar	Jurisdictional Representative
38	McAdams	Carolyn	Mayor	City of Greenwood	Greenwood	Leflore	Jurisdictional Representative
39	McCrory	Robin	Mayor	City of Lexington	Lexington	Holmes	Jurisdictional Representative
40	McDavid, Jr.	Walter	Mayor	City of Metcalfe	Metcalfe	Washington	Jurisdictional Representative
41	McGee	Keith	President	Board of Supervisors	Winona	Montgomery	Jurisdictional Representative
42	McKercher	William	Chief, Dam Safety Division	MS Department of Environmental Quality	Jackson	Hinds	Dams in the Planning Region
43	McMullen	Anthony	Mayor	City of Goodman	Goodman	Holmes	Jurisdictional Representative
44	Mengarelli	Peggy	Mayor	Town of Shelby	Shelby	Bolivar	Jurisdictional Representative
45	Miller	Brent	Area Coordinator, District 3	MEMA	Pearl	MEMA	Regional Hazard Mitigation Planning Council
46	Moore	Percel	City Manager	City of Moorhead	Moorhead	Sunflower	Jurisdictional Representative
47	Neal	Johnnie Mae	Mayor	Town of SIdon	Sidon	Leflore	Jurisdictional Representative
48	Norwood	Desiree	Mayor	Town of Sunflower	Sunflower	Sunflower	Jurisdictional Representative
49	Nowell	Billy	Mayor	City of Cleveland	Cleveland	Bolivar	Jurisdictional Representative
50	Patrick	Billy	Bureau Director, Mitigation Plans	MEMA	Pearl	MEMA	Regional Hazard Mitigation Planning Council
51	Perkins, Jr.	Henry	Mayor	Town of Winstonville	Winstonville	Bolivar	Jurisdictional Representative
52	Peterson	Eula	Mayor	Town of Mound Bayou	Mound Bayou	Bolivar	Jurisdictional Representative
53	Pratt	Allan S.	Emergency Management Director	Montgomery County	Winona	Montgomery	Regional Hazard Mitigation Planning Council
54	Primer, Jr.	William	Mayor	Town of Pickens	Pickens	Holmes	Jurisdictional Representative
55	Quenot	Michelle	City Clerk	City of Kosciusko	Kosciusko	Attala	Jurisdictional Representative
56	Quinton	Bill	Former Emergency Management Director	Bolivar County	Cleveland	Bolivar	Regional Hazard Mitigation Planning Council
57	Randle	Fred	Emergency Management Director	Leflore County	Greenwood	Leflore	Regional Hazard Mitigation Planning Council
58	Ray	Betty	President	Town and Country Garden Club	Greenwood	Leflore	Community Organization
59	Robertson	Nicole	Extension Agent	MS State University Extension	Winona	Montgomery	Drought hazard and its Impact
60	Robinson, Jr.	Henry	Mayor	City of Durant	Durant	Holmes	Jurisdictional Representative
61	Rosenthal	Steven	Mayor	City of Indianola	Indianola	Sunflower	Jurisdictional Representative

	Last Name	First	Title	Agency	Municipality	County	Involvement
62	Scott	Jason	Director, Information & Outreach	Mississippi Forestry Commission	Jackson	Hinds	Technical Specialist for Wildfire
63	Sibley	Larry	Building Official	City of Inverness	Inverness	Sunflower	Jurisdictional Representative
64	Simmons	Erick	Mayor	City of Greenville	Greenville	Washington	Jurisdictional Representative
65	Sims	Gwen	Mayor	City of Ethel	Ethel	Attala	Jurisdictional Representative
66	Sizemore	Lasonja	Clerk	Town of Duck Hill	Duck Hill	Montgomery	Hazards and their Impact
67	Spradling	Stanley	Engineer	Calvert-Spradling Engineers, Inc.	West Point	Clay	Hazards and their Impact
68	Stanton	Everett	Mayor	Town of Shaw	Shaw	Bolivar	Regional Hazard Mitigation Planning Council
69	Steed	Royce	Emergency Management Director	Humphreys County	Belzoni	Humphreys	Regional Hazard Mitigation Planning Council
70	Strachan	Ken	Emergency Management Director	Carroll County	County	Carroll	Regional Hazard Mitigation Planning Council
71	Strachan	Ken	Mayor	City of North Carrollton	Carrollton	Carroll	Regional Hazard Mitigation Planning Council
72	Sutherland	Joe	Engineer	Joe Sutherland Engineering	Grenada	Grenada	Hazards and their regional impacts
73	Sutton	Lenora	Mayor	City of Belzoni	Belzoni	Humphreys	Jurisdictional Representative
74	Sutton	Lenora	Mayor	City of Belzoni	Belzoni	Humphreys	Jurisdictional Representative
75	Taylor	Ramona	Director of Communications	Southern Echo, Social Justice Agency	Jackson	Hinds	Duck Hill flooding project
76	Thomas	Kenny	Mayor	City of Leland	Leland	Washington	Jurisdictional Representative
77	Thomas	Bertha	Mayor	Town of Beulah	Beulah	Bolivar	Jurisdictional Representative
78	Thomas	Taylor	Mayor	Town of Boyle	Boyle	Bolivar	Jurisdictional Representative
79	Townsend	Danny	Emergency Management Director	Attala County	Kosciusko	Attala	Regional Hazard Mitigation Planning Council
80	Truly	Patrice	Assistant Clerk	Town of Kilmichael	Kilmichael	Montgomery	Jurisdictional Representative
81	Truly	Patrice	Clerk	Town of Kilmichael	Kilmichael	Montgomery	Hazards and their Impact
82	Vann	General	Mayor	City of Tchula	Tchula	Holmes	Jurisdictional Representative
83	Ward	Calvin	Mayor	Town of Benoit	Benoit	Bolivar	Jurisdictional Representative
84	Ward	Frances	Mayor	Town of Gunnison	Gunnison	Bolivar	Jurisdictional Representative
85	Ward	Frances	Mayor	Town of Gunnison	Gunnison	Bolivar	Jurisdictional Representative
86	Weatherall	Arrica	Mayor	Town of Cruger	Cruger	Holmes	Jurisdictional Representative
87	Weatherall	Arrica	Mayor	Town of Cruger	Cruger	Holmes	Jurisdictional Representative
88	Westerfield	Andrew	Mayor	Town of Merigold	Merigold	Bolivar	Jurisdictional Representative
89	Williams	Carlon	Planner	City of Greenville	Greenville	Washington	Jurisdictional Representative
90		State of Mississippi	Office of the MS Coordinating Council for Remote Sensing and GIS Systems	State of Mississippi	Jackson	Hinds	CISK initiative listed in each annex

SECTION 3 COMMUNITY PROFILE

3.0 Community Profile overview

This section of the Plan provides a general overview of the Mississippi District 3 Region. It consists of the following four subsections:

- Geography and the Environment
- Population and Demographics
- Land Use and Housing
- Lifelines and Critical Assets
- Employment and Industry

Annexes A-I are County specific annexes which provide a detailed community base profile for each county and its respective jurisdictions.

3.1 Geography and Environment

Mississippi's District 3 is comprised of nine (9) counties primarily located in north central Mississippi, roughly one hour north of the state capital, Jackson. The nine (9) counties in D3 include Attala, Bolivar, Carroll, Holmes, Humphreys, Leflore, Montgomery, Sunflower and Washington. Figure 3.1.0 provides an overview of the planning area and Table 3.1.0 describes the total land and water areas of each county.

Figure 3.1.0: Mississippi District 3 Planning area

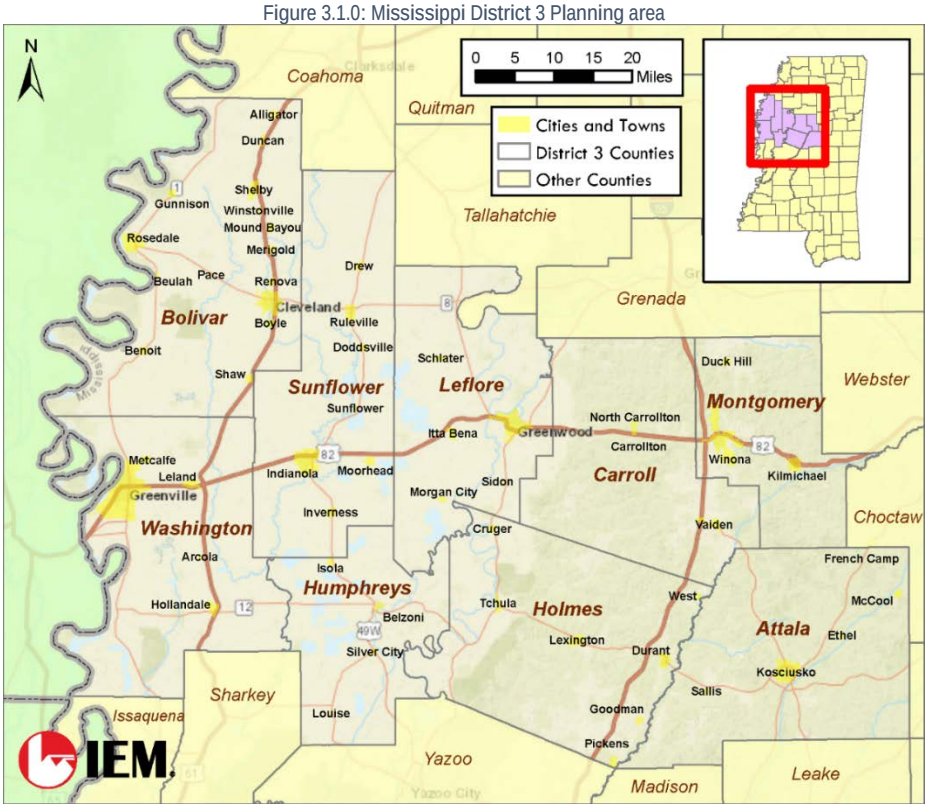


TABLE 3.1.0: MISSISSIPPI DISTRICT 3 TOTAL AREA | SOURCE: 2010 U.S. CENSUS

County	Total Area (Square Miles)	Total Land (Square Miles)	Total Water (Square Miles)
Attala	737.1	735.13	1.97
Bolivar	905.76	876.28	29.47
Carroll	634.54	627.73	6.81
Holmes	764.18	756	8.18
Humphreys	431.16	418.09	13.07
Leflore	606.35	591.93	14.42
Montgomery	407.86	406.85	1.02
Sunflower	707.22	693.79	13.43
Washington	761.26	723.99	37.27

Soils

Southern Mississippi Valley Alluvium: The Delta

Mississippi Delta soils originated from sediments left by flooding of the various rivers that crisscross the region. The term Delta used here is not the same as that traditionally referred to when speaking about a delta "fan" formed at the mouth of a river. Most Delta soils are farmed, with three-fourths of the cropland in the northern portion of Region 3 and less cropland in the southern portion. Major soil management issues in the region include the need to control surface water runoff and stormwater drainage management.

The alluvial origin of sediment originating north of Mississippi causes Delta soils to be naturally diverse. Sediment particle size decreases as the distance from the originating stream increases. In other words, soils closer to running water include proportionally larger silt and sand particles than soils further from the stream. Another factor in Delta soil formation is the movement of surface water over time. Soils formed under standing water have different properties than soils formed under running water.

Soils with a large proportion of clay particles (the smallest basic soil solid) include some unique features. When these soils become dry, small round aggregates form at the surface that look like shotgun buckshot, so "buckshot" is a popular name for Delta clay soils. Soils with large clay contents have very slow water infiltration rates, so they are good areas for high yields in regional aquaculture and rice production.

Southern Mississippi Valley Uplands: Brown Loam Hills and Thin Loess Areas

When historic floodwaters receded in what is now the Delta, strong west-to-east winds blew some of the dry sediment left by flooded rivers over to adjacent uplands. This deposited material is called loess and is the parent material of soils formed in the hilly region along the eastern edge of the Delta. The depth of loess decreases from west to east across the state as the distance from the originating flat lands increases.

Topography

The state is divided into nine (9) physiographic regions as shown here in Figure 3.1.2.

FIGURE 3.1.2: STATE OF MISSISSIPPI PHYSIOGRAPHIC REGIONS

Three of these regions traverse the planning area and are described below:

Delta: This region covers the area of the state that borders the Mississippi River from a portion of DeSoto County down to the northeast corner of Wilkinson County. The general topography is flat plain. Delta soil is characterized as ranging from mildly acidic to mildly alkaline. District 3 counties in this plain include Bolivar, Sunflower, Leflore, Humphreys, Washington, and parts of Carroll and Holmes.

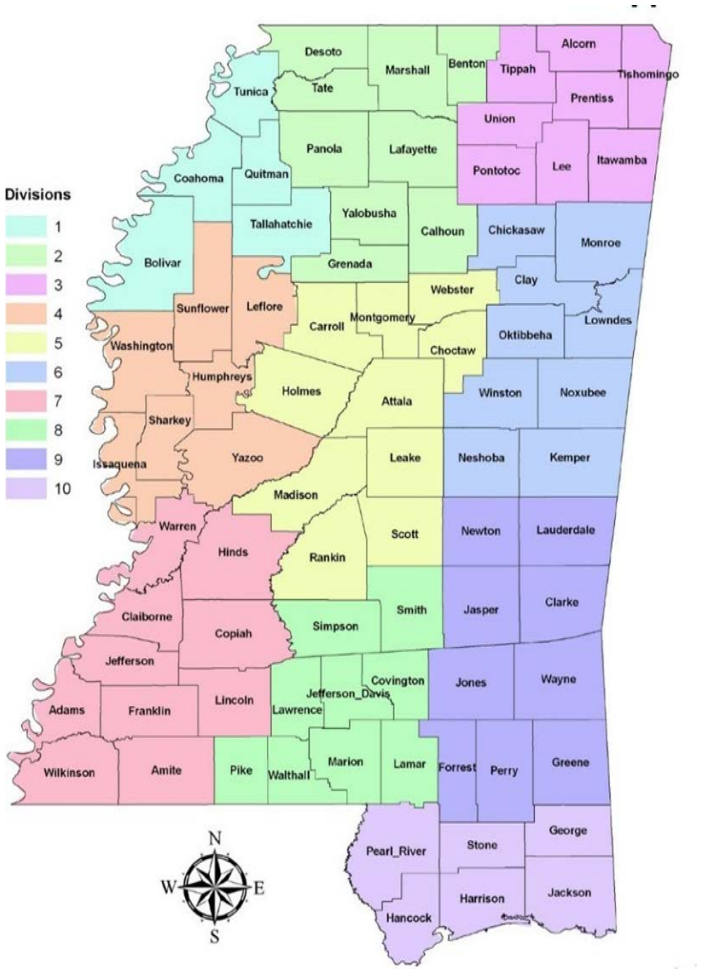
Loess Hills: This region extends from DeSoto County southward to Wilkinson County. The predominant soil type in this region is both acidic and non-acidic. This part of the state is also considered the brown loam region. The topography and physiography of the region are characterized by narrow ridges and steep-sided ravines. Parts of District 3 counties Carroll and Holmes are situated in the Loess Hills region.

North Central Hills: Covering a large portion of Mississippi, this region extends from Marshall County in the northern portion of the state southward to northern Madison County, then southwestward to Wayne County. The soils in this region are mostly acidic. The topography is characterized by both ridges and valleys. District 3 counties in this physiographic region include Montgomery and Attala and parts of Carroll and Humphreys.

Climate

The State of Mississippi is located in the humid subtropical climate region of the United States, which is characterized by long, hot summers, temperate winters and rainfall that is evenly distributed throughout the year. The State is divided into 10 different climate zones: 1-Upper Delta; 2-North Central; 3-Northeast; 4-Lower Delta; 5-Central; 6-East Central; 7-Southwest; 8-South Central; 9-Southeast; and 10-Coastal. Figure 3.1.3 provides an overview of the of the different climate zones in the State. District 3 counties are located in climate zones 1 (Bolivar), 4 (Humphreys, Leflore, Sunflower and Washington) and 5 (Attala, Carroll, Holmes and Montgomery). District 3 Counties can expect long hot summers, moderate winters and frequent rainfall of varying degrees.

FIGURE 3.1.3: CLIMATE DIVISIONS (ZONES) IN MISSISSIPPI | SOURCE: 2018 MEMA SHMP



3.2 Population and Demographics

The jurisdictions within D3 continue to experience a rapid decline in population since the 2000 U.S. Census, as shown in Table 3.2.1 The greatest decline occurred in Washington County and the least decline occurred in Attala County.

The racial characteristics of the participating counties are shown in Table 3.2.2. Most of the counties are made up of more than 64.1 percent of persons who are African American/black. Poverty and other social factors are also important to consider in this plan. Table 3.2.3 provides a summary of each county's percentage of population living in poverty, under 5 years of age, 65 and older, and disabled.

TABLE 3.2.1: POPULATION TRENDS | SOURCE: 2010 U.S. CENSUS, 2018 ESTIMATE

County	2000 Census	2010 Census	2013 Census	2018 Census	Population Decline 2013-2018
Attala	19,661	19,564	19,317	18,365	-952
Bolivar	40,633	34,145	34,049	31,333	-2,716
Carroll	10,769	10,597	10,385	9,911	-474
Holmes	21,609	19,198	18,428	17,62 2	-806
Humphreys	11,206	9,375	8,922	8,257	-665
Leflore	37,947	32,317	31,607	28,919	-2,688
Montgomery	12,189	10,925	10,553	10,023	-530
Sunflower	34,369	29,450	27,997	25,735	-2,262
Washington	62,977	51,137	49,688	45,063	-4,625

TABLE 3.2.2: 2018 DEMOGRAPHICS (IN PERCENT) | SOURCE: 2010 U.S. CENSUS, 2018 ESTIMATES

County	White	Black	Hispanic	Asian	Native American	2 or more Races
Attala	55.20%	43.3 %	2.1 %	.4%	.3 %	.8 %
Bolivar	34.1 %	64.1 %	2.2 %	.9 %	.2 %	.7 %
Carroll	65.5 %	32.9 %	1.7 %	.2 %	.2 %	1.1 %
Holmes	16.2 %	82.5 %	1.1 %	.2 %	.2 %	.8 %
Humphreys	22.4 %	75.8 %	3.7 %	.4 %	.2 %	1.2 %
Leflore	23.5 %	74.7 %	2.8 %	.6 %	.5 %	.7 %
Montgomery	53.2 %	45.0 %	1.4 %	.7 %	.4 %	.7 %
Sunflower	24.7 %	73.9 %	1.9 %	.4 %	.3 %	.6 %
Washington	25.9 %	72.4 %	1.7 %	.7 %	.3 %	.7 %

TABLE 3.2.3: 2018 SPECIAL POPULATIONS | SOURCE: 2010 U.S. CENSUS, 2018 ESTIMATES

County	Below Poverty	Very Young (5 and under)	Elderly (65 and older)	Disabled (Non-institutionalized)
Attala	23.70%	6.30%	19.20%	16.90%
Bolivar	29.40%	6.60%	15.80%	15.40%
Carroll	17.90%	4.30%	23.70%	11.90%
Holmes	33.20%	6.60%	15.00%	13.70%
Humphreys	37.00%	5.70%	17.00%	17.10%
Leflore	35.10%	7.70%	14.40%	7.00%
Montgomery	22.90%	6.00%	21.60%	18.90%
Sunflower	32.60%	5.10%	13.70%	10.20%
Washington	32.60%	7.20%	15.80%	15.30%

3.3 Land Use and Housing

Land Use

The jurisdictions in District 3 are for the most part, sparsely populated when compared to other Mississippi counties. Within District 3, Washington County is the largest in land area and Carroll County has the smallest population density. Overall, communities take advantage of the rich soil for agriculture use to grow crops such as cotton, soybean, corn, and rice. Table 3.3.1 shows the population density per square mile for each county.

TABLE 3.3.1: LAND AREA AND POPULATION DENSITY | SOURCE: 2010 U.S. CENSUS, 2018 ESTIMATES

County	Total Population (2010 Census, 2018 Estimates)	Total Land Square Miles	Population Density (Per Square Mile)
Attala	18,365	737	26.6
Bolivar	31,333	906	39
Carroll	9,911	635	16.9
Holmes	17,622	765	25.4
Humphreys	8,257	431	22.4
Leflore	28,919	606	54.5
Montgomery	10,023	408	26.8
Sunflower	25,735	707	42.2
Washington	45,063	761	70.6

Housing

The previously mentioned population decline is reflected in the decline in housing. Table 3.3.2 shows that -4,957 fewer housing units were reported in the 2018 Census estimates than were reported in the 2010 Census. Bolivar County includes the highest percent of mobile/ manufactured homes, and Washington County has seen the largest decline in the number of housing units.

TABLE 3.3.2: DISTRICT 3 HOUSING CHARACTERISTICS | SOURCE: 2010 U.S. CENSUS, 2018 ESTIMATES

County	Number of Housing Units 2010	Number of Housing Units 2018	% Mobile Homes	Net Change	% Change from 2010 to 2018
Attala	9,126	9244	14.5 %	118	0.01%
Bolivar	14,070	14,400	26.7 %	330	0.24%
Carroll	5,052	5196	22.1 %	144	0.03%
Holmes	8,415	8598	10.8 %	183	0.02%
Humphreys	3,855	3826	11.0 %	-29	-0.01%
Leflore	13,199	13,128	8.4 %	-71	-0.01%
Montgomery	5,194	5765	15.3 %	571	0.11%
Sunflower	9,685	9679	4.8 %	-6	0.00%
Washington	21,708	21609	8.3 %	-99	-0.01%

3.4 Lifelines and Critical Assets

A lifeline is a sector that provides an indispensable service which enables the continuous operation of critical business and government functions and is critical to human health and safety or economic security. Infrastructure associated with lifelines is a mix of public and private ownership and has many interdependencies. As an example, maintaining the function of a hospital during an event that results in a power failure is dependent on communication infrastructure and access to temporary power to prevent interruption of services. Assessing these sectors helps to identify root causes of impacts and consequences from previous hazard events and prioritizes the highest issue areas and interdependencies in order to create effective mitigation solutions.

Infrastructure

Transportation*:* There are several major thoroughfares that traverse the jurisdictions in District 3 as shown in Table 3.4.1 on the following page. Interstate 55 runs north/south through the central portion of Mississippi and is the main access to Jackson, MS and Memphis, TN. There are several small general airports in the planning area. Major airports that provide commercial flights are in Jackson, MS (Jackson-Evers International Airport) and Memphis, TN (Memphis International Airport).

Class I and III rail lines cross through many of the jurisdictions and are used by Canadian National/Illinois Central Railway and other local carriers. The Mississippi River borders the western side of Bolivar and Washington counties. The Port of Rosedale, located in Bolivar County, provides multi-modal access to highway, truck, rail, waterway and air routes.

TABLE 3.4.1: DISTRICT 3 TRANSPORTATION ROUTES

County	Roadway	Rail	Aviation
Attala	12 Mississippi Highway 14 Mississippi Highway 19 Mississippi Highway 35 Mississippi Highway 43 Mississippi Highway Natchez Trace Parkway	Class I Major – Canadian National/ Illinois Central Railroad (CN/ICRR)	Kosciusko-Attala County Airport
Bolivar	61 U.S. Route 61 1 Mississippi Highway 1 8 Mississippi Highway 8 32 Mississippi Highway	Class III Local - Columbus Greenville (CGAY) Great River Rail (GTR)	Cleveland Municipal Airport
Carroll	55 Interstate 55 51 U.S. Route 51 82 U.S. Route 82 17 Mississippi Highway 35 Mississippi Highway	Class I Major - Canadian National/ Illinois Central Railroad (CN/ICRR) Class III Local - Columbus Greenville (CGAY) Closed	Greenwood-Leflore County Airport (located in Carroll County)
Holmes	55 Interstate 55 49 U.S. Route 49 51 U.S. Route 51 12 Mississippi Highway 14 Mississippi Highway 17 Mississippi Highway 19 Mississippi Highway	Class I Major – Canadian National/ Illinois Central Railroad (CN/ICRR)	C. A. Moore Airport (Lexington)

TABLE 3.4.1 CONTINUED: DISTRICT 3 TRANSPORTATION ROUTES

Humphreys	49W U.S. Highway 49W 7 Mississippi Highway 7 12 Mississippi Highway 14 Mississippi Highway 16 Mississippi Highway		Belzoni Municipal Airport
Leflore	49 U.S. Route 49 82 U.S. Route 82 7 Mississippi Highway 7 8 Mississippi Highway 8	Class I Major – Canadian National/ Illinois Central Railroad (CN/ICRR)	Greenwood-Leflore County Airport
Montgomery	55 Interstate 55 51 U.S. Route 51 82 U.S. Route 82		Winona-Montgomery County Airport
Sunflower	49W U.S. Highway 49W 82 U.S. Highway 82 3 Mississippi Highway 3 8 Mississippi Highway 8 32 Mississippi Highway 32	Class III Local - Columbus Greenville (CGAY)	Indianola Municipal Airport Ruleville-Drew Airport
Washington	82 U.S. Highway 82 61 U.S. Highway 61 278 U.S. Highway 278 1 Mississippi Highway 1 12 Mississippi Highway 1	Class III Local - Columbus Greenville (CGAY)	Mid Delta Regional Airport (Greenville) Hollandale Municipal Airport

Utilities*:* The jurisdictions within District 3 are provided with electrical and natural gas services through several providers. Entergy Mississippi provides electrical service to all the counties within this planning area. In addition, Electric Power Associations (EPA) provide services to those outside of the Entergy service area; they include: Central EPA, Delta EPA, Twin County EPA and Yazoo Valley EPA.

- There are two providers of **natural gas** service: Atmos Energy and CenterPoint Energy.
- **Water** and **sewer** services are generally provided through municipal services; however, unincorporated areas may rely on septic systems and wells.
- **Energy** asset maps are provided in each County Annex. Assets include electric substations, oil pipelines, major transmission lines and major gas lines.

As a complement to the utility assets data, researchers consulted the Mississippi Public Service Commission web site for the 2020 update to review the list of utilities shown there. Each county annex provides a detailed table that highlights this information. An attempt was made to prevent duplication; however, it was decided data from both sources should be incorporated into the D3 Base Plan and in each of the county annexes for the sake of thorough documentation.

3.5 Employment and Industry

The next three tables summarize the numbers of persons unemployed and employed in various industries. The Mississippi Department of Employment Securities (MDES) assists individuals in obtaining employment through outreach programs at WIN Job Centers statewide, where counselors match qualified prospective employees with hiring employers. Table 3.5.1, Table 3.5.2, Table 3.5.3 and Table 3.5.4 summarize District 3 county-based employment statistics. It is significant to point out that Holmes, Humphreys and Leflore Counties each have over 40% of their population living below the poverty level. The per capita income in Bolivar, Carroll, Humphreys, Leflore and Washington Counties are near or above the State average.

Table 3.5.1 shows county unemployment trends and compares data by month for the year 2020 against the 2019 annual average. The figures show a spike in unemployment in all counties for the month of April, by which time the impact of COVID-19 resulted in work slowdown or closure at many places of unemployment.

TABLE 3.5.1: DISTRICT 3 UNEMPLOYMENT TRENDS – 2019 ANNUAL AVERAGE VERSUS 2020 | SOURCE: MISSISSIPPI DEPARTMENT OF ECONOMIC SECURITY

Area	2019 Annual Average	2020			
		Jan	Feb	Mar	Apr
Attala	**6.3**	6.6	6.4	5.7	13.4
Bolivar	**7**	7.8	7.1	6.3	10.4
Carroll	**6.3**	6.4	6.2	5.7	13.2
Holmes	**10.4**	10.2	9.3	8.6	28.9
Humphreys	**9.9**	12.6	11.6	9.6	16.6
Leflore	**7.6**	7.9	7.2	6.5	16.8
Montgomery	**6.1**	6.1	6.1	5.5	12.3
Sunflower	**8.9**	10.3	9.2	8	14
Washington	**7.5**	7.9	7.4	6.6	15.4
Mississippi	**5.4**	5.4	5.1	4.8	15.6

While it is unfortunate that the COVID-19 pandemic negatively affected large and small businesses in District 3, statewide, and nationally, there was good economic news in early June. The Federal Bureau of Labor Statistics (BLS) reported a hiring surge in May, during which 2.5 million persons were hired. BLS indicated that these figures may reflect a trend suggesting a return to pre-COVID employment levels which, it is hoped, would bode well for District 3 as well as the rest of the nation.[1]

TABLE 3.5.2: MISSISSIPPI DEPARTMENT OF EMPLOYMENT SECURITY ANNUAL LABOR FORCE REPORT – RESIDENCE BASED AMOUNTS 2020 | SOURCE: MISSISSIPPI ECONOMIC DEVELOPMENT COUNCIL

County	Average Civilian Labor Force (2020)	Average Number Unemployed (2020)	Average Number Employed (2020)	Average Annual Wage (2020)	Per-Capita Income (2020)	Percent Below Poverty (2020)
Attala	6,970	460	6,510	$31,534	$33,809	22.6%
Bolivar	11,900	940	10,960	$34,524	$38,213	37.4%
Carroll	3,220	220	3,200	$29,847	$37,615	14.0%
Holmes	5,650	580	5,070	$31,620	$28,371	46.5%
Humphreys	2,200	270	1,930	$27,785	$31,864	40.5%
Leflore	9,930	790	9,140	$32,546	$36,399	40.3%
Montgomery	3,880	240	3,164	$29,492	$34,180	25.6%
Sunflower	7,560	780	6,780	$32,192	$30,568	33.7%
Washington	1,671	1,310	15,400	$33,355	$27,568	33.7%
Mississippi				$38,099	$37,834	21.5%

[1] U.S. Bureau of Labor Statistics, Employment Situation Summary, https://www.bls.gov/news.release/empsit.nr0.htm, accessed 06/08/2020.

TABLE 3.5.3: MISSISSIPPI DEPARTMENT OF EMPLOYMENT SECURITY ANNUAL LABOR FORCE REPORT – ESTABLISHMENT BASED AMOUNTS 2020 | SOURCE: MISSISSIPPI ECONOMIC DEVELOPMENT COUNCIL

*Establishment Based Amounts 2020	Attala	Bolivar	Carroll	Holmes	Humphreys	Leflore	Montgomery	Sunflower	Washington
Manufacturing	3,950	1,360	90	2,900	700	11,640	2170	73,80	1,180
Non-Manufacturing (total):	73	9,280	170	520	2,060	2,700	80	300	14,860
Agriculture, Forestry, Fishing & Hunting	10	0	10	10	0	0	90	0	0
Mining	10	0	0	0	0	0	0	0	20
Utilities	20	30	10	10	10	70	20	10	40
Construction	360	310	170	70	30	610	80	120	330
Wholesale Trade	80	260	30	20	40	630	70	360	660
Retail Trade	700	1,560	110	470	160	1,540	380	760	2,210
Transportation & Warehousing	130	450	30	30	40	360	90	860	610
Information	60	90	0	0	20	140	10	20	180
Finance & Insurance	150	250	30	80	120	320	110	200	340
Real Estate, Rental & Leasing	40	140	0	30	10	110	10	40	190
Professional & Business Service	140	230	0	50	10	270	40	60	400
Management of Companies & Entertainment	0	50	10	10	20	80	10	120	180
Admin Support & Waste Management	560	470	10	10	10	160	20	50	550
Educational Services	10	80	30	50	40	200	40	80	170
Health Care & Social Assistance	400	1,660	120	450	210	1,900	370	800	2,420
Arts, Entertainment & Recreation	60	60	0	10	0	80	10	30	260
Accommodation & Food Service	400	1,000	20	120	80	1,100	240	460	1,769
Other Service (except public administration)	60	150	0	80	10	180	40	240	740
Government	1,090	2,500	380	1,400	550	3,890	540	3,170	3,800
Education	570	1,730	150	850	290	1,590	210	960	1,290

Note: *Establishment based amounts are estimates and do not include self-employed individuals, religious entities or nonprofit institutions. Amounts include a pro-rata share of unclassified employment.

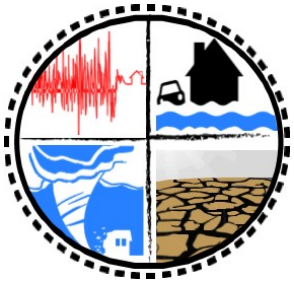
SECTION 4 HAZARD IDENTIFICATION AND RISK ASSESSMENT (HIRA)

The FEMA Hazard Identification and Risk Assessment (HIRA) is a process that consists of a number of sequential steps such as hazard identification, consequence & frequency assessment, risk estimation based on the existing controls and recommendations to reduce those risks which are not under acceptable limits for the region.

This section of the plan describes the process implemented by the RHMC to identify and rank each hazard; and profiles each hazard that was ranked as being significant enough for further evaluation. It contains the following subsections:

- Hazard Identification Overview;
- Hazard Identification and Risk Assessment Methodology;
- Natural Hazard Profiles and Risk Assessment

4.0 Hazard Identification Overview



The hazard identification process helps communities recognize potentially threatening risk-related events. Hazards may be described as natural, technological, or human-caused events that could inflict harm on people, property, and the environment; or they could interfere with commerce or human activities. Such events would include, but are not limited to, tropical storms, floods, severe storms, and other incidents affecting the local population or the built environment.

Per the FEMA HMP requirements outlined in 44 CFR 201.6 (c)(2)(I), members of the RHMC considered all hazards that could potentially affect the communities located in the D3 Region. Planning participants reviewed information from the previously approved *2015 District 3 Multi-Jurisdictional Hazard Mitigation Plan (MJHMP)*, and the *2018 Mississippi SHMP*. Hazards identified during this step were evaluated by the RHMC jurisdictions to consider a broad range of impacts. Information about historical occurrences of natural hazards was taken from several sources: the FEMA list of federal declarations; the FEMA Data Visualization web site; and the NOAA NWS Storm Events Database at the National Centers of Environmental Information (NCEI). Data taken from the last source is simplified with the notation Source: NCEI.

4.1 Hazard Identification and Risk Assessment Methodology

During the review of hazards to be considered for the 2020 plan update, the RHMC determined the process of identifying and profiling hazards would be adapted slightly from the process followed for the 2015 plan. The revised step-by-step process began with a review of a broad range of natural, technological and human-caused hazards by identifying potential impacts within specific criteria. Hazards with no or minimal impacts were then eliminated for further consideration in the ranking process. The remaining hazards were then evaluated for vulnerability and probability of occurrence. Following this step, additional hazards were removed based on the determination of minimal vulnerability level and low probability of occurrence. The outcome of the process described in the following steps resulted in a list of hazards to which the jurisdictions within the planning area are susceptible and which should be considered for potential mitigation actions.

Step 1: Initial Review of All Hazards

The initial hazard review began with the broad list of FEMA suggested natural hazards. Further review of the hazards considered the hazards presented in the Mississippi 2018 SHMP, along with hazards profiled in the 2015 D3 RHMP.

After discussing natural hazards identified as being of concern to the counties within District 3, the RHMC determined several technological and human-caused hazards should also be initially considered. These include Hazardous Materials Incidents and Human-Infectious Disease. The 2015 plan included discussion of Pandemic health-related hazards, including West Nile Virus and Pandemic Influenza. While retaining a discussion of these two diseases, a section on Coronavirus Disease of 2019 (COVID-19) has been added considering the current impacts on the District 3 counties as this plan update was being compiled. In addition, all Counties within the planning area received both a Federal Emergency Declaration (EM-3474) and, later, a Major Disaster Declaration (DR-4528) for the COVID-19 pandemic.

All jurisdictions within the planning area concurred with the impacts presented in Table 4.1. A discussion of the full range of hazards was considered.

Table 4.1: Hazard Impacts and Consequences Assessment (All District 3 Jurisdictions)

IMPACTS/ CONSEQUENCES → / **HAZARDS FOR CONSIDERATION** (***BOLD*** *- Included in 2015 District 3 RHMP)* (**Included in 2018 Mississippi HMP)* ↓	Mass Casualty Potential	Communication Failure	Transportation Infrastructure Loss	Emergency Response Operations Impacted	Healthcare System Impact	Homes and Businesses Damaged	Utility Infrastructure Damage or Failure	Water System Damage or Failure	Sewer System Damage or Failure	Environmental Damage or Long-Term Impact	Agricultural Losses - Crops	Agricultural Losses - Animals	Economic Impact-Direct or Indirect	Commodity Shortage(s)	Civil Unrest	Impacts to Cultural or Historical Assets	Public Confidence in Govt.	[Other]	[Other]	[Other]	**TOTAL IMPACTS (number)**
Natural Hazards (FEMA)																					
Avalanche																					0
***Dam/Levee Failure**				√		√	√	√	√	√		√				√					8
***Drought**								√		√	√	√	√	√							6
***Earthquake**		√	√	√		√	√	√	√	√						√					9
Erosion										√	√										2
Expansive Soils																					0
Extreme Cold				√	√						√	√									4
Extreme Heat				√	√		√				√	√									5
***Flood**		√	√	√	√	√	√	√	√	√	√	√	√			√	√				14
Severe Storm (Thunderstorm, Lightning, Hail and High Wind		√	√	√	√	√	√				√					√					8
***Hurricane/Tropical Storm**		√		√		√	√									√					5
Landslide			√																		1
*Sea Level Rise/Climate Change										√	√	√	√	√	√		√				7
***Severe Winter Weather**		√	√	√	√		√				√	√									7
Storm Surge																					0
Subsidence/Sink holes			√																		1

IMPACTS/ CONSEQUENCES → / HAZARDS FOR CONSIDERATION (**BOLD** - Included in 2015 District 3 RHMP) (*Included in 2018 Mississippi HMP) ↓	Mass Casualty Potential	Communication Failure	Transportation Infrastructure Loss	Emergency Response Operations Impacted	Healthcare System Impact	Homes and Businesses Damaged	Utility Infrastructure Damage or Failure	Water System Damage or Failure	Sewer System Damage or Failure	Environmental Damage or Long-Term Impact	Agricultural Losses - Crops	Agricultural Losses - Animals	Economic Impact-Direct or Indirect	Commodity Shortage(s)	Civil Unrest	Impacts to Cultural or Historical Assets	Public Confidence in Govt.	[Other]	[Other]	[Other]	TOTAL IMPACTS (number)
Volcano																					0
***Tornado**		√	√	√	√	√	√									√					7
Tsunami																					0
***Wildfire**				√		√	√			√	√	√									6
Technological Hazards																					
Critical Supply Chain Disruption			√				√						√	√	√		√				6
*Cyber Incident/Attack		√	√	√			√	√	√				√	√	√		√				10
***Hazardous Materials**	√				√	√		√		√											5
Nuclear/Radiological	√				√	√				√					√		√				6
Transportation Incident	√		√	√	√									√							5
Human-Caused Hazards																					
Active Shooter	√			√	√										√	√	√				6
Arson/Incendiary Attack	√				√	√									√	√	√				6
Biological/Chemical Attack	√				√			√							√	√	√				6
***Pandemic/Human Infectious Disease** (Influenza, Coronavirus-COVID-19, West Nile Virus**)**			√	√	√	√					√		√	√	√		√				9

This process resulted in eliminating the following hazards, none of which are likely to occur within the planning area due to the nature of the hazard and/or the location of the District 3 counties:

- Avalanche
- Coastal Erosion
- Landslide
- Sea Level Rise
- Storm Surge
- Subsidence/Sink Hole
- Tsunami
- Volcano

Step 2: Hazard Vulnerability Ranking

In keeping with the same process followed in the *2015 District 3 Regional Hazard Mitigation Plan*, as well as the methodology presented in the *2018 Mississippi State Hazard Mitigation Plan*, the next step in the hazard identification and risk assessment process for the 2020 plan update involved the analysis of general hazard risk and vulnerability and ranking the hazards that were not eliminated in Step 1 for risk characteristics. Risk characteristics were defined as: area impacted, health and safety, property damage, environmental damage and economic disruption. A scoring system was used to assign numeric quantifiers to each category, in order to obtain a total score. Table 4.1.2 defines the scoring criteria, and Table 4.1.3 illustrates the outcome of this process. The scores from the risk characteristics worksheet were added to calculate the **Total Risk Score** for each hazard presented in Table 4.1.4.

Table 4.1.2 : Risk Characteristics – Scoring Criteria

RISK CHARACTERISTIC (VULNERABILITY)		SCORE
Area Impacted	No area in the jurisdiction directly impacted	0
	Less than 25% of the jurisdiction impacted	1
(The percentage of the jurisdiction at risk to an impact from each hazard)	Less than 50% of the jurisdiction impacted	2
	Less than 75% of the jurisdiction impacted	3
	Over 75% of the jurisdiction impacted	4
Health and Safety Consequences	No health and safety impact	0
	Few injuries or illnesses	1
(The health and safety consequences that can occur)	Few fatalities but many injuries or illnesses	2
	Numerous Fatalities	3
Property Damage	No property damage	0
	Few properties destroyed or damaged	1
(The amount of property damage that can occur)	Few destroyed but many damaged	2
	Few damaged and many destroyed	3
	Many properties destroyed and damaged	4
Environmental Damage	Little or no environmental damage	0
(The environmental damage that can occur)	Resources damaged with short term recovery	1
	Resources damaged with long term recovery	2
	Resources destroyed beyond recovery	3
Economic Disruption	No economic impact	0
	Low direct and/or indirect costs	1
(The economic disruption that can occur)	High direct and low indirect costs	2
	Low direct and high indirect costs	3
	High direct and high indirect costs	4

Table *4.1.3 : Hazard Risk/Vulnerability Ranking Worksheet*

Risk Characteristics (Vulnerability) → / **HAZARD** ↓	Area Impacted (Location)	Health/Safety	Property Damage	Environmental Damage	Economic Damage	**RISK CHARACTERISTICS - Total Score (number)**
Natural Hazards						
Dam/Levee Failure	1	1	1	1	1	5
Drought	4	1	0	2	1	8
Earthquake	4	1	2	2	1	10
Expansive Soils	0	0	0	1	1	2
Extreme Heat	4	1	0	1	0	6
Flood	1	1	1	2	2	7
Severe Storm (Thunderstorm, Lightning, H	3	1	1	1	1	7
Severe Winter Weather	4	1	1	1	1	8
Tornado	1	1	2	1	1	6
Tropical Storm	1	1	1	0	1	4
Wildfire	1	1	1	2	1	6
[Other]						
Technological/Human Caused Hazards						
Cyber Incident/Attack	4	1	0	0	4	9
Hazardous Materials	1	1	1	1	0	4
Pandemic/Human Infectious Disease	4	4	0	0	4	12

Step 3: Hazard Risk Level

The **Total Risk Score** was then determined based on the total score of risk characteristics (vulnerability), multiplied by a "probability of future occurrence" value of 1 through 5 using the following formula:

Vulnerability *(Sum of risk characteristic scores)* x Probability of Occurrence = Total Risk Score

The following probability criteria was aligned with a scoring system to calculate the Total Risk Score and Risk Level.

PROBABILITY OF FUTURE OCCURRENCE	
Criteria	***Score***
(Susceptible) Unknown but anticipate rare occurrence	1
(Low) 1 – 4 documented occurrences over last 10 years	2
(Likely) 5 – 7 documented occurrences over last 10 years	3
(Highly Likely) 8 – 10 documented occurrences over last 10 years	4
(Extremely Likely) More than 10 occurrences over last 10 years	5

The Total Risk Score was then converted to a "risk level", based on the following scoring system.

RISK LEVEL	TOTAL RISK SCORE
Low	**0-15**
A hazard with a ***LOW RISK*** rating is expected to have little to no impact upon the jurisdiction. The hazard poses minimal health and safety consequences to the state's residents and is expected to cause little to no property damage. The occurrence of a hazard with a ***LOW RISK*** rating is rare; however, due to other factors such as geographic location it is still possible for such a hazard to occur and cause even significant damage based upon the magnitude of the event.	
Medium	**16-30**
A hazard with a ***MODERATE RISK*** rating is expected to have a moderate impact upon the jurisdiction. The hazard poses minor health and safety consequences with minor injuries expected and few to no fatalities. The hazard may cause some property to be damaged or destroyed. The occurrence of a hazard with a ***MODERATE RISK*** rating is likely at least once within the next 25 years.	
High	**31 or More**
A hazard with a ***HIGH-RISK*** rating is expected to have a significant impact upon the jurisdiction. The hazard poses high health and safety consequences with numerous injuries and fatalities possible. The hazard may cause even some property to be damaged or destroyed. A hazard with a ***HIGH-RISK*** rating is expected to occur at least once within a 12-month period but can occur multiple times within a year.	

Table 4.1.4: Total Risk Score and Risk Level of Final Hazards Considered for the D3 RHMP Update

Hazard	*Vulnerability Score (Sum of Risk Characteristic Scores)*	*Probability of Future Occurrence Score*	*Total Risk Score*	*RISK LEVEL*
Dam/Levee Failure	5	1	5	Low
Drought	8	3	24	Medium
Earthquake	10	1	10	Low
Expansive Soils	2	1	2	Low
Extreme Heat	6	2	12	Low
Flood	7	4	28	Medium
Severe Storm (Thunderstorm, Lightning, Hail and High Wind)	7	5	35	High
Severe Winter Weather	8	3	24	Medium
Tornado	6	3	18	Medium
Tropical Storm	4	1	4	Low
Wildfire	6	2	12	Low
Cyber Incident/Attack	9	1	9	Low
Hazardous Materials	4	2	8	Low
Pandemic/Human Infectious Disease	12	0	12	Low

The outcome of the hazard risk level evaluation process caused the planning group to further eliminate hazards because there were either no impacts, or there would be minimal impacts to people, property, the economy, and the environment. The RHMC agreed that Expansive Soils would be retained in the plan because the RHMC wanted documentation there was a level of concern even though there is little likelihood of occurrence. Other than this hazard, others were not carried forward as a hazard in the 2020 RHMP based on data that suggests they would pose little or no threat to the jurisdictions in comparison to hazards of highest concern. Table 4.1.5 lists the hazards eliminated from final consideration following the assessment of their potential impacts, vulnerability and probability.

Table 4.1.5 : Justification for Hazards Eliminated from the D3 RHMP 2020 Update

Hazard	Justification for Elimination
Natural Hazards	
Avalanche	• Topography and climate conditions within District 3 jurisdictions are not conducive to this hazard.
Erosion	• This hazard was not included in either the 2015 RHMP or the 2018 SHMP, and potential impacts are minimal and localized.
Extreme Cold	• Although climate conditions within District 3 jurisdictions may allow this hazard to occur, preparedness measures are adequate to prevent significant impacts.
Landslide	• Topography within District 3 jurisdictions is not generally conducive to this hazard for natural occurrences • Any earth movement in relation to man-made features, such as road cuts, are sufficiently handled and limited in magnitude.
Storm Surge	• District 3 jurisdictions are not located in coastal areas and therefore are not susceptible to hurricane/tropical storm surge conditions.
Subsidence/Sinkhole	• Although there are occasional incidents of this hazard (such as a 2015 incident in Meridian, MS that swallowed multiple cars in a new parking lot) they are infrequent and are generally local events related to the collapse of aging infrastructure. • There are no significant reports of this hazard occurring in the region.
Volcano	• There is no volcanic activity within District 3 or within an area that would result in significant impact to the Planning Area.
Tsunami	• District 3 jurisdictions are not located in coastal areas and therefore are not susceptible to tsunami conditions.
Technological	
Critical Supply Chain Disruption	• This hazard is primarily caused by one of the other profiled hazards, such as Pandemic/Human Infectious Disease. • Historically, this hazard is related to economic conditions that impact limited types of supplies. • Conditions related to this are addressed through coordinated, multi-agency prevention/preparedness and response plans.
Cyber Incident/Attack	• This hazard is primarily the responsibility of law enforcement surveillance and prevention measures. • Historically, this hazard is related to criminal or terrorism activities that fall under the responsibility of local, state, national and international law enforcement agencies. • Conditions related to this are addressed through coordinated, multi-agency prevention/preparedness and response plans.
Nuclear/Radiological	• There are no nuclear power facilities within the Planning Area. • A segment of Holmes County is located within the Radiological Emergency Program planning area and is included in the Program's comprehensive preparedness and response plan. • Conditions related to this are addressed through coordinated, multi-

Hazard	Justification for Elimination
	agency prevention/preparedness and response plans.
Transportation Incident	• This hazard is broad in scope and is primarily related to one of the profiled hazards, such as Hazardous Materials. • Conditions related to this are addressed through coordinated, multi-agency prevention/preparedness and response plans.
Human-Caused Hazards	
Active Shooter	• Law enforcement departments in each county and jurisdiction cover in their training and procedural manuals how to respond to such incidents.
Arson/ Incendiary Attack	• Local fire departments are trained to handle such emergencies and do so as needed. Fire prevention education and training is available for both fire professionals and citizens.
Biological/ Chemical Attack	• Emergency management professionals and private industry are familiar with the ways such incidents might occur. They are trained to identify situations that may create the hazard and eliminate them in order to protect property and the lives of those living and working nearby.

In addition to the step-by-step process described previously, the team also collected data from FEMA, including its list of disaster declarations for the state of Mississippi and the agency's Data Visualization Tool; NOAA's National Center for Environmental Information (NCEI – formerly known as the National Climatic Data Center, or NCDC); the United States Geological Survey (USGS); the Mississippi Department of Environmental Quality (MDEQ) Dam Safety Division (MDEQ); the Mississippi State Department of Health (MDOH), and other sources. Collected information revealed the type, location, extent and previous occurrences of natural hazards affecting the planning area. Table 4.1.5 shows the classification of ***natural and technological/human-caused*** hazards the RHMC determined should be included in this plan update.

Table 4.1.5 : Justification for Hazards Eliminated from the D3 RHMP 2020 Update

Natural Hazards		
• Dam/Levee Failure • Drought • Earthquake • Extreme Heat	• Flood • Severe Storm (Thunderstorm, Lightning, Hail and High Wind) • Severe Winter Weather	• Tornado • Tropical Storm/Hurricane • Wildfire
Technological/ Human-Caused Hazards		
• Hazardous Material Incidents	• Human Infectious Disease/Pandemic	

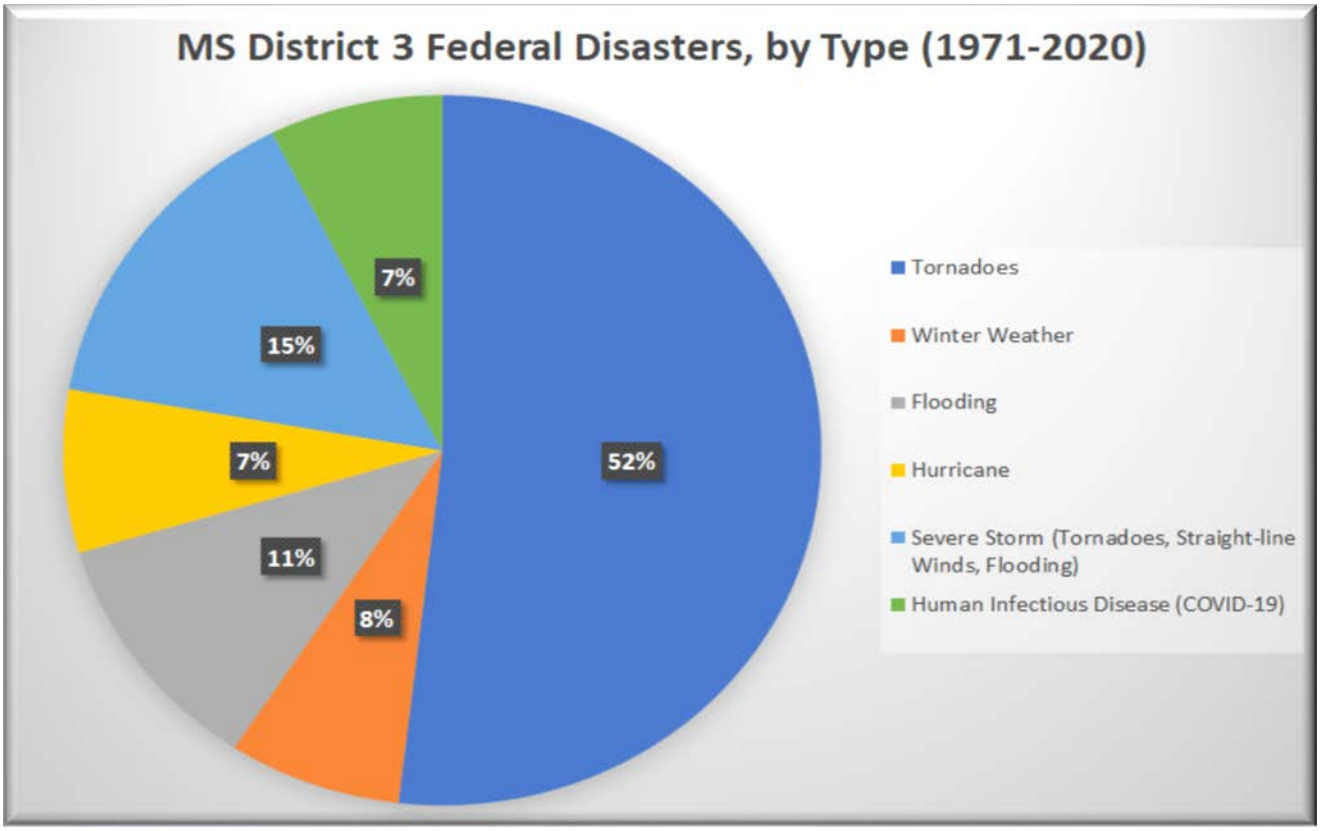
Federal Disaster Declarations

Since 1974, counties within D3 have been issued 29 federal disaster declarations. In the past five years, or in the time since the 2015 District 3 RHMP was written, the region has received Federal Disaster Declarations for events caused by severe storms, flooding, tornadoes, and straight-line winds. The entire state, including D3 has been included in the Emergency Declaration and Disaster Declaration issued as a result of the COVID-19 pandemic on March 13, 2020. Table 4.1.6 shows the 29 declared events affecting the region, and the shaded rows highlight the seven that have occurred since 2015.

Table 4.1.6 : Federal Disaster Declarations in Mississippi District 3 from 1971 through April of 2020 | Source: FEMA Disaster Declarations

Declaration	Hazard Type	Affected Counties	Declaration Date
DR-4528	Covid-19 Pandemic	Attala, Bolivar, Carroll, Holmes, Humphries, Leflore, Montgomery, Sunflower, Washington	April 5, 2020
EM-3474	Covid-19 Pandemic	Attala, Bolivar, Carroll, Holmes, Humphries, Leflore, Montgomery, Sunflower, Washington	March 13, 2020
DR-4478	Severe Storm, Tornadoes, Straight-line Winds, Flooding	Bolivar, Sunflower, Washington	March 12, 2020
DR-4450	Severe Storm, Tornadoes, Straight-line Winds, Flooding	Holmes	December 6, 2019
DR-4429	Severe Storm, Tornadoes, Straight-line Winds, Flooding	Carroll, Humphreys, Leflore, Montgomery, Sunflower, Washington	April 23, 2019
DR-4314	Severe Storm, Tornadoes, Straight-line Winds, Flooding	Carroll, Holmes, Montgomery	May 22, 2017
DR-4268	Severe Storm, Flooding	Bolivar, Holmes, Leflore, Sunflower, Washington	March 25, 2016
DR-4175	Severe Storm, Tornado, Flooding	Montgomery	April 30,2014
DR-4081	Hurricane	Attala, Carroll, Holmes, Montgomery	August 8,2012
DR-1983	Flooding	Bolivar, Humphreys, Washington	May 11,2011
DR-1972	Severe Storm, Tornado	Attala, Carroll, Holmes, Montgomery,	April 29, 2011
DR-1906	Severe Storm, Tornado	Attala	April 29, 2010
DR-1604	Hurricane	Attala, Bolivar, Carroll, Holmes, Humphreys, Leflore, Montgomery, Sunflower, Washington	August 29,2005
DR-1594	Hurricane	Attala	July 10, 2005
DR-1459	Severe Storm, Tornado	Attala, Holmes	April 24, 2003
DR-1398	Severe Storm, Tornado	Bolivar, Humphreys, Sunflower, Washington	December 7, 2001
DR-1360	Severe Storm, Tornado	Attala, Bolivar, Carroll, Holmes, Humphreys, Leflore, Sunflower, Washington	February 23, 2001
DR-1265	Severe Winter Weather	Attala, Bolivar, Carroll, Humphreys, Leflore, Montgomery, Sunflower, Washington	January 25, 1999
DR-1178	Flooding	Bolivar, Washington	June 13, 1997
DR-1009	Severe Winter Weather	Bolivar, Leflore, Sunflower, Washington	February 18, 1994
DR-968	Severe Storm, Tornado	Attala	November 25,
DR-939	Severe Storm, Tornado	Washington	March 20, 1992
DR-906	Severe Storm, Tornado	Bolivar, Carroll, Holmes, Humphreys, Leflore, Sunflower, Washington	May 17, 1991
DR-888	Severe Storm, Tornado	Carroll, Humphreys, Leflore	January 3, 1991
DR-895	Flooding	Bolivar, Leflore, Sunflower, Washington	March 5, 1991
DR-683	Severe Storm, Tornado	Holmes, Leflore, Washington	June 1, 1983
DR-577	Severe Storm, Tornado	Attala, Holmes, Leflore, Montgomery	April 16, 1979
DR-368	Severe Storm, Tornado	Bolivar, Carroll, Holmes, Humphreys, Leflore, Montgomery, Sunflower, Washington	March 27, 1973
DR-302	Severe Storm, Tornado	Carroll, Holmes, Humphreys, Leflore, Sunflower, Washington	February 22, 1971

Figure 4.1.0: Federal Disaster Declarations by Type (1971 – 2020)



Summary of Losses

The following hazards did not have any reported impacts (damages reported) during the planning period.

- Dams/Levees
- Earthquakes
- Expansive Soils
- Wildfire

Table 4.1.7 provides a summary of damages sustained to property and crops by county for each of the hazards profiled in the plan. The loss figures are based on data tracked by NCEI for reported events.

Table 4.1.7 – Summary of Hazard Ranking Events 2000-2019 | Source: NCEI

		Attala	Bolivar	Carroll	Holmes	Humphreys	Leflore	Montgomery	Sunflower	Washington
Hazard Type										
Drought	No. of Events	7	8	12	13	10	11	7	9	9
	Prop Damage	$70,000	-	$60,000	$120,000	$130,000	$80,000	$50,000	-	-
	Crop Damage	$4,400,000	$7,251,000	$3,881,000	$3,821,000	$6,991,000	$4,931,000	$2,400,000	$4,301,000	$7,301,000
	Death / Injury	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -
Excessive Heat / Heat	No. of Events	5	5	5	5	5	6	5	6	7
	Prop Damage	-	-	-	-	-	-	-	-	-
	Crop Damage	-	-	-	-	-	-	-	-	-
	Death / Injury	- /-	2 /-	- /-	- /-	- /-	- /-	- /-	1 /-	3 /-
Flood	No. of Events	12	44	25	21	16	35	14	41	55
	Prop Damage	$1,400,000	$2,817,000	$1,026,000	$1,473,000	$1,897,000	$2,167,000	$781,000	$2,757,000	$17,407,000
	Crop Damage	-	$1,205,000	$150,000	$300,000	$1,100,000	-	-	$1,200,000	$12,252,000
	Death / Injury	- / -	- / -	- / -	- / -	- / -	- / -	- / 1	- / -	- / -
Severe Storm	No. of Events	118	257	187	129	229	229	82	136	226
	Prop Damage	$1,708,000	$6,251,000	$6,997,000	$1,781,000	$821,500	$7,169,000	$2,020,000	$10,894,000	$5,373,000
	Crop Damage	$100,000	$720,000	$726,000	$48,000	$150,000	$1,350,000	$200,000	$3,550,000	$409,000
	Death / Injury	/ 1	- / -2	1 / -	1 / -	- /-	1 /-	- /-	- /-	1 / 1
Severe Winter Weather	No. of Events	10	24	6	9	12	16	7	16	1
	Prop Damage	$1,123,000	$1,957,000	$330,000	$1,160,000	$910,000	$1,620,000	$642,000	$1,415,000	$1,430,000
	Crop Damage	-	-	-	-	-	-	-	-	-
	Death / Injury	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -
Tornado	No. of Events	12	12	9	19	12	17	5	16	10
	Prop Damage	$65,900,000	$13,192,000	$915,000	$68,137,000	$6,383,000	$4,575,000	$713,000	$2,070,000	$4,555,000
	Crop Damage	$7,116,000	$705,000	$720,000	$7,025,000	$705,000	$1,115,000	$800,000	$215,000	$3,000
	Death / Injury	0 / 10	0 / 37	- / -	3 / 44	1 / 10	- / -	- / -	- / 3	1 / 14
Tropical Storm / Hurricane	No. of Events	3	2	3	2	2	3	2	2	3
	Prop Damage	$500,150,000	$710,000	$1,010,000	$1,000,000	$530,000	$1,081,043	$10,020,000	$510,000	$586,043
	Crop Damage	$20,000,000	$5,200,000	$15,050,000	$15,000,000	$8,200,000	$12,100,000	$50,050,000	$5,150,000	$8,200,000
	Death / Injury	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -

Summary of Hazard Ranking

Because quantitative data does not always provide a full picture of hazard impacts, the results of the statistical ranking were discussed with the RHMC and with individual EMDs to secure their perspective on how each hazard affects their jurisdictions. With their input, hazards were ranked as being of Low, Medium, or High concern per county-specific listings presented in Table 4.1.4-1.

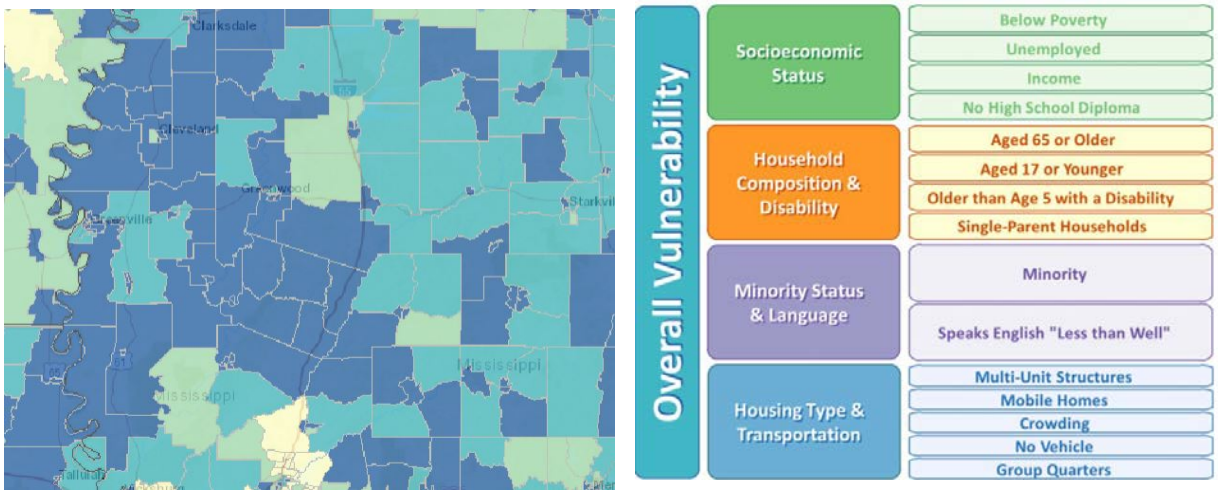
Table *4.1.4-1 – Summary of Hazard Ranking*

Hazard Type	*Attala*	*Bolivar*	*Carroll*	*Holmes*	*Humphreys*	*Leflore*	*Montgomery*	*Sunflower*	*Washington*
Dam/Levee Failure	Low	High	Medium	Low	Low	Low	Low	Low	Low
Drought	Low	Low	Low	Low	Low	Low	Low	Low	Low
Earthquake	Low	Low	Low	Low	Low	Low	Low	Low	Low
Extreme Heat/Heat	Low	Low	Low	Low	Low	Low	Low	Low	Low
Expansive Soils	Low	Low	Low	Low	Low	Low	Low	Low	Low
Flood	High	High	Low	Medium	High	Medium	Medium	High	High
Severe Storm	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	High
Severe Winter Weather	Medium	Medium	Low	Low	Low	Medium	Low	Medium	Medium
Tornado	High	Medium	High	High	Medium	Medium	High	High	Medium
Tropical Storm/Hurricane	Low	Low	Low	Low	Low	Low	Low	Low	Low
Wildfire	Low	Low	Low	Low	Low	Low	Low	Low	Low

4.2 Natural Hazard Profiles and Risk Assessment

This section presents the natural hazards likely to affect the planning area as determined by risk level, ranking them as being of high, medium, or low concern. Hazard profiles include the hazard description, location, extent (or magnitude), previous occurrences, and probability of future events. Information presented is based on best available data and may vary between hazards. Vulnerability was measured for impact to people; property and crop damage; and damage to critical facilities and infrastructure. Collection and analysis of hazard and vulnerability data enabled participating jurisdictions to identify and prioritize appropriate mitigation actions to reduce or eliminate hazard-related losses in the mitigation strategy. The following tools were utilized in gathering data for the 2020 RHMP Update:

- ***Geospatial Information System (GIS) –*** *a computer system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographical date.*
- ***Flood Insurance Rate Maps (FIRM) –*** *an official community map on which FEMA has delineated both the special flood hazard areas (SFHA) and the risk premium zones applicable to the community.*
- ***HAZUS – MH:*** *A GIS-based that includes natural hazard loss estimation software. When available, information from this program has been incorporated into individual hazards.*
- **Centers for Disease Control and Prevention (CDC) – Social Vulnerability Index (SVI)**: This is a database created by the Agency for Toxic Substances and Disease Registry (ATSDR) to help emergency response planners and public health officials identify and map communities most likely to need support before, during, and after a hazardous event. The SVI uses U.S. Census data to rank census tracks on 15 social factors, including poverty, lack of vehicle access, crowded housing. Data is grouped into four related themes to help public health officials and local planners better prepare for and respond to emergency events like hurricanes, disease outbreaks or exposure to dangerous chemicals. Maps showing the SVI for each county are included in the County Annexes.



Methodology for Determining Probability of Future Occurrences for Natural Hazards Profiled

There is some challenge in using statistics to document past natural hazard events due to the difference in hazard definitions, how incidents are reported, and the type of database that produces analysis of these events. For the purpose of this plan update, the National Center for Environmental Information (NCEI), Storm Events Database (NOAA) serves as the primary data source for documenting previous weather occurrences and calculating future probability. Where quantitative data was available, it was used to estimate the probability of the occurrence of a given event. The recurrence interval or return period is based on the probability a given event will be equaled or exceeded in any given year. This was calculated by dividing the number of years on record by the number of events. In this case an event may have occurred several times in single year, but for calculation purposes that event is listed occurring once for that year.

The Table 4.2 provides a general description that is being used to define the probability of future occurrences for the identified hazards of concern. These descriptions vary from those used earlier to assist hazard ranking.

Table 4.2: General Descriptions Used to Define Future Probability

Probability of Future Occurrence	Numerical
Susceptible	Unknown or less than less than 1% chance occurrence in a given year
Low	1 to 35% chance of occurrence in a given year
Likely	36 to 75% chance of occurrence in a given year
Highly Likely	76% or greater chance of occurrence in a given year

Hazard Profiles

Dam/Levee Failure

Hazard Description

A dam is any artificial barrier, including appurtenant works, constructed to impound or divert water, wastewater, liquid borne materials or solids that may flow if saturated. All structures necessary to maintain the water level in an impoundment or to divert a stream from its course will be considered one dam.

A levee is an artificial embankment alongside a river. The main purpose of an artificial levee is to prevent flooding of the adjoining countryside; however, they also confine the flow of the river resulting in higher and faster water flow.

The Surface Water and Dam Safety Divisions of the Office of Land and Water Resources, Mississippi Department of Environmental Quality (MDEQ) develop regulations on Dam Safety for the state. Dams are categorized according to what lies downstream, as well as the expected impact of dam failure. The following is taken from regulations for dams in Mississippi, describing the statutory dam categories and their characteristics.

Low Hazard (Category III, or Class A): Dam in which failure would at the most, result in damage to agricultural land, farm buildings (excluding residences), or minor roads. Without exception, all low hazard dams in Mississippi are earthen dams.

Significant Hazard (Category II, or Class B): Dam in which failure poses no threat to life, but which may cause significant damage to main roads, minor roads, or cause interruption of service of public utilities.

High Hazard (Category I, or Class C): Dam failure may cause loss of life, serious damage to homes, industrial or commercial buildings, important public utilities, main highways or railroads. Dams constructed in residential, commercial, or industrial areas are classified as high hazard dams unless otherwise classified on a case-by-case business. For example, dams constructed where there is potential for development receive a high hazard classification. The term “High Hazard” does not speak to the quality of the structure, but the potential for a resultant death or exposure to property damage downstream in case of a failure. A dam can be as small as six feet in height, but if a homeowner lives within a reasonable distance of the structure, he would be considered to be vulnerable.

A more detail discussion of the location and extent, previous occurrences and overall vulnerability for each county and its jurisdictions to this hazard is provided in the respective county’s annex.

Location and Extent

The Dam Safety Division at MDEQ routinely reviews the numbers and rankings of dams statewide. During review, dams may be removed from the inventory or placed in categories other than those termed as being of High, Significant, or Low concern. A more detail discussion of the location and extent, previous occurrences and overall vulnerability for each county and its jurisdictions to this hazard is provided in the respective county’s annex.

Table 4.2.1-1 shows the change in the number of dams since the 2015 RHMP was written. Between 2015 and 2019, the total number of regional inventoried dams decreased from 414 to 262. Of these, 224 are classified as low hazard, 32 as high hazard and 6 as significant hazard. Figure 4.2.1 is a map of the dam locations. Carroll County includes the fifth highest number of dams in the state.

Table 4.2.1-1 - Number of Dams in District 3, by Classification | Source: MDEQ Dam Safety Division, 2018 State of Mississippi SHMP

County	Significant		High		Low		Total	
	2015	2020	2015	2020	2015	2020	2015	2020
Attala		1		2	56	44	56	47
Bolivar		-	1	-	25	14	26	14
Carroll	~~4~~	4	21	23	80	86	105	113
Holmes	2	1	3	5	56	39	61	45
Humphreys		-		-	63	4	63	4
Leflore		-		-	10	-	10	-
Montgomery	2	-		2	32	22	34	24
Sunflower		-		-	28	12	28	12
Washington		-		-	31	3	31	3
Total Dams	**8**	**6**	**25**	**32**	**381**	**224**	**414**	**262**

Figure 4.2.1-1: Number of Dams in District 3, by Classification | Source: MDEQ Dam Safety Division, 2018 State Hazard Mitigation Plan

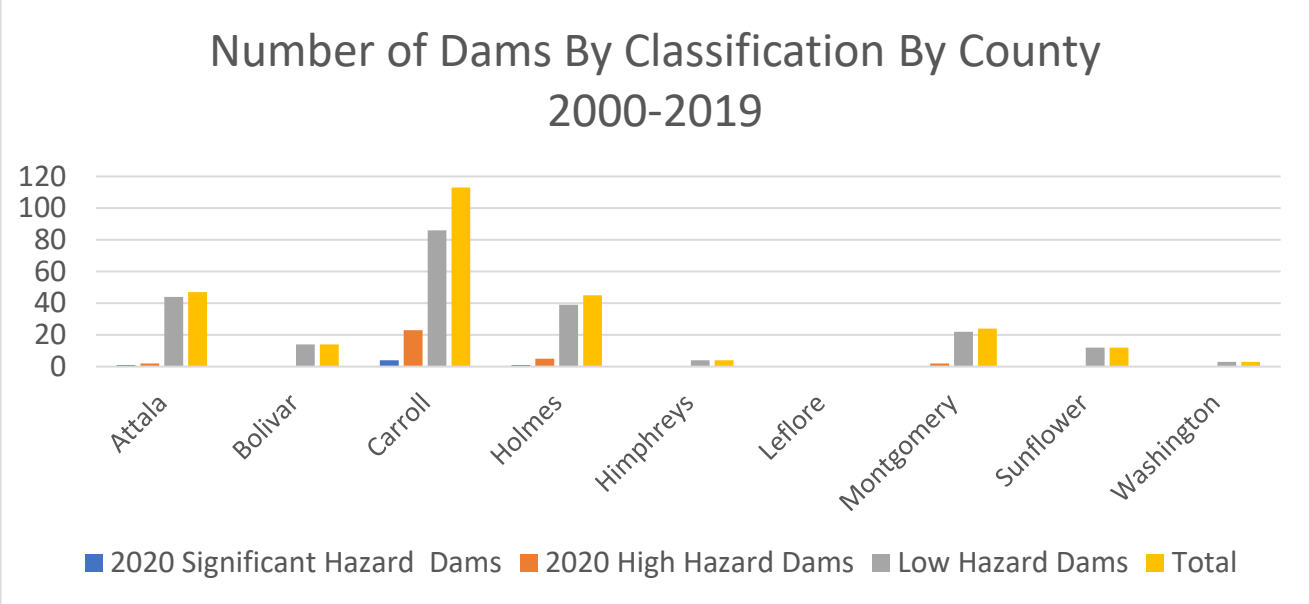
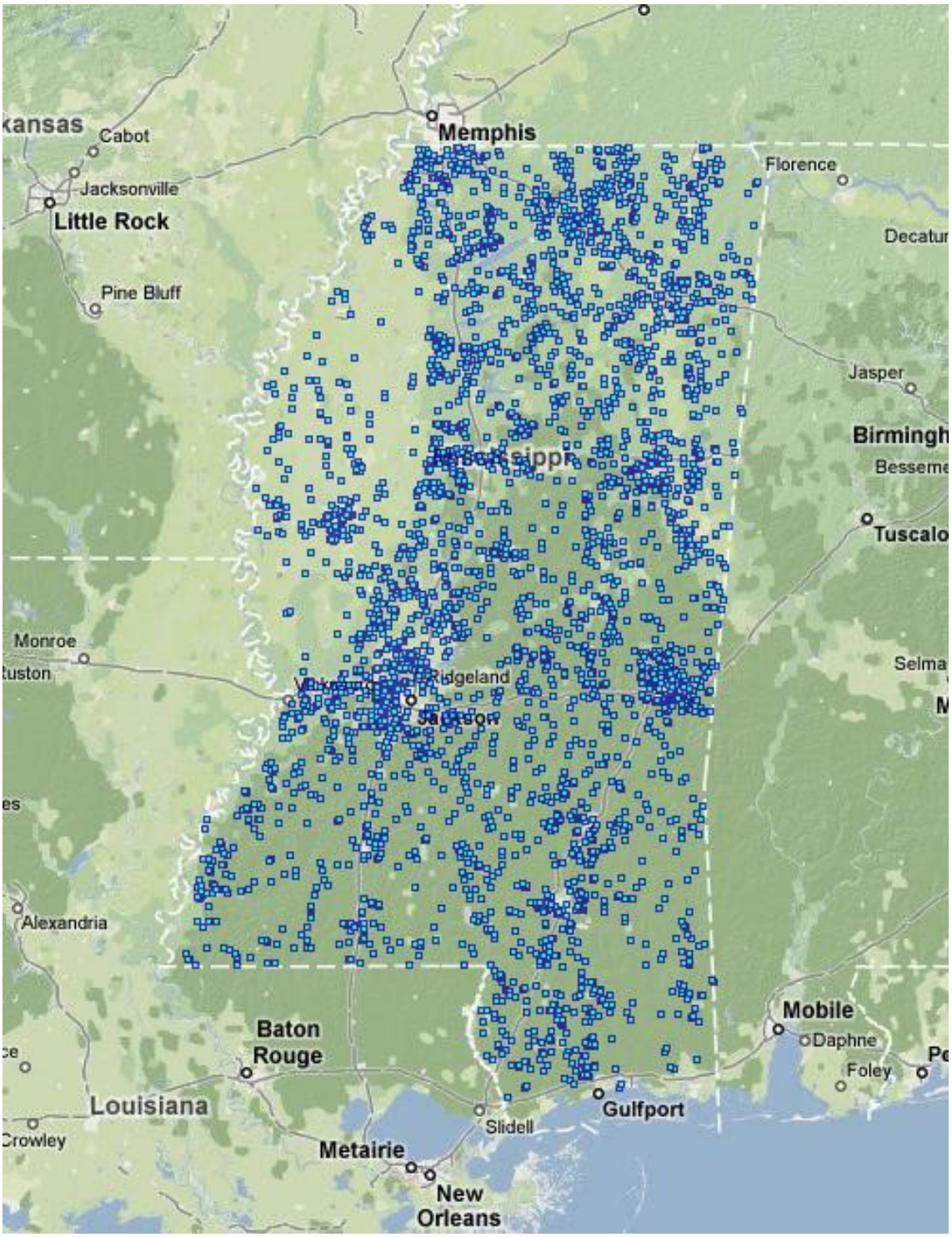


Table 4.2.1-2 compares the changes in classification for dams located in the planning area since 2015 RHMP. A total of 3 dams (1 in Bolivar County and 2 in Carroll County) were reclassified from high to low. Additionally, a total of 10 dams (2 in Attala, 4 in Carroll, 2 in Holmes, and 2 in Montgomery) were reclassified from low to high.

Table 4.2.1-2: Dam Hazard Class Changes - Comparing Change, 2015-2020 | Source: MDEQ Dam Safety Division, 2018 State of Mississippi SHMP

State ID	County	Dam Name	2015 Plan	2020 Plan
From High to Low				
	Bolivar	Delta Stream Electric Station Dam	H	L
	Carroll	Abiaca Watershed Structure Y-34-12 Dam	H	L
	Carroll	Bag Sands Watershed Structure Y-32-19 Dam	H	L
From Low to High				
	Attala	Kenneth Lowe Lake Dam	L	H
	Attala	Albin Pond Dam	L	H
	Carroll	Abiaca Watershed Structure Y-34-13 Dam	L	H
	Carroll	Pelucia Watershed Structure Y-33a-14 Dam	L	H
	Carroll	Abotlaproofa Watershed Structure Y-34-15 Dam	L	H
	Carroll	Abiaca Watershed Structure Y-34-29 Dam	L	H
	Holmes	Tackett Watershed Structure 9 Dam	L	H
	Holmes	Floodwater Retarding Structure Site 35	L	H
	Montgomery	Winona Country Club Lake Dam	L	H
	Montgomery	E&E Ranch Lake Dam	L	H

Figure 4.2.1-2: Mississippi Dam Locations I *Source: 2018 Mississippi SHMP*



Levee locations are shown in Figure 4.2.1-3. Mapping inputs were provided by jurisdictions of the Mississippi Levee Board and the U.S. Army Corp of Engineers (USACE).

Figure 4.2.1-3 –Mississippi Levee System | Source: Memphis District via Neel-Schaffer Inc.

Previous Occurrences

The Mississippi Department of Environmental Quality Dam Safety Division records statewide dam and levee failures. Table 4.2.1-3 shows failures occurring in D3 between 1982 and 2020. There have been no dam or levee failures in District 3 since the 2015 RHMP update.

Table 4.2.1-3 - Dam Failures 1982 – 2020 | Source: MDEQ Dam Safety Division

Date	County	Structure Name	Cause of Failure
April 2002	Carroll	Billups Dam	Piping
June 1989	Leflore	Abiaca Creek	Breached
April 1983	Leflore	Pelucia Bayou	Breached
December 1982	Leflore	Pelucia Bayou	Overtopped

The most significant and damaging flood caused by levee failure in the United States took place April 21, 1927 on the Mississippi River near Mound Landing in Bolivar County. This event caused flooding on adjacent land between the cities of Beulah and Vicksburg. This break is portrayed in aerial photographs in Figure 4.2.1-4 and Figure 4.2.1-5. Most of the alluvial valley was under water. This devastating event caused the deaths of at least 246 people and flooded numerous cities, towns, and villages. The flood inundated 1,800 square miles of land, drove 700,000 people from their homes, and destroyed 1.5 million farm animals. Economic losses were staggering and reached hundreds of millions of dollars. Interstate freight and passenger traffic was suspended; telegraph and telephone communication were hindered; the United States Postal Service was unable to make deliveries; and, overall, the operation of industry and commerce were paralyzed. on May 15, 1928, as a result of this event, the U.S. Congress passed the General Flood Control Act of 1928, causing the federal government to assume the cost of all levee construction.

Other incidents of levee failure along the Mississippi River prior to the General Flood Control Act of 1928 are recounted by Bolivar County resident and State legislator Walter Sillers in his 1929 report to the American Red Cross. [2]

- *In 1882, the entire Bolivar County Mississippi River levee (about 85 miles), seemed to snap in a hundred places in one night, during a terrible storm on the night of February 28th, and the whole county was under water.*
- *A section of the levee a mile long caved into the river south of the town of Prentiss in 1865, and other levees, north and south, in Bolivar County, either caved in or broke; and as the stage of water was high for that day, a disastrous overflow swept over the country, drowning stock, sweeping away fences, destroying crops, and carrying destruction and disaster in its wake.*
- *A private levee along Lake Vermillion from Lake Beulah to Neblett's Landing in Bolivar County was adopted as a part of the main levee system, in lieu of the abandoned levee. Despite all the work and care given to this levee proper, there were many breaks in it [in] 1867, 1882, 1884, 1874 and 1897. A break occurred in the Catfish*

[2] Walter Sillers (American National Red Cross. (1929). *The Mississippi valley flood disaster of 1927: official report of the relief operations.* Washington, D.C.: The American National Red Cross. https://babel.hathitrust.org/cgi/pt?id=mdp.39015033926133&view=1up&seq=7.

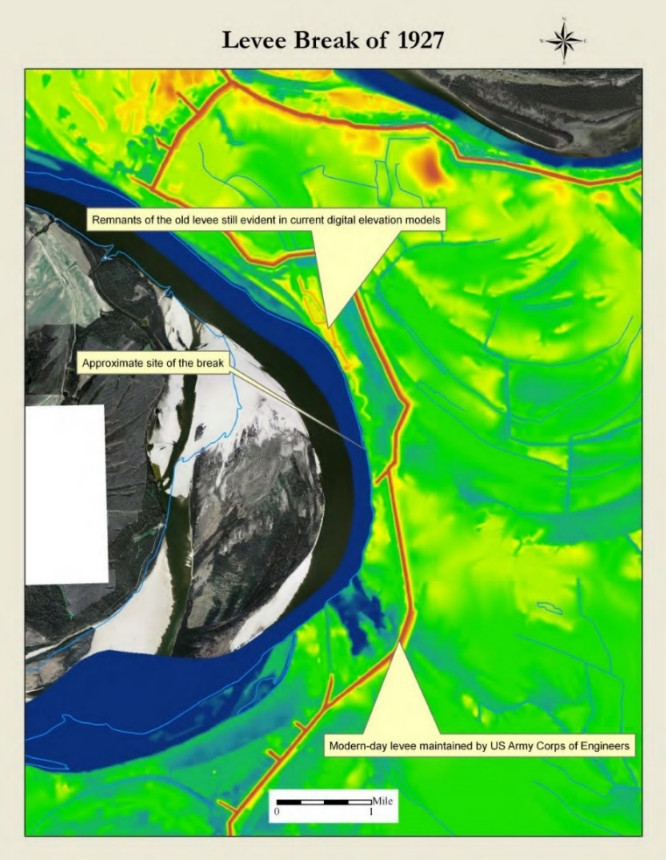
Point Levee in 1890, causing this entire Point, with its improved plantations, to be thrown outside the levee and abandoned. The most disastrous of all was in 1912, in which, the water was the highest on record and caused a disastrous break in the levee four miles below Beulah.

- *In 1922, the closure of the Cypress Creek levees on the Arkansas side of the Mississippi River raised the flood line to the extent water carried over the top of the Mississippi Levees from Kentucky Ridge to Mound Landing, causing a desperate struggle and a vast expenditure of money to top it off and hold it against the increased flood line of the river.*

In 1926, prior to the 1927 levee failure, Bolivar County was operating under the second Flood Control Act of 1923, under which all levee boards contributed one-third of the cost of construction of the levees and maintained the works post-construction.

Figure 4.2.1-4 – Levee Failure 1927 I Source: 2018 Mississippi SHMP

Figure 4.2.1-5 – Levee Failure 1927 | Source: 2018 Mississippi SHMP



Probability of Future Occurrences

While the structural weakness of a dam is apparent from outside observation, a sunny-day event, without warning, can turn an earthen dam into a muddy whirlpool. There are ways to evaluate imminent failure of a structure, but these do not always provide the information needed to foretell future events. Therefore, all dams located within the D3 planning area can expect some level of breach at any given time. The probability of future occurrence is classified as susceptible.

Assessing Vulnerability

Life, property, the economy and the environment are vulnerable to dam and levee failures throughout D3 because the water rushes at everything in its pathway after a breach.

People

Dam/Levee Failure can put nearby populations in harm's way. Loss of life is the primary concern in assessing vulnerability to dam and levee failure. For this reason, a dam is considered high hazard if only one life is at-risk to inundation in the event of a failure. When water is released from a dam failure, its course and destination can become unpredictable. The National Weather Service will issue a Flash Flood Warning in the event of a dam failure. Drivers attempting to cross highways lacking drainage culverts without using a bridge are at risk of being caught in a flash flood.

Of the population exposed to dam and/or levee failure, the most vulnerable include the economically disadvantaged and the population over age 65. Economically disadvantaged populations are more

vulnerable because they are likely to evaluate their risk and make decisions to evacuate based on net economic impact on their families. The population over age 65 is also highly vulnerable because these people are more likely to seek or need medical attention which may not be available because of isolation during a flood event, and they may have more difficulty evacuating.

Often, warning time for dam failure is limited. These events are frequently associated with other natural hazard events such as earthquakes, landslides, or severe weather, which limits their predictability and compounds the hazard. Populations without adequate warning of the event are highly vulnerable to this hazard.

MDEQ Dam Safety Division records do not include deaths directly attributable to dam failure. In 2020, an indirect death occurred when a driver ignored a warning sign and drove into a ravine created by a dam failure that resulted from Tropical Storm Isidore.

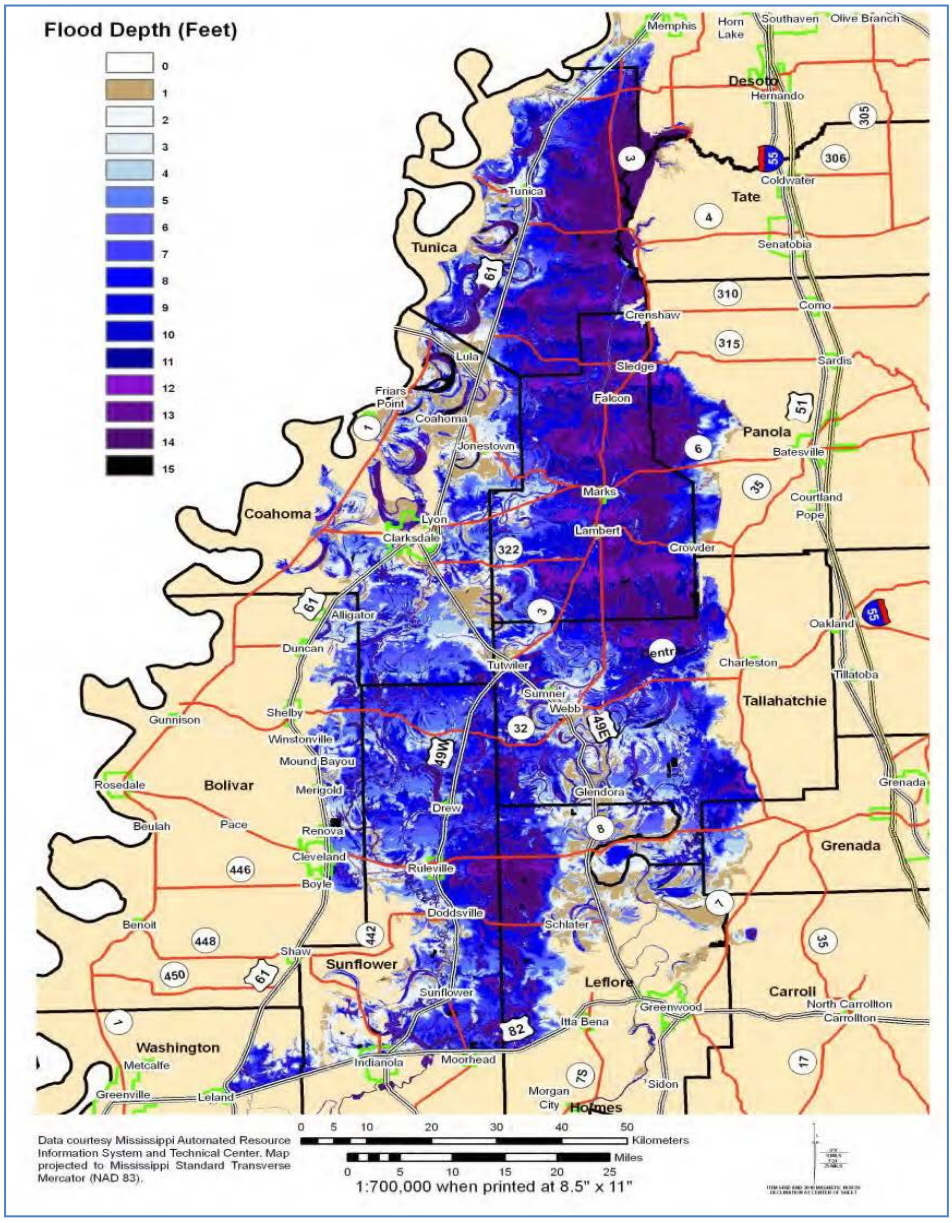
Property

Residential homes as well as public buildings and infrastructure are vulnerable to damage if formerly impounded waters are released due to dam or levee failure. In many cases a dam or levee failure results in property damage that cannot be returned to pre-incident levels. Homes built within the footprint of a "low hazard" dam suddenly may change the dam's status to "high hazard" and unknowingly place homeowners and their families at risk. The design lifetime of an earthen dam is about 50 years. Often, the owner is not able to conduct routine site inspections of the dam and may not detect warning signs of an eminent failure that might impact downstream properties.

All transportation infrastructure within the dam failure inundation zone is vulnerable to damage, resulting in potential cutoff of evacuation routes, limitations on emergency access, and possible isolation issues. Utilities such as overhead power lines, cable lines, and phone lines could also be vulnerable. Loss of these utilities could create additional isolation issues within the inundation areas. Dam failure can cause severe downstream flooding and may transport large volumes of sediment and debris, depending on the magnitude of the event. Widespread damage to buildings and infrastructure affected by an event would result in large costs to repair these locations. In addition to physical damage costs, businesses can be closed while flood waters retreat, and utilities returned to a functioning state.

The 2018 SHMP provides an assessment of multi-county dam failure scenario, which is included as part of this D3 RHMP update. The presented scenario assumes a failure at Arkabutla Lake and Dam and predicts water from a failure originating in DeSoto County would eventually end in Leflore County. Water from the failure would take 45 days to travel to the Sunflower River and involve untold damage to private and public property (2018 SHMP). Since the movement of water would be slowed in its journey to the Sunflower River, there would be ample warning to people downstream to enable evacuation, but the event would still cause hundreds of deaths because water would block roads people need in order to evacuate. The disruption to business and the costs of recovery would range in the billions of dollars. Figure 4.2.5 depicts flooding that could be expected as a result of a Lake Arkabutla Dam Failure.

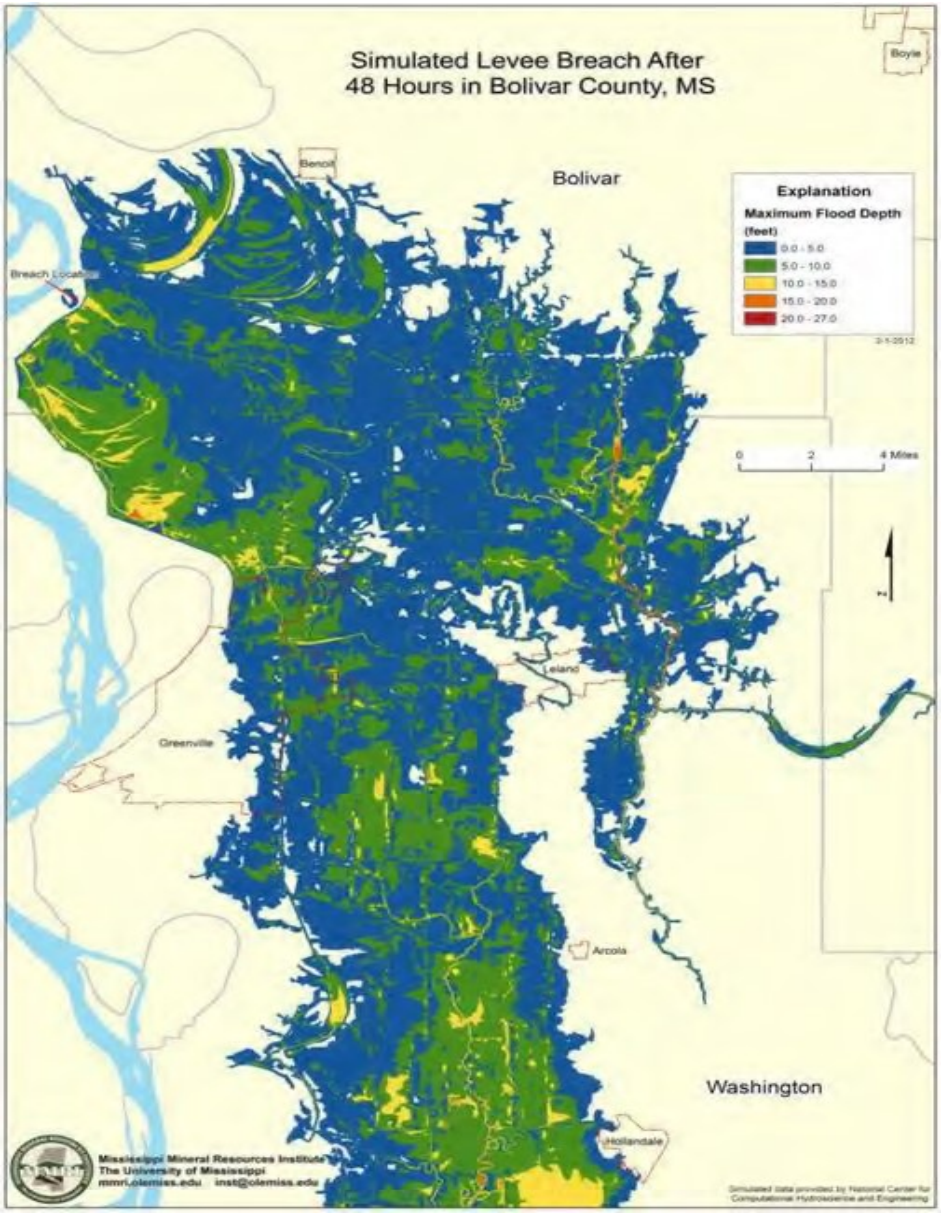
Figure 4.2.1-6–Lake Arkabutla Dam Failure Scenario | Source: 2018 Mississippi SHMP



Carroll County is ranked as the county with the fifth highest number of dams in the state. The county and its jurisdictions include many historic properties that serve as the basis for its tourist industry. Any impacts caused by flooding due to a dam breech would be devastating to the County.

MEMA also contracted with the University of Mississippi to further explore the risks associated with levees along the Mississippi River. The University and MEMA developed a scenario in which there was a levee affected at Mounds Landing, located in Bolivar County. Figure 4.2.6 shows a simulated levee breach 48 hours post-impact from Mound Bayou.

Figure 4.2.1-7 –Levee Breach Flood Model – Mounds Landing | Source: University of Mississippi



Economy

Water surge from Dam or Levee Failure can cause significant economic damage. Structures housing large or small businesses located near the failure are at risk for inundation. Inundation of crops, and trees may destroy assets necessary for successful use in farming or forestry-related industries. Because water in these situations inundates with particularly heavy force, its power can destroy homes and businesses otherwise able to withstand wind and weather**.**

Environment

Water that is impounded loses its dissolved oxygen. When a dam empties into a watercourse, fish in the watercourse suffocate and die as a result of a lack of biologically dissolved oxygen. Silt is often at the bottom of a dam impoundment and will enable water-borne bacteria and microbes to grow in an environment free of the cleansing action of sunlight. Mining operations utilize dams to impound tailings and may include processed water, process chemicals, and portions of un-recovered minerals, all of which are toxic to aquatic and human life. This does not imply that dams are a hazard to people and to the environment, but waterborne minerals and water without aeration need to remain impounded behind a dam.

Impact of Growth and Development on Dam/Levee *Failure*

There are currently no Dam/Levee Failure land use policies in MEMA District 3, nor has the region or its communities adopted development or building regulations designed to decrease the overall vulnerability to Dam/Levee Failure events. The greatest potential change in land use and future development may be an increase in residential and commercial development near dams, resulting in the need to review and update the classification of a dam.

Impacts of Climate Change

As global temperatures continue to change, excessive rainfall events associated with tropical storms/hurricanes and severe thunderstorms have the potential to increase the vulnerability of dam and levee structures in District 3 counties due to higher water levels. Dam design is based on assumptions about a river or body of water's flow behavior, expressed as hydrographs. As annual rainfall levels and changes in weather patterns continue to increase, they can significantly affect the hydrograph used for design of a dam. If the hygrograph changes, the dam conceivably could lose some or all of its designed margin of safety, also known as freeboard. Loss of designed margin of safety increases possibility that floodwaters would overtop the dam or create unintended loads. These situations could lead to a dam failure.

Drought

Hazard Description

According to the National Oceanic and Atmospheric Administration (NOAA), a drought is defined as a period of unusually dry weather persisting long enough to cause serious problems, such as crop damage and/or water supply shortages. The severity of the drought depends upon the degree of moisture deficiency and the duration of the drought.

Drought occurs under differing conditions, based on these reference points:

Meteorological drought is defined as a period of substantially diminished precipitation duration and/or intensity. The commonly used definition of meteorological drought is an interval of time, generally on the order of months or years, during which the actual moisture supply at a given place consistently falls below the average moisture supply.

Agricultural drought occurs when there is inadequate soil moisture to meet the needs of a crop at a given time. Agricultural drought usually occurs after or during meteorological drought, but before hydrological drought and can affect livestock and other dry-land agricultural operations.

Hydrological drought refers to deficiencies in surface and subsurface water supplies from deficiencies in precipitation. It is measured as stream flow, snowpack, and as lake, reservoir, and groundwater levels. There is usually a delay between lack of rain or snow and less measurable water in streams, lakes, and reservoirs. Therefore, hydrological measurements tend to lag other drought indicators.

Socio-economic drought occurs when physical water shortages start to affect the health, wellbeing, and quality of life of people, or when drought starts to affect the supply and demand of an economic product.

A drought's severity depends on numerous factors, including duration, intensity, and geographic extent, as well as regional water demands by humans, livestock, crops, and vegetation. The severity of drought can be aggravated by other climatic factors, such as prolonged high winds and low relative humidity. Due to its multi-dimensional nature, drought is difficult to define in exact terms and poses difficulties in terms of comprehensive risk assessments.

In 1965, Wayne Palmer, a meteorologist with the Office of Climatology, U.S. Weather Bureau (now the National Weather Service), developed an index to "measure the departure of the moisture supply." This index was based on the supply-and-demand concept of the water balance equation, considering more than merely the precipitation deficit at specific locations. The objective of the Palmer Drought Severity Index (PDSI) was to provide a measurement of moisture conditions that were "standardized" so comparisons using the index could be made between locations and between time periods. While Palmer's indices are water balance indices that consider water supply (precipitation), demand (evapotranspiration) and loss (runoff), another commonly used drought index, the Standardized Precipitation Index (SPI), is a probability index that considers only precipitation. Therefore, and for the purposes of this plan, drought will be analyzed using the PDSI.

The PDSI varies between -4.0 and +4.0. Weekly Palmer Index values are calculated for the Climate Divisions during every growing season and are available from the Climate Prediction Center. The entire planning area could expect to experience the entire range of drought severity and classification. Table 4.2.2-1 lists the Palmer Drought Severity Index.

Table 4.2.2-1: Palmer Drought Severity Index | Source: NCDC (https://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/)

Index Value	Classification	Index Value	Classification
4.00 or more	Extremely wet	-0.50 to -0.99	Incipient dry spell
3.00 to 3.99	Very wet	-1.00 to -1.99	Mild drought
2.00 to 2.99	Moderately wet	-2.00 to -2.99	Moderate drought
1.00 to 1.99	Slightly wet	-3.00 to -3.99	Severe drought
0.50 to 0.99	Incipient wet spell	-4.00 or less	Extreme drought
0.49 to -0.49	Near normal		

The Keetch-Byram Drought Index (KBDI) is also used to assess the level of drought. The KBDI is a mathematical system for relating current and recent weather conditions to potential or expected wildfire behavior. This system was originally developed for the southeastern United States and is based primarily on recent rainfall patterns. The KBDI drought index system is the most widely used by fire managers in the south. It is also one of the only drought index systems specifically developed to equate the effects of drought with potential fire activities.

The result of this system is a drought index number ranging from 0 to 800 accurately describing the amount of moisture missing. A rating of zero defines the point of no moisture deficiency and 800 is the maximum drought possible.

These numbers correlate with potential fire behavior as follows:

- 0 - 200: Soil moisture and large class fuel moistures are high and do not contribute much to fire intensity. Typical of spring dormant season following winter precipitation.
- 200 - 400: Typical of late spring, early growing season. Lower litter and duff layers are drying and beginning to contribute to fire intensity.
- 400 - 600: Typical of late summer, early fall. Lower litter and duff layers actively contribute to fire intensity and will burn actively.
- 600 - 800: Often associated with more severe drought with increased wildfire occurrence. Intense, deep burning fires with significant downwind spotting can be expected. Live fuels can also be expected to burn actively at these levels.

Location and Extent

Drought affects the entire planning area equally. A severe, prolonged drought could have negative and lasting impacts on residents, agriculture, industry, and infrastructure. When available water tables decline and potable water becomes harder to obtain, the residents, commuting population, and visitors are exposed to greater health risks. Any water-dependent functions in the state are exposed to potential loss of or failure to function. PDSI and KBDI maps (Figure 4.2.2-a and Figure 4.2.2-b) demonstrate the extent of drought for April 7, 2020 compared to April 9, 2019.

Figure 4.2.2-a Extent of Drought April 7-April 9, 2020 | Source Memphis District via Neel-Schaffer Inc.

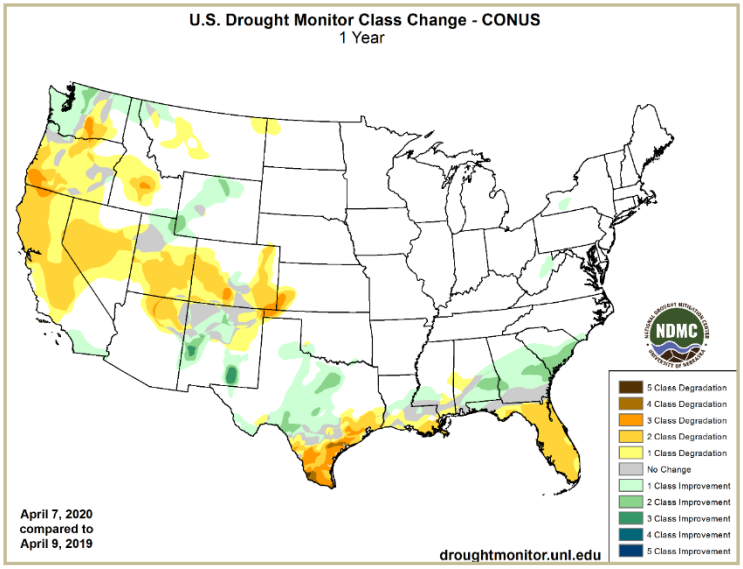
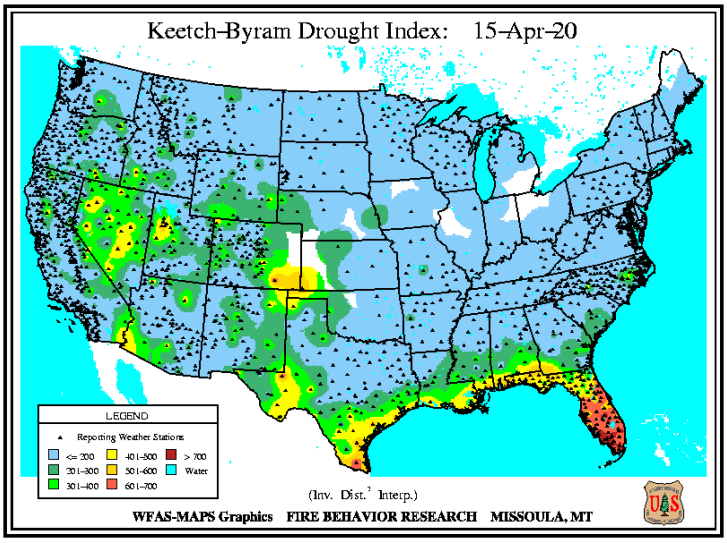


Figure 4.2.2-b: KDBI Extent of Drought April 7-April 9, 2020



Previous Occurrences

NCEI records show there were 98 documented Drought events in MEMA D 3 Counties in the period between January 1, 2000 and December 1, 2019. During this period, total drought-related property damage exceeded $640,000 and the region experienced $46.2 million in crop damage. The total dollar value of losses from damages to both property and crops has also risen throughout the District since the 2015 RHMP was written. Table 4.2.2-2 summarizes the total number of events and associated value of losses to both property and crops between 2000 and 2019. There were 51 events between 2000 and 2015, and there have been 47 new events since the previous plan. Additionally, the total losses from property damage from 2000 to 2015 was $320,000 and since 2015 there has been an increase of $329,000. The total losses from crop damage from 2000 to 2015 was $41,700,000 and there has been an increase of $4,529, 000 in damages since the 2015 plan. Fortunately, no drought-related deaths have been reported.

Table 4.2.2-2: Summary of Drought Events 2000-2019 | Source: NCEI

County	2014 Plan No of Events	2019 Plan No of Events	2014 Plan Property Damage ($)	2019 Plan Property Damage ($)	2014 Plan Crop Damage ($)	2019 Crop Damage ($)
Attala	7	12	70,000	120,000	4,400,000	4,891,000
Bolivar	5	8	-	-	6,800,000	7,251,000
Carroll	6	12	30,000	60,000	3,300,000	3,821,000
Holmes	6	13	40,000	120,000	3,300,000	3,821,000
Humphreys	5	10	80,000	130,000	6,500,000	6,991,000
Leflore	5	11	50,000	80,000	4,400,000	4,931,000
Montgomery	7	14	50,000	130,000	2,400,000	2,921,000
Sunflower	5	9	-	-	3,800,000	4,301,000
Washington	5	9	-	-	6,800,000	7,301,000
Total D3	51	98	320,000	640,000	41,700,000	46,229,000

Figure 4.2.2-1 provides a comparison of the total number of drought events for each county in the planning area. Figure 4.2.2-2 provides a comparison of the total damages (property and crops) for each county in the planning area.

Figure 4.2.2-1 - Comparison of Drought Events by County 2000-2019 | Source: NCEI

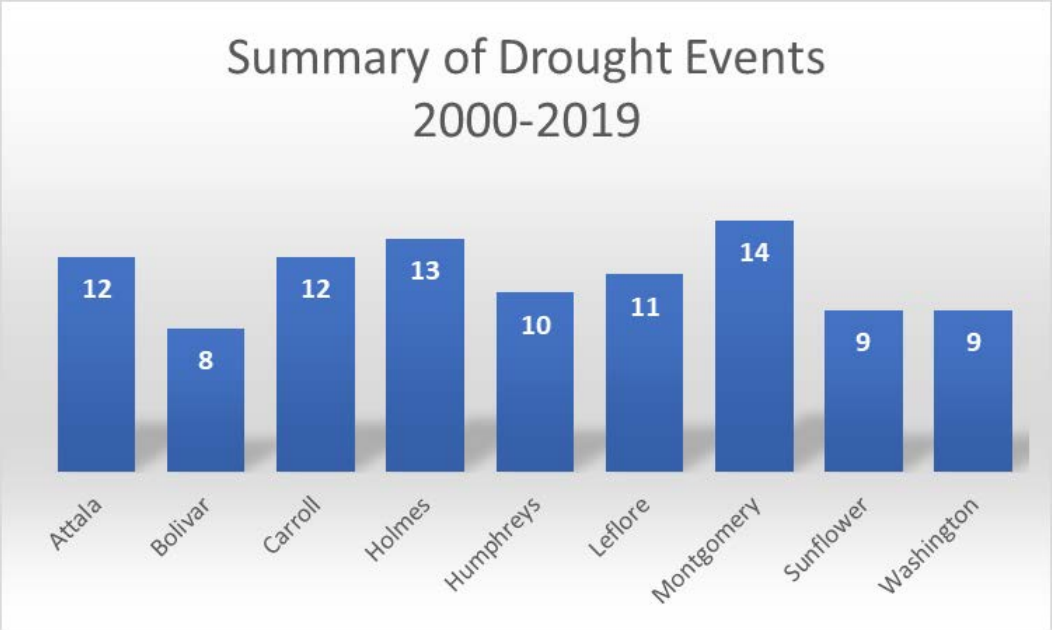
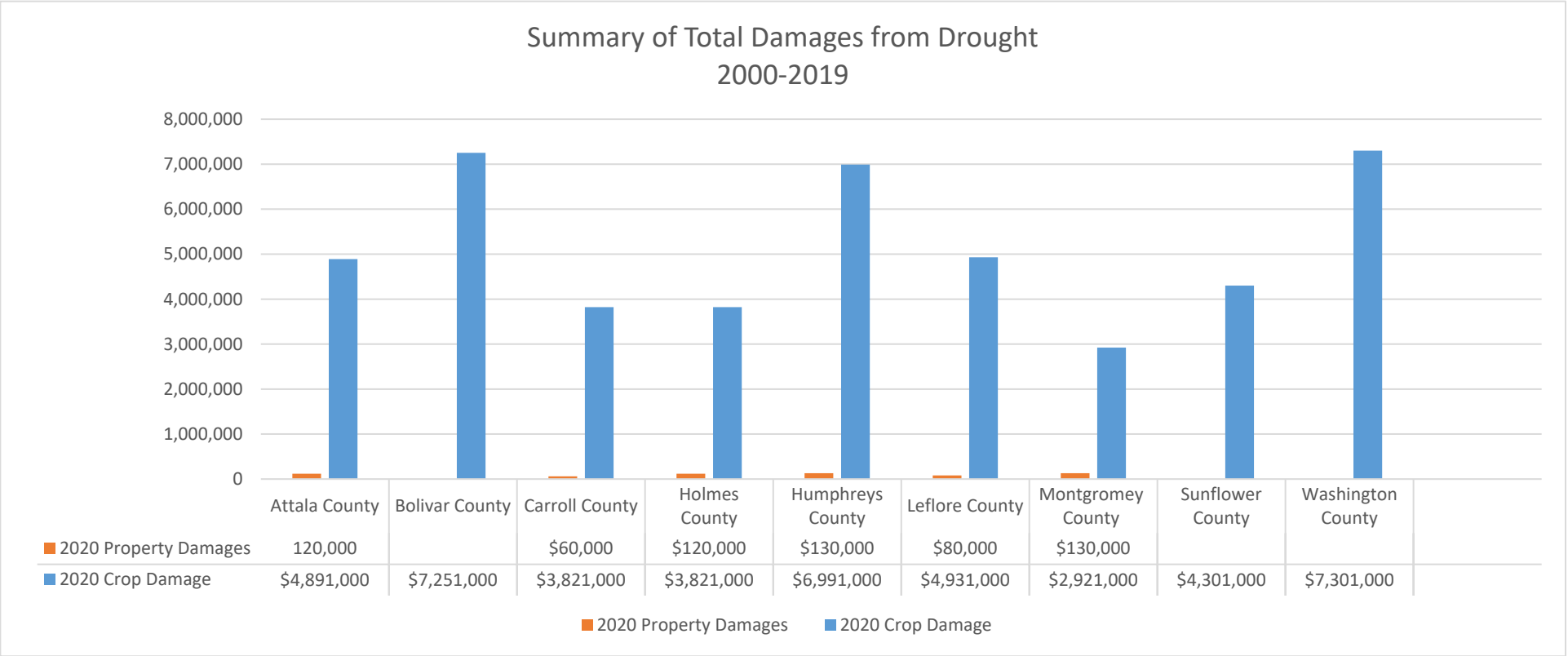


Figure 4.2.2-2 - Comparison of Damages from Drought Events by County-2000-2019 I Source: NCEI

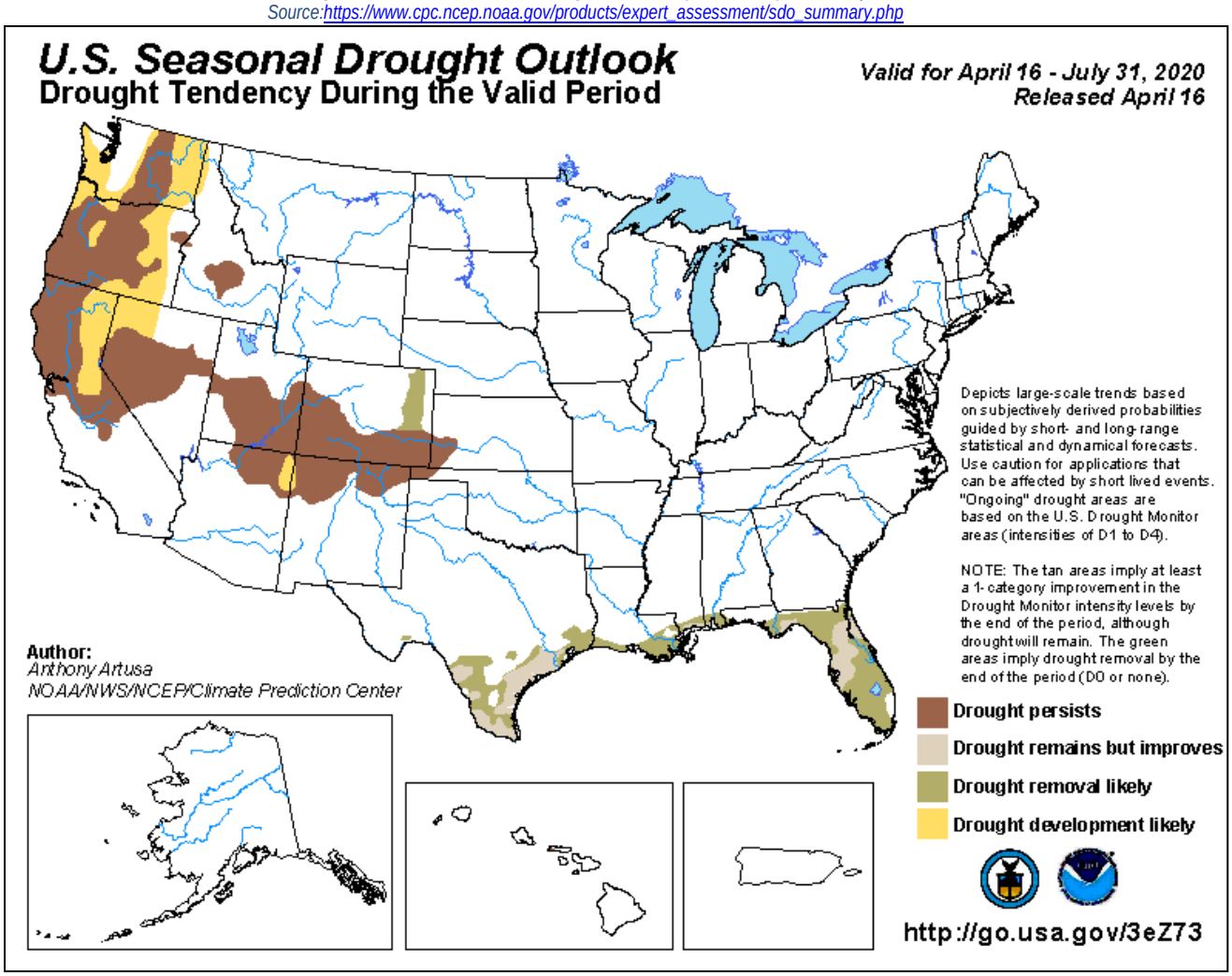


	Attala County	Bolivar County	Carroll County	Holmes County	Humphreys County	Leflore County	Montgromey County	Sunflower County	Washington County
2020 Property Damages	120,000		$60,000	$120,000	$130,000	$80,000	$130,000		
2020 Crop Damage	$4,891,000	$7,251,000	$3,821,000	$3,821,000	$6,991,000	$4,931,000	$2,921,000	$4,301,000	$7,301,000

Probability of Future Occurrences

Forecasting limitations make it unrealistic to estimate precisely the probability of future drought occurrences within the context of this plan. Given statewide drought indices, however, the probability of future drought conditions is likely, as determined by the U.S. Seasonal Drought Outlook. The most current Outlook map is provided in Figure 4.2.2-3; however, continuous monitoring of drought indices and forecasts will allow jurisdictions to anticipate future short-term trends.

Figure 4.2.2-3: U.S. Seasonal Drought Outlook, April 16 – July 31, 2020 |
Source:https://www.cpc.ncep.noaa.gov/products/expert_assessment/sdo_summary.php



Assessing Vulnerability

People

Drought negatively impacts the population when the water supply is affected. Persons lacking water cannot maintain sufficient internal body temperatures for normal well-being may experience headache, dizziness, weakness, cramping, nausea, vomiting, confusion, dehydration, and in some cases death. Drought may also be accompanied by extreme heat, and both hazards affect vulnerable populations – young children, the elderly, and those with a handicap or other special need. If the population of each of the D3 Counties increases based on inappropriate development or special populations, their respective vulnerabilities to Drought will also increase.

Property

It is difficult to quantify the vulnerability of any given area to drought, or the effect of the hazard on the inventory of critical facilities in effort to estimate exposure or losses. In MEMA District 3, a drought would have a negligible impact on critical facilities and a minimal impact to public safety, although land used for agricultural purposes is among the most vulnerable. Table 4.2.2-3 is a summary of the total acreage in each of the D3 Counties dedicated to agricultural uses in comparison to the total acreage in each county. Based on statistics from the USDA 2017

Census of Agricultural Census Report, Attala and Montgomery Counties have the lowest percentages of acreage dedicated to agriculture at 25 and 26 percent respectively. In contrast, over 70 per cent of the land in Bolivar, Leflore, Sunflower and Washington Counties is used for agricultural purposes. In the remaining two counties, Carroll and Humphreys, total percentage of land used for agriculture is 44 and 60 percent respectively.

Table 4.2.2-3 Total Agricultural Acreage in D3 Counties | Source: USDA 2017 Census of Agricultural

County	Total Land Square Miles	Total Acres	Total Acres in Farmland	Total Acres in Farmland
Attala	737	471,680	118,012	25%
Bolivar	906	579,840	409,242	71%
Carroll	635	406,400	177,454	44%
Holmes	765	489,600	241,339	49%
Humphreys	431	275,840	164,153	60%
Leflore	606	387,840	298,807	74%
Montgomery	408	261,120	67,717	26%
Sunflower	707	452,480	388,542	86%
Washington	761	487,040	370,581	76%

Economy

The most immediate effect of drought in the D3 planning area will be felt by the agricultural sector due to its heavy dependence on stored water. This lack of adequate water supply can cause many economic impacts on agriculture and related sectors (forestry, fisheries, and waterborne activities). Crop damage, which would result in economic losses, is an indirect impact. Drought may also create conditions that promote the occurrence of other natural hazards, such as wildfire and wind erosion. Dry conditions have the dual impact of increasing the likelihood of wildfires while decreasing the quantity and pressure of water available for use by firefighters. The likelihood of flash flooding is increased if a period of severe drought is followed by a period of extreme precipitation, due to the inability of the ground to rapidly absorb water runoff.

In addition to losses in yields in crop and livestock production, drought is associated with increased insect infestations, plant diseases, and wind erosion. Drought can lead to other losses because so many sectors are affected by losses that include reduced income for farmers and reduced business for retailers and others who provide goods and services to farmers. This leads to unemployment, increased credit risk for financial institutions, capital shortfalls, and loss of tax revenue. Prices for food, energy, and other products may also increase as supplies decrease.

When a drought occurs, the agricultural industry is most at risk for economic impact and damage. Crops do not mature during droughts, which results in smaller crop yield, undernourishment of wildlife and livestock, decreases in land values, and ultimately financial loss to the farmer. Table 4.2.2-4 provides estimates of economic impacts of agriculture activities in the planning area. The 2017 Census of Agriculture shows that D3 counties included 3,112 farms encompassing 2,235,847 acres of total farmland. The total value of products produced on this property and sold in the marketplace is $1.092 billion.

Table 4.2.2-4: Economic Impact of Agriculture in the Planning Area | Source: USDA 2017 Census

County	Number of Farms	Farmland (acres)	Average Size (acres)	Total Value of Products Sold	Product Value from Crops	Product Value from Livestock
Attala	468	118,012	252	$207,997,000	30%	70%
Bolivar	412	409,242	993	$39,387,000	100%	0%
Carroll	446	177,454	398	$66,288,000	83%	17%
Holmes	496	241,339	487	$95,894,000	96%	4%
Humphreys	179	164,153,	917	$209,985,000	82%	24%
Leflore	257	298,807	1,163	$14,733,000	68%	32%
Montgomery	270	67,717	251	$14,733,000	55%	45%
Sunflower	311	388,581	1,245	$223,785,000	86%	4%
Washington	273	370,581	1,357	$219,370,000	NA	NA
Total	3,114	2,235,886	7,063	$1,092,172,000		

A prolonged drought can have a serious economic impact on a community. Increased demand for water and electricity may result in shortages and higher costs for these resources. Industries that rely on water for business may be impacted the most (for example, landscaping businesses). Although most businesses will still be operational, they may be impacted aesthetically. These aesthetic impacts are most significant within the recreation and tourism industry. Moreover, droughts within another area could impact the food supply/price of food for residents within the County.

Environment

Drought affects human and animal habitat because there is less water available in lakes, streams, aquifers, soil, wetlands, springs, and other surface and subsurface sources. Decreased water availability may lessen water quality by altering levels of salinity, bacteria, turbidity, pH, and temperature. Any such alteration may affect the aquatic habitat of numerous plants and animals found throughout the state.

Low water flow may result in decreased sewage flows and subsequent increases in the level of contaminants found in the water supply. A decrease in water availability overall would lead to a decrease in the drinking water supply and the availability of water for agricultural purposes, thus affecting the food supply. Such a disruption would also lessen the availability of “food” found in the general habitat that would be consumed by fauna and animals. End results could include in a loss of biodiversity; increases in human and animal mortality; an uptick in the level of disease in humans and animals; and an increase in the number of endangered species.

Impact of Population Growth and Development on Drought

There are currently no districtwide drought management plans designed to reduce the regions overall vulnerability to Drought. However, any segment of the planning area targeted for future growth and development can be impacted including agriculture, residential, commercial, industrial and recreational. The greatest potential change in land use and future development may be a decrease in agriculture areas that can be converted to residential or commercial uses.

Impacts of Climate Change

With long-range climate change as a result of global warming, Drought events will occur more frequently, and occurrences may be more severe in District 3 counties.

As of April 2020, no state-developed climate adaptation plan has been finalized; however, predictions from the U.S. Environmental Protection Agency (EPA), “What Climate Change Means for Mississippi”, EPA 430-F-16-026, dated August 2016, provides an overview of

expected impacts in Mississippi related to lightning-producing severe storms, drought, forest resources and wildfire:

- Mississippi will become warmer, and both floods and droughts may be more severe. The changing climate is likely to produce more intense storms and increase the number of unpleasantly hot days.

- Climate change can significantly affect the sustainability of water supplies in the future. As parts of the United States get drier, the amount and quality of water available will likely decrease, impacting people's health and food supplies. With climate change, the entire country will likely face some level of drought. A report by the Natural Resources Defense Council (NRDC) found that 1,100 counties (one-third of all counties in the contiguous 48 states) face higher risks of water shortages by mid-century as a result of climate change.

- Higher temperatures and changes in rainfall will likely have both harmful and beneficial effects on farming. Over the next seventy years, Mississippi is likely to have 30 to 60 days per year with temperatures above 95°F, compared with about 15 days today. Over the next several decades, hotter summers are likely to reduce yields of corn. But higher concentrations of atmospheric carbon dioxide increase crop yields, and that fertilizing effect is likely to offset the harmful effects of heat on soybeans, cotton, wheat, and peanuts—if enough water is available. More severe droughts, however, could cause crop failures. Higher temperatures are also likely to reduce livestock productivity, because heat stress disrupts the animals' metabolism.

Based on this assessment, although the level of agriculture cover is expected to remain the same in the planning area, it is possible increased periods of drought may increase the need for additional water to support both farming and the general population.

Earthquake

Hazard Description

The United States Geologic Survey (USGS) defines an earthquake as a sudden motion or trembling of the earth caused by an abrupt release of stored energy beneath the earth's surface. Earthquake characteristics include magnitude, peak ground acceleration, and distance from the epicenter. The epicenter of an earthquake is located on the ground surface directly above the focus, or the location, where the earthquake begins.

Location and Extent

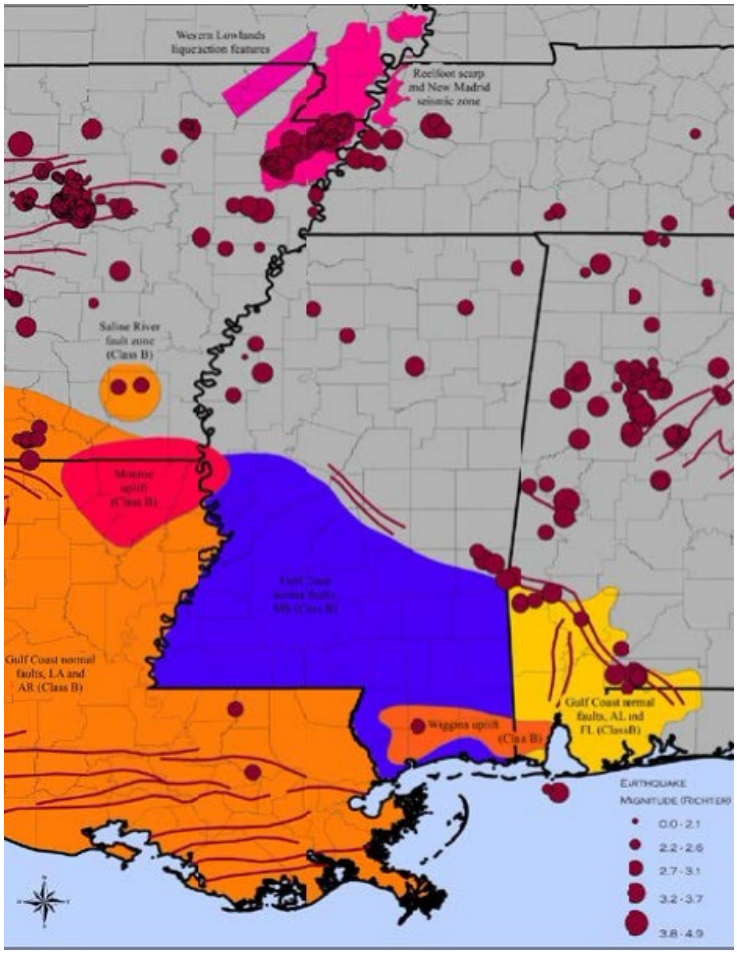
Although the New Madrid Seismic Zone (NMSZ) is the primary location of seismic activity for the Southeastern United States, earthquakes may originate outside of this area. The USGS has recorded more than 40 earthquakes that occurred in the state of Mississippi between 1911 and the present. Though none of these Mississippi-centered events inflicted severe damage, they should not be regarded as inconsequential.

The White River Fault Zone (WRFZ) is another notable seismic zone that was identified in 1944. The Charleston earthquake of 1931 in Tallahatchie County, Mississippi may have been centered along this fault. This is the largest recorded Mississippi-centered earthquake at a magnitude of 5.0. The WRFZ runs from Grenada, Mississippi northward to Newport, Arkansas, approximately 280 miles. Grenada is a city in Grenada County, which borders three D3 counties: Leflore, Carroll, and Montgomery. Figure 4.2.3-0 shows many of Mississippi's

earthquake event epicenters were in the northwest quadrant of the state and may be associated with the WRFZ. This Zone should be considered an area of high seismic concern.

Earthquakes do not occur solely along naturally active fault lines. Volcanoes and oil and gas production may also trigger an earthquake. Mississippi has not had volcanic activity for millions of years, so the projected impact from such an event is minimal. There is widespread oil and gas production in the state, but such activity would produce relatively small earthquakes that present minimal hazard risk.

Figure 4.2.3-0 Mississippi Earthquake Epicenters | Source: 2018 State of Mississippi SHMP



In 1935, Charles Richter developed the local magnitude (ML) scale for moderate-size (3<ML<7) earthquakes in southern California. The ML scale is more commonly referred to as the “Richter scale” by the press and the general public, and seismic specialists are more likely to use this term when discussing earthquake events. Current methodologies used to measure earthquake magnitude (ML, duration magnitude MD, surface-wave magnitude MS, tele-seismic body-wave magnitude mb, moment magnitude M, etc.) yield results consistent with ML. Most generally accepted methods for measuring magnitude were designed to be consistent with the Richter scale, which is shown in Table 4.2.3-1.

Table 4.2.3-1 Richter Scale | Source: U.S. Geological Survey (USGS)

Magnitude	Earthquake Effects
< 3.5	An event is generally not felt but recorded.
3.5-5.4	Event is often felt but rarely causes damage.
< 6.0	Slight damage to well-designed buildings. May cause major damage to poorly constructed structures across small regions.
6.1-6.9	May be destructive in inhabited areas of up to about 62 miles (100 kilometers) wide.
7.0-7.9	Major earthquake. May cause serious damage over larger areas.
8 or >	Great earthquake. May cause serious damage in areas several hundred kilometers across.

The Mercalli intensity scale is a tool used to measure earthquake intensity and effects, as opposed to magnitude (as measured by the Richter Scale). Generally abbreviated as M_w, sometimes described as the obsolete Richter magnitude, which measures *energy* released by the event. The intensity of an earthquake is not totally determined by its magnitude. The scale quantifies how an earthquake occurring on the earth's surface affects humans, natural features, and man-made structures on a scale from I (not felt) to XII (total destruction) as shown in Table 4.2.3-2. The assigned value is affected by the distance of a given place to the earthquake epicenter, with the highest intensity felt closest to the event. Data gathered from affected persons is used to determine an intensity value for their location.

The Mercalli (Intensity) scale originated with the widely used simple ten-degree Rossi-Forel scale, which was later revised by Italian vulcanologist Giuseppe Mercalli in 1884 and 1906. In 1902, the ten-degree Mercalli scale was expanded to twelve degrees by Italian physicist Adolfo Cancani. It was later completely re-written by the German geophysicist August Heinrich Sieberg and became known as the Mercalli-Cancani-Sieberg (MCS) scale.

The MCS scale was modified and published in 1931 in English by Harry O. Wood and Frank Neumann as the Mercalli-Wood-Neumann (MWN) scale. It was later improved by Charles Richter, the father of the Richter magnitude scale. The scale is known today as the Modified Mercalli scale or Modified Mercalli Intensity scale (Table 4.2.3-2).

Table 4.2.3-2: Intensity Scale and Definitions | Source: U.S. Geological Survey (USGS) Earthquake Hazards Program

Magnitude Modified Mercalli Intensity	
1.0 – 3.0	I
3.0 – 3.9	II - III
4.0 – 4.9	IV - V
5.0 – 5.9	VI - VII
6.0 – 6.9	VII - IX
7.0 and Higher	VIII or Higher
Intensity Definitions	
I - Not felt except by a very few under especially favorable conditions.	
II - Felt only by a few persons at rest, especially on upper floors of buildings.	
III - Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations are similar to the passing of a truck. Duration estimated.	
IV - Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation is like a heavy truck striking building. Standing motor cars rocked noticeably	
V - Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.	
VI - Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage is slight.	
VII - Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.	
VIII - Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage is great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.	
IX - Damage considerable in specially designed structures; well–designed, frame structures thrown out of plumb. Damage is great in substantial buildings, with partial collapse. Buildings shifted off foundations.	
X - Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.	
XI - Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.	
XII - Damage total. Lines of sight and level are distorted. Objects are thrown into the air.	

Previous Occurrences

There have been no earthquakes documented within D3 since 2002; and none occurring outside District 3 have impacted the planning area since 2006. Table 4.2.3-3 lists event originated in Mississippi and were felt within the D3 planning area. The largest, with a magnitude of 4.4, occurred in 1967 in Bolivar County. Damage typically begins to occur when an earthquake reaches a magnitude of 4 or greater. Nevertheless, every earthquake is unique and should be considered a potentially dangerous event.

Table 4.2.3-3: Mississippi D3 Earthquake reports | Source: U.S. Geological Survey (USGS) and MDEQ Office of Geology

Date	Latitude	Longitude	Magnitude	Community	County
October 26, 2002	34.03	-90.68	3.1	Duncan	Bolivar
May 25, 1973	33.94	-90.63	Not available	Lombardy	Sunflower
January 1, 1973	33.78	-90.62	3.5	Ruleville	Sunflower
June 29, 1967	33.55	-90.81	Not available	Shaw	Bolivar
June 4, 1967	33.55	-90.84	4.4	Shaw	Bolivar

Table 4.2.3-4 shows a sampling of events originated in other states but were powerful enough to be felt by Mississippi residents. Three were felt by Bolivar County residents.

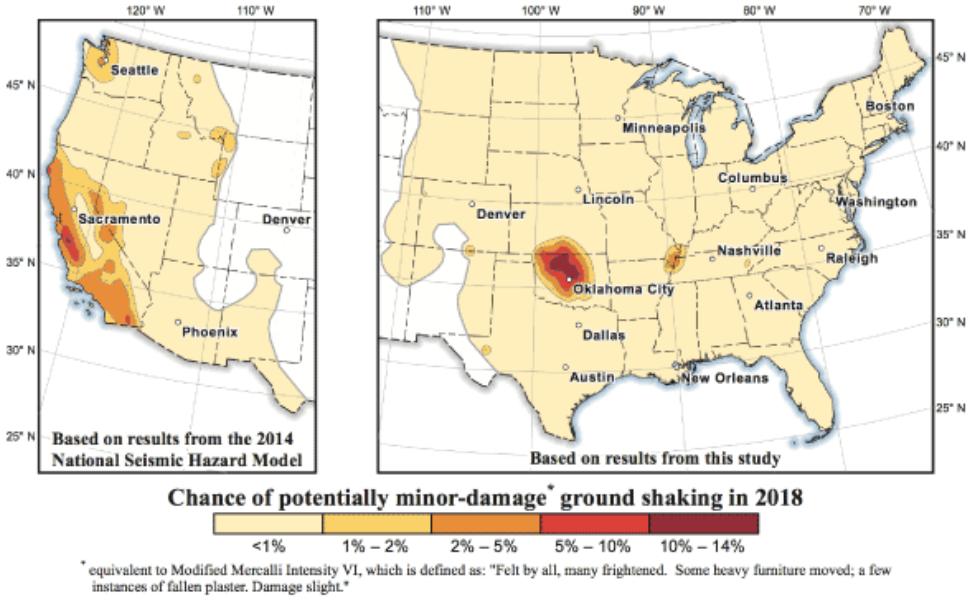
Table 4.2.3-4: Earthquakes Reported Outside of Mississippi | Source: U.S. Geological Survey (USGS) and MDEQ Office of Geology

Date	Origin	Magnitude	Maximum Intensity	Intensities Reported in MS	MEMA D3 Counties Affected
Sept 10, 2006	253 miles SSW of Apalachicola, FL	6	VI	I, II, III, IV	Bolivar
June 2, 2005	10 miles NNW of Dyersburg, TN	4	III	I	--
May 1, 2005	15 miles WSW of Blytheville, AR	4.1	IV	I, II, III	Bolivar
Feb 10, 2005	22 miles WSW of Blytheville, AR	4.1	V	I, II, III	--
Nov 7, 2004	25 miles SW of Tuscaloosa, AL	4	V	I, II, III, IV	--
April 29, 2003	8 miles ENE of Fort Payne, AL	4.6	V	I, II, III, IV	--
March 29, 1972	New Madrid Seismic Zone	Not available	IV	I, II, III, IV	Bolivar
1811-1812	New Madrid Seismic Zone	7.8 - 8.1	XI	Not available	--

Probability of Future Occurrences

Earthquake predictions are much more difficult to assess in the Central and Southern U.S. as the majority of the USGS Earthquake Hazards Program stations are located in the western United States (other than one station in Reston, Virginia). The National Earthquake Information Center (NEIC) is located in Denver, Colorado. The New Madrid Fault Zone generates very little surface deformation (change) over time; therefore, as seismic events occur along the New Madrid, data are collected, and probabilities can be calculated. According to a study by the Center for Earthquake Research and Information (CERI) at the University of Memphis in 2002, the probability of a repeat of the 1811-1812 earthquakes in a 50-year time period is 7-10 percent. In the same study, the probability of a magnitude 6.0 or greater earthquake within a 50-year time period was estimated to be 25-40 percent. Earthquakes would be considered as likely to occur in the future since the region is susceptible to such events.

Figure 4.2.3-1: 2018 One Year Model | Source: 2018 Mississippi SHMP, National Seismic Hazard Model



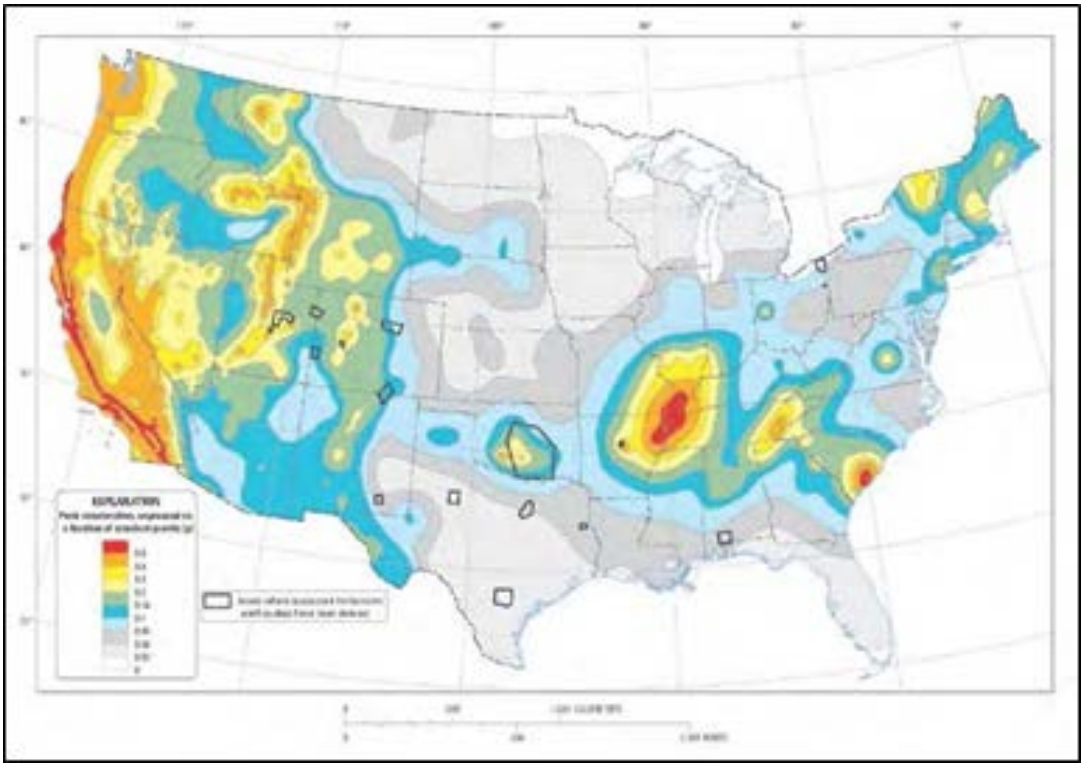
The map in Figure 4.2.3-1 shows the chance of damage from an earthquake in the Central and Eastern United States during 2018. Percent chances are represented as follows: pale yellow, less than 1 percent; dark yellow, 1 to 2 percent; orange, 2 to 5 percent; red, 5 to 10 percent; dark red, 10 to 12 percent. (See Hazard from the western United States from the 2014 National Seismic Hazard Maps (Petersen et al., 2014) for comparison). (Public domain.) The USGS has produced the 2018 one-year probabilistic seismic hazard forecast for the central and eastern United States from modelling on induced and natural earthquakes. For consistency, the updated 2018 forecast is developed using the same probabilistic seismicity-based methodology mentioned in the two previous forecasts.

Rates of earthquakes occurrence nationwide where M ≥ 3.0 increased between 2008 and 2015 but have steadily declined over the past three years, especially in areas where fluid injection associated with underground drilling has decreased. The seismicity pattern in 2017 was complex with earthquakes more spatially dispersed than in previous years. Earthquake rates in the New Madrid seismic zone (11 earthquakes M ≥ 3) continue to be higher than historical levels. Almost all these earthquakes occurred within the highest hazard regions of the 2017 forecast.

Assessing Vulnerability

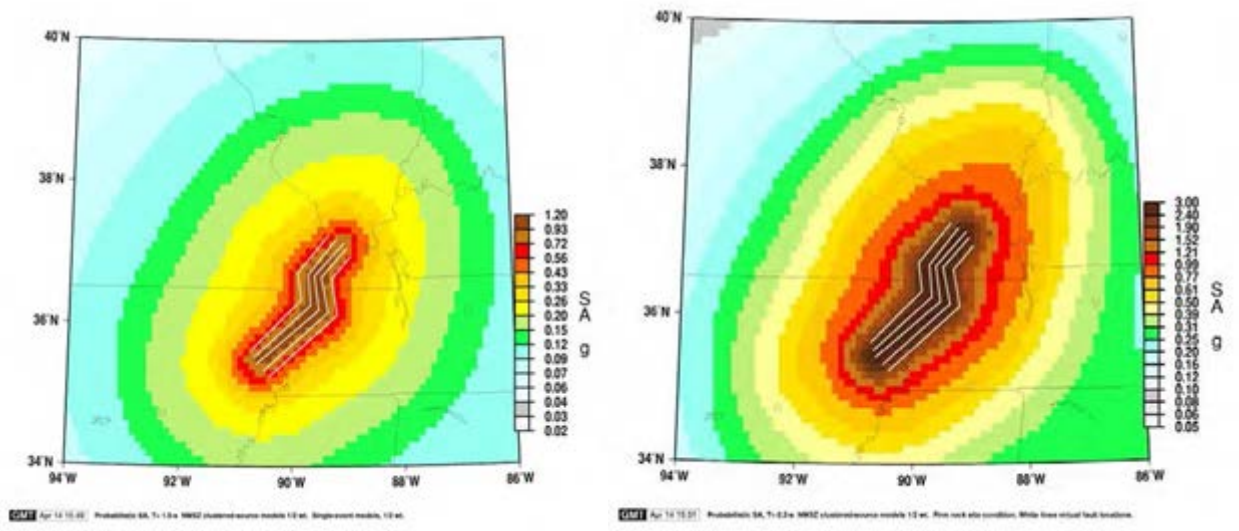
The potential for an earthquake to produce damage arises from many factors, such as condition and/or construction of the affected structures, soil characteristics, and earthquake characteristics. In most cases, the damage incurred by an earthquake is greatest near the epicenter and decreases with distance. Peak Ground Acceleration (PGA) is the maximum acceleration of a particle during an earthquake. More simply, PGA is the measure of the strength of ground movement. An earthquake's PGA is greatest near its epicenter, which helps explain why earthquake damage is greatest near the epicenter. Figure 4.2.3-2 provides the PGA potential for a two percent in 50-year rupture of the New Madrid Fault along with the frequency at which the ground will shake. Figures 4.2.3-3 provides spectral acceleration for one and five hertz ruptures.

Figure 4.2.3-2 – Peak Ground Acceleration | Source: USGS



1 Hz Rupture ***5Hz Rupture***

Figure 4.2.3-3 – Spectral Acceleration by Hertz Ruptures. | *Source: USGS*



Seismic waves may also create other earthquake-related hazards, such as liquefaction and slope failure. Liquefaction may occur where loose sand and silt saturated with water is shaken by earthquake energy. The mixture takes on the qualities of a liquid when shaken and can result in a lack of structural support and eventual failure of a structure built upon the liquidlike soil. In Mississippi, liquefaction is more likely to occur where there is a significant floodplain such as the Mississippi River. Table 4.2.3-5 shows an evaluation of each county based on its location within

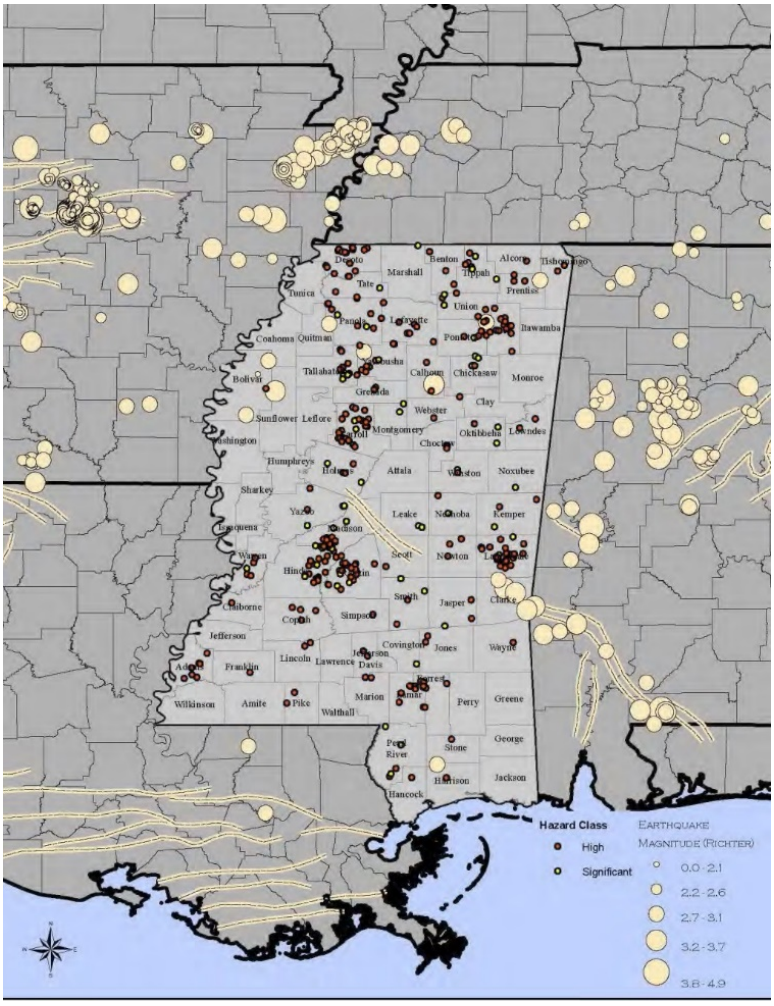
floodplains and seismic zones. The liquefaction potential listed in the table references the HAZUS scenario for liquefaction potential in each county. Slope failure during a seismic event can result in extensive damage. The area's most likely to experience slope failure during an earthquake are the bluffs that bound the Mississippi River floodplain, riverbanks, steep slopes in the Bluff Hills, levees, earth-filled embankments and transportation embankments.

Table 4.2.3-5 - High Liquefaction Hazard by County | Source: 2018 State of Mississippi SHMP

County	Seismic Source[1]	Geographic Area of Concern[2]	Liquefaction Potential
Bolivar	NMSZ	MRFP	Very High
Carroll	NMSZ, WRFZ	MRFP	Very High, Very Low
Holmes	NMSZ	MRFP	Very High, Very Low
Humphreys	NMSZ	MRFP	Very High
Leflore	NMSZ, WRFZ	MRFP, YaRFP	Very High
Sunflower	NMSZ, WRFZ	MRFP	Very High
Washington	NMSZ	MRFP	Very High
[1]NMSZ = New Madrid Seismic Zone WRFZ = White River Fault Zone		[2]MRFP = Mississippi River Floodplain YaRFP = Yalobusha River Floodplain	

Dams: The nature of earthquakes provides a substantial risk to dams and levees. As previously discussed in the Dam/Levee Failure section of this plan, the counties within this planning region have the most dams within the state. Figure 4.2.3-4 overlays the significant and high hazard dams with the historic seismic recordings.

Figure 4.2.3-4 - High Liquefaction Hazard by County | Source: 2018 State of Mississippi SHMP



Bridges: The Mississippi Department of Transportation (MDOT) conducts ongoing biennial inspections for all bridge structures. In anticipation of a future earthquake resulting from activity in the New Madrid Fault, it also monitors and inspects bridges that it has retrofitted, or upgraded, to perform better as a result of newer technology developed to address a seismic event. The bridge retrofit program is concentrated on primary and secondary access routes in Northwest Mississippi. Retrofit activities consist basically of securing bridge caps to piers, thus increasing the probability the structure will remain standing after an earthquake. Today, all new bridges are constructed using earthquake-resistant technology.

Impacts of Growth and Development

Mississippi's District 3 counties currently have no earthquake- specific land-use or development policies. There has been no new adoption of development or building regulations designed to increase or decrease the overall vulnerability to earthquakes. The greatest potential change in land use and future development may be a decrease in agriculture areas as a result of land rezoned for residential or commercial use. This would cause more residences or businesses to be placed at risk regardless of where in the district they are built.

Impacts of Climate Change

As a geological hazard, potential changes in climate conditions in the future have no anticipated effect on earthquake risk or vulnerability.

Expansive Soils

Hazard Description

Expansive soils contain minerals such as smectite clays that are capable of absorbing water. When they absorb water, they increase in volume. The more water they absorb the more their volume increases. Expansions of ten percent or more are not uncommon. This change in volume can exert enough force on a building or other structure to cause damage.

Cracked foundations, floors and basement walls are typical types of damage done by swelling soils. Damage to the upper floors of the building can occur when motion in the structure is significant.
Expansive soils will also shrink when they dry out. This shrinkage can remove support from buildings or other structures and result in damaging subsidence. Fissures in the soil can also develop. These fissures can facilitate the deep penetration of water when moist conditions or runoff occurs. This produces a cycle of shrinkage and swelling that places repetitive stress on structures.

Soils are composed of a variety of materials, most of which do not expand in the presence of moisture. However, several clay minerals are expansive. These include smectite, bentonite, montmorillonite, beidellite, vermiculite, attapulgite, nontronite, illite and chlorite. There are also some sulfate salts that will expand with changes in temperature. When a soil contains a large amount of expansive minerals it has the potential of significant expansion. When the soil contains very little expansive minerals it has little expansive potential. When expansive soils are present, they will generally not cause a problem if their water content remains constant. The situation where greatest damage occurs is when there are significant or repeated moisture content changes.

During the Hazard Identification Process described in the 2018 State Hazard Mitigation Plan Update, that Planning Committee chose to exclude Expansive Soils from the list of hazards included in the Update. Its decision was based on a review of a number of resources: the 2013 State of Mississippi Standard Mitigation Plan; Historical data from NCEI; The list of FEMA Disaster Declarations, USGS, NFIP and various internet resources; and Local hazard mitigation plans

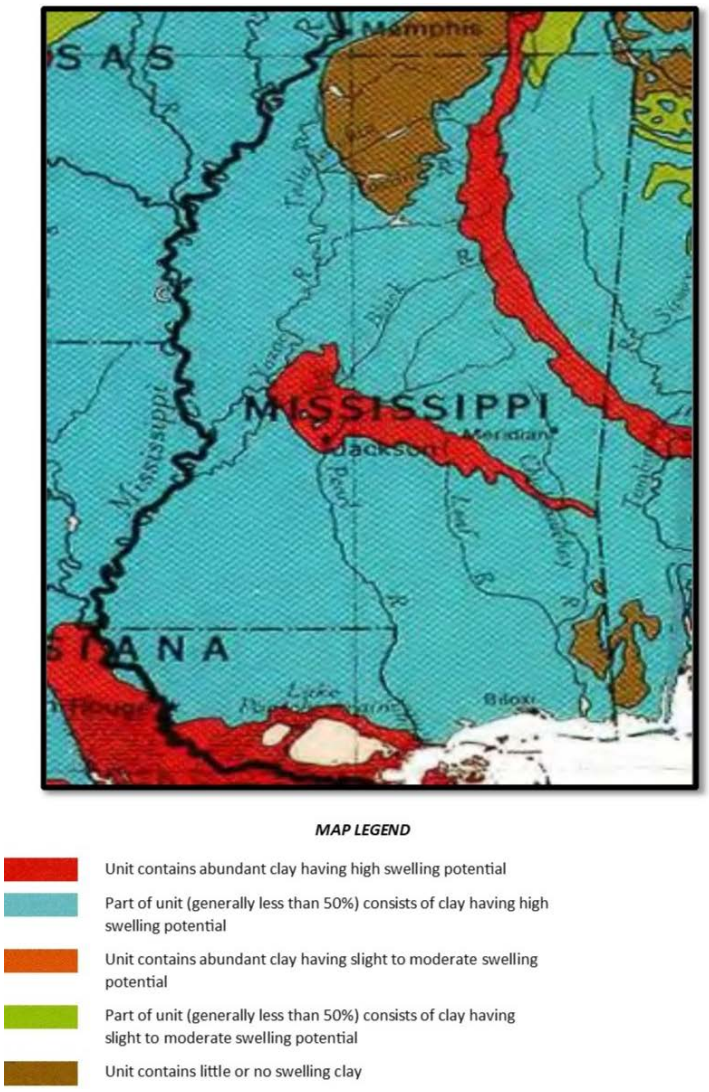
Expansive Soils was not selected to be fully profiled in the SHMP Updated because only 36% of local mitigation plans identified expansive soils as a hazard to be profiled, and because the hazard does not appear to pose a significant threat to State-owned assets or critical facilities. However, during a June 2020 hazard ranking discussion among members of the District 3 RHMC, the group elected to include Expansive Soils in its 2020 Plan Update for project planning purposes.

Location and Extent

Expansive soils are present throughout Mississippi and have been known to cause considerable damage to housing and infrastructure. The American Society of Civil Engineers estimates a quarter of all homes in the United States have some damage caused by expansive soils. In a typical year they cause a greater financial loss to property owners than earthquakes, floods, hurricanes and tornadoes combined. The damage done by expansive soils is typically attributed to poor construction practices or a misconception that all buildings experience this type of damage as they age.

Figure 4.2.4-0 provides the distribution of expansive soils in Mississippi. Less than 50% of the soil in most of D3 consists of clay having high swelling potential.

Figure 4.2.4-0- Swelling Clay Map of Mississippi | Source USGS



Previous Occurrences

There is no historical record of significant expansive soil events in the D3 Region. Expansive soils can cause considerable damage to structural foundations in the region, although they do not pose a significant threat to human life.

Probability of Future Occurrences

Based on information gathered from USGS the probability of future expansive soil events is **likely**.

Assessing Vulnerability

Assessing the vulnerability of expansive soils in D3 cannot be done because there is no

historical data with regards to expansive soil occurrences or damage in the region. Expansive soils are not identified in the state plan and have not historically been a problem for most areas in Mississippi.

Impacts of Growth and Development on Expansive Soils

D3 counties currently have no land-use or development policies related to Expansive Soil. There has been no new adoption of development or building regulations designed to increase or decrease the overall vulnerability to expansive soil events. The greatest potential change in land use and future development may be a decrease in forestland/agriculture areas that can be converted to residential or commercial uses.

Impacts of Climate Change

The Soil Science Society of America reminds the community that climate is one of several factors in soil formation and on the properties of soil in a given region. Soils in warmer or wetter climates are more developed, or demonstrating nutritive properties, than soils in cooler or drier climates.[3] Because the incidence of expansive soils increases with moisture changes in the soil, the increased frequency between excessive rain and drought events could lead to increased incidents of expansive soils, resulting in damage to critical infrastructure or property. Because the incidence of expansive soils increases with moisture changes in the soil, the increased frequency between excessive rain and drought events could lead to increased incidents of expansive soils, resulting in damage to critical infrastructure or property.

Extreme Heat

Hazard Description

According to the National Weather Service, extreme temperatures (including extreme heat and extreme cold) are the number one weather-related cause of death in the United States (https://www.weather.gov/hazstat/). Extreme heat may be generally defined as temperatures that hover 10 degrees or more above the average high temperature for the region, last for prolonged periods of time, and are often accompanied by high humidity. At certain levels the human body cannot maintain proper internal temperatures and may experience severe health disorders including heat cramps, heat exhaustion or heatstroke (a life-threatening condition).

For planning purposes, both heat and excessive heat will be combined under a single hazard renamed Extreme Heat.

- Excessive heat events normally occur from a combination of high temperature (significantly above normal) and high humidity.
- Heat events normally occur when there is a heat index of at least 105°F but less than 115°F for less than three hours per day, or nighttime lows above 80°F for two consecutive days.

Effects of Extreme Heat on the Human Body:

- 80–89° F - Fatigue possible with prolonged exposure and/or physical activity.
- 90–104° F - Sunstroke, heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity.

[3] Soil Society of America, Climate and Soils, November 2105, accessed June 25, 2020 (https://www.soils.org/files/sssa/iys/november-soils-overview.pdf).

- 105–129° F - Sunstroke, heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity.
- 130° F and Higher – Heat stroke/sunstroke highly likely with continued exposure.

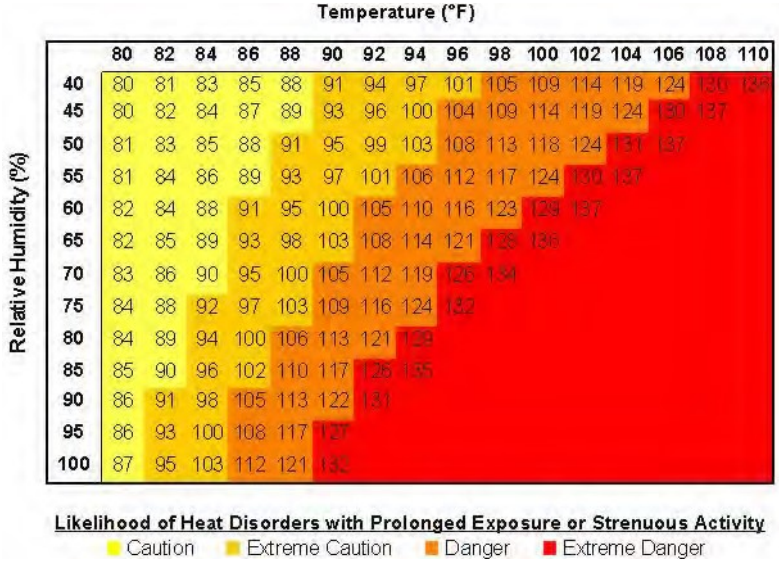
The National Weather Service issues heat advisories and excessive heat warnings when unusual periods of hot weather are expected.

Table 4.2.5-1: NWS Extreme Heat Advisory – Watch and Warning Alerts

Advisory, Watch or Warning	Conditions
Excessive Heat Outlook	The potential exists for an excessive heat event in the next 3 – 7 days. • Provides information to the Heat Index forecast map for the contiguous United States for those who need considerable lead time to prepare for the event, such as public utilities, emergency management and public health officials.
Excessive Heat Watch: Be Prepared!	Conditions are favorable for an excessive heat event in the next 24 to 72 hours. • Issued when the risk of a heat wave has increased but its occurrence and timing is still uncertain
Heat Advisory: Take Action!	Issued within 12 hours of the onset of extremely dangerous heat conditions. • When the maximum heat temperature is expected to be 100° or higher for at least 2 days and nighttime air temperatures will not drop below 75°. • Criteria vary across the country, especially in areas not used to dangerous heat conditions. • Take precautions to avoid heat illness • Not taking precautions could lead to serious illness or death.
Excessive Heat Warning: Take Action!	Issued within 12 hours of the onset of extremely dangerous heat conditions. • The maximum heat index temperature is expected to be 105° or higher for at least 2 days and nighttime air temperatures will not drop below 75°. • Criteria vary across the county, especially in areas not used to dangerous heat conditions • Take immediate precautions to avoid heat illness • Not taking precautions could lead to serious illness or death

Weather forecasters also utilize a heat index methodology for determining how hot it feels when relative humidity is factored with the actual air temperature (Figure 4.2.5-0).

Figure 4.2.5-1: Heat Index Obtained from NOAA



Location and Extent

Extreme heat conditions can impact all counties within the planning area. The warmest month in D3 is typically July, when the average daytime temperature can rise to 91.4 degrees F. In addition, Mississippi tends to experience hot, humid weather over the summer, when temperatures can hover in the 90-degree F range for days, often with 90 percent humidity.

Previous Occurrences

The NOAA National Centers for Environmental Information (NCEI), shows 49 reported Extreme Heat events in the twenty-year period between January 1, 2000 and December 1, 2019 in the planning area. The NCEI data documents that Bolivar, Leflore, and Sunflower Counties have each respectively reported one death due to extreme heat (occurring in - 2010 and 2005), while Washington County has reported 2 deaths due to excessive heat (occurring in 2010). However, no new extreme heat events have been reported since the previous plan. Table 4.2.5-2 provides a summary of the number of Extreme Heat events from 2000 to 2019 followed by event narratives on significant events, collected from NCEI.

Table 4.2.5-2: Extreme Heat / Heat Events: 2000-2019 I Source: NCEI

County	No. of Events	Event Type	Death	Injury	Property Damage	Crop Damage
Attala	1	Excessive Heat	-	-	-	-
	4	Heat	-	-	-	-
Bolivar	1	Excessive Heat	1	-	-	-
	4	Heat	-	-	-	-
Carroll	1	Excessive Heat	-	-	-	-
	4	Heat	-	-	-	-
Holmes	1	Excessive Heat	-	-	-	-
	4	Heat	-	-	-	-
Humphreys	1	Excessive Heat	-	-	-	-
	4	Heat	-	-	-	-
Leflore	1	Excessive Heat	-	-	-	-
	5	Heat	1	-	-	-
Montgomery	1	Excessive Heat	-	-	-	-
	4	Heat	-	-	-	-
Sunflower	1	Excessive Heat	-	-	-	-
	5	Heat	1	-	-	-
Washington	1	Excessive Heat		-	-	-
	6	Heat	2	-	-	-

August 1, 2010 - A four-day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS Jackson, MS forecast area, 19 record highs were set between August 1^{s} and 4. On August 2, the second warmest average temperature was recorded. The low was 78 and the high 105 degrees, resulting in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in three fatalities across the forecast area with two of those occurring in Bolivar and Washington Counties. The death in Bolivar was a man found lying near a tree in his yard in Cleveland. Bolivar County officials said the man lived alone and had been dead at least a day. A jug of water was found near his body. The other fatality in Washington was a woman who was found dead in her home on the morning of August 5. The Washington County Coroner's office said the temperature in her home was 100 degrees.

August 2, 2007 - During the first half of August, a heat wave took hold of the region and brought some of the warmest temperatures since the summer of 2000. This heat wave began around August and lasted until August 16. Between August 10 and 15 the entire area reached 100 degrees or higher. Twenty-three record highs were also set during this time with one location, Greenwood, tying their all-time highest temperature at 106 degrees. In addition to the hot temperatures, humidity levels were quite high. As the temperature soared each day, high relative humidity resulted in heat index values between 105 and 112 degrees. The hot

temperatures during the first and middle part of the month helped to contribute to one of the warmest months on record for August. Each of the six climate locations or stations of record recorded August temperatures in the top five warmest with two stations, Greenville and Hattiesburg, recording their warmest August ever.

July 15, 2006 - A small "heat wave" gripped the region during the middle of July with high temperatures ranging from the upper 90s to around 100 degrees for five days with overnight lows only reaching the middle 70s. The hottest temperatures during this period occurred from the Mississippi Delta, across northern Mississippi and then down to the Jackson Metro area and toward Meridian. This area peaked between 100 and 102 degrees for at least two days during the hot five day stretch.

August 17, 2005 – An extreme heat event occurred during the middle to latter part of August 2005. This "heat wave" covered a large portion of the south and lasted for a period of about 10 days. Each of these days had high temperatures consistently between 95 and 100 degrees, with one or two of these days reaching 100 degrees or more. Additionally, overnight lows remained warm with lower and middle 70s recorded. This is the first time since August 2000 where 100-degree temperatures were reached in this area as well as having such an extended period of extremely high temperatures.
July 23, 2005 - A five day "heat wave" occurred across most of the region between July 23 to 27. The actual air temperature and relative humidity values combined to produce heat index values near 110 degrees daily. Each day saw high temperatures ranging from 95 to 99 degrees with overnight lows in the middle 70s. This turned out to be the warmest stretch of weather experienced in this region since July 2001.

Probability of Future Occurrences

Extreme temperatures will continue to be a likely occurrence in the planning area. It is anticipated the effects of climate change will result in an increase in the frequency, duration and intensity of extreme heat events, and a decrease in the frequency of extreme cold events. Heat waves are projected to become much more commonplace in a warmer future with potentially major implications for human health. The probability of future occurrence is classified as **likely**.

Assessing Vulnerability

People

Extreme heat can gravely affect the population. At certain levels the human body cannot maintain proper internal temperatures and may experience adverse health effects to include, headaches, dizziness, weakness, cramping, nausea, vomiting, confusion, dehydration, and in some cases death. The very young, elderly, persons with special needs and handicapped persons are vulnerable to extreme heat. The percentage of the most vulnerable population in each county is provided in Table 4.2.5-3. As the population of each county in the planning area increases, so will vulnerabilities to the hazard on the part of the general public and special populations.

Extreme heat can cause serious injury or death, but not in large numbers. The greatest potential impact to people in relation to extreme heat is to those who are considered vulnerable, such as children and the elderly. Despite prevalent hot-weather preparedness messages and warnings, extreme heat is one of the predominant causes of weather fatalities.

Table 4.2.5-3: District 3's Special Population | Source: 2010 U.S. Census, 2018 estimates

County	Below Poverty	Very Young (5 and under)	Elderly (65 and older)	Disabled (Non-institutionalized)
Attala	23.70%	6.30%	19.20%	16.90%
Bolivar	29.40%	6.60%	15.80%	15.40%
Carroll	17.90%	4.30%	23.70%	11.90%
Holmes	33.20%	6.60%	15.00%	13.70%
Humphreys	37.00%	5.70%	17.00%	17.10%
Leflore	35.10%	7.70%	14.40%	7.00%
Montgomery	22.90%	6.00%	21.60%	18.90%
Sunflower	32.60%	5.10%	13.70%	10.20%
Washington	32.60%	7.20%	15.80%	15.30%

In addition to the groups identified in Table 4.2.5-3 the following demographic groups are also more susceptible to the effects of extreme heat:

- Women who are pregnant
- Persons with medical conditions (e.g., heart disease, diabetes, high blood pressure, insulin-dependent, dialysis)
- Persons with mental illness/disabilities or cognitive disorders
- Persons who use medical equipment (e.g., ventilators, oxygen, G-tubes)
- Individuals with drug or alcohol dependencies
- Persons with mobility devices (e.g., wheelchairs, walkers, canes)
- Persons who are non-ambulatory
- Persons who are socially isolated
- Persons who do not speak English with minimal access to information

Property

Extreme heat does not typically have a significant impact on buildings. However, depending on its scale, critical facilities such as roads, bridges, power lines and other energy generating facilities, and water supply systems can be affected by heat stress on metal and road materials, or become overused and create system break downs and outages. The increased use of air conditioning in homes and workplaces during heat events can compound into a significant demand on energy that can lead to utility "brownouts" and "blackouts".

- ***Brownouts*** can be an intentional or unintentional drop in voltage in an electrical power supply system or grid. Intentional brownouts are used by power companies in an emergency for load reduction to prevent a total power outage. They can last for minutes or hours. Different types of electrical equipment will react in different ways to brownouts. Some devices will be severely affected, while others may not be affected at all.

- ***Blackouts*** can be a short- or long-term loss of electrical power to a limited or widespread area. There are many causes of power failures in electric networks; however, a significant overload of the system, such as one occurring to an extreme heat event, can lead to a blackout.

Economy

Economic impacts related to extreme heat are most commonly related to short- or long-term effects on agriculture and the food supply system by reducing the water and supply, reducing crop production and increasing animal mortality. Due to large amount of acreage identified as agricultural uses in the District 3 planning area, extreme heat can have a direct and indirect impact on the economy. Depending on its scale, extreme heat can impact both livestock and crop production. Changes occurring in the animal population as a result of heat stress include elevated body temperature, respiration rates, increased maintenance, energy requirement, decreased efficiency of nutrient utilization, decreased dry matter intake, decreased milk production, and reduced reproductive performance. Extreme heat stress can reduce plant photosynthetic and transpiration efficiencies and negatively impact plant root development, which collectively can negatively impact agricultural yield. Information or data indicating any direct economic losses due to previous extreme heat events in the planning area have not been identified.

Environment

Extended periods of extreme heat can have devastating effects on the natural environment, including water supply, which can impact drinking water, as well as water for irrigation, navigation and recreation. When accompanied by drought, periods of extreme heat can also result in extensive crop failure and increase the risk of wildfires.

Impact of Population Growth and Development on Extreme Heat

D3 counties currently have no land-use or development policies directly related to Extreme Heat. There has been no new adoption of development or building regulations designed to increase or decrease the overall vulnerability to Extreme Heat. The greatest potential change in land use and future development may be a decrease in agriculture areas that can be converted to residential or commercial uses.

Impacts of Climate Change

As global temperatures continue to rise, and extreme heat events continue to increase in frequency due to climate change, MEMA D 3 Counties will continue to feel the impacts of excessive heat.

As of April 2020, no state-developed climate adaptation plan has been finalized; however, predictions from the U.S. Environmental Protection Agency (EPA), “What Climate Change Means for Mississippi”, EPA 430-F-16-026, dated August 2016, provides an overview of expected impacts in Mississippi related to lightning-producing severe storms, extreme temperature, drought, forest resources and wildfire:

- Mississippi will become warmer, and both floods and droughts may be more severe. The changing climate is likely to produce more intense storms and increase the number of unpleasantly hot days. Tropical storms and hurricanes have become more intense during the past 20 years. Although warming oceans provide these storms with more potential energy, scientists are not sure whether the recent intensification reflects a long-term trend.

- Extremely hot days can be uncomfortable and dangerous. Certain people are especially vulnerable, including children, the elderly, the sick, and the poor. High air temperatures can cause heat stroke, dehydration, and affect people's cardiovascular and nervous systems. Warmer air can also increase the formation of ground-level ozone, a key component of smog. Ozone has a variety of health effects, aggravates lung diseases such as asthma, and increases the risk of premature death from heart or lung disease. EPA and the Mississippi Department of Environmental Quality have been working to reduce ozone concentrations. As the climate changes, continued progress toward clean air will become more difficult.

The results of this assessment show that the planning area population will continue to fluctuate; and it is possible that increased periods of extreme heat may increase heat-related health concerns in vulnerable populations.

Flood

Hazard Description

The National Weather Service (NWS) *Turn Around Don't Drown* campaign stresses there are more deaths each year from flooding than other thunderstorm hazards.[4] This aligns with Information from the Centers for Disease Control and Prevention (CDC), which reports two primary reasons for flood-related drownings, both of which are avoidable: driving a vehicle into flood water and walking into or near flood waters. Most people don't appreciate the force and power of water. Only six inches of fast-moving water is needed to cause an adult to lose balance. Twelve inches of rushing water is enough to move or displace most cars.

In areas removed from the Mississippi Gulf Coast (such as MEMA District 3), two primary types of flooding generally occur. Communities and their residents should be able to discern between the different types of flooding and prepare accordingly.

River (Riverine or Stream) Flooding: Riverine floods occur along rivers, streams, or channels primarily during heavy or prolonged rainfall. Other contributing factors include: (1) elimination of ground cover on drainage slopes resulting from tree cutting, wildfires, land development, or overgrazing; (2) the simultaneous arrival of flood crests from major tributaries; and (3) blocked drainage from debris, dams, or inadequately sized drainage structures. Floods from these sources can be "flash," or rapid, but are usually more gradual and have longer duration than flash floods.

Flash Flooding (Rapid): Flash floods result from heavy, localized rainfall, including slow-moving intense thunderstorms that cause overflow from creeks, streams, branches, and rivers. They frequently occur when rain falls on areas with steep slopes, such as that seen in several District 3 counties; or in the built environment, where impervious surfaces, gutters, and storm sewers speed up the flow of run-off. The unexpected onslaught and torrential nature of flash floods makes this hazard particularly lethal. Flash flooding is frequently caused by restricted drainage systems, which occurs primarily in urban or developed areas when the volume of run-off exceeds the capacity of the drainage system. Flooding of this nature can be the result of increased development, inadequate drainage, riverine flooding, flash flooding, or a combination of all.

[4] The Weather Channel, Turn Around Don't Drown, https://www.weather.gov/safety/flood-turn-around-dont-drown, accessed 04/13/2020.

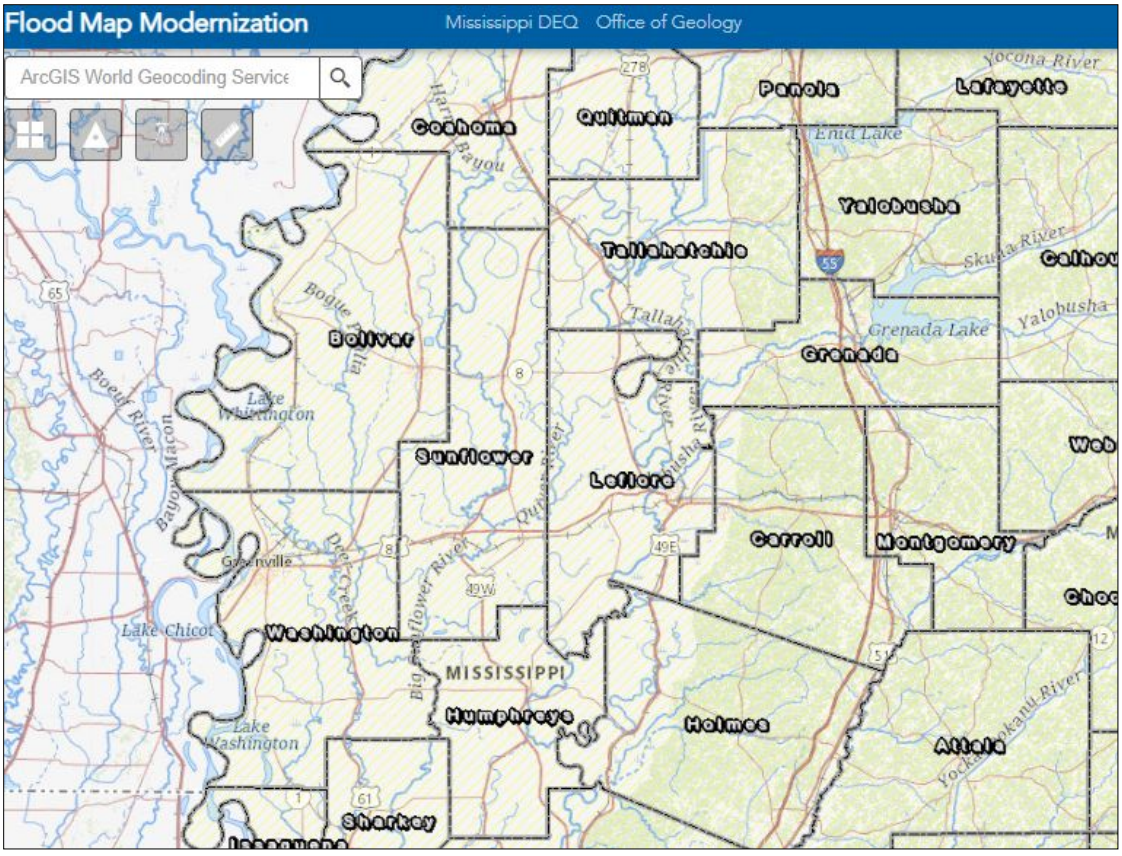
A more detail discussion of the location and extent, previous occurrences and overall vulnerability for each county and its jurisdictions to this hazard is provided in the respective county's annex.

Location and Extent

The major water body associated with regional flooding is the Mississippi, which forms the western boundary of Bolivar and Washington Counties. However, overflow from the rivers and tributaries feeding several other river basins account for flooding that occurs in District 3. In addition to the Mississippi River Basin, the *2018 Mississippi Standard Hazard Mitigation Plan* (SHMP) points out three additional river basins include waters that flow through District 3 Counties: Black River Basin; Tombigbee River Basin; and Yazoo River Basin. In addition to the rivers themselves, numerous tributaries and streams feed into these major water bodies. Bolivar, Carroll, Holmes, Humphreys, Leflore, Sunflower and Washington Counties are located within the Yazoo River Basin and Attala and Montgomery are in the Big Black River Basin.

The Mississippi Department of Environmental Quality (MDEQ) geologic web site incorporates information about large and small water bodies coursing through District 3. Figure 4.2.6-0 is a map which shows the nine counties and the region's major rivers, their tributaries, and rivulets. The land in the eastern portion of the district-shown in yellow on the left-hand side of the image, is low-lying and relatively close to the Mississippi River. Terrain shaded in green on the right-hand side of the image reflects the rolling hills that characterize much of northern Mississippi, and which also causes communities located therein to be subject to flash flooding.

Figure 4.2.6-0: Flood Areas Mapped by the Mississippi Map Modernization Project |
Source: Mississippi Department of Environmental Quality, Map Modernization Program



In addition to State mapping efforts, FEMA is gradually modernizing Digital Flood Insurance Rate Maps (DFIRMs) nationally. Maps are updated based on based on a community's exposure to the flood hazard. Among other uses, insurance companies consult DFIRMS to estimate a property's flood risk level, which affect the flood premium paid by property owners. Table 4.2.6-1 shows recently published information from the FEMA Map Service Center. Included for each community is the year of publication for the community's most recent maps.

Table 4.2.6-1: D3 Dates of Latest FEMA Flood Maps – Broken Down by County and Municipality | Source: msc.fema.gov

County	Municipalities (C: City) (T: Town)		Date - Most Recent FIRMS	# Panels
Attala	Ethel (T) Kosciusko (C) McCool (T)	Sallis (V) Unincorporated Areas	All Jurisdictions 8/2/2011	33
Bolivar	Alligator (T) Benoit (T) Beulah (T) Boyle (T) Cleveland(C) Duncan (T) Gunnison (T) Merigold (T)	Mound Bayou (C) Pace (T) Renova (T) Rosedale(C) Shaw (C) Shelby (C) Winstonville (T) Unincorporated Areas	All Jurisdictions 3/21/2017	55
Carroll	Carrollton (T) North Carrollton (T)	Vaiden (T) Unincorporated Areas	All Jurisdictions 5/2/2017	24
Holmes	Cruger (T) Durant (C) Goodman (T) Lexington (C)	Pickens (T) Tchula ((T) West (T) Unincorporated Areas	All Jurisdictions 1/18/2012	45
Humphreys	Belzoni (C) Isola (T) Louise (T)	Silver City (T) Unincorporated Areas	All Jurisdictions 3/15/2012	31
Leflore	Greenwood (C) Itta Bena (C) Morgan City (T) Schlater (T) Sidon (T) Unincorporated Areas		6/25/1982, 8/16/2012 4/3/1978, 5/16/2012 4/3/1978, 5/16/2012 9/27/1985, 5/16/2012 3/15/1978, 5/16/2016 11/1/1979, 3/25/1983, 5/16/2012	68
Montgomery	Duck Hill (T) Kilmichael (T)	Winona (C) Unincorporated Areas	All Jurisdictions: 9/17/2010	22
Sunflower	Doddsville (T) Drew (C) Indianola (C) Inverness (T)	Moorhead (C) Ruleville (T) Sunflower (T) Unincorporated Areas	All Jurisdictions: 1/18/2012	52
Washington	Arcola Greenville (C) Holladale (C)	Leland (C) Metcalfe (T) Unincorporated Areas	All Jurisdictions: 1/18/2012	53

Previous Occurrences

Table 4.2.6-2 details the ten (10) presidential declarations Between 2000 and 2020, which were issued following flood events that occurred in District 3. The most recent declaration was issued in March 2020 for severe flooding that took place the previous month and affected Bolivar, Sunflower and Washington Counties. The table shows several flood events occurred over a period of weeks. Two back-to-back floods occurred in the year 2011. This information suggests that flood events have severe impact on the District. It is worth noting that this list only includes

declarations that specifically mentioned flooding, although others implied potential flooding as a consequence of the hazard event: Hurricane Katrina (DR-1604, 2005); Hurricane Gustav (DR-1794, 2008); and Hurricane Isaac (DR-4081, 2012). Table 4.2.6-3 and Table 4.2.6-4 show the eight flood occurrences and 270 flash flood events that took place in the last 20 years recorded in the NWS Storm Events Database.

Table 4.2.6-2 – Federal Disaster Declarations (2000 - 2020) | Source: FEMA Disaster Declarations-Mississippi

Declaration Number	Incident Period	Counties Affected	Declaration Date
DR-1360	February 16 – March 15, 2001	Attala, Bolivar, Carroll, Holmes, Humphries, Leflore, Sunflower, Washington	2/23/2001
DR-1753	March 28 – May 19, 2008	Bolivar, Washington	5/8/2008
DR-1906	April 23 – April 24, 2010	Holmes	4/29/2010
DR-1972	April 15 – April 28, 2011	Carroll, Holmes, Leflore, Montgomery, Sunflower	4/29/2011
DR-1983	May 3, 2011 – June 17, 2011	Bolivar, Humphries, Washington	5/11/2011
DR-4175	April 28, 2014 – May 3, 2014	Montgomery	4/30/2014
DR-4628	March 9 – March 29, 2016	Bolivar, Holmes, Leflore, Sunflower, Washington	3/25/2016
DR-4314	April 30, 2017	Carroll, Holmes, Montgomery	5/22/2017
Dr-4429	February 22 – March 29, 2019	Carroll, Humphries, Leflore, Montgomery, Sunflower, Washington	4/23/2019
DR-4478	January 10-11, 2020	Bolivar, Sunflower, Washington	3/12/2020

Table 4.2.6-3 – Sampling of Significant Flood Events with Damages (2000-2019), by Community | Source: NCE/

County	Community	Event Date	Property Damage ($)	Crop Damage ($)
Bolivar (Zone)		1/22/2006	300,000.00	-
Bolivar	Gunnison	3/12/2006	75,000.00	-
Bolivar	Lamont	5/4/2011	1,000,000.00	100,000.00
Humphreys	Anchorage	5/8/2011	500,000.00	200,000.00
Sunflower	Indianola	3/12/2016	200,000.00	-
Washington	Greenville	3/12/2016	50,000.00	-
Washington	Greenville	2/22/2018	10,000.00	-
Washington	Hampton	5/5/2011	5,000,000.00	200,000.00
Total District 3			$ 7,135,000.00	$ 500,000.00

Table 4.2.6-4– All Flash Flood Damages, 2000-2019 | Source: NCEI

County	Flash Flood Events (#)	Property Damage ($)	Crop Damage ($)
Attala	23	2,655,000.00	0
Bolivar	41	1,447,500.00	1,105,000.00
Carroll	25	1,26,000.00	150,000.00
Holmes	21	3,145,000.00	300,000.00
Humphreys	14	1,397,000.00	900,000.00
Leflore	35	2,167,500.00	0
Montgomery	20	1,006,000.00	0
Sunflower	39	2,659,500.00	1,200,000.00
Washington	52	43,173,500.00	28,362,000.00
Total District 3	270	$ 57,651,000.00	$ 30,017,000.00

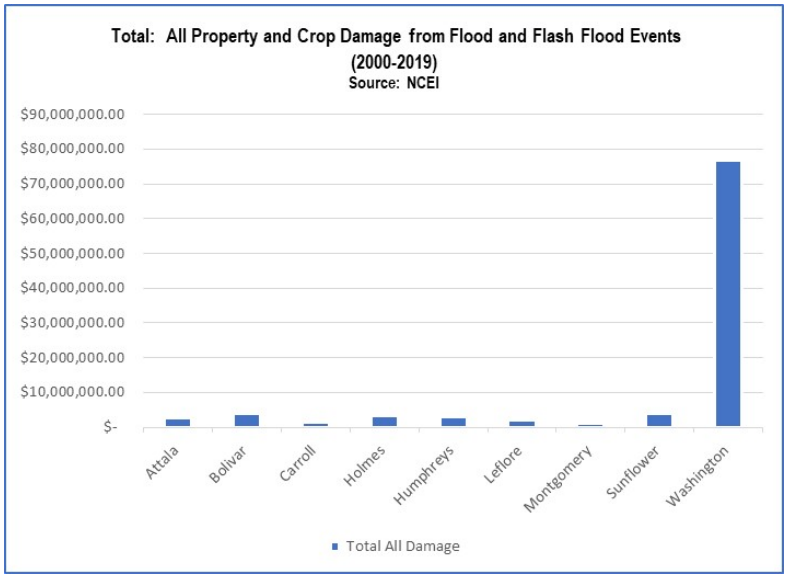
Table 4.2.6-5 includes county specific damage figures stemming from flood and flash flood occurrences. The table shows flooding, as opposed to flash flooding, has been identified as occurring largely in the two counties bordering the Mississippi River, Bolivar County and Washington County. The others listed, Humphreys and Sunflower, are immediately to the west of the river border counties. Flash flood data, on the other hand, indicates each of the District 3 counties is vulnerable to one degree or another. Revisiting the fact Bolivar and Washington are the two counties most vulnerable, given they are adjacent to the Mississippi, it is reasonable to assume they are equally at risk for experiencing flash flooding. Washington County leads all counties in the number of flash flood events (52) and total costs for property and crop damage, but Bolivar County figures are lower. There were still a relatively high number of occurrences (41) in Bolivar County compared to the remaining seven counties, but the damage figures are not as high as those of Washington County.

Table 4.2.6-5 – Total Flood Losses: Flood and Flash Flood Combined (2000-2019) | Source: NCEI

County	Flash Flood Property Damage ($)	Flash Flood Crop Damage ($)	Flood Property Damage ($)	Flood Crop Damage ($)	Total Property Damage	Total Crop Damage	Total - All Damage
Attala	$ 2,655,000.00	$ -	$ -	$ -	$ 2,655,000.00	$ -	$ 2,655,000.00
Bolivar	$ 1,447,500.00	$ 1,105,000.00	$ 1,375,000.00	$ 100,000.00	$ 2,822,500.00	$ 1,205,000.00	$ 4,027,500.00
Carroll	$ 1,026,000.00	$ 150,000.00	$ -	$ -	$ 1,260,000.00	$ 150,000.00	$ 1,410,000.00
Holmes	$ 3,145,000.00	$ 300,000.00	$ -	$ -	$ 3,145,000.00	$ 300,000.00	$ 3,445,000.00
Humphreys	$ 1,397,000.00	$ 900,000.00	$ 500,000.00	$ 200,000.00	$ 1,897,000.00	$ 1,100,000.00	$ 2,997,000.00
Leflore	$ 2,167,500.00	$ -	$ -	$ -	$ 2,167,500.00	$ -	$ 2,167,500.00
Montgomery	$ 1,006,000.00	$ -	$ -	$ -	$ 1,006,000.00	$ -	$ 1,006,000.00
Sunflower	$ 2,659,500.00	$ 1,200,000.00	$ 200,000.00	$ -	$ 2,859,500.00	$ 1,200,000.00	$ 4,059,500.00
Washington	$ 43,173,500.00	$28,362,000.00	$ 5,060,000.00	$ 200,000.00	$48,233,500.00	$28,562,000.00	$ 76,795,500.00
Total District 3	$ 57,651,000.00	$30,017,000.00	$ 7,135,000.00	$ 500,000.00	$66,046,000.00	$32,517,000.00	$ 98,563,000.00

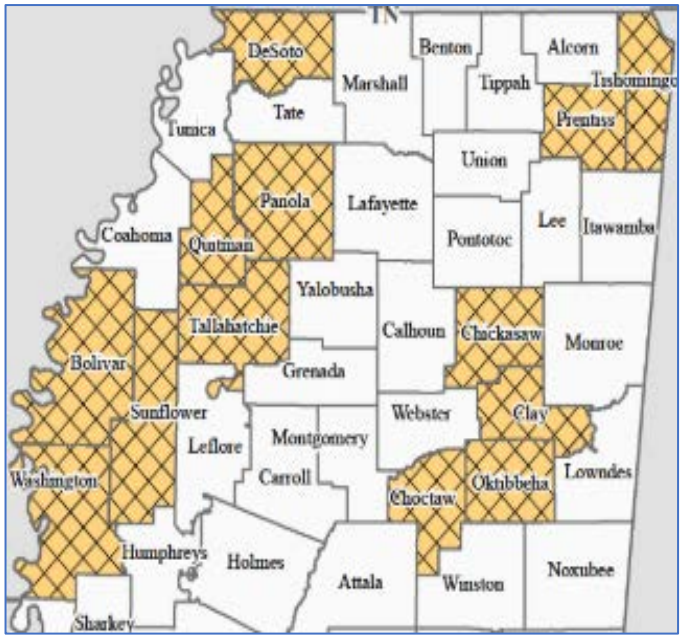
Figure 4.2.6-6 visually depicts the degree to which Washington County has experienced significantly more damage than other counties in District 3.

Figure 4.2.6-6: Total of all Property and Crop Damage by County



Significant Flood Events

January 11-12, 2020 - The most recent event for which a declaration was issued took place in early 2020. While the declaration covers flooding that occurred over at two-day period in January, the region experienced heavy amounts of rainfall during succeeding weeks, thus exacerbating the situation that existed at the time of the declaration. The map of declared counties shown here is for FEMA-4478-DR Mississippi Disaster Declaration for 3/12/2020. The map was map updated on 4/08/2020. It indicates only three D3 counties were included in the declaration -- Bolivar, Sunflower and Washington – but all District 3 county emergency management directors reported infrastructure and residential damage. As of June 1, 2020, a total of $370,830.22 in FEMA Public Assistance funding had been allocated to affected counties.

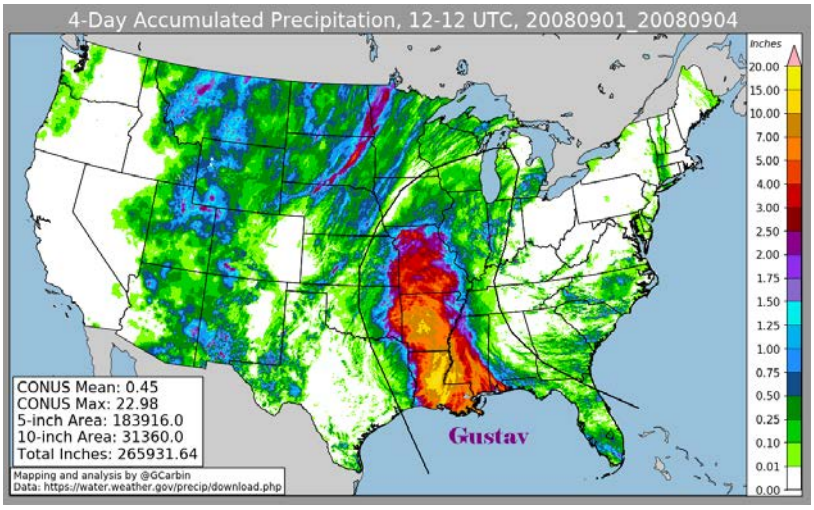


May 5, 2011 - The flood of 2011 began near the end of March, when heavy rainfall of 2 to 5 inches fell across Arkansas, Southeast Missouri, and the Ohio River Valley. The Mississippi River crested well above flood stage at Cairo around the middle of March and at flood stage at Vicksburg around the end of the month. The river receded until early April when 2 to 5 inches of rain fell over North Kentucky and the Ohio River prompting the river to rise once again. Several moderate to heavy rainfall events occurred during the month adding to the already overflowing tributaries of the Ohio River. Excessively heavy rainfall from 5 to 20 inches occurred from April 22nd to the 27th across northern Arkansas, southern Missouri, and up the Ohio River Valley. This produced the greatest surge in the river levels. During the following week, the first week of May, an additional 3 to 10 inches of rainfall occurred across Arkansas and southern Missouri, north to the Ohio River Valley. Rainfall for the two-week period was over 800 percent of normal.

These rainfall events, along with a moderate to major flood moving down the Upper Mississippi River from a late March snow melt combined to produce river crests above the 1937, 1973, and the 2008 flood levels. Record flooding occurred at Vicksburg and Natchez. The backwater areas up the Yazoo River exceeded all but the 1927 flood levels and ended up exceeding the 2008 river flood crests by 6 to 7 feet. Flooding along the Mississippi River caused extensive flooding of low-lying farmland and urban areas around the river. All flood waters were within the mainline levee. Sixty-one homes were destroyed, 18 sustained major damage and 63 sustained minor damage. One mobile home and 1 business were destroyed, with 19 businesses sustaining minor damage. Twenty-four roads had major damage, and 3 public buildings were destroyed.

September 3, 2008 - Hurricane Gustav was the second major hurricane of the 2008 Atlantic Hurricane Season. It took shape as a tropical depression on the morning of August 25 just southeast of Haiti, and rapidly strengthened to hurricane status by the morning of August 26. After inflicting serious damage on portions of Haiti, Jamaica, and Cuba, Gustav entered the southeastern portion of the Gulf of Mexico and took aim at the Gulf Coast of the United States. Although Gustav attained Category 4 status earlier in the event, the storm made landfall as a strong Category 2 system at Cocodrie, Louisiana, on September 1, containing maximum sustained winds around 110 mph. It slowed down and weakened as it continued its northwest track across southern Louisiana, where major damage was inflicted. The pace of the system continued to slow dramatically over the next few days as it turned gradually to the right around a large ridge of high pressure over the Southeast. The remnants of Gustav finally began moving rapidly away from the Lower Mississippi Valley on September 4 as an incoming disturbance deflected it to the northeast.

Figure 4.2.6-2: 4-Day Accumulation Precipitation | Source: NOAA; https://www.wpc.ncep.noaa.gov/tropical/rain/gustav2008.html



Gustav was responsible for multiple hazardous weather elements across the service area such as tropical storm force winds, tornadoes, flash flooding, and areal flooding from extensive rains.

As Gustav slowed on September 2, flash flooding became a major issue lasting into the next day as the storm slowly lifted to the north and northeast. The first round of heavy rain and flash flooding was across portions of southeast Mississippi as the outer rain bands started to move across the same areas. Total rainfall across this area was between 4 and 7 inches. The heaviest rains fell across areas near and west of the Mississippi River. Some of the Mississippi counties boarding the river received 8 to 11 inches of rain. Areas west of the river across Louisiana and southeast Arkansas saw extreme rainfall. Many locations received between 11 and 20 inches of rain. The highest measured rainfall was at Larto Lake where 21 inches fell. The flooding rains had a tremendous impact on area crops. Crop damage was extensive across Louisiana and western Mississippi. The flooding rains came at a crucial time as most crops will be harvested in September. Crop damage from Gustav will range between $300-400 million.

During the late afternoon and evening of September 3, a heavy band of storms developed across the region and produced five to nine inches of rainfall in three to five hours. This additional rainfall brought the total in Washington County to between seven and 11 inches for the entire three-day event. This rainfall flooded numerous roads, many of which were closed or washed out. Approximately 250 to 270 structures were flooded, with damage ranging from

minor to major. Damage was widespread and significant. Agriculture was also hart hit. Farmland was flooded and entire crops were lost or significantly damaged, while salvaged crops produced low yields.

March 9, 1997 - The Mississippi River was above flood stage near March 9th, and it crested between the 21st and the 26th, causing considerable damage in the state of Mississippi.

Table 4.2.6-6: Number of Homes and Mobile Homes Damages by County, March 9, 1997

County	Residential Structures Damaged
Bolivar County	68
Claiborne County	5
Issaquena County	23
Jefferson County	9
Warren County	68
Adams County	No dwellings damaged, but significant impact to agricultural lands

Probability of Future Occurrences

The list of FEMA flood declarations and NWS data indicate floods and flash floods frequently occur within MEMA District 3. The flood hazard is ranked as being highly likely based on historical data and the location of District 3 counties near major rivers, tributaries and lakes.

Assessing Vulnerability

To assess vulnerability for flood events, the planning team gathered statistical information presented in the *2018 State of Mississippi Hazard Mitigation Plan*. The state utilized HAZUS-MH impact analyses for direct economic losses for buildings and societal impacts (displaced people and shelter needs). The primary indicators used to assess flood losses were:

- Direct building losses combined with income losses,
- Loss ratio of the direct building losses compared to overall building inventory, and
- Population displaced by the food and shelter needs.

People

The displaced population presented in Table 4.2.6-7 is based on the inundation area of a 100-year flood scenario run as part of the Mississippi SHMP Update, with data broken down by MEMA District. Individuals and households will be displaced from their homes even when the home has suffered little or no damage either because they were evacuated (i.e., a warning was issued) or there was no physical access to the property because of flooded roadways. Displaced persons using shelters are likely be individuals with lower incomes and those who do not have family and friends living nearby with whom they could temporarily reside. Age plays a secondary role in shelter use in that there are some individuals who will go to a public shelter even if they have the financial means to go elsewhere. These will usually be younger, less established families and elderly families (HAZUS-MR4 User's Manual). HAZUS-MR4 does not model flood casualties given that flood-related deaths and injuries typically do not have the same significant impact on the medical infrastructure as those associated with earthquakes.

Table 4.2.6-7 - Flooding Impacts on People – Displaced People in 100-Year Flood Scenario - Data Broken Down by MEMA Region I Source: 2018 State of Mississippi SHMP

MEMA Region	Number of Households	Number of People Needing Shelter
Region 1	3,193	379
Region 2	3,615	305
Region 3	2,383	390
Region 4	2,289	555
Region 5	5,345	1,219
Region 6	2,255	123
Region 7	1,413	84
Region 8	2,506	178
Region 9	4,281	465

Property

Table 4.2.6-8 shows potential base-flood building and income losses broken down by MEMA district in the 2018 SHMP, as a result of a HAZUS-MH analysis. Within District 3, counties along the Mississippi river corridor are likely to experience significant flood losses, but the same is true for Leflore and Humphreys Counties, which are near the Tallahatchie and Yazoo Rivers. Note: There may be levees located in the region not represented in the HAZUS model.

Table 4.2.6-8 – Building and Income Loss by District | Source: 2018 State of Mississippi SHMP Update, based on HAZUS-MH 100- Year Flood Scenario

MEMA Region	Total Building Losses	Total Business Interruption	Total Building-Related Economic Losses
Region 1	$ 2.239B	$ 2.408B	$ 4.647B
Region 2	$ 4.463B	$ 4.375B	$ 8.838B
Region 3	$ 454.83M	$ 461.70M	$ 916.53M
Region 4	$ 1.32B	$ 878.36M	$ 2.200B
Region 5	$ 2.681B	$ 3.334B	$ 6.016B
Region 6	$ 846.46M	$ 722.62M	$ 1.569B
Region 7	$ 769.26M	$ 457M	$1.226B
Region 8	$ 981.64M	$ 770.5 M	$ 1.752B
Region 9	$1.368B	$953.88M	$2.322B

The same HAZUS-MH flood loss scenario was used to estimate potential loss of at-risk critical facilities, including hospitals, fire and police stations, emergency operation centers and schools. A summary of data from the 2018 SHMP broken down by MEMA District in shown in shown in Table 4.2.6-9.

Table 4.2.6-9 – Critical Facilities Potentially Within Base Flood Hazard Area | Source: 2018 State of Mississippi SHMP, based on HAZUS-MH 100- Year Flood Scenario

MEMA Region	Number of Potential At-Risk Critical Facilities
Region 1	217
Region 2	272
Region 3	233
Region 4	218
Region 5	404
Region 6	201
Region 7	153
Region 8	210
Region 9	295

The FEMA National Flood Insurance Program

The U.S. Congress enacted the National Flood Insurance Act of 1968 to create the **National Flood Insurance Program** (NFIP). The program makes flood insurance available to homeowners whose communities participate in NFIP. It provides an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods. NFIP reduces the impact of flooding on private and public structures by providing flood insurance coverage to property owners, renters, and businesses, and by encouraging communities to adopt and enforce floodplain management regulations. These efforts help mitigate the effects of flooding on existing, new, and improved structures. NFIP also tracks structural flood losses, including those considered Repetitive Losses (RL) and Severe Repetitive Losses (SRL).

NFIP defines a repetitive loss property as an insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling ten-year period. At least two of the claims must be more than ten-days apart. A **repetitive loss** property may or may not be currently insured by the NFIP. NFIP also defines an SRL property as structures accommodating one to four family residences whose owners have filed four or more claims of more than $5,000, or at least two claims cumulatively exceed the building's value.

The *2018 State HMP* describes how HAZUS-MH was used to determine the level of exposure of properties identified as RL and SRL structures. As of 2018, NFIP had documented 313 Repetitive Flood Claims (RFC) from 112 Severe Repetitive Loss (SRL) District 3 properties. There are Repetitive Loss (RL) and SRL properties in all but two counties, Attala and Montgomery. Show below are RL and SRL figures for each county, as well as the number of properties mitigated against flooding.

Table 4.2.6-10 provides a summary of the total number of RL/SRL properties in each of the nine District 3 Counties. Data on the types (residential, commercial, institutional, etc..) of repetitive loss properties is unavailable and the information below serves as the best available data. A more detail breakdown of the RL/SRL by jurisdiction is provided in the respected county annexes. Table 4.2.6-11 provides a summary of the total number of NFIP participating communities and number of RL/SRL properties mitigated in each county.

Table 4.2.6-10: D3 Repetitive Loss/Severe Repetitive Loss Properties Summary | Source: 2018 State of Mississippi SHMP

County	Repetitive Loss				Severe Repetitive Loss			
	No. of Properties 2009	No. of Properties 2011	No. of Properties 2016	No. of Flood Claims	No. of Properties 2009	No. of Properties 2011	No. of Properties 2016	No. of Flood Claims
Attala	0	0	1	2	0	0	0	0
Bolivar	155	108	210	631	2	48	2	228
Carroll	4	4	4	8	0	0	0	0
Holmes	11	12	12	27	0	0	0	0
Humphreys	40	31	46	161	2	10	1	61
Leflore	29	27	27	71	0	2	0	8
Montgomery	0	0	0	0	0	0	0	0
Sunflower	19	16	20	72	1	4	0	21
Washington	152	115	191	631	14	48	8	250
Total	410	313	511	1,603	19	112	11	568

Table 4.2.6-11: Number of Mitigated Properties in MEMA District 3 | Source: 2018 State of Mississippi SHMP

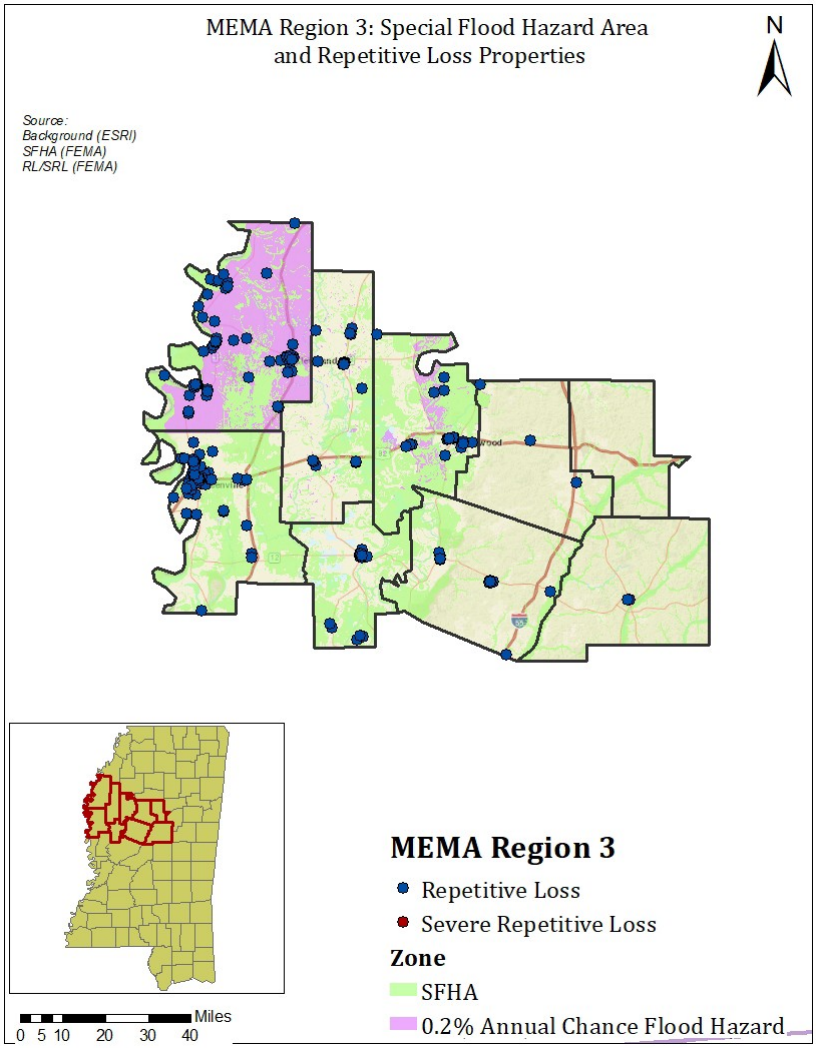
County	No. of NFIP Communities	No. of Mitigated Properties
Attala	5	0
Bolivar	16	20
Carroll	4	0
Holmes	8	0
Humphreys	5	1
Leflore	6	1
Montgomery	4	0
Sunflower	8	4
Washington	6	26
Total	62	52

The State Plan shows two D3 counties (Bolivar and Washington) are among the top 10 Mississippi counties in dollar value for NFIP losses.

Table 4.2.6-12 NFIP Loss Statistics Top 10 Counties January 1978 February 2018 | Source: bsa.nfipstats.html (NFIP Policy and Loss by Community February 2018)

County	Total Losses	Closed Losses	Open Losses	Closed w/o Payment Losses	Total Payments
Harrison	15,165	12,777	12	2,376	$ 1,281,229,535
Hancock	9,646	8,572	14	1,060	$ 737,684,695
Jackson	10,650	9,121	26	1,503	$ 793,296,088
Hinds	4,195	3,399	32	764	$ 59,269,646
Washington	1,849	1,515	25	309	$ 33,696,394
Warren	2,765	2,418	1	346	$ 30,876,258
Bolivar	1,300	1,135	4	161	$ 22,411,146
Wilkinson	1,871	1,592	1	278	$ 20,595,214
Pearl River	730	568	1	161	$ 13,509,714
Forrest	1,746	1,379	1	366	$ 9,754,713

Figure 4.2.6-3 D3 Special Flood Hazard Area (SHFA) and Repetitive Loss Structures |
Source: 2018 State of Mississippi SHMP



The Community Rating System

Of D3's nine counties and 53 municipalities, two currently participate in the NFIP Community Rating System (CRS): The City of Cleveland and the City of Greenville. CRS is a voluntary incentive program that encourages a commitment to community floodplain management activities that exceed the minimum NFIP requirements. CRS communities are ranked (lowest to highest) from Class 10 to Class 1. Class 10 is the entry level program class, while Class 1 includes communities that engage in a full range of all activities that generate points associated with class ranking. With each move toward a higher class (or a lower-class number), property owners receive a greater discount on flood insurance premiums. The City of Cleveland is a class 8, so its property owners receive 10 percent discount on flood insurance premiums. There are 197 policies in force with a total insured value of $114,863. As a result of CRS participation, property owners receive a $5,043 savings in their NFIP premiums. The City of Greenville is ranked as Class 9 community and, as such, receives a five percent discount. There are 1435 NFIP policies in force totaling $826,573 of coverage. Policy holders collectively save $70,062 annually as a result of the City's CRS status.

As of August 2019, 331 Mississippi communities participate in NFIP, but only 31 are CRS participants. Of the top 50 communities with the most insurance policies in force, only about half of them participate in the CRS program. Bolivar County is listed as being number 25 of the top 50 with 403 policies in force but does not participate. (CRS Resources.org)

Economy

Given the extensive land holdings used for agricultural and forestry use in each of the D3 counties, flood can cause tremendous economic harm to the region. Table 4.2.6-8 shows that D3 would, in a 100-year flood scenario run using the HAZUS-MH software, suffer $252.83 million in building losses; $461.70 million in business interruption costs; and a total of $916.53 million in combined costs. These figures do not consider the cost to municipalities and counties to repair roads that wash out during periods of above average rainfall. Mississippi's Region 3 Emergency Management Directors reported widespread roadway buckling during the heavy rains of February 2020. Some communities experienced damage that was heavy but not severe enough to meet the threshold for being awarded a federal declaration.

Environment and Land Use

Traditionally, floodwaters were seen as a way for nature to replenish nature by depositing fresh silt on top of existing land to freshen areas used for fishing and farming. This may still be the case in certain areas of the world, but human efforts to channel water away from its natural course create complex mechanisms for keeping water within boundaries of man's choosing. As a result, a torrential storm, hurricane, or other severe event causes water to overflow river or stream banks and inundate the adjacent environment. Floodwaters may carry pollution, fertilizer from farm runoff, large objects hurled as floating debris, and other harmful influences. Because communities are often established near waterways for aesthetic and economic reasons, waterway overtopping affects even built environment mechanisms designed to support water flow, including swales, water and sewer systems, and normally pleasant meandering streams.

Impact on Population Growth and Development

It is only natural that people want to live near waterways, even those that are manmade. The look and flow of calm water is soothing, and rivers and lakes create focal points around which community life is built. Thankfully, communities participating in the National Flood Insurance Program (NFIP) – and, more specifically, the Community Rating System – are taking steps to minimize growth and development in the Special Hazard Flood Area (SFHA, also known as the Flood Zone), where there is a 1% annual chance of flooding in any given year. But structures located outside the Flood Zone are equally at risk, as NFIP statistics reveal: 20 to 25 percent of all NFIP claims recorded by FEMA are from the owners of properties not located in the SFHA. It is important for jurisdictions to thoroughly review proposals for new development to ensure a safe community in two respects. First, it would be unwise to erect new homes or businesses in areas that might flood, thus putting people and property in harm's way. Second, new construction alters the shape of the land and the direction in which water naturally flows. Many a property owner reports flooding that only recently started to occur in their neighborhood after nearby development took place.

Impact of Climate Change

Because flooding occurs as a result of both inland water overflow and rising sea levels, the relationship between climate change and inland flooding in places far from the coast may not seem obvious at first. However, most of the major waterways running through D3 flow into the Mississippi River, and the Mississippi River flows to the Gulf of Mexico. As such, rising tides hundreds of miles away could potentially impact the district's most interior counties – Attala, Carroll, and Montgomery – located west of the Mighty Mississippi. However, the

Intergovernmental Panel on Climate Change, the United Nations body for assessing climate change, recently released a special report on weather extremes. The Climate Science Special Report discusses the degree to which several water-related variables contribute to floods, including rainfall and snow melt. Furthermore, the report states that "more flooding in the United States is occurring in the Mississippi River Valley, Midwest, and Northeast, while U.S. coastal flooding has doubled in a matter of decades." [5]

Severe Storm (Thunderstorm/High Wind/Lightning/Hail)

Hazard Description

In the Delta Region, severe storms can occur at most any time. Cold fronts and daytime heating of the atmosphere cause these events. Severe storms can produce tornadoes, strong gusty winds, lightning, hail and heavy rain. This hazard section focuses on the high wind, hail and lightning hazards associated with thunderstorms.

> *Thunderstorms* are defined by the National Weather Service (NWS) as "a local storm produced by a cumulonimbus cloud and accompanied by lightning and thunder." Storms alone rarely cause losses to life or property, but devastating storm losses may occur as a result of storm components: high winds, lightning, tornadoes, heavy rain (flash flood), and hail. The NWS further defines a thunderstorm that produces a tornado, winds of at least 58 mph (50 knots), and/or hail at least ¾" in diameter as a "severe thunderstorm". Such wind events may cause structural damage as a result of a severe thunderstorm.
>
> *High winds* are a general term associated with sustained or gusting winds of significant strength to cause risk or damage to crops, vegetation, buildings, infrastructure, or transportation. High winds are typically associated with weather frontal systems that bring other severe weather elements, such as hail and lightning.
>
> High winds can damage property by carrying projectile debris or by breaking a building envelope as wind buffets weak points around doors, windows, and roofs. Winds can increase in speed as they pass between closely situated buildings through a Venturi effect that may increase the potential for damage.

The National Weather Service recognizes and defines three levels of wind events:

- *Wind Advisory* – Sustained winds of 30mph or more or gusts of 45mph or greater for a duration for one hour or longer.
- *High Winds* – Sustained winds of 40mph or greater for at least one hour, or frequent gusts of wind to 58mph or greater.
- *Extreme Wind Warnings* – Sustained winds of 115mph or greater during a land-falling hurricane.

Winds and related damages can also be defined through the Beaufort Wind Scale as shown in Table 4.2.7-1

[5]U.S. Global Change Research Program, Climate Science Special Report, Fourth National Climate Assessment (NCA4), Volume I, https://science2017.globalchange.gov/.

Table 4.2.7-1 - Beaufort Wind Scale | Source: NOAA Storm Prediction Center

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted; small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft. taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft., whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-20 ft., white foam streaks off breakers	Whole trees moving, resistance felt walking against wind
8	34-40	Gale	Moderately high (13-20 ft.) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Whole trees in motion, resistance felt walking against wind
9	41-47	Strong Gale	High waves (20 ft.), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (20-30 ft.) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (30-45 ft.) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft., sea completely white with driving spray, visibility greatly reduced	

Lightning is a visible electrical discharge produced by a thunderstorm. The discharge may occur within or between clouds, between the cloud and air, between a cloud and the ground or between the ground and a cloud. Lightning is created by static electrical energy and can generate enough electricity to set buildings on fire and electrocute people. Lightning can strike anywhere and anytime thunderstorms are in the area. Almost all lightning occurs within 10 miles of the parent thunderstorm, but in rare cases it can strike as much as 50 miles away. Metal buildings, tall structures, open fields, and swimming pools are at greater risk of lightning strikes. There are two major categories of lightning:

- *Cloud Flashes* – sometimes have visible channels that extend out into the air around the storm but do not strike the ground. This is often further defined as cloud-to-air, cloud-to cloud, or intra-cloud lightning.
- *Ground Flashes* – Lightning channels that travel from cloud-to-ground or ground-to cloud. There are two categories of ground flashes: natural and artificially initiated/triggered.

- Artificially initiated lightning includes strikes to tall structures, airplanes, rockets, and towers on mountains. Artificially initiated lightning travels from ground to cloud while natural lightning travels from cloud to ground.

Hail is defined by the National Weather Service (NWS) as a showery precipitation in the form of irregular pellets or balls of ice more than 5 mm in diameter, falling from a cumulonimbus cloud. Studies of thunderstorms provided through the NWS indicate two conditions are required for hail to develop: sufficiently strong and persistent up-draft velocities and an accumulation of liquid water in a super-cooled state in the upper parts of the storm. Hailstones are formed as water vapor in the warm surface layer rises quickly into the cold upper atmosphere. Water vapor freezes and fall; in the process accumulating additional water vapor. This cycle continues until there is too much weight for the updraft to support and frozen water falls too quickly to the ground to melt along the way.

The size of hailstones is best determined by measuring their diameter with a ruler. In the absence of a ruler, hailstone size is often visually estimated by comparing its size to that of known objects. Table 4.2.7-2 provides a reference of commonly used objects for this purpose.

Table 4.2.7-2 - Hail Size Chart | Source: National Weather Service

Hail Diameter Size	Description	Hail Diameter Size	Description
1/4"	Pea	2"	Hen Egg / Lime
1/2"	Plain M&M	2 1/2"	Tennis Ball
3/4"	Penny	2 3/4"	Baseball
7/8"	Nickel	3"	Teacup /Large Apple
1" (severe)	Quarter	4"	Softball
1 1/4"	Half Dollar	4 1/2"	Grapefruit
1 1/2"	Ping Pong Ball/Walnut	4 3/4"- 5"	Computer CD-DVD
1 3/4"	Golf Ball		

Location and Extent

Severe storms are not a location-specific hazard. All areas of D3 are vulnerable to severe storms. The conditions for severe storm are common in the south because of the atmospheric conditions. These systems are unpredictable as far as where they will strike and to the extent of impact. Thunderstorms can be accompanied by high wind, hail and lightning. All communities within the planning area are susceptible to these events. Figures 4.2.7-0 through Figure 4.2.7-1 are presented here to show the impact of high wind, lightning, and hail in and around the planning area.

Figure 4.2.7-0 – Statewide Severe Wind Events | Source: 2018 State of Mississippi SHMP

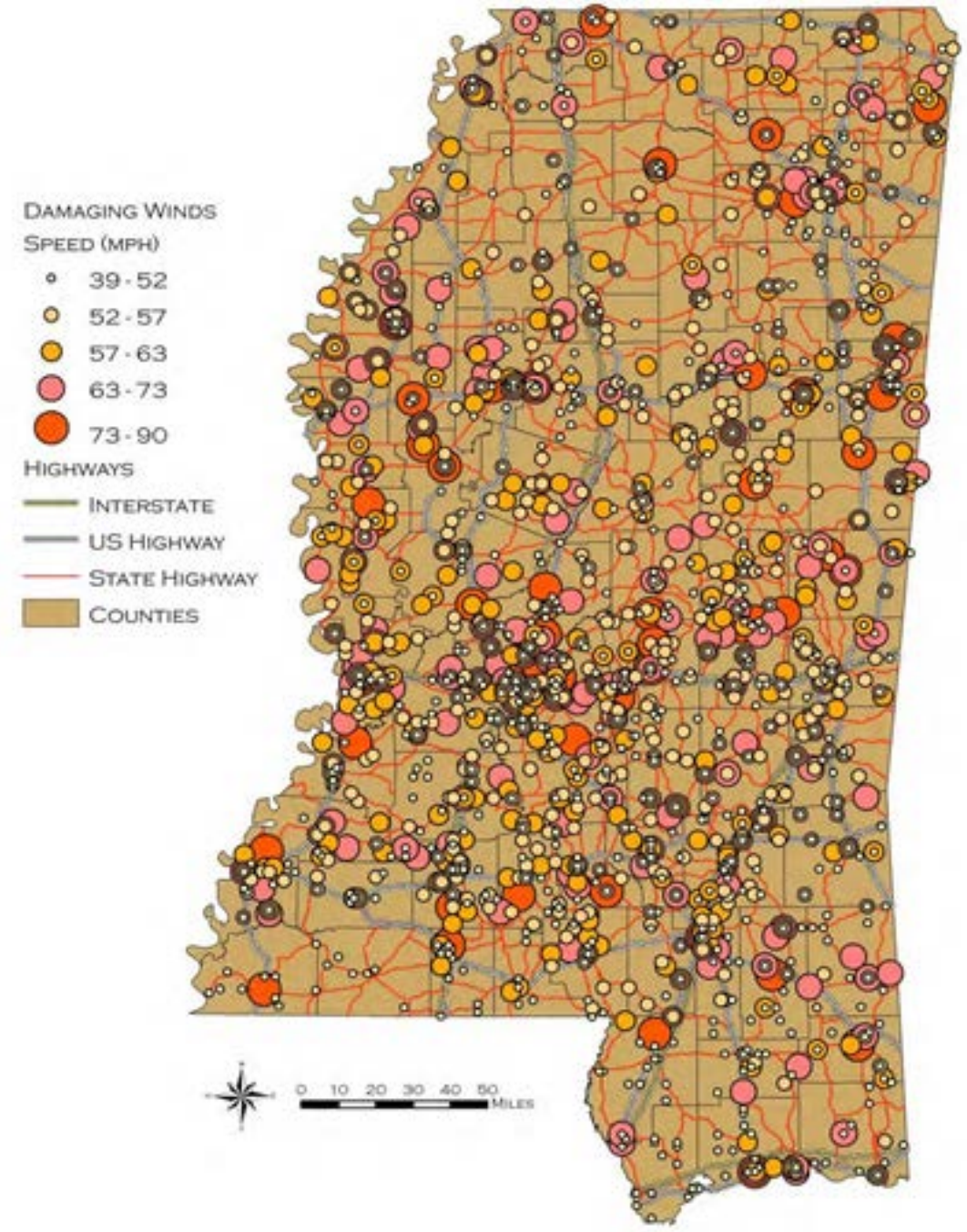
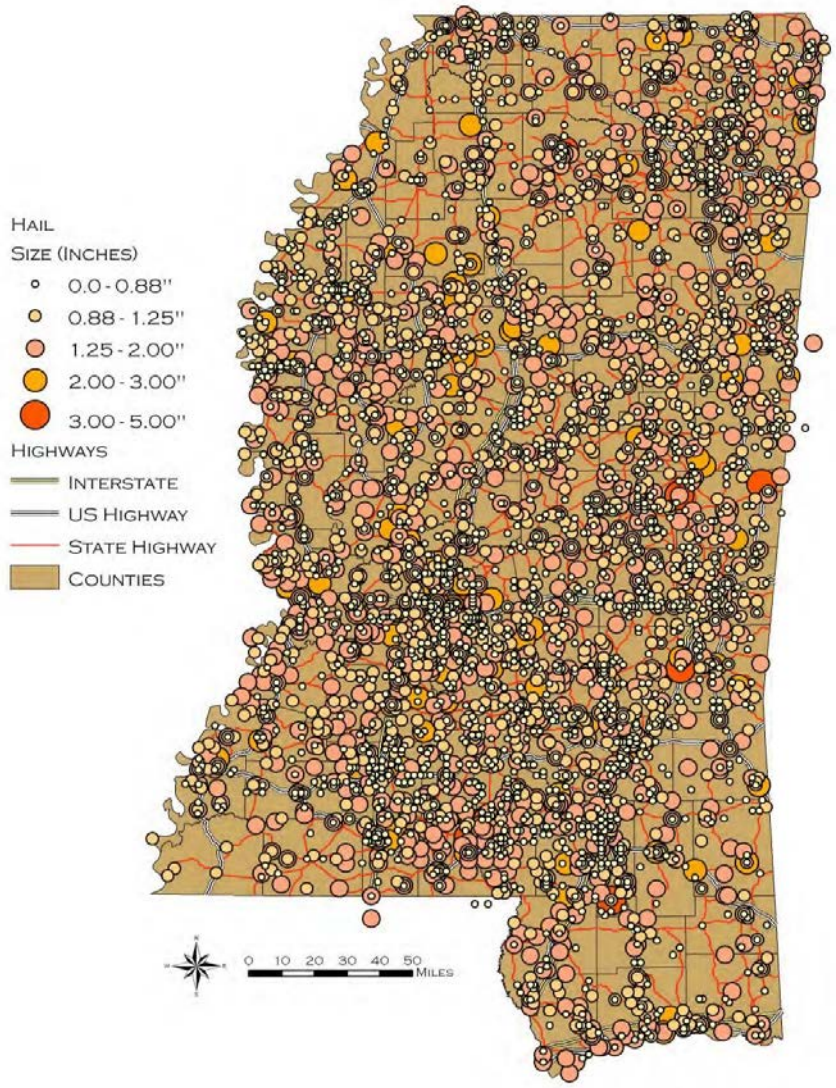


Figure 4.2.7-1 – Statewide Hail Events | Source: State of Mississippi 2018 Hazard Mitigation Plan



Previous Occurrences

The plan update includes historical data from the NOAA National Centers for Environmental Information (NCEI) as well as information from past newspaper articles relating to severe storms. There have been over 1271 reported Severe Storm events in the twenty years between January 1, 2000 and December 1, 2019 in MEMA D3 Counties. Over this time period, the total losses to property damage due to Severe Storms exceed $46.543 million and total losses to crop damages exceeds $7.253 million. Additionally, there was one death reported in both Carroll and Washington Counties from Thunderstorms and three injuries reported throughout the planning area as a result of Severe Storms. Table 4.2.7-3 provides a breakdown of the number of severe storms events by category by county with the respective dollar losses for both property and crop damage. As we can see, thunderstorms and hail events continue to be a major hazard in the planning area with 176 thunderstorm events and 59 hailstorm events collectively accounting for over $5.864 million in property damage since the last plan. Event details by county are presented in their respective Annexes.

Table 4.2.7-3 – Severe Storm Events (2000-2019) I Source: NCEI

County	No. Events	Deaths	Injury	Property Damage	Crop Damage	No. Events	Deaths	Injury	Property Damage	Crop Damage
	Thunderstorm Wind					***Lightning***				
Attala	100	-	-	$3,298,000	-	1	-	-	$80,000	-
Bolivar	102	-	2	$5,589,000	$15,000	1	-	-	$35,000	-
Carroll	83	1	-	$1,787,000	$225,000	2	-	-	$40,000	-
Holmes	83	-	-	$1,599,000	$48,000	-	-	-	-	-
Humphreys	46 (14)	-	-	$774,500	$150,000	1	-	-	$10,000	-
Leflore	81	-	-	$4,612,000	$50,000	2	-	-	$53,000	-
Montgomery	65	-	-	$1,119,000	-	1	-	-	$20,000	-
Sunflower	86	-		$8,219,000	$50,000	2	-	-	$202,000	-
Washington	93	1	1	$4,028,000	$5,000	3	-	-	$140,000	-
Region Totals		2	3	$31,025,500	$543,000	13	-	-	$580,000	-
	High Wind					***Hail***				
Attala	3	-	-	$168,000	$100,000	58	-	-	$337,000	- -
Bolivar	2	-	-	$820,000	-	67	-	-	$727,000	$705,000
Carroll	-	-	-	-	-	34	-	-	$5,150,000 -	$501,500 -
Holmes	-	-	-	-	-	46	-	-	$182,000	- -
Humphreys	-	-	-	-	-	23	-	-	$37,000	- -
Leflore	-	-	-	-	-	45	-	-	$2,504,000 -	$1,300,000 -
Montgomery	1	-	-		-	34	-	-	$1,331,000	$200,000 -
Sunflower	-	-	-	-	-	48	-	-	$2,477,000	$3,500,000 -
Washington	1	- -	- -	- -	- -	57	- -	- -	$1,205,000	$404,000 -
Region Totals	7	-	-	$988,000	$100,000	412	-	-	$13,950,000	$6,610,500

Probability of Future Occurrences

Every year, severe storms which includes damaging winds, lightning and hail occur in all the counties within this planning region. The probability of future occurrence is classified as **highly likely**.

Assessing Vulnerability

People

The impacts of severe storms to the population can be deadly. As such, the population in the planning region is vulnerability to severe storms. The very young, elderly, persons with special needs and handicapped persons are the most vulnerable to severe storms. High winds can cause debris to strike people, animals, buildings and property, which in turn causes significant injuries, fatalities, and property damage. People and animals can also be impacted by hail if they are caught outdoors with no protection. People are also at risk from the effects of lightning. As the current population trends in the planning area begin to reverse and see increases, the areas vulnerability to severe storms will also increase in both the general population and those described as being most at risk.

Property

Typically, damage associated with severe storms includes structural fires, broken glass, dented automobiles or siding, and personal injuries or even death. Wind damages typically include broken branches, uprooted trees, roofs blown off, walls blown down, small structures leveled, and in extreme cases, boats and airplanes being overturned. Buildings, automobiles, and infrastructural components (such as electrical feed lines) can suffer damage from high wind and lightning.

A critical facilities vulnerability assessment determined that all critical facilities, as well as all public, private and commercial property, are susceptible. Critical facilities that house vulnerable individuals should be prepared to provide utilities backup services in the event of a power failure. Vulnerable infrastructure includes electric transmission lines and utility poles that may be impacted by falling trees and other windborne debris. Roofs of homes and businesses can become compromised due to severe thunderstorms, strong winds and hail causing structural collapse. Power outages may affect operations of businesses and schools; may limit access to water supplies by fire fighters; and municipal services such as sewer and water purification systems may be rendered inoperable.

Critical infrastructure associated with power transmission, telecommunications and road signage are vulnerable to hail.

Manufactured homes are particularly susceptible to hail events due to construction types (vinyl siding, lesser gauge metal roofs).

Economy

The impacts from severe storms may cause short-term direct economic losses due to property damage or indirect losses due to infrastructure failure. Another type of loss due to severe storms could result from hailstorms that damage agricultural crops.

Environment

The effects of severe storms have the potential to impact the environment. As examples, lightning strikes may cause wildfires in forested areas; hail may damage vulnerable vegetation and crops.

Impact of Growth and Development on Severe Winter Weather

There are currently no major Severe Storm land use policies in MEMA District 3, nor has the region or its communities adopted development or building regulations designed to decrease the overall vulnerability to Severe Storm events. The greatest growth-related impact related to growth may come from the development of forest and agriculture land for residential or commercial uses. If these changes are not properly managed, homes and businesses could be constructed in high-hazard areas.

Impacts of Climate Change

As global temperatures continue to change severe storm events such as thunderstorms, high winds, lighting and hail events may be more severe. The changing climate is likely to produce more intense severe storms and increase the number of unpleasantly weather days.

Severe Winter Weather

Hazard Description

The National Weather Service describes Severe Winter Weather as having three factors -- cold air, moisture and lift – which, collectively foster conditions suitable for storm development. Below is a listing of definitions for winter weather events that could impact the planning area.

Cold/Wind Chill: The combination of wind and temperature that serves as an estimate of how cold it feels to exposed human skin. Wind chill values below -19 degrees are considered dangerous.

Heavy Snow: This generally means:

- snowfall accumulating to 4" or more in depth in 12 hours or less; or
- snowfall accumulating to 6" or more in depth in 24 hours or less

Ice Storm: The U.S. National Weather Service defines an ice storm as a storm which results in the accumulation of at least 0.25-inch (6.4 mm) of ice on exposed surfaces.[1]

Winter storm/Winter Weather: May constitute any combination of sleet, snow, ice, and wind that accumulates 18 centimeters (7 in) or more of snow in 12 hours or less; or 23 centimeters (9 in) or more in 24 hours or 1.3 centimeters (0.5 in) of ice.

The National Weather Service issues the following watches and warnings when impacts from the hazard are suspected.

Winter Storm Watch: Alert to the possibility of a blizzard, heavy snow, heavy freezing rain, or heavy sleet. Generally issued 12 to 48 hours before the beginning of a Winter Storm.

Winter Storm Warning: Issued 12 to 24 hours before hazardous winter weather may occur in the form of heavy snow, heavy freezing rain, or heavy sleet.

Winter Storm Outlook: Issued prior to a Winter Storm Watch, when forecasters have evidence that winter storm conditions. An outlook is usually issued 3 to 5 days in advance of a winter storm.

Wind Chill Warning: Issued when wind chill temperatures are expected to be hazardous to life within several minutes of exposure.

Wind Chill Advisory: Issued when wind chill temperatures are expected to significantly inconvenience life during prolonged exposure and, if caution is not exercised, could lead to hazardous exposure.

Winter Weather Advisory: Issued when it is expected that accumulations of snow, freezing rain, freezing drizzle, and sleet will cause significant inconveniences. Worse, a lack of caution could create life-threatening situations for vulnerable populations.

Location and Extent

Severe Winter Weather is not spatially defined and equally impacts all areas of the District. Severe Winter Weather typically occurs when one or all of the three previously described conditions exist – cold/wind chill, heavy snow, ice storm and winter storm/winter weather. All participating jurisdictions have been impacted by Severe Winter Weather events. The extent of damage can impact aging infrastructure, homes and businesses. Ice storms are considered the most severe of the four. Two presidential declarations for winter weather events are listed in Table 4.2.8-1.

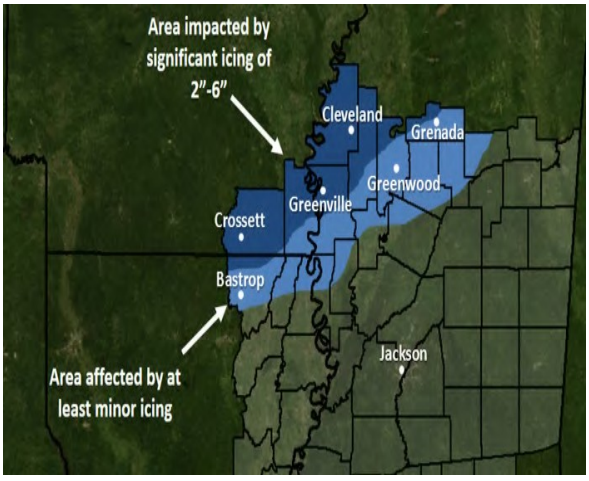
Table 4.2.8-1 – Presidential Declarations for Severe Winter Weather Events | Source: FEMA Disaster Declarations-Mississippi

Declaration Number	Event Type	Incident Period	Counties Affected	Date of Declaration
DR-1265	Severe Winter Storms, Ice and Freezing Rain	Dec 23-26, 1998	Attala, Bolivar, Carroll, Humphreys, Leflore, Montgomery, Sunflower, Washington	Jan 25, 1999
DR-1009	Severe Storm, Winter Storm, Freezing Rain and Sleet	Feb 9-4, 1994	Bolivar, Leflore, Sunflower, Washington	Feb 18, 1994

Previous Occurrences

Based on historical data from the NOAA National Centers for Environmental Information (NCEI) as well as information from past newspaper articles relating to winter storms. There have been over 150 reported Severe Winter Weather events in the twenty-two years between January 1, 1998 and December 1, 2020 in MEMA D 3 Counties. Over this time period, the total losses due to property damage exceed $20.14 million but there no deaths.

The Jackson, MS National Weather Service Office reported the worst winter storm on record affecting the ArkLaMiss Delta region occurred February 9-11, 1994. The map at right represents the approximate area within the NWS Jackson forecast area affected by this. Areas shaded in light blue experienced at least some icing, mainly during the late-night hours of February 9th into the morning hours of February 10th. Areas shaded in a darker blue experienced a more prolonged period of icing that began on the evening of February 9th and lasted into the morning of February 11th.



While no storms of this magnitude have occurred since 1994, 31 notable events were documented by NCEI as having occurred between 1996 and 2020. Damage over this period was comparatively limited, totaling $26,000 for the entire period. Following is a summary of an event from each county as described by those noted by NCEI as reporting the storm incidents. While no Holmes County-based weather spotters or NWS reported severe winter storm events, the far-reaching extent of these storms suggests that the county was likely affected by events impacting surrounding counties.

Table 4.2.8-2: Summary of District 3 Severe Winter Storm Events | Source: NCEI

Date	County	Event Narrative
1/16/2018	Attala, Bolivar, Carroll, Holmes, Humphreys, Leflore, Montgomery, Sunflower, Washington	A mix of light snow and sleet fell across the county. Accumulations of up to 0.8 inches of snow and 0.10 inches of sleet. Accumulating snow impacted the ArkLaMiss on January 16, 2018 with accumulations ranging from 1- 3 inches across much of the area. During the early morning hours on the 15th, a strong arctic cold front was quickly moving through the Central Plains towards the Deep South with an impressive 1050mb surface high pressure ushering in a brutally cold arctic airmass behind the frontal passage. Further aloft in the atmosphere, a closed cold core upper-level low was located over the Upper Midwest with a positively tilted trough axis extending to the west/southwest through the Northern Plains. A 120-knot jet stream - diving into the base of the trough helped the trough dig further south and west over the Texas/Oklahoma panhandles as the closed low transitioned into an open wave. By sunrise on the 16th, the trough axis was oriented from Lake Michigan southwest through the Southern Plains with a strengthening upper-level jet stretched from northern Arkansas through Maine. This orientation allowed flow to become more backed out of the southwest, resulting in sufficient moisture return over ArkLaMiss. At the same time, the arctic cold front raced well ahead of the upper level weather front with temperatures plummeting well below freezing. This set the stage for the moist southwest flow aloft to overrun the cold arctic air and produce a frontal band of snow as right entrance region jet dynamics overspread the area. Total property damages for all District 3 counties was $140,000.
1/7/2010	Sunflower	About half an inch of snow accumulated on grassy areas around the county. A strong cold front pushed through the region late on December 6. Low level moisture behind the front was significant enough for light snow to fall across portions of southeast Arkansas, northeast Louisiana and the delta region of Mississippi.
1/7/2010	Bolivar	Three events are listed as having occurred in the county on this date, but one is described as follows: One to one and half inches of snow accumulated near Duncan. During the midst of the arctic outbreak, a weather system affected the ArkLaMiss region on the 7th and brought a mix of wintry precipitation. A mix of freezing rain, sleet, and light snow fell across the northern third of the forecast area. Some precipitation caused icing on bridges, overpasses, and roads during the morning into the early afternoon.

1/7/2010	Montgomery	Light freezing rain and sleet resulted in a light glaze of ice on trees. An estimated one quarter inch of ice was observed around Winona. During the midst of the arctic outbreak, a weather system affected the ArkLaMiss region on the 7th and brought a mix of wintry precipitation. A mix of freezing rain, sleet, and light snow fell across the northern third of the forecast area. Some precipitation caused icing on bridges, overpasses, and roads during the morning into the early afternoon.
3/1/2009	Attala and Leflore	Patchy light snow showers moved over the county overnight and ended just after dawn. A half inch of snow was reported on grassy surfaces around Kosciusko. Bridges along highway 440 and highway 35 were iced over. A potent cold upper area of low pressure aloft plowed through the Lower Mississippi Valley Saturday night into early Sunday morning, producing light to moderate snow across a good portion of the ArkLaMiss region. Most of the region experienced at least some snowfall during this event. The bulk of measured accumulations, greater than a dusting, were generally confined north of I-20, while accumulations of an inch or greater were mainly limited to areas of Central and Northern Mississippi. Most of the heaviest snowfall, between 1 and 3 inches, was measured with this system across the northeast portion of Central Mississippi.
12/16/2008	Washington	Icing reported on bridges along Highway 1 and Highway 438 due to light freezing rain. An area of light freezing rain developed in a shallow cold airmass across the delta region of the ARKLAMISS. No significant amount of icing was noted with this system.

A summary of the number of events and damages incurred for Severe Winter Weather-related events is provided in Table 4.2.8-3. Figure 4.2.8-0 is provided as graphic representation of the number of events. (It is important to note crop damages were not reported to the NCEI). Figure 4.2.8-1 and Figure 4.2.8-2 show the costs associated with winter and cold related weather events.

Event summaries are highlighted in figures below. Information related to the 1994 Presidential Declaration noted previously was not found in the NCEI database.

Figure 4.2.8-0-Severe Winter Weather Events, by Categories | Source: NCEI

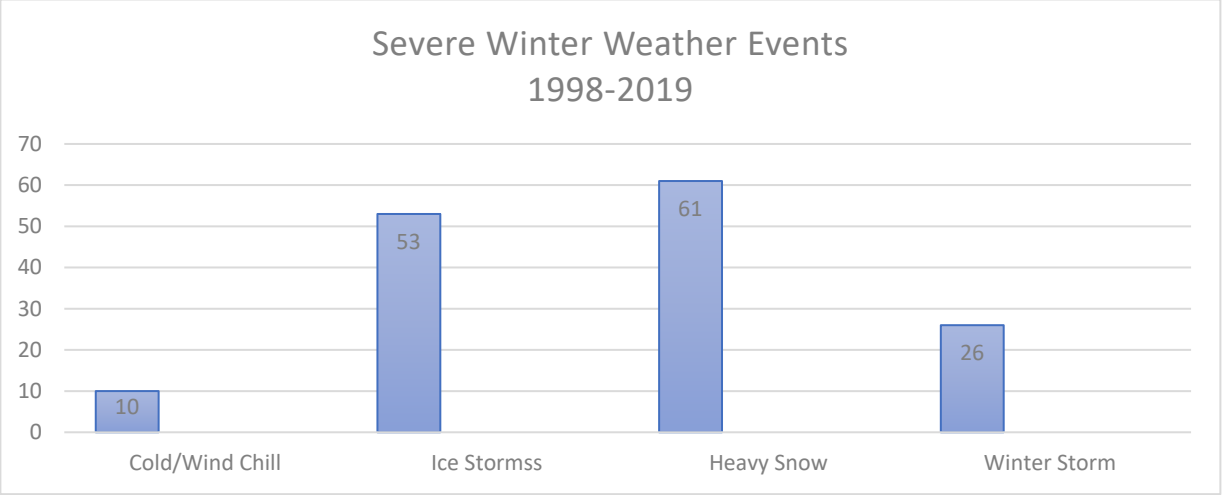
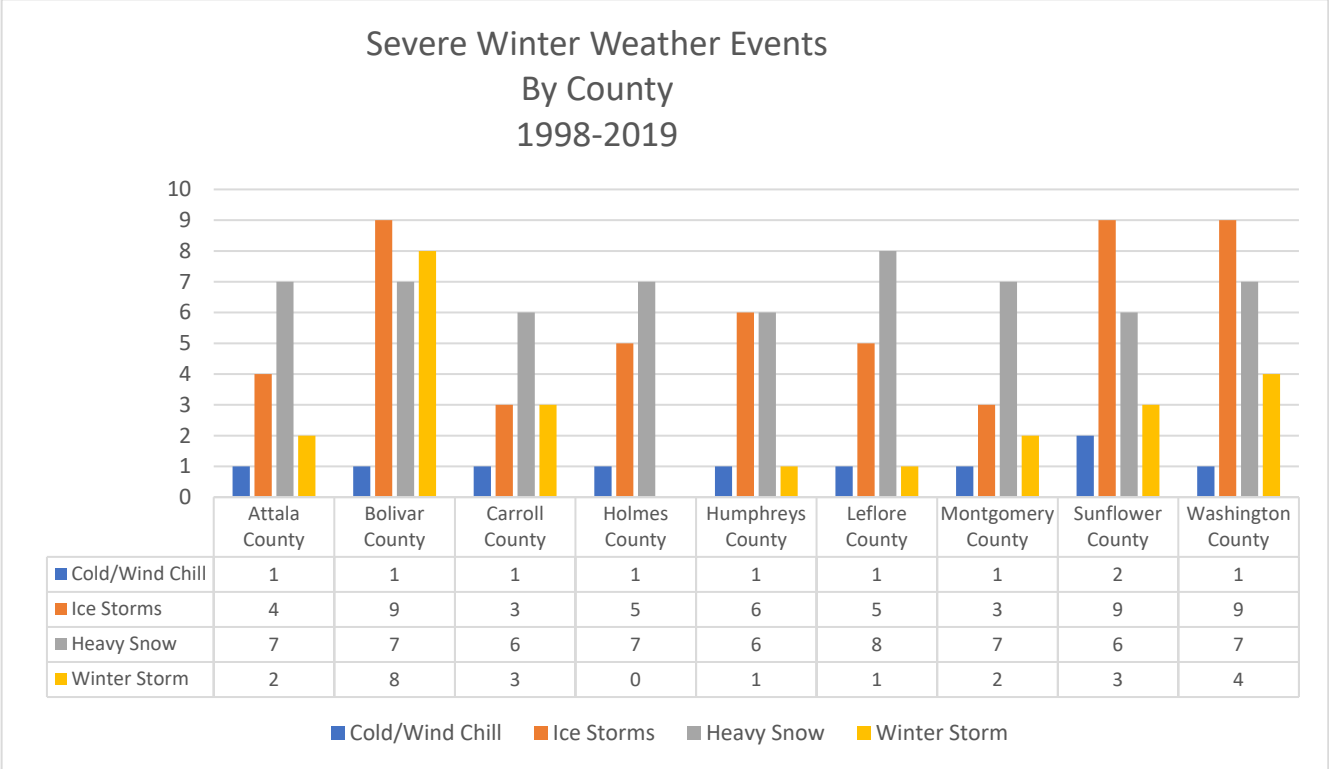


Figure 4.2.8-1: Severe Weather Events by County



	Attala County	Bolivar County	Carroll County	Holmes County	Humphreys County	Leflore County	Montgomery County	Sunflower County	Washington County
Cold/Wind Chill	1	1	1	1	1	1	1	2	1
Ice Storms	4	9	3	5	6	5	3	9	9
Heavy Snow	7	7	6	7	6	8	7	6	7
Winter Storm	2	8	3	0	1	1	2	3	4

Figure 4.2.8-2: Severe Winter Weather | Source: NCEI

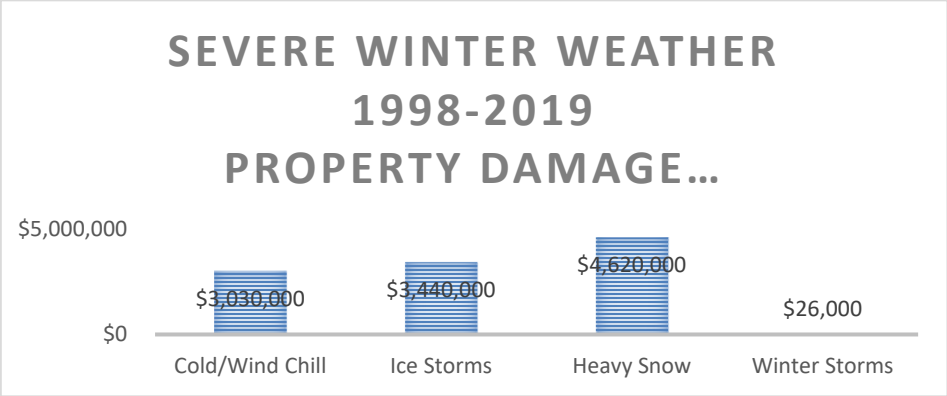
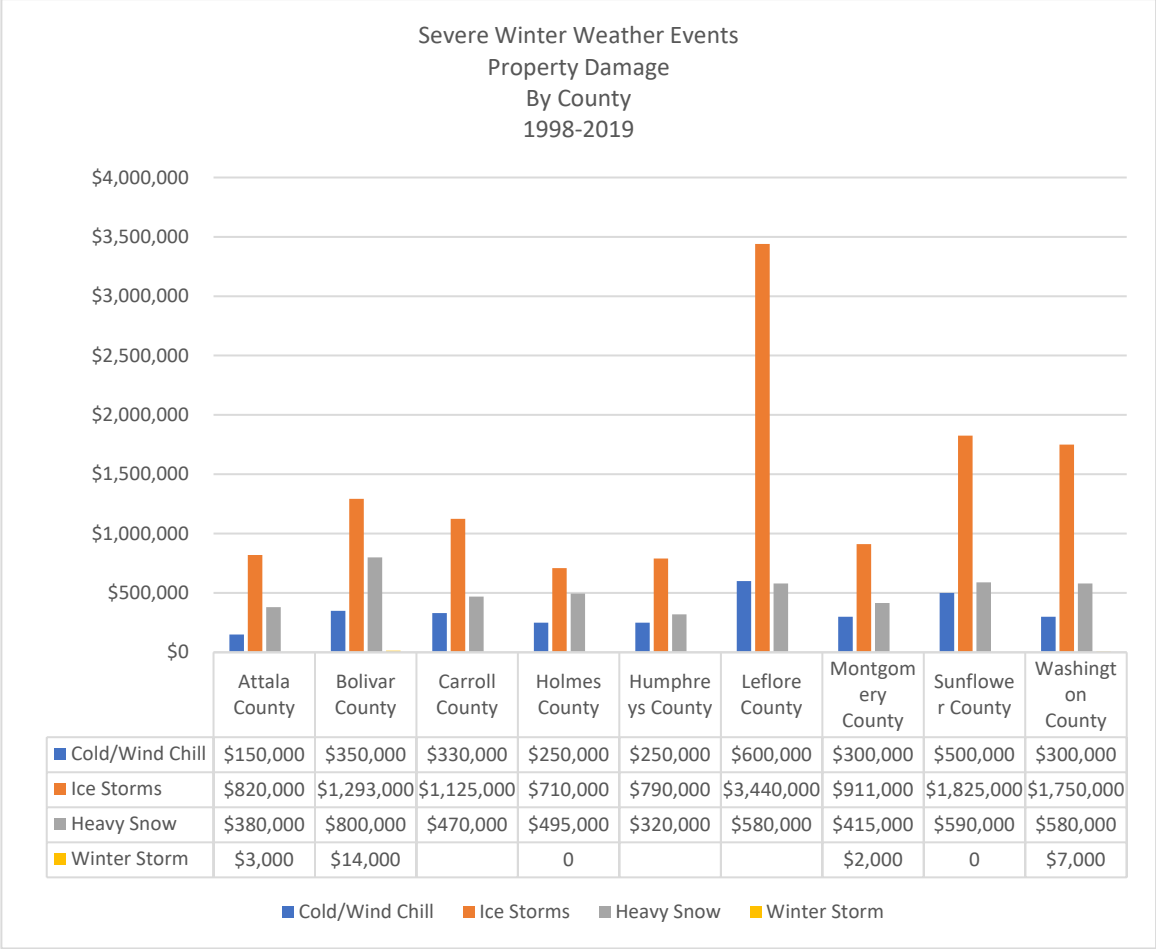


Figure 4.2.8-3-Severe Winter Weather Events Property Damage by County | Source: NCEI



	Attala County	Bolivar County	Carroll County	Holmes County	Humphreys County	Leflore County	Montgomery County	Sunflower County	Washington County
Cold/Wind Chill	$150,000	$350,000	$330,000	$250,000	$250,000	$600,000	$300,000	$500,000	$300,000
Ice Storms	$820,000	$1,293,000	$1,125,000	$710,000	$790,000	$3,440,000	$911,000	$1,825,000	$1,750,000
Heavy Snow	$380,000	$800,000	$470,000	$495,000	$320,000	$580,000	$415,000	$590,000	$580,000
Winter Storm	$3,000	$14,000		0			$2,000	0	$7,000

Table 4.2.8-3 – Severe Winter Weather Events, 1998-2019 | Source: NCEI

County	No. Events	Deaths	Injury	Property Damage	No. Events	Deaths	Injury	Property Damage
	Cold / Wind Chill				***Ice Storm***			
Attala	1	-	-	$150,000	4	-	-	$820,000
Bolivar	1	-	-	$350,000	9	-	-	$1,293,000
Carroll	1	-	-	$330,000	3	-	-	$1,125,000
Holmes	1	-	-	$250,000	5	-	-	$610,000
Humphreys	1	-	-	$250,000	6	-	-	$690,000
Leflore	1	-	-	$600,000	5	-	-	$3,440,000
Montgomery	1	-	-	$300,000	3	-	-	$911,000
Sunflower	2	-	-	$500,000	9	-	-	$1,825,000
Washington	1	-	-	$300,000	9	-	-	$1,750,000
	10	-	-	$3,030,000	53	-	-	$12,464,000
	Heavy Snow				***Winter Storm / Winter Weather***			
Attala	7	-	-	$380,000	3	-	-	$3,000
Bolivar	7	-	-	$800,000	8	-	-	$14,000
Carroll	6	-	-	$470,000	3	-	-	-
Holmes	7	-	-	$495,000	0	-	-	-
Humphreys	6	-	-	$320,000	1	-	-	-
Leflore	8	-	-	$580,000	2	-	-	-
Montgomery	7	-	-	$415,000	2	-	-	$2,000
Sunflower	6	-	-	$590,000	3	-	-	-
Washington	7	-	-	$580,000	4	-	-	$7,000
	61	-	-	$4,620,000	26	-	-	$26,000

Probability of Future Occurrences

It is highly likely that Severe Winter Weather will occur in the region.

Assessing Vulnerability

People

The impacts of Severe Winter Weather to the population can be deadly. In extremely cold weather, the human body cannot maintain proper internal temperatures and may experience adverse health effects. These include, headache, dizziness, weakness, cramping, nausea, vomiting, confusion, dehydration, and, in a worst-case scenario, death. As such, Severe Winter Weather is important for the planning region. A lack of mobility or knowledge of the preparedness horizon may cause young children, the elderly, persons with special needs, and handicapped persons to be particularly vulnerable. As the population of each of the MEMA D 3 Counties increases, their vulnerability to Severe Winter Weather will also increase, both in the general population and for those described as being most at risk.

Property

A critical facilities vulnerability assessment determined all critical facilities, as well as all public, private and commercial property, are susceptible. Critical facilities that house vulnerable individuals should be prepared to provide utilities backup services in the event of a power failure. Vulnerable infrastructure includes electric transmission lines and utility poles that may be weighed down by ice and freezing rain. These assets were thus greatly affected during the 1994 ice storm, and to a lesser extent in other storms described. Roofs of homes and businesses can become compromised due to ice accumulations, causing structures to collapse. Power outages may affect operations of businesses and schools; may limit access to water supplies by fire fighters; and municipal services such as sewer and water purification systems may be rendered inoperable.

Economy

While counties within the planning area may be vulnerable to short-term economic losses resulting from direct impacts of Severe Winter Weather, it is unlikely they would sustain long-term losses. Direct impacts could include temporary business closures due to loss of power; road closure; or delays in the shipment of goods.

Environment

Severe Winter Weather can impact all the planning area; however, environmental damage is unlikely to be widespread. Typically, damage related to Severe Winter Weather is related to ice storms that may cause crop damage or loss, and loss of trees due to ice forming on trunks and branches.

Impacts of Growth and Development

There are currently no Severe Winter Weather land use policies in MEMA District 3, nor has the region or its communities adopted development or building regulations designed to decrease the overall vulnerability to Severe Winter Weather events. The greatest growth-related impact related to growth may come from the development of forest and agriculture land for residential or commercial uses. If these changes are not properly managed, new homes and businesses could be equally at risk to the impact of severe winter weather.

Impacts of Climate Change

As global temperatures continue to change, Severe Winter Weather events may decrease in frequency but increase in severity, so MEMA D3 counties will continue to feel the impacts of Severe Winter Weather. One such impact could be a reduced snowpack from higher elevations to the north and west that drain into local water bodies, thus decreasing water availability and management.

Tornado

Hazard Description

Tornadoes, spawned from powerful thunderstorms, are capable of inflicting devastation and death within a matter of seconds. A tornado appears as a rotating, funnel- shaped cloud that extends from a thunderstorm to the ground and includes whirling winds capable of reaching 300 miles per hour over a storm path that may run a mile wide and 50 miles long. While all states are susceptible to the hazard, the National Weather Service and National Insurance Institute (NII) released figures for the year 2019 showing that over 1,400 tornadoes were reported nationwide. Parts of the Midwest are included in the sobriquet "tornado alley" because of the hazard's prevalence, but sections of the South that experience equally high tornadic activity are nicknamed "Dixie alley." The National Insurance Institute reported that during the period 1997 to 2016, tornadoes accounted for nearly 40 percent of all insured catastrophic losses**.**

Source: IEM NCTCOG Recovery Tabletop Exercise Situation Manual

The top ten states for tornado incidence in 2018 are shown below, with the number of reported tornadoes.

1. Louisiana: 86
2. Iowa: 84
3. Mississippi: 68
4. Illinois: 64
5. Alabama: 52
6. Texas: 52
7. Florida: 48
8. Missouri: 48
9. Kansas: 45
10. Kentucky: 41

Source: National Weather Service and Insurance Information Institute, https://www.bankrate.com/insurance/homeowners-insurance/the-10-worst-states-for-tornadoes/

Some tornadoes are clearly visible, while rain or nearby low- hanging clouds obscure others. A tornado may develop so rapidly that little to no advance warning is given. The air may be still and there is often no wind before an event occurs. A cloud of debris can mark the location of a tornado even if a funnel is not visible. Tornadoes generally occur near the trailing edge of a thunderstorm, though it is not uncommon to see clear, sunlit skies behind a tornado formation.

In 2007, the United States upgraded the tool with which meteorologists measure storm magnitude by transitioning from using the Fujita Scale (F Scale) to the Enhanced Fujita Scale (EF Scale) to better rate tornado strength and to provide a more accurate representation of the surface wind speeds seen in the most violent tornadoes. Both are shown in Table 4.2.9-1. Event magnitude is estimated by reviewing the level of post-event damage. Both scales are presented here to support information presented later in this section about the number of tornado events of each magnitude that have occurred in D3.

Table 4.2.9-1 – Comparison between the Fujita Scale (F-Scale) and Enhanced Fujita (EF) Scale | Source: NOAA

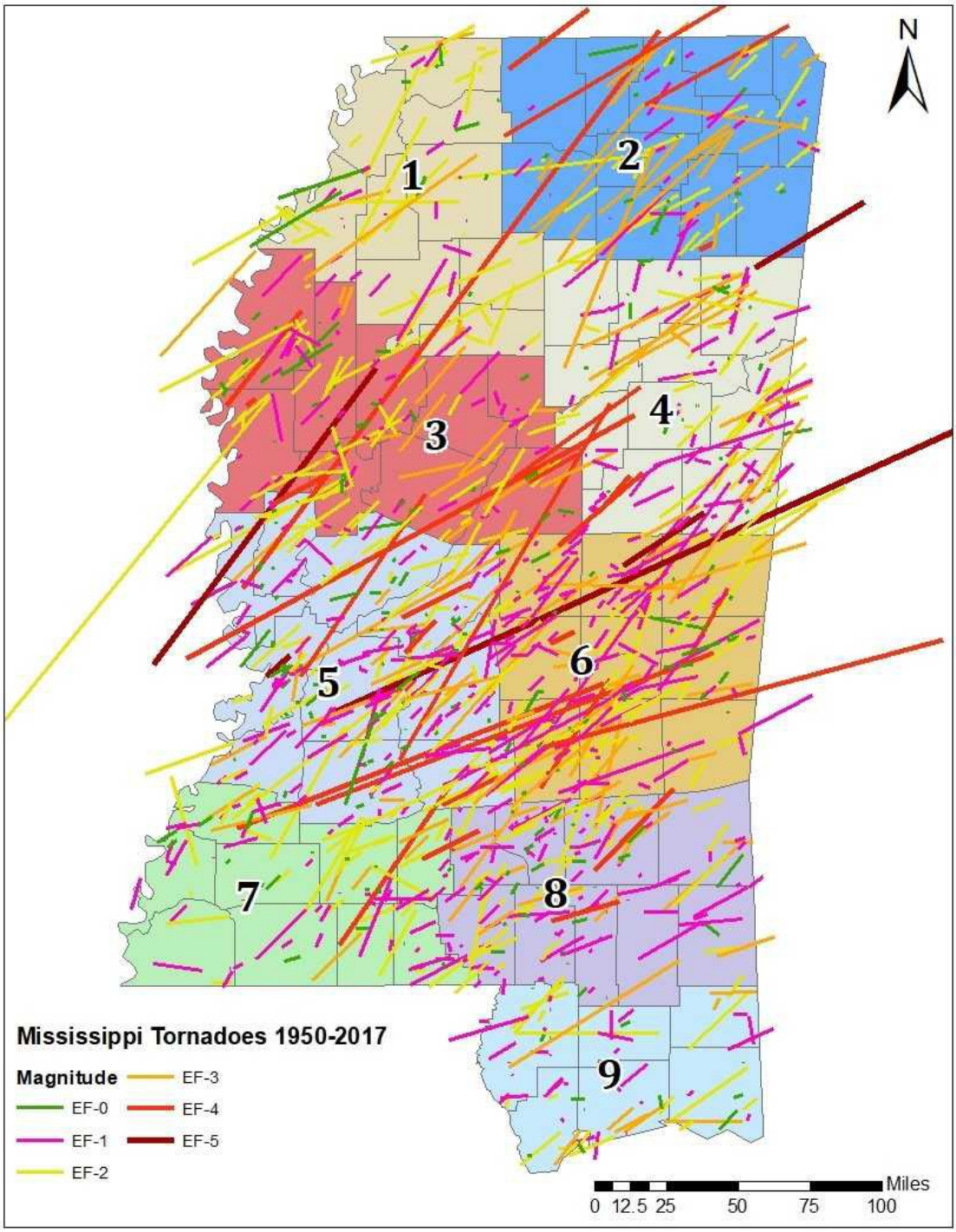
Fujita Scale Developed in 1971 and Used Until 2007			Enhanced Fujita Scale (EF) Used as Measure of Magnitude in the U.S. Since 2007		
F Category	Wind Speed (mph)	Potential Damage	EF Category	Wind Speed (mph)	Potential Damage
F0	< 73	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.	EF0	65-85	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees toppled.
F1	73-112	Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.	EF1	86-110	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; broken window/other glass broken.
F2	113-157	Considerable damage. Roofs torn from frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.	EF2	111-135	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
F3	158-206	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.	EF3	136-165	Severe damage. Entire stories of well-constructed homes destroyed; severe damage to large buildings, (e.g., shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
F4	207-260	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown, and large missiles generated.	EF4	166-200	Devastating damage. Well-constructed houses and whole frame houses completely leveled; cars thrown, and small missiles generated.
F5	261-318	Incredible damage. Strong framed houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds); trees debarked; incredible phenomena will occur.	EF5	>200	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile- sized missiles fly through the air in excess of 100 m (109 yd.); high-rise buildings have significant structural deformation; incredible phenomena will occur.

Location and Extent

Figure 4.2.9-0**,** taken from the 2018 State of Mississippi Hazard Mitigation Plan, further illustrates tornado impacts. The graphic demonstrates the extent of impact tornadoes have had not only in this planning area, but neighboring counties as well. Individual tornado maps are provided in each of the individual county annexes.

Fortunately, most previous events have been at the lower levels of magnitude, although descriptions of several historic events of severe magnitude show tornadoes are capable of traveling across states to leave significant destruction in its wake.

Figure 4.2.9-0- Tornado Events 1950 to 2017 | Source: 2018 State of Mississippi SHMP



Previous Occurrences

Table 4.2.9-2 shows that nine (9) presidential declarations were issued between 2000–2019 for D3 communities affected by tornadoes.

While this plan update generally focuses on hazard events occurring in the past 20 years, but the next table, covering the past 50 years, is included to show the periodic recurrence of tornadic events over time. An event severe enough to warrant a presidential disaster declaration occurs, on average, every four to seven years and each county has been included in several declarations.

Table 4.2.9-2 - Presidential Disaster Declarations, 1971 – 2019 | Source: FEMA Disaster Declarations-Mississippi

Declaration Number	Incident Period	Counties Affected	Declaration Date
DR-4450	4/13/2019 - 4/14/2019	Holmes	6/20/2019
DR-4429	2/22/2019 - 3/29/2019	Carroll, Humphries, Leflore, Montgomery, Sunflower Washington	4/23/2019
DR-4314	4/30/2017	Carroll, Holmes, Montgomery	5/22/2017
DR-4175	4/28/2014 - 5/3/2014	Montgomery	4/30/2014
DR-1972	4/15/2011 to 4/28/2011	Carroll, Holmes, Leflore, Montgomery, Sunflower	4/29/2010
DR-1906	4/23/2010 - 4/24/2010	Holmes	4/29/2010
DR-1459	4/6/2003 - 4/25/2003	Attala, Holmes	4/24/2003
DR-1398	11/24/2001 - 12/17/2001	Bolivar, Holmes, Humphries, Sunflower, Washington	12/7/2001
DR-1360	2/16/2001 - 3/15/2001	Attala, Bolivar, Carroll, Holmes, Humphries, Leflore, Sunflower, Washington	2/23/2001
DR-968	4/26/1991 - 5/31/1991	Attala	11/25/1992
DR-906	12/19/1990 - 1/14/1991	Bolivar, Carroll, Holmes, Humphries, Leflore, Sunflower, Warren, Washington	5/17/1991
DR-888	6/1/1983	Humphries, Leflore	1/3/1991
DR-683	6/1/1983	Holmes, Washington	6/1/1983
DR-577	6/16/1979	Attala, Holmes, Leflore, Montgomery	4/16/1979
DR-302	2/22/1971	Carroll, Holmes, Humphries, Leflore, Sunflower, Washington	2/22/1971

Data from the National Weather Service Storm Data Center also shows tornadoes occur districtwide. Table 4.2.9-3 shows the number of events that occurred during a 20-year period broken down by county and magnitude. Because the NWS graduated from the F-Scale to the EF-Scale in the middle of this period, data from both measurements is included.

Table 4.2.9-3 – Tornado Events 2000-2019 | Source: NCEI

	Magnitude								Damage	
County	F0/EF0	F1/EF1	F2/EF2	F3/EF3	F4/EF4	Total	Deaths	Injuries	Property ($)	Crop ($)
Attala	5	9	6	3	0	23	0	0	$66,248,000.00	$7,116,000.00
Bolivar	12	5	5	0	1	23	0	37	$13,192,000.00	$500,000.00
Carroll	5	3	1	0	0	9	0	0	$925,000.00	$720,000.00
Holmes	6	6	4	2	1	19	3	44	$68,137,000.00	$7,025,000.00
Humphreys	5	4	2	1	0	12	1	10	$6,383,000.00	$705,000.00
Leflore	6	9	1	1	0	17	0	0	$4,575,000.00	$1,115,000.00
Montgomery	3	7	2	0	0	12	0	0	$6,390,100.00	$2,100,000.00
Sunflower	7	8	1	0	0	16	0	3	$2,070,000.00	$215,000.00
Washington	7	1	1	0	1	10	1	14	$4,555,000.00	$3,000.00
Total D 3	56	52	23	7	3	141	5	118	$172,465,100.00	$19,499,000.00

Descriptions of several major events that occurred in the planning area are provided below. Those of historic relevance were retained from the 2015 plan because of their significance in size and impact.

January 1, 2020 – A total of $4,555,000 in property and crop damage was caused by a series of tornadoes affecting Bolivar, Washington, and Sunflower counties. Several events began in separate areas of the three counties, the most devastating event occurring in Bolivar County, where an EF-2 tornado touched down near the Mississippi River and tracked through Benoit, crossed The Dahomey National Wildlife Refuge, and continued eastward. The tornado destroyed concrete power poles and mobile homes northwest of Cleveland and from there crossed into Sunflower County. Maximum peak wind speeds were estimated to be 130 miles per hour.

April 30, 2017 - Weather patterns created a series of tornadoes that struck Attala, Carroll, Holmes and Montgomery counties and caused a total of $12,320,000 in property and crop damage. The NWS reported that in the early morning hours of this date, a squall line of severe thunderstorms developed across central Louisiana and pushed eastward across the ArkLaMiss delta, intensifying as it approached the Mississippi River and causing wind damage and tornadoes. Once the line reached Mississippi, numerous tornadoes developed along the advancing line and tracked roughly from Claiborne County (outside of District 3) through counties to the south of the District (Hinds, Madison, Webster and Yazoo) to affect the D3 counties in eastern Holmes, southeastern Carroll, and overall Montgomery. This corridor is where the most significant damage occurred, including one fatality. Flash flooding, hail, and other wind damage occurred as these storms moved through.

January 22, 2012 - Several severe storms developed across portions of the central Mississippi, including one that spawned a tornado in northern Bolivar County. Damaging thunderstorm winds and hail up to golf ball size also occurred. Four mobile homes were destroyed, and eight others experienced major damage. A number of other homes sustained heavy damage along the path; two metal frame buildings were destroyed, and several power poles were snapped. A 200-foot radio tower was destroyed, a grain bin was blown away, and numerous trees and power lines were blown down. Maximum wind speeds were around 120 mph.

Location	County	Date	Magnitude	Death	Injury	Property Damage	Crop Damage
Alligator	Bolivar	01/22/12	EF2	0	1	$700,000	0

April 15-28, 2011 (DR-1972) - A historic outbreak of tornadoes across Arkansas, Louisiana, and Mississippi (ArkLaMiss) began late on Tuesday, April 26th continuing into the early morning hours of Wednesday, April 27th. The event ramped up again during the early afternoon of April 27th continuing into the early evening. The activity on April 26th began as super cell thunderstorms producing large hail and tornadoes across northeast Texas and portions of Arkansas before evolving into a squall line as it moved east.

This line of storms evolved through many stages as it moved across several states before dissipating. It produced wind damage as it pushed east and was responsible for 23 of the 32 tornadoes that occurred across the three-state area during this event. Of those 23, 12 were rated as strong (EF2, EF3) tornadoes and extended over a long geographic range (or had "long tracks").

Loss of life during this historic event was staggering: 321 people died, making this the second deadliest tornado outbreak in U.S. history. This system produced the first EF-5 tornado in Mississippi since the Candlestick Park tornado (Jackson) occurred on May 3, 1966. This was the first recorded date since the advent of such storm records that two EF-5 tornadoes were recorded on the same day in the state. The second EF-5 tornado was citied in Smithville. Four tornadoes, all rated either EF-4 or EF-5, had a total path length of over 100 miles and were spread across several southern states during this event. The impact of events that occurred during this timeframe are shown in the next table.

Table 4.2.9-3a – Impacts of Tornado Series of April 15-28, 2011 | Source: NCEI

Location	County	Date	Magnitude	Death	Injury	Property Damage	Crop Damage
Possum Neck	Attala	4-15-2011	EF2	0	2	$35,000	0
Hesterville	Attala	4-15-2011	EF0	0	0	0	$1,000
Sallis	Attala	4-27-2011	EF2	0	0	$550,000	$250,000
Ethel	Attala	4-27-2011	EF1	0	0	$25,000	0
Beatty	Carroll	4-27-2011	EF2	0	0	$5,000	$300,000
Beatty	Carroll	4-27-2011	EF1	0	0	$100,000	0
Franklin	Holmes	4-15-2011	EF1	0	0	$10,000	$500,000
Bee Lake	Holmes	4-27-2011	EF1	0	0	$50,000	$100,000
Owens Wells	Holmes	4-27-2011	EF2	0	0	$100,000	$400,000
Lexington	Holmes	4-27-2011	EF3	0	0	$600,000	$600,000
Durant	Holmes	4-27-2011	EF0	0	0	$25,000	0
Polar Creek	Montgomery	4-27-2011	EF1	0	0	$3,000	0
Polar Creek	Montgomery	4-27-2011	EF2	0	0	$350,000	$800,000

April 23-24, 2010 (DR-1906) During the midday hours of April 24, 2010, an intense super cell thunderstorm produced a violent, long-track tornado that cut across the center of the NWS Jackson, MS forecast region. It touched down south of Interstate 20 west of Tallulah in Madison Parish, Louisiana, then grew larger and more intense while moving in a northeasterly direction. Moving at about 55 mph, it was on the ground roughly two hours and 44 minutes while covering 149 miles. It touched nine counties and parishes and caused the most damage in Madison Parish, Louisiana and Warren, Yazoo, Holmes, Attala, and Choctaw Counties in Mississippi. Recorded damage was in the EF2 and EF3 ranges, although Yazoo and Holmes Counties experienced EF4 magnitude damage with maximum winds of 170 mph. The storm caused 146 injuries and 10 fatalities: five deaths in Choctaw County, four in Yazoo County, and one in Holmes County. This tornado's path ranks as the fourth-longest in Mississippi history. It is the

widest known tornado, with a maximum width of 1.75 miles. It also ranks as the ninth deadliest in Mississippi tornado with 10 fatalities, making it the deadliest since November 21, 1992, This was the first violent tornado (EF4 or greater) in the month of April since April 18, 1978.

Location	County	Date	Magnitude	Death	Injury	Property Damage	Crop Damage
Boyette	Attala	4-24-2010	EF2	0	0	$60,000	$4,000,000

Funnel Cloud

A funnel cloud extends downward from the sky in the same shape as that of a tornado, but the cloud trough does not touch the ground. Funnel clouds generally accompany severe storms and include heavy rain and/or hail. Several of the more serious funnel cloud occurrences and their impacts were described om the NOAA Storm Data Base. While funnel cloud events generally do not cause damage or loss of life on the scale of a tornadic event, it's worth mentioning that 18 funnel cloud events were recorded over seven of the nine counties; Holmes and Montgomery Counties have no recorded events of funnel clouds.

7/24/2017
Sunflower County
Town of Halstead

There were multiple pictures of a funnel cloud that brought showers and thunderstorms in a warm and very moist air mass. Heavy rainfall caused significant localized flooding event, some sites receiving over 6 inches of rain in a short period of time. Many roads were covered in several inches of water and persons experienced waist deep water in their homes. The combination of strong gusty winds and saturated ground resulted in downed trees.

5/25/2011
Sunflower County
Town of Waco

A funnel cloud was observed west of Inverness. It accompanied a powerful, late season, low pressure system that brought numerous thunderstorms to the Deep South starting late in the evening of May 25th, continuing into the early morning hours of May 26th. Additional storms occurred during the early afternoon hours of May 26th and produced hail two inches in diameter.

1/9/2009
Leflore County
Town of Sunnyside

A storm spotter reported a funnel cloud near the intersection of Highway 8 and County Road 522. A potent complex of thunderstorms raced across the northwest portion of the forecast area and brought a line severe storms to the Delta region. Several thunderstorms brought damaging winds to portions of southeast Arkansas, northeast Louisiana, and the Delta portion of Mississippi. Tornadoes also occurred during this event, one causing a fatality in Wayside.

4/7/2006
Washington County
Town of Hollandale

Large hail and damage across southern Washington County were caused by a supercell thunderstorm that developed over Arkansas and then moved east-northeast across southern Washington County. This storm produced a swath of half dollar- to golf ball-sized hail from near Chatham and through Hollandale and Arcola enroute to the southern end of the county. Large trees also fell in Chatham near Highway 1.

Probability of Future Occurrences

The list of FEMA declarations for tornado events and NCEI data both show tornados have occurred regularly in recent years and are, thus, highly likely to occur in the future. Meteorologists at The Weather Channel created a series of images showing where in the United States tornadoes are likely to occur during a given month. These visuals indicate the most likely months during which tornadoes will strike D3 are from November through April.

Figure 4.2.9-1: Tornado Risk Areas

Source: The Weather Channel, "Your Average Tornado Risk by Month," March 20, 2020.

Assessing Vulnerability

Limitations in Tornado Detection: Data about previous occurrences may be based on underreporting if events occurred and were not documented in the NWS Storm Event Database because they were not reported by local offices of emergency management, trained storm spotters, or another observer. D3 is a largely rural area with low population density, so events may occur but not be observed. Figure 4.2.9-2 provides an example of this by comparing population density to tornado paths in Bolivar County. This figure illustrates the clustering of reported tornadoes around populated areas, such as the City of Cleveland. There is a high degree of probability that tornadoes occurred equally regularly in the sparsely populated areas of the county, but they were not documented by NWS if they were not reported.

Figure 4.2.9-2 – D3 Tornado Events, 1950-2017 | Source: 2018 State of Mississippi SHMP

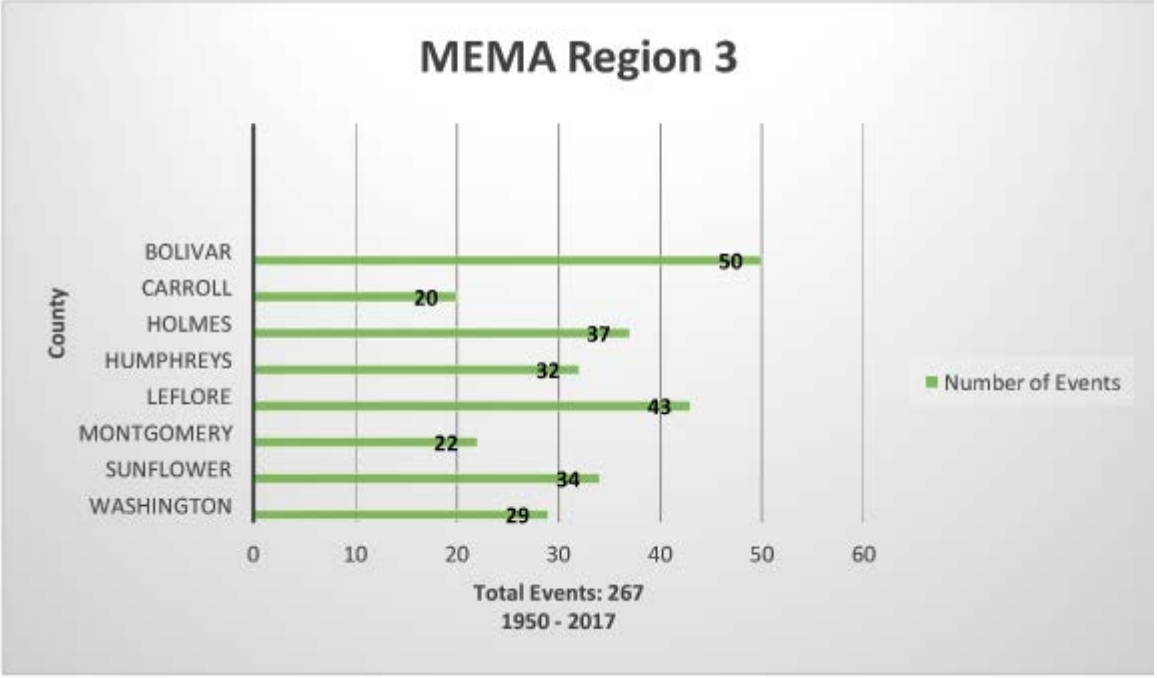
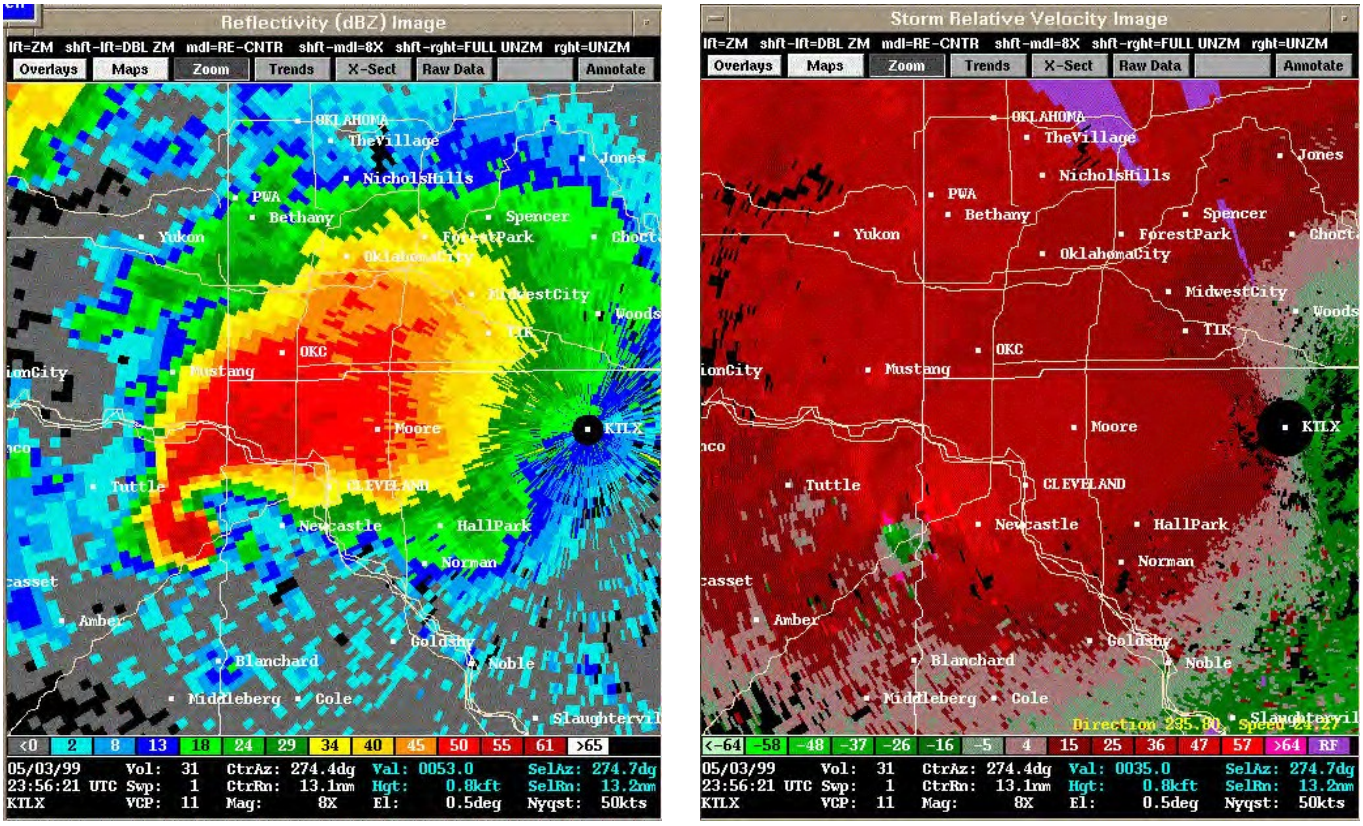


Figure 4.2.9-3 - D3– Tornado Scenario in Relation to Critical Assets

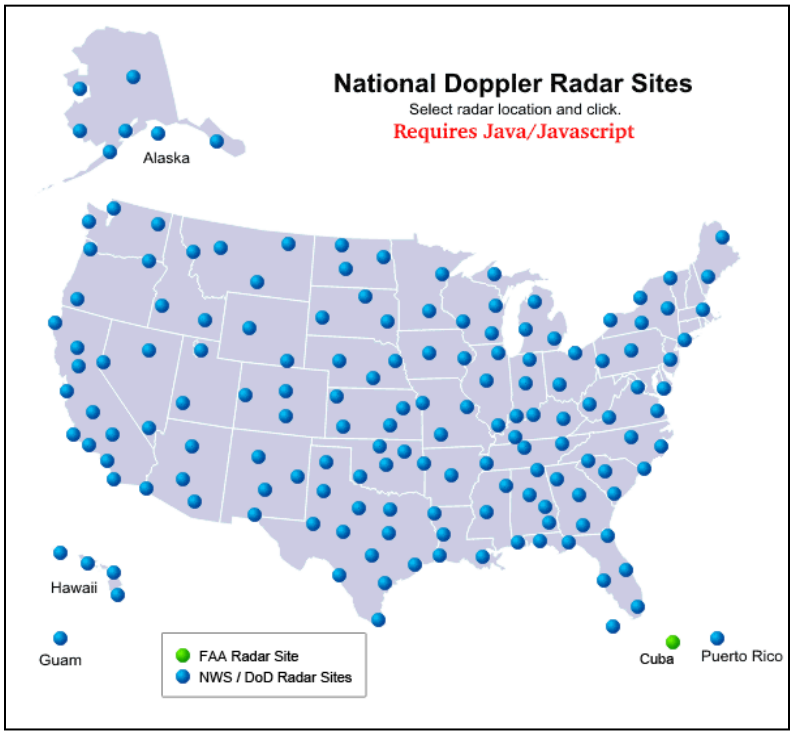
The use of advanced weather radar systems has improved tornado warning times. However, blind spots may occur because radar locations are at least 100 miles apart, so “blind spots” may occur. Thus, the potential exists a tornado may not be identified. Radar projects a beam of electromagnetic radiation upward at a slight angle, typically starting at 0.5 degrees from the horizontal (the beam increases with height with each 360 degree turn up to a designated height and then starts over again). When a beam strikes an object in the atmosphere (including water molecules and debris), it is reflected toward the radar system and the intensity is measured as reflectivity in decibels as shown in Figure 4.2.9-4a. More advanced radar systems, such as the WSR-88D NEXRAD system, can determine whether rain, hail or debris suspended in the atmosphere is moving toward the radar or away from it and at what speed the object is moving (storm relative velocity). Concentrated areas of opposing winds, such as those presented in Figure 4.2.9-4b, suggest the presence of a tornado. This allows radar systems and their operators to detect rotating updrafts, hook echoes, and similar features associated with tornadic storms.

Figure 4.2.9-4a and b - Weather Radar Imagery | Source: NOAA National Weather Service



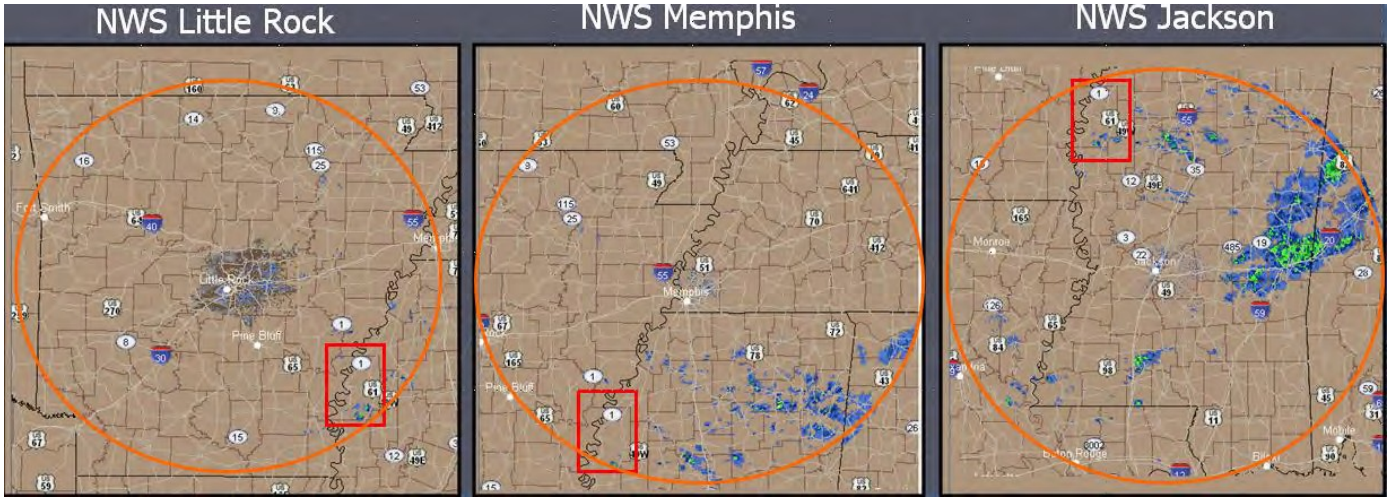
The accuracy of WSR-88D NEXRAD radar systems is somewhat limited. Figure 4.2.9-5 shows the location of WSR-88D NEXRAD radar stations in the United States. The maximum range of radar beams from each station is roughly 124 miles. While Mississippi has consistently experienced a high number of tornado events, there are only two NWS weather radar systems in the state. Figure 4.2.9-5 suggests gaps in coverage for portions of Mississippi, especially considering the “surfaced-based” nature of convective storms producing tornadoes. The base altitude or ceiling for tornado-producing thunderstorms can be as low as 500-1,000 feet above ground level. As such, a tornado may, literally, “sneak under the radar.” However, latest improvements have been occurring within the past year or so. The NWS Jackson WSR-88D radar has undergone a lowering of its radar angle. In other words, instead of the electromagnetic beam starting at 0.5 degrees, it will begin at 0.3 degrees. This will result in the ability to see the structure of a storm at a lower level (such as a tornado) and from a longer distance. Thus, this lowering will aid in filling in more of the missing gap; the area of which a storm may develop between two radars.

Figure 4.2.9-5 - National Doppler Radar Sites | Source: NOAA, National Weather Service



The consequences of having poor radar coverage was apparent when a tornado struck the Village of Alligator on January 22, 2012. NWS was unable to provide an event warning due to the relatively low altitude of the tornadic circulation; the relatively weak nature of the tornado (EF-1); and its distance from dual-pole radar systems. Yet, significant damage was done in this rural village, which lacks building codes and does not provide storm shelters. Figure 4.2.9-6 shows an example of the radar gaps in northwest Mississippi.

Figure 4.2.9-6 - Radar Gaps in Mississippi | Source: Delta State University / National Weather Service



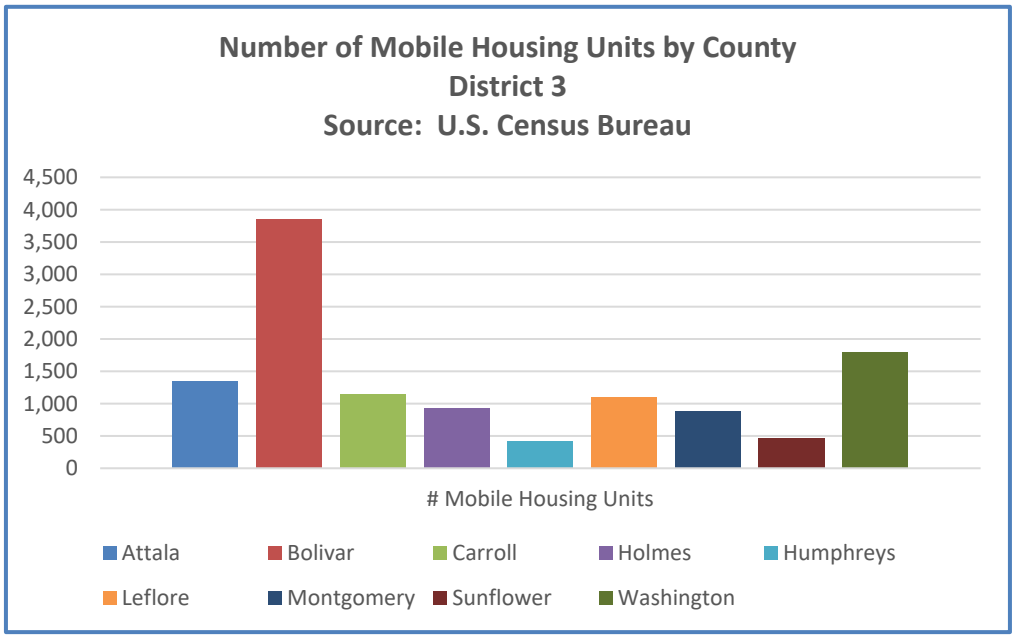
Populations Living in Mobile/Manufactured Housing: Persons working or living in an above ground structure are vulnerable to tornado events. Those living in mobile homes, also known as manufactured homes or manufactured housing, are at risk since their homes, by and large, do not lie on a foundation or are not tied to the ground with hurricane straps. Table 4.2.9-4 shows the number of households for which mobile homes are their residential structure. Lack of a warning system or access to a tornado shelter puts their lives at risk should an event rapidly occur.

Table 4.2.9-4 – Mobile/Manufactured Homes 2018 | Source: US Census Bureau (2018 Estimate)

County	No. Mobile/ Manufactured Homes	Percent of Total Housing	Population Density
Attala	1,340	14.5	26.6
Bolivar	3,850	26.7	39
Carroll	1,148	22.1	16.9
Holmes	928	10.8	25.4
Humphreys	421	11.9	22.4
Leflore	1,103	8.8	54.5
Montgomery	882	13.1	26.8
Sunflower	465	4.8	42.2
Washington	1,794	7.7	70.6

The chart included as Figure 4.2.9-7 visually depicts the number of mobile homes in each county, showing the number of structures at risk from the tornado hazard.

Figure 4.2.9-7 – Mobile/Manufactured Homes | Source: U. S. Census Bureau (2018 Estimate)



Populations other than those living in manufactured housing are also at-risk during a tornado. These include people living or working outside of the siren warning area; those without a telephone land line or cell phone service; persons who do not have a NOAA weather radio; and those who are medically homebound. Disruption in electrical distribution affects diabetics whose insulin must be refrigerated, and those who rely on mechanical ventilation systems. Patients in nursing homes, hospitals, and receiving home health care are best served in structures that include a source of back-up power.

Assessing Vulnerability

People

Individuals and family most affected by tornado are those living and working in mobile homes and other structures built before more stringent building standards were implemented. While Several D3 EM Directors commented they would like to see additional storm shelters constructed. Those living and working in areas too far from the location of storm sirens may be caught off guard by a rapidly approaching event. Table 4.2.9-3, presented earlier, shows between the years 2000-2019 five (5) deaths and 118 injuries were attributed to tornado events.

Property

While tornado events are generally short-lived, their intensity nature creates the potential for severe damage. All critical facilities, as well as all public, private and commercial property, are susceptible to the hazard. Referring again to Table 4.2.9-3, NCEI data shows $172,465,100 in total property damage occurred across the planning region. Attala and Holmes Counties sustained the greatest amount of damage, receiving $ 66,248,000 and $68,137,000 respectively.

Economy

A significant portion of land in D3 is used for agricultural purposes and NCEI data shows the nine counties experienced $19,499,000 in crop losses during the period 2000-2019. As was the case with property damage, Attala and Holmes County saw the greatest losses at $7,116,000 and $7,025,000 respectively. As agricultural land is developed for residential and business use, crop losses will be lessened, but homes and commercial structures built on farmland will be vulnerable to tornado if structures are not built to high construction standards.

Environment

Every person, structure, animal, and natural feature within a tornado path is affected by the impact of a tornadic event. The entire food chain is disrupted, including wildlife, livestock, and crops. Large objects propelled as missals cause harm to persons and damage or all but the most resilient structures, including bridges, power lines, and wastewater treatment plants. Trees destroyed during a tornado may take up to 100 years to regrow, thus affecting forestry-related occupations.

Impacts of Growth and Development on the Tornado Hazard

It is only natural communities should want to develop new residential areas and commercial concerns. There is a great deal of open space in the planning region, some of which – under careful management – could be used for moderate development. Those undertaking growth initiatives in this area of high tornadic activity, however, should ensure development is pursued keeping in mind construction standards suitable for regions at risk to tornado.

Impacts of Climate Change

An article from the National Geographic Society (NGS) Resource Library discusses the challenges in discussing how tornado patterns may change as a result of climate change.[6] In discussing climate change, scientists point out tying more severe drought or increased rainfall to a warmer planet is easier than predicting evolving tornadic activity because, while many such events occur, they are short lived and, as such, harder to model. While no long-term trends have been identified regarding frequency, there are fewer days with at least one tornado but more days with over thirty. The overall number of annual events is the same, but the events are more clustered.

NGS also points out the location of tornados has shifted: in terms of overall events, the percentage of those taking place in the Midwest, or Tornado Alley, is falling, while more events are taking place in the states of Mississippi, Alabama, Arkansas, Missouri, Illinois, Indiana, Tennessee, and Kentucky. In summary, the group states "scientific understanding isn't detailed enough to project direction and magnitude of future change."[7] For D3 communities, this suggests taking mitigation measures, such as improving construction standards and creating household or community safe rooms, will offer the best protection against the effects of climate change on the tornado hazard.

Tropical Storm / Hurricane

Hazard Description

Hurricanes and tropical storms are naturally occurring events which produce damaging high winds, generate dangerous storm surge flooding, cause pounding storm surf, spawn tornadoes, and produce torrential rainfall that can cause inland flooding. The Atlantic hurricane season begins June 1 and ends November 30, but hurricanes have developed outside of the designated season.

On a recurrent basis, hurricanes are the strongest natural hazard threat to human life and property. Tropical storms and hurricanes can threaten the jurisdictions within D3 with high winds and rain.

[6] National Geographic Society Resource Library, https://www.nationalgeographic.org/article/tornadoes-and-climate-change/, n.d.

[7] Ibid.

The following terms are used to describe tropical storms / hurricanes:

Tropical Wave: A trough or cyclonic curvature maximum in the trade-wind easterlies. The wave may reach maximum amplitude in the lower middle troposphere.

Tropical Depression: A tropical cyclone with maximum sustained surface wind speeds (using the U.S. 1-minute average) of 33 kt (38 mph or 62 km/hr) or less.

Tropical Storm: A tropical cyclone with maximum sustained surface wind speed (using the U.S. 1-minute average) ranges from 34 kt (39 mph or 63 km/hr) to 63 kt (73 mph or 118 km/hr).

Hurricane: A tropical cyclone with maximum sustained surface winds (using the U.S. 1minute average) of 64 kt (74 mph or 119 km/hr) or more.

Hurricane wind intensity is measured using the Saffir-Simpson Hurricane Wind Scale based on a 1-5 rating of sustained wind speed at the time of measurement. This is used to estimate the potential property damage expected along the coast from hurricane landfall. Hurricanes reaching Category 3 and higher are considered major hurricanes because of potential significant loss of life and damage to property. Category 1 and 2 storms are still dangerous, however, and require preventative measures. Wind speed is the determining factor in the scale. All winds are described using the U.S. 1-minute average as the measure of sustained wind speed. Previously, storm surge was described by the Saffir-Simpson Scale, but it is no longer included.

Table 4.2.10-1 summarizes the Scale by category, wind speed, and expected damage.

Table 4.2.10-1 - Saffir-Simpson Hurricane Wind Scale | Source: National Hurricane Center

Category	Previous Range	New Range	Effects on Land
One	74-95 mph	No change	**Very dangerous winds will produce some damage:** Well-constructed frame homes could have damage to roof, shingles, vinyl siding, and gutters. Large branches of trees will snap, and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days
Two	96-110 mph	No Change	**Extremely dangerous winds will cause extensive damage:** Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
Three	111-130 mph	111-129 mph	**Devastating damage will occur:** Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable several days to weeks after the storm passes

Category	Previous Range	New Range	Effects on Land
Four	131-155 mph	130-156 mph	**Catastrophic damage will occur:** Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted, and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
Category	**Previous Range**	**New Range**	**Effects on Land**
Five	Greater than 155 mph	Greater than 157 mph	**Catastrophic damage will occur:** A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Location and Extent

Although the Mississippi Delta is located over 200 miles from Mississippi's Gulf Coast, it is vulnerable to the unavoidable effects of tropical storms/hurricanes as they come ashore and move inland. These storms, as they move inland can produce violent winds, torrential rains, tornadoes and flash flooding. The extent of damages has a significant threat to the population, property and agricultural assets in the Delta.

To illustrate the extent of impacts of tropical storms/hurricanes, Figures 4.2.10-0 Tropical Storms and Figure 4.2.10-1 Category 1-3 Hurricane and Figure 4.2.10-2 Category 4-5 are provided from a statewide level. County-level maps of historical events are provided in the Annex section of this plan.

Figure 4.2.10-0 – Tropical Storms, 1950-2019 | Source: csc.noaa.gov/hurricanes

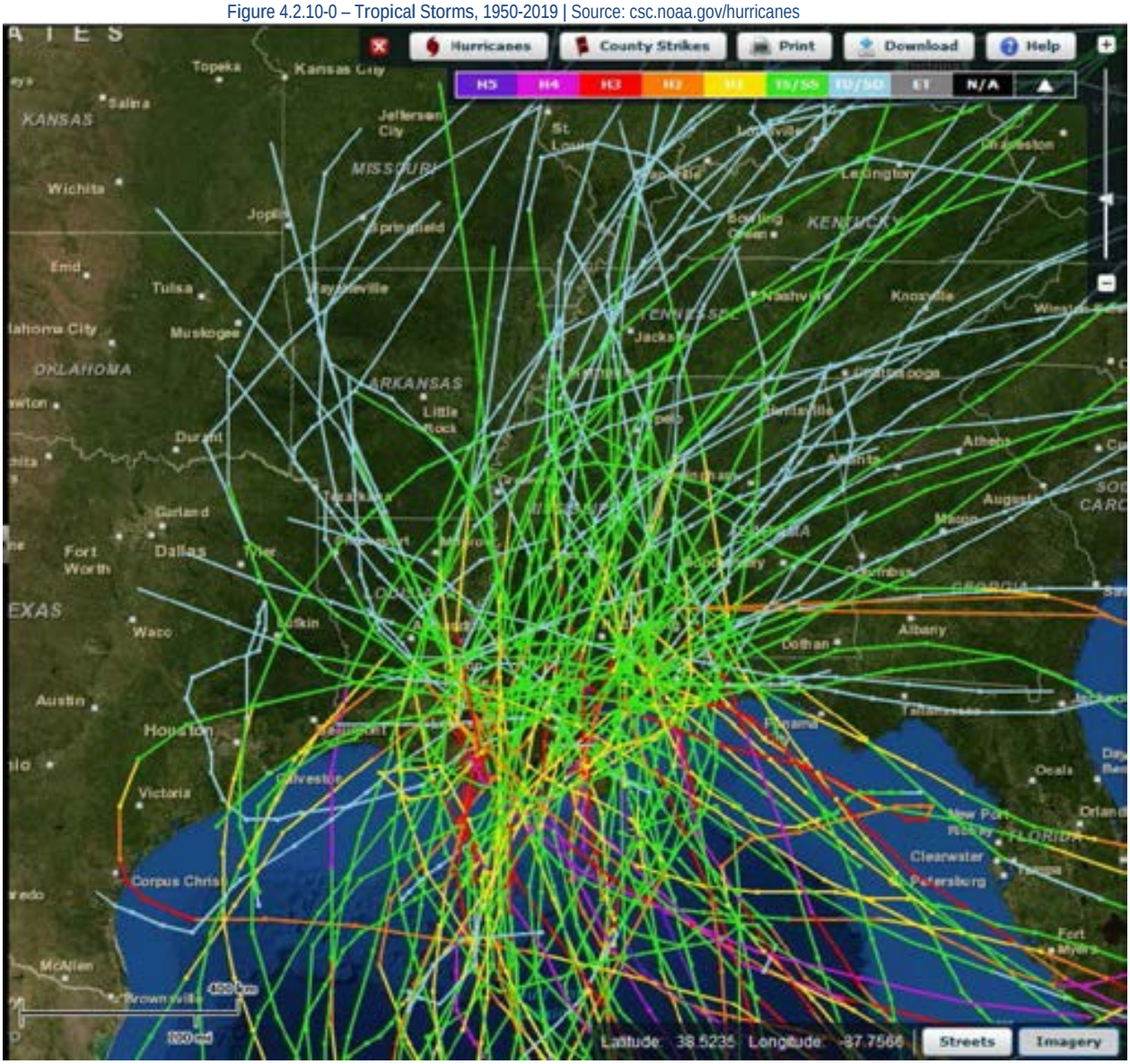


Figure 4.2.10-1 – Category 1, and 2 Historical Hurricanes 1950-2019 | Source: csc.noaa.gov/hurricanes

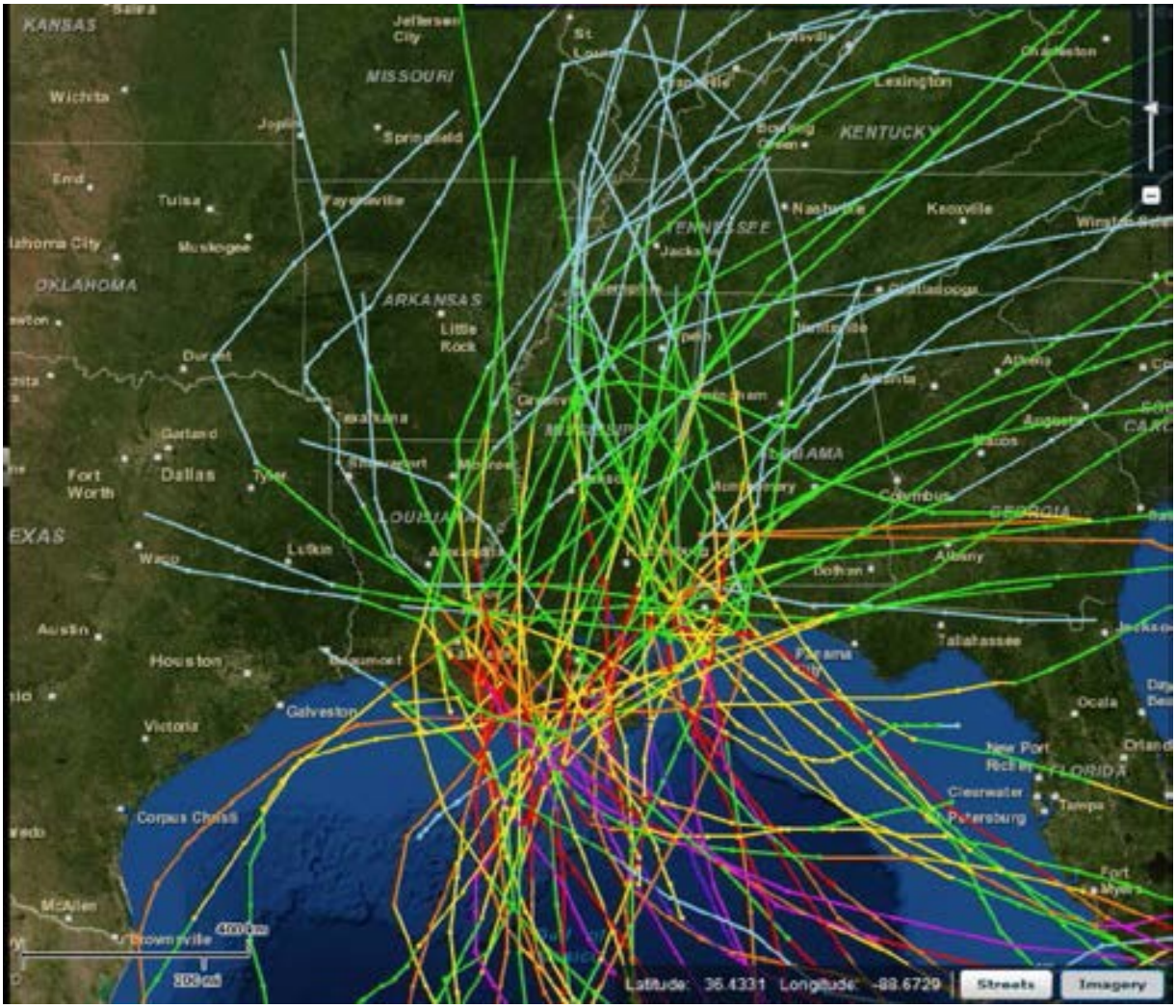
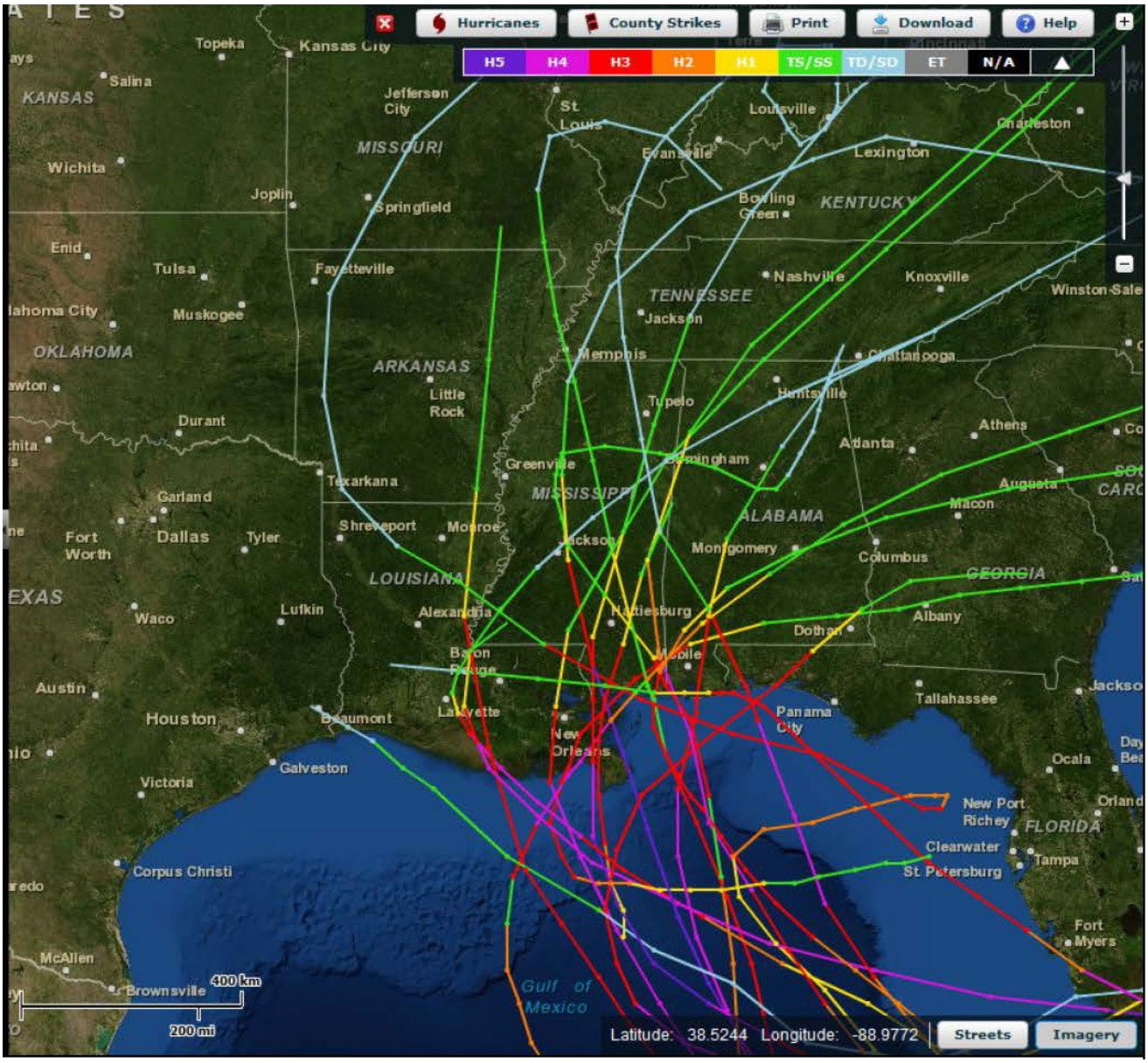


Figure 4.2.10-2 – Categories 3, 4 and 5 Historical Hurricanes, 1852-2019 | Source: csc.noaa.gov/hurricanes



Previous Occurrences

Table 4.2.10-2 provides a summary of impacts documented by the National Weather Service from 2000 to 2019 for the communities located in Mississippi's D3.

Table 4.2.10-2 – Hurricane Events 2000-2019 | Source: NCEI

County/Zone	Death	Injury	Property Damage ($)	Crop Damage ($)
Hurricane Rita - September 24, 2005				
Bolivar (Zone)	-	-	10,000	200,000
Carroll (Zone)	-	-	10,000	50,000
Holmes (Zone)	-	-	10,000	100,000
Humphreys (Zone)	-	-	30,000	200,000
Leflore (Zone)	-	-	10,000	100,000
Sunflower (Zone)	-	-	10,000	150,000
Washington (Zone)	-	-	15,000	200,000
Totals	**-**	**-**	**$95,000**	**$1,000,000**
Hurricane Katrina - August 29, 2005				
Attala (Zone)	-	-	50,000,000	20,000,000
Bolivar (Zone)	-	-	700,000	5,000,000
Carroll (Zone)	-	-	1,000,000	15,000,000
Holmes (Zone)	-	-	1,000,000	15,000,000
Humphreys (Zone)	-	-	500,000	8,000,000
Leflore (Zone)	-	-	1,000,000	12,000,000
Montgomery (Zone)	-	1	10,000,000	50,000,000
Sunflower (Zone)	-	-	500,000	5,000,000
Washington (Zone)	- 6	-	500,000	8,000,000
Totals	**-**	**1**	**$65,200,000**	**$138,000,000**
Hurricane Lili - October 3, 2002				
Attala (Zone)	-	-	-	-
Carroll (Zone)	-	-	-	-
Leflore (Zone)	-	-	71,043	-
Washington (Zone)	-	-	71,043	-
Total	-	-	$142,086	-
Hurricane Harvey				
Attala (Zone)	**-**	**-**	**15,000**	**-**
Totals	**-**	**-**	**$15,000**	**-**
Total All Events	**-**	**1**	**$65,452,086**	**$139,000,000**

Hurricane Harvey was the most recent tropical cyclone event to impact the planning area, occurring in 2017. Although it was a major hurricane when it made landfall along the Texas coast, it had largely dissipated as it tracked through the MEMA D3 counties and impacted the area with high winds and heavy rainfall.

The National Hurricane Center provides this summary of the storm's development and impact:

> *Harvey started as a typical weak August tropical storm that affected the Lesser Antilles and dissipated over the central Caribbean Sea. However, after re-forming over the Bay of Campeche, Harvey rapidly intensified into a category 4 hurricane (on the Saffir Simpson Hurricane Wind Scale) before making landfall along the middle Texas coast. The storm then stalled, with its center over or near the Texas coast for four days, dropping historic amounts of rainfall of more than 60 inches over southeastern Texas. These rains caused catastrophic flooding, and Harvey is the second-most costly hurricane in U.S. history, after accounting for inflation, behind only Katrina (2005). At least 68 people died from the direct effects of the storm in Texas, the largest number of direct deaths from a tropical cyclone in that state since 1919.*
>
> *Harvey made several loops in its landfall path between August 25 and 30, 2017, making its final landfall in southwestern Louisiana near Cameron with 40-kt sustained winds. Thereafter, the cyclone slowly weakened over land, becoming a tropical depression and moving northeastward over the southern United States while producing heavy rainfall. It transformed into an extratropical cyclone by September 1 over the Tennessee Valley. The cyclone dissipated over northern Kentucky late the next day.*

Harvey was the most significant tropical cyclone rainfall event in United States history, both in scope and peak rainfall amounts, since reliable rainfall records began around the 1880s. The highest storm total rainfall report from Harvey was 60.58 inches near Nederland, Texas.

There were 52 tornadoes preliminarily reported during Harvey, about half of which occurred near and south of the Houston, TX metro area. Over 150 tornado warnings were issued during the event. Tornadoes were also noted in Louisiana, Mississippi, Alabama and Tennessee as the storm moved near or over those states. Fortunately, nearly all the tornadoes were relatively weak, of EF-0 and EF-1 intensity, with generally minor damage, few injuries and no deaths attributed to them.

Impacts to the MEMA D3 planning area were minimal, primarily occurring on August 31, 2017, with Attala and Washington Counties reporting strong or high winds of 52 and 59 miles per hour, respectively. Attala County reported $15,000 in property damage associated with this event.

Figure 4.2.10-3: Tropical Storm/Hurricane Tracks, 2000-2019 |
Source: Office for Coastal Management, NOAA; accessed at: https://coast.noaa.gov/hurricanes/#map=4/32/-80

Probability of Future Occurrences

The area has been impacted by hurricanes/tropical storms in the past and it can be expected they will experience more in the future. While other hurricanes have undoubtedly impacted the area, the systems had lost their tropical characteristics by the time they reached the planning area, and so were not recorded as either hurricanes or tropical systems. Based on historical event data and location from the coast, the effects of climate change on future hurricane and tropical storm events cannot be determined at the present time due to insufficient evidence. The probability of future occurrence is classified as **low**.

Assessing Vulnerability

People
Because the planning area is located inland of the Mississippi coastline, hurricanes usually lose strength as they make landfall and move northward without hurricane force winds impacting the area. The entire planning area's population is at risk to Tropical Storms and Hurricanes. Impacts during hurricanes may also result from spawned tornadoes and flooding from heavy rain.
The impacts of Tropical Storms and Hurricanes to the population can have grave effects. Preparedness for Tropical Storms and Hurricanes is important within this planning region. The very young, elderly, persons with special needs and handicapped persons as well as persons below the poverty level are vulnerable to Tropical Storms and Hurricanes. As the population of each of the MEMA D3 Counties increase their respective vulnerabilities to Tropical Storms and

Hurricanes will also increase.

Property
While evaluating critical facilities vulnerable to Tropical Storms and Hurricanes, it was determined all critical facilities, as well as all public, private and commercial property, are susceptible to impacts from the hazard. Critical facilities that house vulnerable individuals should be equipped with backup electrical equipment in the event of a power failure. Electricity transmission lines and utility poles that can be weighed down by falling trees and other wind-borne debris are vulnerable. Occasionally, roofs of homes and business are compromised by high winds, causing structures to collapse. Power outages may keep businesses and schools from operating, fire fighters from access to water supplies, and municipal services such as sewer and water purification systems may not be operational.

Economy
Tropical storms and hurricanes may cause short-term direct economic losses due to property damage or indirect losses due to infrastructure failure. Damage to multi-million-dollar agriculture interest in District 3 could also result from those events.

Environment
As in the case with tornadic events, every person, structure, animal, and natural feature thin the path of tropical storms and hurricanes can be affected the impacted. The entire food chain is disrupted, including wildlife, livestock, and crops. Large objects propelled as missals cause harm to persons and damage or all but e most resilient structures, including bridges, powerlines, and wastewater treatment plant. Trees destroyed during a tropical storms and hurricanes may take up to 100 years to regrow, thus affecting forestry-related occupations

Impacts of Growth and Development
All counties within District 3 are considered to be rural, based on the population per square mile and have experienced declining populations over the past decade or longer. There is no significant planned new development within District 3 counties and any growth that may occur during the next planning cycle is unlikely to have a significant impact on the level of vulnerability to tropical storms/hurricanes events.

Impacts of Climate Change
As of April 2020, a state-developed climate adaptation plan has not been finalized. However, predictions from the U.S. Environmental Protection Agency (EPA) were outlined in the document titled “What Climate Change Means for Mississippi” (EPA 430-F-16-026), dated August 2016. It provides an overview of expected impacts in Mississippi related to lightning-producing severe storms, drought, forest resources and wildfire:

Mississippi will become warmer, and both floods and droughts may be more severe. The changing climate is likely to produce more intense storms and increase the number of unpleasantly hot days. Tropical storms and hurricanes have become more intense during the past 20 years. Although warming oceans provide these storms with more potential energy, scientists are not sure whether the recent intensification reflects a long-term trend.

Based on this assessment, there is an increasing potential for tropical storms and hurricanes due to warming oceans, although scientists are not sure whether ocean temperatures that provide these storms with more potential energy are related to the recent intensification over a long-term trend. Nevertheless, hurricane wind speeds and rainfall rates are likely to increase as the climate continues to warm.

Wild/Urban Fire

Hazard Description

Wildfires are defined as any uncontrolled fire in combustible vegetation that occurs in a forest, countryside, or other open wilderness area. They are often given other names such as grass fire, brush fire, bush fire, forest fire, hill fire, muck fire, peat fire, and wildland fire (typically associated with the type of vegetation being burned). Wildfires are typically large, can spread at rapid speeds, and unexpectedly change direction. Wildfires are also known to jump fire breaks, roads, and rivers. Some even become large enough to create "their own weather," which further exacerbates wildfire spread. Events Wildfires can be caused naturally (i.e., lightning), as well as by man (i.e., accidental or arson). The *2018 Mississippi State Hazard Mitigation Plan (MSHMP)* notes that in Mississippi, most fires are human caused, with arson as the most prevalent origin, followed by debris burning debris. Lightning is the typical cause of natural wildfires. (*MSHMP*, p. 254)

The 2018 Mississippi Standard Hazard Mitigation Plan (SHMP) provides the following overview of wildfires and their impacts in the state:

> *The Mississippi Forestry Commission (MFC) responded to and suppressed 2,318 wildfires that burned 33,574 acres in Fiscal Year 2017. MFC Wildland Firefighters saved 4,441 structures threatened by wildfire activity. Unfortunately, 33 structures were damaged or destroyed. The average wildfire size was 14 acres.*
>
> *As the population in rural areas increases, so do the issues facing Wildland/Urban Interface (WUI). Wildland/Urban Interface is the development of residential and commercial areas adjacent to or commingled with vegetative areas.* ***More than half of the homes in Mississippi are part of a WUI.*** *As further development in forested areas occurs this number increases. Wildfires in urban areas threaten human life, structures and wildland resources.*

Wildfires are particularly prevalent in summer, autumn, and during droughts, when fallen branches, leaves, grasses and scrub dry out and become highly flammable. Some experts believe that global warming is increasing the severity and frequency of droughts in many areas, thus creating more intense and frequent wildfires.

Wildfires tend to be most common and severe during years of drought and occur on days featuring strong winds and low humidity. With extensive urbanization of wildlands, such events often involve destruction of suburban homes located in the wildland urban interface (WUI), a zone of transition between developed areas and undeveloped wildland. Wildfires crossing into developed areas have caused large-scale damage to both private and public property and, in the process, destroying homes and causing deaths. Additionally, fires can start in urban areas and spread into wildland areas. Causes of urban fires include electrical-related structural and vehicle fires, incendiary arson, unattended cooking fires, smoking materials, heating devices, fuel systems, sparks, hazardous material spills, and spontaneous combustion.

Table 4.2.11-1- Fire Danger Rating System | Source: USFS WFAS

Fire Danger Rating and Color Code		Description
Low (L)	Dark Green	Fuels do not ignite readily from small firebrands, although a more intense heat source, such as lightning, may start fires in duff or punky wood. Fires in open cured grasslands may burn freely a few hours after rain, but woods fires spread slowly by creeping or smoldering, and burn in irregular fingers. There is little danger of spotting.
Moderate (M)	Light Green or Blue	Fires can start from most accidental causes, but except for lightning fires in some areas, the number of starts is generally low. Fires in open cured grasslands will burn briskly and spread rapidly on windy days. Timber fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel, especially draped fuel, may burn hot. Short-distance spotting may occur but is not persistent. Fires are not likely to become serious and control is relatively easy.
High (H)	Yellow	All fine dead fuels ignite readily, and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High intensity burning may develop on slopes or in concentrations of fine fuels. Fires may become serious and their control difficult unless they are attacked successfully while small.
Very High (VH)	Orange	Fires start easily from all causes and, immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high intensity characteristics, such as long-distance spotting and fire whirlwinds when they burn into heavier fuels.
Extreme (E)	Red	Fires start quickly, spread furiously, and burn intensely. All fires are potentially serious. Development into high intensity burning will usually be faster and occur from smaller fires than in the very high fire danger class. Direct attack is rarely possible and may be dangerous except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions the only effective and safe control action is on the flanks until the weather changes or the fuel supply lessens.

Fire Management

Prescribed burning, also known as controlled burning, is the deliberate use of fire under specified and controlled conditions. Prescribed burning is used by forest management professionals and individual landowners to accomplish one or more of the following objectives in reducing wildfires:

> ***Fuel Reduction –*** The reduction of accumulated grass, weeds, pine needles, and hardwood leaves. This type of vegetation can encourage wildfires in young stands and hinder regeneration of older stands.
>
> ***Hardwood Control –*** Prevents hardwood trees from competing with pines for nutrients and moisture; impeding visibility and access through the stands; and interfering with natural regeneration in areas better suited for growing pines.

Many counties in the state use burn bans, issued by each County Board of Supervisors and approved by the Mississippi Forestry Commission, as a tool to reduce or control burning on private lands.

Fire managers use the Keetch-Byram Drought Index (KBDI), a mathematical system for relating current and recent weather conditions to potential or expected fire behavior. This system, originally developed for the southeastern United States, is based primarily on recent rainfall patterns and was specifically established to correlate the effects of drought with potential fire activities.

The KBDI attempts to measure the amount of precipitation needed to bring the top eight inches of soil back to saturation. A value of zero represents complete soil saturation or no moisture deficiency. A value of 800, the maximum fire drought indicator possible, means it would take eight inches of precipitation to fully saturate the soil. At any point in between, the KBDI number indicates the amount of precipitation it would take to bring the moisture level back to zero.

High KBDI values indicate that conditions are favorable for the occurrence and spread of wildfires. The following shows how KBDI and expected fire potential relate.

- **KBDI = 0 – 200:** Soil and fuel moisture is high. Most fuels will not contribute to wildfire intensity. This condition is often seen in the spring after winter precipitation.

- **KBDI = 200 – 400:** Fuels are beginning to dry and contribute to wildfire intensity. Heavier fuels will still not readily ignite and burn. This condition is often seen in late spring.

- **KBDI = 400 – 600:** Wildfire intensity begins to increase significantly. Wildfires will readily burn, and larger fuels could burn or smolder for several days. This is often the case during late summer and early fall.

- **KBDI = 600 – 800:** Wildfires show extreme intensity. Deep-burning, intense wildfires with significant spotting can be expected. This often occurs during a severe drought.

A more detail discussion of the location and extent, previous occurrences and overall vulnerability for each county and its jurisdictions to this hazard is provided in the respective county's annex.

Location and Extent

Because of the densely forested areas on the eastern side of District 3, in Attala, Carroll, Holmes and Montgomery Counties, these areas are more susceptible to wildland fires. Other areas of the county have limited acreage in forested land comingled with structures and are consequently less likely to have wildfires of any significant size.

A more detail discussion of the location and extent, previous occurrences and overall vulnerability for each county and its jurisdictions to this hazard is provided in the respective county's annex.

Figure 4.2.11-0 Wildland/Urban Interface Land Cover with distinctive land cover mix within D3 | Source: 2018 SHMP

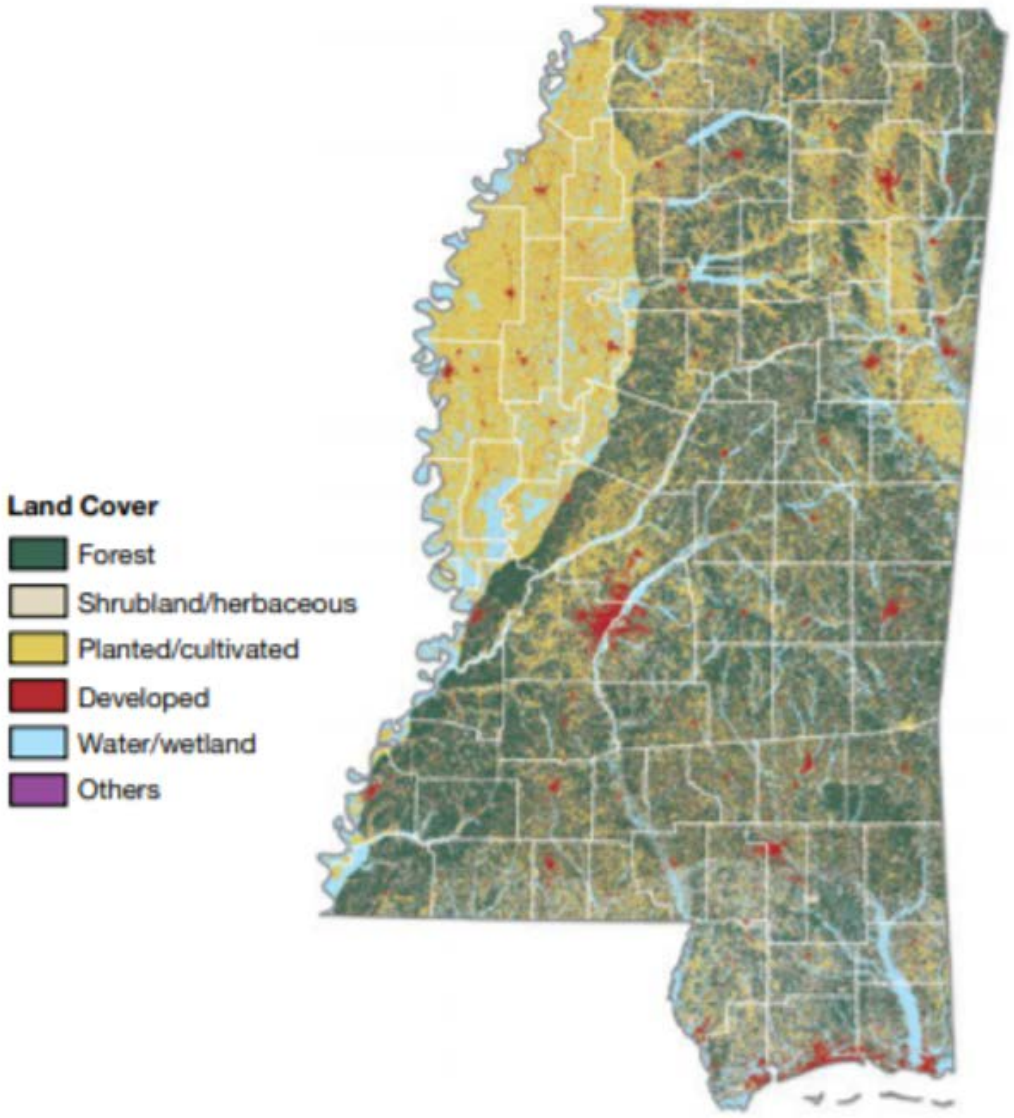
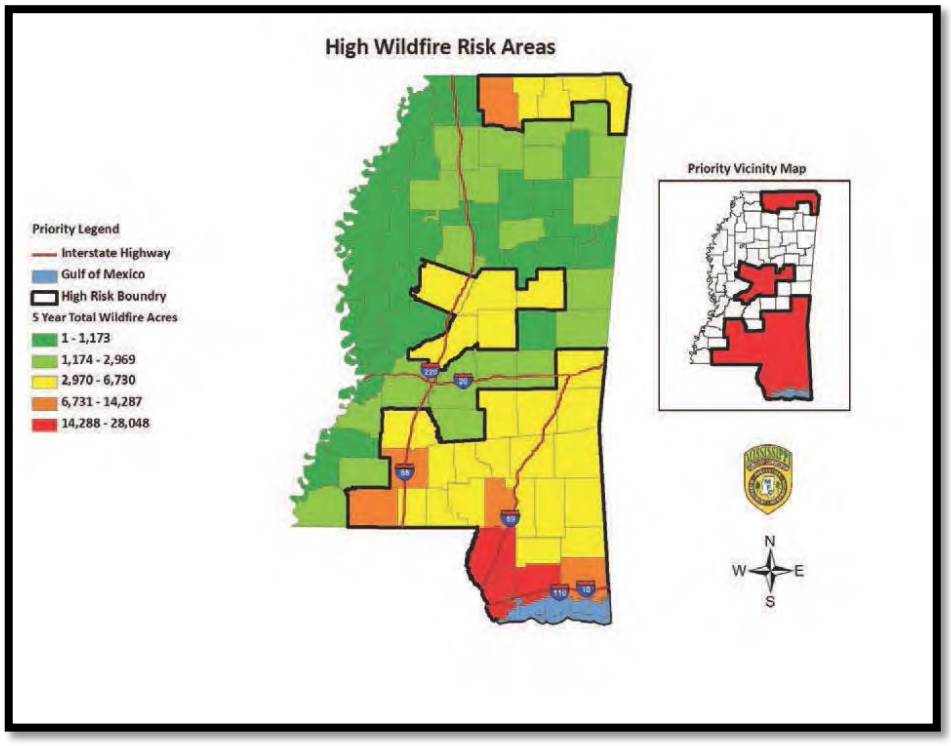


Figure 4.2.11-1 shows the **higher Wildfire Risk Areas** for the eastern portion of the planning area, shown in yellow. The entire D3 planning area is not located in the High-Risk Boundary and other areas of District 3, shaded in light or dark green, are depicted as low levels of risk. Areas in this nine-county region is shaded as light or dark green.

Figure 4.2.11-1– High Wildfire Risk Areas, all Counties I Source: Mississippi Forestry Commission



Information regarding the number of acres of forestland obtained from the Mississippi Forest Commission's most current Forestland Statistics report is presented in Table 4.2.11-2.

Table 4.2.11-2 – District 3 Forestland Statistics | Source: www.mfc.ms.gov*

		Forestland			
County	Total Land Area (Acres)	Acres	Coverage (%)	Pine	Hardwood
Attala	471,597	284,817	60.4	49.1	41.3
Bolivar	279,658	86,465	30.9	0.0	100.0
Carroll	405,982	263,06	64.7	22.5	68.5
Holmes	488,932	197,380	40.3	15.1	84.8
Humphreys	275,892	30,268	10.9	0.0	100.0
Leflore	387,967	57,537	14.8	0.0	100.0
Montgomery	260,948	161,110	61.7	36.1	54.2
Sunflower	452,541	23,174	0.05	0.0	100.0
Washington	487,198	74,984	15.3	0.0	100.0

Source: 2016-2017 Forest Inventory, Delta Region, Mississippi Forestry Commission; and 2014-2015 Forest Inventory, Central Region, Mississippi Forestry Commission.* *District 3 Counties are divided between the Delta Forestry Region (Bolivar, Holmes, Humphreys, Leflore, Sunflower, Washington) and the Central Forestry Region (Attala, Carroll, Montgomery).

Analysis of the change in total forestland since 2015 indicates the total acreage and percent of coverage continues to decline in all counties, with Attala (-23.2%) and Holmes (-22.8%) Counties seeing the greatest decline in forested land. The average loss of the other seven District 3 counties was 5.43 percent. Most forested land in the planning area is under private ownership.

Previous Occurrences

Local weather, drought conditions, vegetative cover and topographic conditions are factors in determining the potential for future occurrences. Wildfires are difficult to predict due to the variation in how and when they occur. Documentation of fire events by local fire departments is not consistent across the planning region. The NOAA National Centers for Environmental Information (NCEI), Storm Events Database, shows no reported wildfires in the fifty-nine years between January 1, 1960 and December 1, 2019 for the D3 counties.

Table 4.2.11-3 – Wildfire Data 2014 to 2019 | Source: Mississippi Forestry Commission; data provided April 20, 2020; www.mfc.ms.gov

County	2019		2018		2017		2016		2015		2014	
	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned
Attala	28	782	21	392	38	468	59	1,170	52	597	32	187
Bolivar							1	80				
Carroll	5	18	4	32	13	172	24	387	24	268	16	83
Holmes	13	87	15	522	27	532	39	432	43	441	36	486
Humphreys												
Leflore	-	-	-	-	-	-	1	22	6	150	-	-
Montgomery	4	34	-	-	1	7	14	139	12	154	8	135
Sunflower	-	-	-	-	-	-	1	-	-	-	-	-
Washington	1	5	-	-	1	32	-	-	1	8	1	40

Information provided by the Mississippi Forestry Commission indicates wildfires may occur during any season but, since 2012, the worst fires (determined by the number of acres burned) have occurred in late Summer and early Fall. Data presented in Table 4.2.11-3 also indicates the county-level differences in the total number of fires and acreage burned from year to year.

Past wildfires have threatened and destroyed property. Table 4.2.11-4 presents a statistical analysis of residences, commercial buildings and outbuilding, by county, threatened or destroyed since 2015. Within the planning area, Attala County has had the greatest number, totaling 228, of threatened or destroyed structures.

Table 4.2.11-4 D3 Residence and Structures Threatened and or Destroyed by Wildfire Since 2015 I
Source Mississippi Forestry Commission, data provided April 20, 2020; www.mfc.ms.gov

Residences and Structures Threatened and or Destroyed by Wildfire Since 2015						
County	*Residences Threatened*	*Residences Destroyed*	*Commercial Building Threatened*	*Commercial Building Destroyed*	*Outbuilding Threatened*	*Outbuilding Destroyed*
Attala	149	3	4	0	75	8
Bolivar						
Carroll	113	0	45	0	33	1
Holmes	116	0	3	0	98	2
Humphreys	0	0	0	0	0	0
Leflore	2	0	0	0	6	0
Montgomery	33	0	4	0	43	4
Sunflower	0	0	0	0	0	0
Washington	1	0	0	0	1	0
TOTALS	414	3	56	0	256	15

Probability of Future Occurrences

Forecasting limitations make estimating probability of wildfire unrealistic within the context of this plan. Given the state's wildfire risk assessment for this planning region, the probability of wildfire is considered to be low, although continuous monitoring is recommended. Historical data and environmental trends suggest that it is highly likely that wildfires will continue to occur in D3.

Assessing Vulnerability

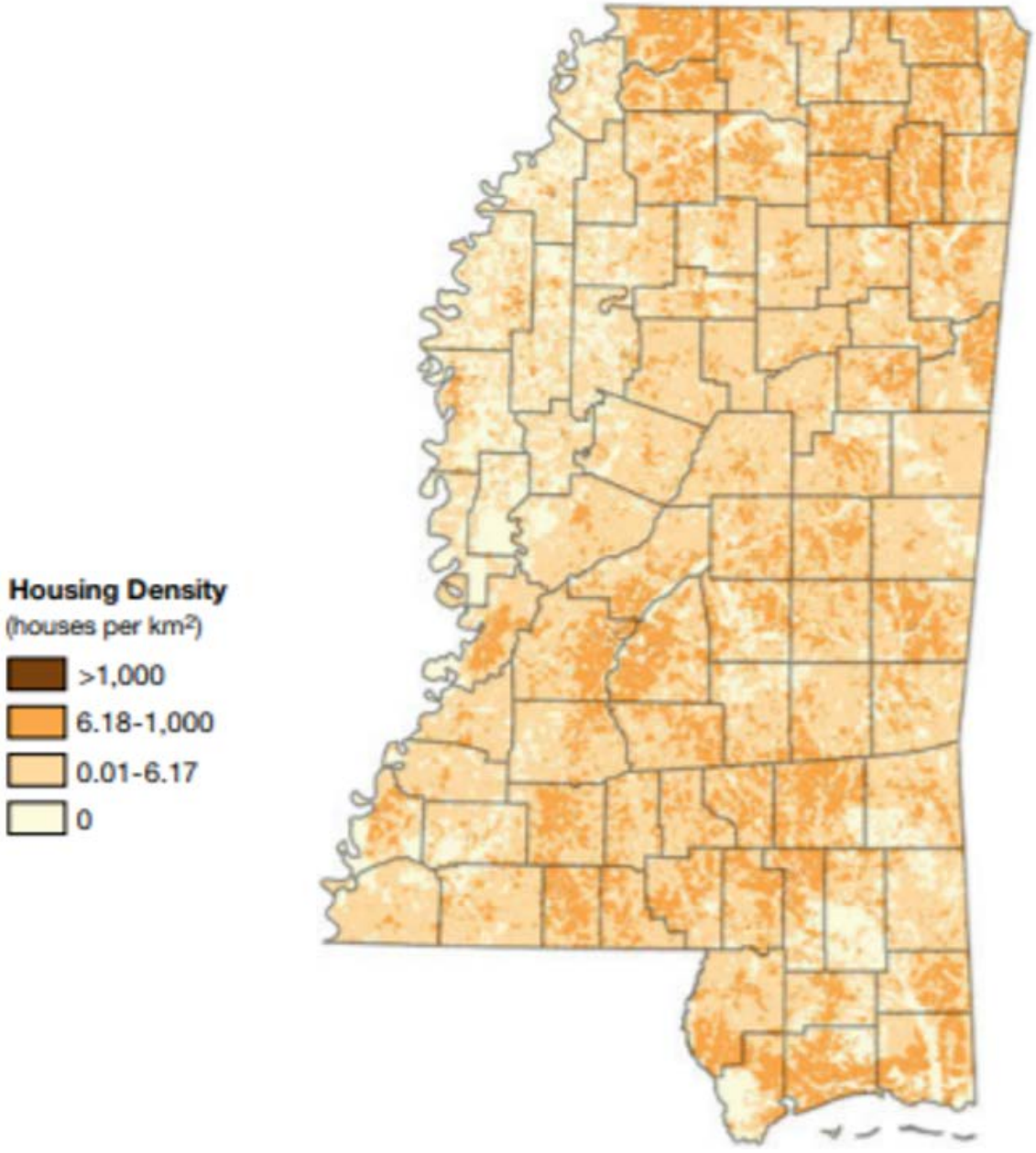
People

In general, people living within forested areas, such as the urban/wildland interface, state and national forests and other private forested lands, are most vulnerable to wildland fires. In MEMA District 3, forested areas are primarily in the rural eastern side of Attala, Carroll, Holmes and Montgomery counties. There are no state or national forests in MEMA D3.

Property

Property within forested areas is vulnerable to wildfires, should they occur within the vicinity. Consideration of housing density is a factor in assessing vulnerability in wildland/urban interface areas due to the attraction of building housing within forested tracts. In general, housing density in District 3 counties is lower than other parts of the state; however, the forested lands along the eastern border of District 3 in Attala, Carroll, Holmes, and Montgomery Counties creased an area of higher vulnerability if homes and commercial structures are located in close proximity with forested areas.

Figure 4.2.11-2: Housing Density in Mississippi | Source: 2018 Mississippi State Hazard Mitigation Plan



In general, wildfire mitigation measures, such as the Firewise USA® program, help reduce vulnerability. This voluntary program can help property owners, neighborhoods and communities take actions during the planning, development, and construction stages of a building that make the property less likely to be affected by wildfire. The program also provides suggested methods of lowering vulnerability for existing homes and structures. The FireWise USA includes a community outreach component called FireWise Communities, which promotes specific mitigation measures to lower wildfire risk. Such measures could be applicable in District 3 communities since this wildfire mitigation focus is described as "a national voluntary program for communities to lower wildfire risk through appropriate design, construction, and mitigation actions." Program components of the program emphasize appropriate planning, development and property mitigation, such as:

- Road designs that allow adequate access for firefighting equipment
- Use of fire-resistant materials for building construction and road signs
- Eliminating potential fuel sources within the "home ignition zone"
- Neighborhood wildfire plans

Within District 3, the Town of Ethel (Attala County) participates in the FireWise Communities program.

Environment

The effects of wildfires are most frequently felt in the environment. Depending on the scale of the incident, wildfires may burn large swaths of forest, leaving areas vulnerable to increased soil runoff and landslides. There is no currently available information or data documenting previous events of this scale in MEMA District 3. However, disaster response and recovery experts stress the degree to which land scarred by wildfire becomes less resilient. A recent study noted the effects of the extensive wildfires experienced in Western states, including how the hazard affects the larger environment; it also documented the degree to which a severe wildfire may significantly lessen the ability of the ground to absorb water. As such, areas not typically flood prone may become at higher risk for flash flooding and mudflows.

Economy

Depending on its scale, a wildfire may have direct and indirect economic impacts due to increased use of local resources for fire suppression and, if needed, activation of evacuation and sheltering operations. The use of mutual aid resources increases a community's costs to pay for actual services as well as support for first responder housing, meals, and transportation. Small businesses in the wildland interface areas may be at risk to suffer economic damage due to a wildfire event, if orders to close businesses or evacuate are put in place. These measures may directly impact the economy by reducing the availability of goods and services. Additional indirect economic losses may be incurred through reduction or loss of employee wages. Business closures that are initially temporary during the height of the event may become permanent if actual property damage occurs as a result of the wildfire.

Impacts of Growth and Development

The report titled *2016-2017 Forest Inventory, Delta Region, Mississippi*, Mississippi Forestry Commission, notes that although some population centers have been expanding in recent years into forested lands, most of this growth is within the Jackson metroplex, the vicinity of

Hattiesburg, and the Mississippi Gulf Coast. These areas do not directly impact the District 3 counties or their municipalities (MFC, p. 6), although the Jackson major metropolitan region is within 50 miles of the southernmost District 3 counties. Countless stories are told in the news media about the degree to which of smoke and fumes from large fires in one section of California create unhealthy atmospheric conditions in distant communities.

Impacts of Climate Change

As of April 2020, no state-developed climate adaptation plan has been finalized. However, predictions from the U.S. Environmental Protection Agency (EPA) were outlined in the document titled "What Climate Change Means for Mississippi" (EPA 430-F-16-026), dated August 2016. It provides an overview of expected impacts in Mississippi related to lightning-producing severe storms, drought, forest resources and wildfire:

> Mississippi will become warmer, and both floods and droughts may be more severe. The changing climate is likely to produce more intense storms and increase the number of unpleasantly hot days. Tropical storms and hurricanes have become more intense during the past 20 years. Although warming oceans provide these storms with more potential energy, scientists are not sure whether the recent intensification reflects a long-term trend.
> Higher temperatures and changes in rainfall are unlikely to substantially reduce forest cover in Mississippi, although the composition of trees in the forests may change. More droughts would reduce forest productivity, and climate change is also likely to increase the damage from insects and disease. But longer growing seasons and higher carbon dioxide concentrations could more than offset the losses from those factors. Forests cover almost two-thirds of the state. Oak, hickory, and white pine trees are most common in the northern part of the state, except along the Mississippi River delta. In the southern part of the state, loblolly and longleaf pines are most common. As the climate warms, forests in southern Mississippi are likely to have more oaks and white pines, and fewer loblolly and longleaf pines.

Based on this assessment, although the level of forest cover is expected to remain the same in the planning area, it is possible increased periods of drought and more intense storms may increase the level of fuel in forested areas.

4.3 Technological and Human-Caused Hazards

For the purpose of this plan, "human-caused hazards" are incidents caused by their relationship with human activity, which include but are not limited to those of a chemical, biological, radiological, nuclear, explosive, or technological (including cyber) nature, whether accidental or intentional. For the purpose of this plan, this category also includes Human Infectious Disease. These are distinct from natural hazards primarily in that they originate from human activity, whether intentional or unintentional. In contrast, while the risks presented by natural hazards may be increased or decreased as a result of human activity, they are not inherently human-induced.

The term "technological hazards" refers to the origins of incidents that can arise from human activities such as the manufacture, transportation, storage, and use of hazardous materials. For the sake of simplicity, this Plan assumes that technological emergencies are accidental and that their consequences are unintended.

Hazardous Material Incidents

Hazard Description

A Hazardous Material (HAZMAT) incident may be defined as a spill or release of chemicals, radioactive materials or biological materials inside a building or structure, or to the environment. Large spills or releases, or those of a quantity within legally required reporting criteria are considered within this hazard category. Small spills or releases, that can be managed by trained personnel who are familiar with the chemical's make-up and site protocols, are not addressed within this Plan. People are at risk if a chemical is used unsafely or released in harmful amounts into the environment in proximity to residences, businesses or transportation corridors.

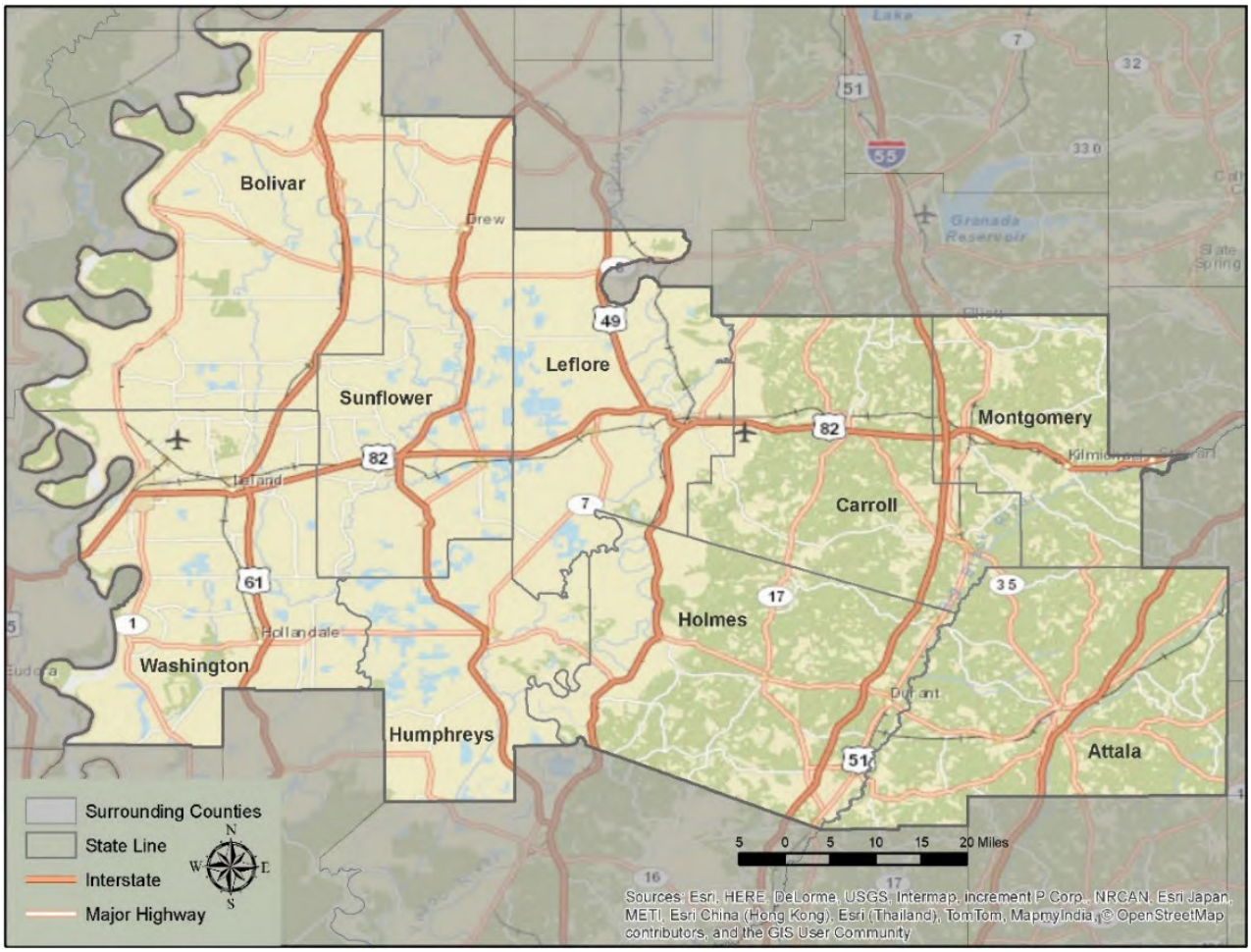
Location and Extent

Hazardous materials incidents may occur in *fixed* locations or *in-transit.* Incidents may occur in fixed locations or sites where materials are produced, stored, used or disposed. The location of hazardous materials incidents *in-transit* is best described as proximity to transportation corridors, be it railways or highways.

An analysis of all modes of transportation reveals rail and roadway transportation modes pose risks to the health, safety and welfare of citizens, as well as visitors or those traveling to and through the entire planning area. The extent of the hazard impact varies depending on conditions, such as location, time and size of the incident, direction of wind, and other factors.

Due to the large number and wide variety of hazardous material transportation corridors in the planning area, as well as the many determinant factors related to vulnerability, it is difficult to identify specific areas and populations vulnerable to the hazard. Major corridors in the planning area with vehicles transporting hazardous materials include Interstate 55, US Route 51, US Highway 49W, US Highway 61, US Highway 278 US Route 82, and US Highway 49.

Figure 4.3.1-0 – Transportation I *Source: ESRI, DeLorme, USGS*



The D3 planning includes has one major railway line, the Canadian National Railway (formerly Illinois Central Railroad), which traverses through Holmes and Leflore County. This major railroad also serves as an Amtrak passenger train route. The piggyback route for the Illinois Central Railroad runs through Carroll and Montgomery Counties, and along the Attala and Holmes shared county line. Additionally, the D3 planning area has two local railroads, which include the Columbus and Greenville Railroad (Bolivar, Washington, Sunflower, Leflore, Carroll, and Montgomery Counties) and the Koscuisko and Southwestern Railroad (Attala County). These railroads provide routes where hazardous materials are transported via train to locations throughout the State of Mississippi and throughout the United States.

Controls on certain hazardous materials help to limit and mitigate potential hazardous material incidents. The Superfund Amendments and Reauthorization Act (SARA) Title III Section 313 Emergency Planning and Community Right-to-Know Act (EPCRA), which is also known as "SARA, Title III", requires certain facilities to report both routine and accidental chemical releases. Reports must be submitted annually to the U.S Environmental Protection Agency (EPA) and the State Emergency Response Commission (SERC). The law establishes the specific thresholds for reporting and defines other requirements including how to report immediate incidents, and coordinate with community public safety and other officials through Local Emergency Planning Committees (LEPC), whose membership must include, at a minimum:

- Elected state and local officials
- Police, fire, civil defense [emergency management] and public health professionals
- Environment, transportation, and hospital officials
- Facility (industry) representatives
- Representatives from community groups and the media

The LEPC is responsible for developing a community emergency response plan, reviewing the plan at least annually, and providing information about chemicals in the community to citizens upon request. LEPC's in D3 include those formed to serve Holmes County and Leflore County.

Every facility that uses or maintains specific chemicals is required to have a facility emergency coordinator; report hazmat inventories annually to the LEPC, SERC and local fire department; provide material safety data sheets or a list of hazardous chemicals; and allow local fire departments to conduct on-site inspections of hazmat facilities. The LEPC ensures planning for hazmat incidents is incorporated into local emergency management plans, assesses capabilities, and develops hazmat response capabilities planned around local resources, mutual aid and contractors. In addition, LEPC's conduct hazmat training and exercises to test the plans and capabilities.

In addition to the SARA Title 3 requirements, additional preventative measures assist in lowering the risk from HAZMAT spills and releases. The U.S. Department of Transportation maintains a hazardous materials placard system used to mark vehicles or containers that transport hazardous materials by road, rail, sea or air. This system facilitates personal safety measures and safe handling actions by emergency response personnel if a chemical is involved in a transportation incident.

Figure 4.3.1-1 U.S. Department of Transportation Bulk Transportation Placard System |

Source: U.S. Department of Transportation, accessed at: https://pixy.org/1176466/

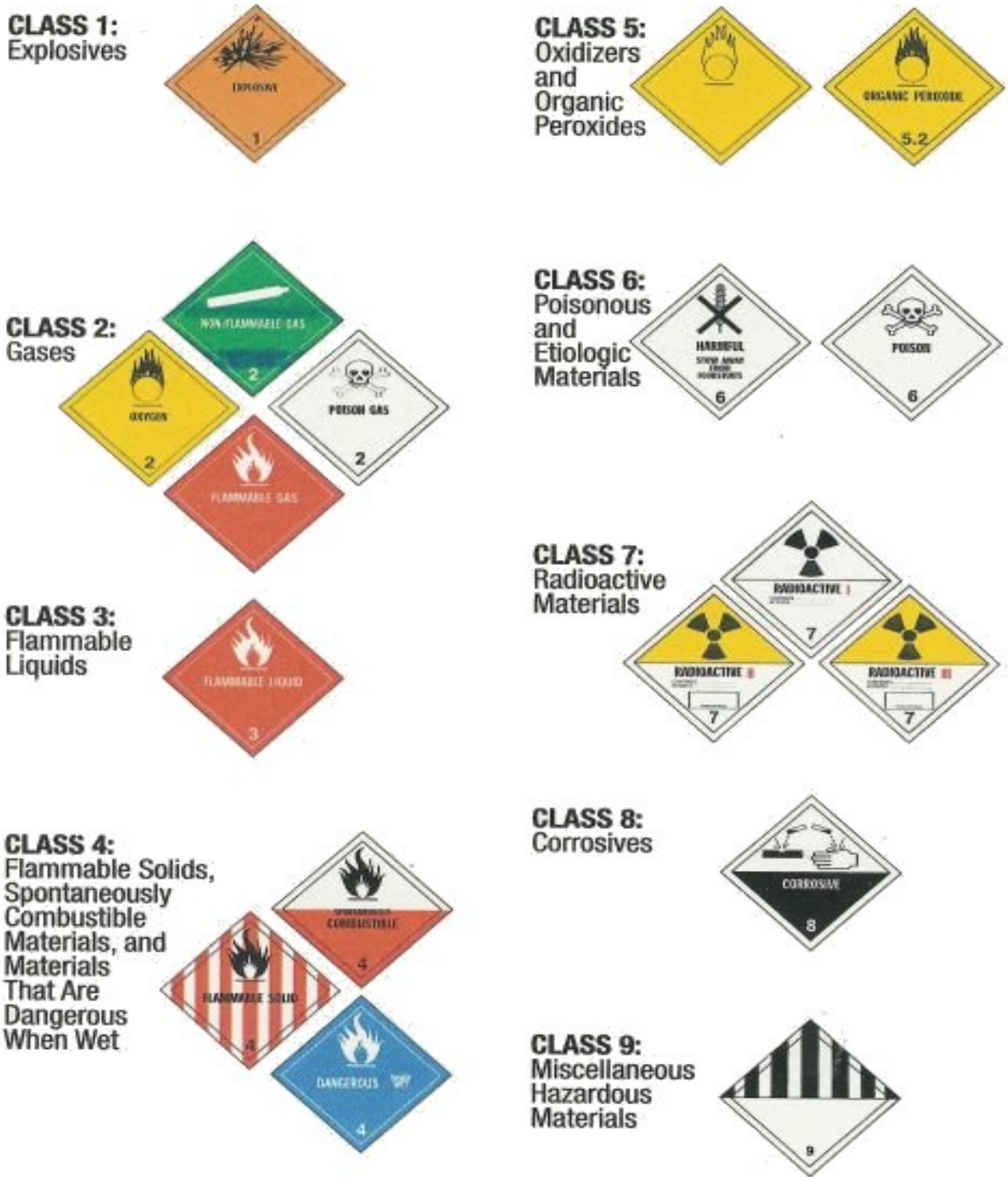


Table 4.3.1-1 provides a summary of release reports submitted to the U.S. Environmental Protection Agency (EPA) between 2014 and 2018 from facilities possessing hazardous materials in MEMA District 3. Review of report data indicates the overall trend for District 3 counties is a very slight decline in the number of reports over the five-year period. The numbers of facilities reporting hazardous material releases within the District varied from between 19 to 23. Report summaries for 2019 are not yet available. Further details on facilities and number of releases can be found in the respective County Annexes of this Plan.

Table 4.3.1-1 - EPA Toxic Release Inventory Summary for D3 Region, 2014-2018 |
Source: U.S. Environmental Protection Agency, Toxic Release Inventory Program Database; https://www.epa.gov/toxics-release-inventory-tri-program

	2018		2017		2016		2015		2014	
County	No. Facilities	No. Reports	No. Facilities	No. Reports	No. Facilities	No. Reports	No. Facilities	No. Reports	No. Facilities	No. Reports
Attala	-	-	-	-	1	1	1	2	1	2
Bolivar	4	15	4	13	4	12	4	12	4	13
Carroll	-	-	-	-	-	-	-	-	-	-
Holmes	1	1	2	2	3	3	2	2	2	2
Humphreys	2	2	2	2	2	2	1	2	2	2
Leflore	7	22	7	23	7	23	5	24	6	24
Montgomery	-	-	-	-	-	-	-	-	-	-
Sunflower	3	8	3	8	3	9	3	9	3	10
Washington	3	28	3	24	3	29	3	30	3	31
TOTALS	**20**	**76**	**19**	**72**	**23**	**79**	**19**	**81**	**19**	**84**

Probability of Future Occurrences
Based on historical data, there is a moderate probability of a hazardous materials incident occurring within the D3 region. The extent of the severity of the incident is unknown due to numerous variables, such as the quantity, environmental conditions, proximity to vulnerable populations and property, and availability of emergency response resources.

Assessing Vulnerabilities
Location, magnitude, type of problem, wind velocity and direction, and weather conditions vary with each incident, thus making an exact assessment of vulnerability difficult at best. For identification purposes, the rail line and roadway impacts are discussed in general terms.

Hazardous materials-related events are typically more of a life safety issue than a property damage issue, although some incidents could result in significant property damage due to contamination or incendiary effects if an explosive incendiary-type incident occurred. In addition, due to the nature of some types of infrastructure, such as power stations and water treatment facilities, a hazardous material incident may result in physical damage to this type of facility causing result in short-or long-term loss of services.

People
Persons with property located within a half-mile buffer of a hazardous material incident are most vulnerable to exposure. First responders are also at risk while containing the spill; however, personal protective equipment (PPE) and other safety measures mitigate potential exposure (time, distance, and shielding).

Property

Critical facilities and infrastructure within a half-mile buffer are most likely to be affected by a hazardous material incident, although this estimate is based on the type and volume of the

chemical and other factors. Equipment used for containment of the spill could be impacted but companies mitigate against damage when staff follow safety protocols to reduce or eliminate accidents.

Transportation Systems may be impacted from a hazardous materials incident. In the case of an accident on the Canadian National/Illinois Central Railway, population and areas within a half mile on either side of the railroad are most vulnerable to the effects of a hazardous material release. The number of cars involved in the accident, volume and type of materials carried, wind direction and velocity, and atmospheric conditions will dictate with more specificity vulnerable areas and the resultant need for evacuation or other actions.

Heavy trucks carrying hazardous chemicals on Interstate 55, US Route 51, US Highway 49W, US Highway 61, US Highway 278 US Route 82, and US Highway 49 pose the greatest risk to areas and populations within a half mile of the highway system. Variables, such as atmospheric conditions, wind direction and velocity, and type of chemical, will dictate with more specificity, vulnerable areas and populations

.

Environment

Lifeline Utility Systems may be affected by hazardous materials spills or releases and include the planning area's storm water systems, wastewater systems or water systems. Each jurisdiction's storm water system may be contaminated by materials from the spill in the immediate aftermath of the spill. Leakage could be transported to the storm sewer system or the community's wastewater system until responders are able to contain the spill.

Economy

Estimates of potential losses caused by hazardous spills are very difficult to determine due to the many variables that exist with hazardous materials incidents (weather, wind direction, type of chemical released, etc.). The MEMA Planning region has identified that, in order to understand the amount and type of hazardous materials in the region, that a strategy involving the completion of commodity flow studies in the region shall be included in the Mitigation Strategies for MEMA District 3.

Impacts of Growth and Development

Hazardous materials spills and releases tend to be higher in industrial areas, or areas near transportation hubs such as ports, railways, major highways and airports. Future expansion of industrial facilities in any of these areas may increase future potential for hazardous materials incidents, and increasing exposure to people, property, the economy and the environment. All counties within District 3 are considered to be rural, based on the population per square mile and have experienced declining populations over the past decade or longer. There is no significant planned industrial development within District 3 counties and any growth that may occur during the next planning cycle is unlikely to have a significant impact on the level of vulnerability to hazardous materials incidents.

Impacts of Climate Change

As of April 2020, no state-developed climate adaptation plan has been finalized; however, predictions from the U.S. Environmental Protection Agency (EPA), "What Climate Change Means for Mississippi", (EPA 430-F-16-026), dated August 2016, provides an overview of expected impacts in Mississippi related to natural hazards:

Mississippi will become warmer, and both floods and droughts may be more severe. The changing climate is likely to produce more intense storms and increase the number of unpleasantly hot days. Tropical storms and hurricanes have become more intense during the past 20 years. Although warming oceans provide these storms with more potential energy, scientists are not sure whether the recent intensification reflects a long-term trend.

Based on this assessment, future climate changes could have a negligible effect on the planning area in relation to hazardous materials. As an example, increasing temperatures could have a minimal indirect impact on the quantities of specific types of chemicals related to power generation and water utilities; however, this is not anticipated to cause a significant change in the level of risk or vulnerability.

Human Infectious Disease Outbreak/Pandemic

Figure 4.3.2-0: Changes in the 2020 RHMP Update

Changes in the 2020 RHMP Update:

- The category "Health-Related Hazards" in the 2015 RHMP, which included Pandemic Influenza and West Nile Virus, was changed to "Human Infectious Disease/Pandemic" for the 2020 RHMP Update in order to provide broader focus on disease outbreaks that pose the greatest threat to a large number of the population and impacts to the jurisdiction's community lifelines.
- The new category, "Human Infectious Disease/Pandemic" was added to re-focus public health outbreaks on specific threats, such as influenza and coronavirus, with the highest potential to impact the greatest number of people and constrain the jurisdiction's community lifelines.
- West Nile Virus was removed as a hazard of concern.

Justification for Removing West Nile Virus in the 2020 RHMP Update:

The hazard risk related to West Nile Virus was reassessed with the following data and information since the 2015 Plan:

	2018		2017		2016		2015		2014	
State	No. Cases	No. Fatalities								
Mississippi	50	2	63	2	43	2	38	1	43	7

Source: West Nile Virus Disease Cases by State, Centers for Disease Control, https://www.cdc.gov/westnile/statsmaps/finalmapsdata/index.html

West Nile Virus is included in the Mississippi Department of Health's (MDOH) comprehensive surveillance and monitoring program, and instances of the disease are managed on a case-by-case basis within the capabilities of state and local healthcare systems. As of December 4, 2019, the DOH reported only 15 cases of West Nile Virus and no deaths statewide in 2019, none of which are in any of the nine District 3 counties.

The results of this risk assessment indicated that due to infrequent occurrence and very low impact, the hazard would not be included in the 2020 RHMP update. West Nile Virus will be re-evaluated in the next planning cycle to identify any change to its risk and vulnerability.

Humans are susceptible to various types of viral infection, most of which can be successfully managed through appropriate and timely medical surveillance, evaluation and private care. Understandably, human infectious disease outbreaks routinely occur in any human population, but, fortunately, most viral outbreaks are limited in their spread through surveillance and monitoring systems and procedures that immediately identify the virus and initiate containment measures. Outbreaks are more likely to occur when a novel (new) virus appears in a population and may result in widespread infection that reaches epidemic or even pandemic proportions. The following definitions guide the determination of the scope and scale of a disease outbreak:

Table 4.3.2-1: Determination of the Scope and Scale of a Disease Outbreak | Source: World Health Organization

Disease Level	Definition
Sporadic	When a disease occurs infrequently and irregularly
Endemic	The baseline level of disease, marked by constant presence and/or usual prevalence of a disease or infectious agent in a population within a geographic area
Hyperendemic	Persistent, high levels of disease occurrence
Epidemic (or ***Outbreak***, used for a more limited geographic area)	An increase, often sudden, in the number of cases of a disease above what is normally expected in that population in that area
Pandemic	*An Epidemic that has spread over several countries or continents, usually affecting a large number of people*

This plan addresses human infectious disease outbreaks which result in pandemic. Other disease levels, including epidemic, are generally considered to be manageable within the capacity and capabilities of local resources, which may include mutual aid. For planning purposes, pandemic outbreaks are considered as “worst case scenarios” and appropriate mitigation actions that address pandemic outbreaks would also support outbreaks of lesser magnitudes.

Pandemics

The Centers for Disease Control and Prevention (CDC) defines a pandemic as an epidemic occurring worldwide or over a very wide area, crossing international boundaries, and usually affecting many people. A pandemic outbreak represents a public health emergency impacting all sectors of society. Its occurrence is also unique because, although it has been rare in the past, it is considered inevitable. A pandemic outbreak occurs when a significant antigenic drift, or shift, occurs in a virus, resulting in a new, or “novel” strain spreading efficiently from person-to-person, to which the population has not been exposed and there is no underlying immunity. The severity of the outbreak event is generally variable and unpredictable.

A large amount of infectious disease cases will increase the burden to hospitals and other healthcare infrastructure. Morbidity and mortality may disproportionately impact younger and healthier people (as was experienced with the influenza pandemic in 1918) or may impact older and medically-at-risk people (as it is occurring in the coronavirus outbreak currently underway in 2020). This may reduce the availability of workers due to worker illness, isolation/quarantine, or workers caring for those who are ill. It may also restrict normal activities of the population and result in shortages or unavailability of commodities. Mitigation strategies, such as “stay-at-home” orders and closure of non-essential businesses, may decrease opportunities for disease transmission but will also likely create additional burdens on workforce productivity and the availability of essential goods and services.

Types of Infectious Disease Outbreaks (Pandemics) and Previous Occurrences

Influenza

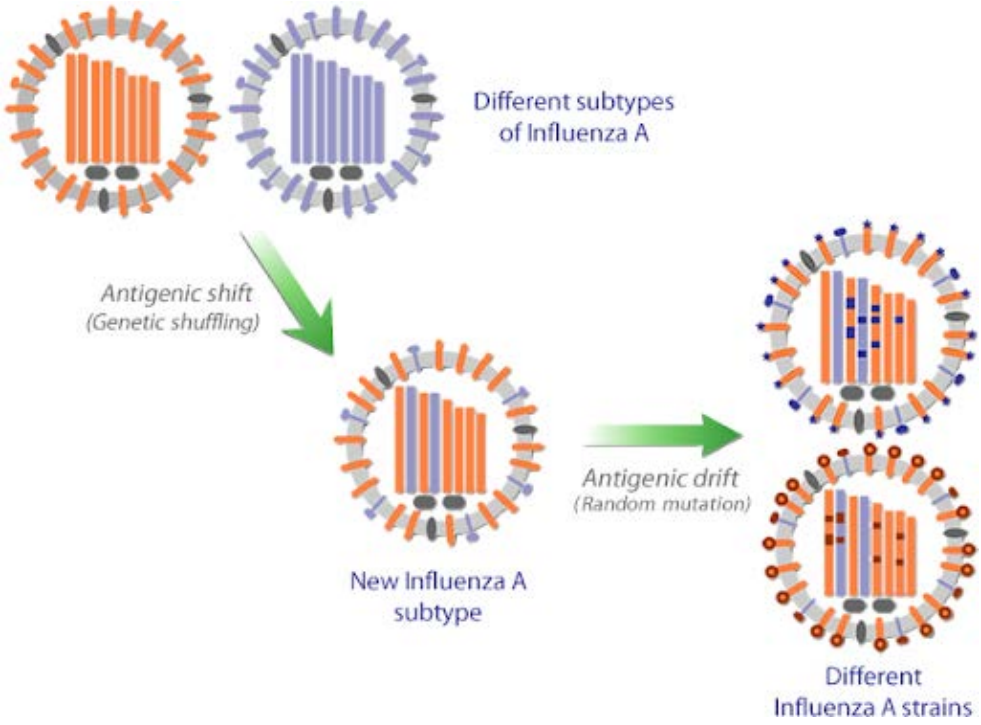
Influenza, or flu, is a contagious respiratory infection which can be caused by several flu viruses. These viruses generally infect the nose, throat and lungs and typically occur seasonally. Symptoms include fever, chills, muscle aches, coughing, congestion, headache and fatigue experienced for a week or so. Most people infected with the flu improve within two weeks; however, some may develop serious complications, such as pneumonia. The U.S. Department of Health and Human Services defines pandemic influenza as a new virulent flu strain, for which most people have no immunity, that spreads easily from person-to-person causing a global outbreak, or pandemic. Because there is little natural immunity, the disease can spread easily from person to person. Various strains of influenza often mutate from animal populations to humans, such as the H1N1 virus or "Swine Flu" which is a respiratory disease of pigs caused by type A influenza virus. Vaccines are typically developed annually, based on the primary type of virus that is currently impacting large proportions of the population. Most outbreaks occur seasonally, beginning in the late fall and winter months, with lessening of cases by spring.

The influenza virus can infect humans of any age and medical condition; however, depending on the influenza strain and other conditions, the most vulnerable populations are the very young, the elderly, and those with compromised immune systems.

There were four pandemic influenza events in the past century: 1918 ("Spanish Flu"), 1957 (H2N2 or "Asian Flu"), 1968 (H3N2 or "Hong Kong flu") and 2009 (H1N1). The flu pandemic of 1918 has been one of the most severe disease events in known history.

Some forms of previous viruses continue to circulate worldwide as seasonal influenza viruses that have undergone mutation or *antigenic shift* which changes the genes of the virus. Viruses that have undergone *antigenic drift* result in small changes in the virus, which is the main reason people can get the flu more than one time. In addition, it is the primary reason why flu vaccine composition must be reviewed and updated annually year (or as needed) to keep up with evolving influenza viruses.

Figure: 4.3.2-1 Antigenic Drift and Shift | Source: World Health Organization



Coronavirus

Coronaviruses are a large family of viruses common in people and many different species of animals, including camels, cattle, cats and bats. Rarely, do animal coronaviruses infect people and then spread between people; however, they can mutate to human spread, causing respiratory illness (like the flu) with symptoms such as a cough, fever, and in more severe cases, difficulty breathing and pneumonia. Previous pandemics involving coronaviruses include the severe acute respiratory syndrome (SARS) outbreak which appeared in China in 2003 and spread to over 8,000 people worldwide and killed almost 800. In addition, the Middle East Respiratory Syndrome (MERS) was another coronavirus (MERS-CoV) that developed in 2012, with the first cases reported in Jordan. Most reported cases were linked through travel to, or residence in, countries in and near the Arabian Peninsula, although the largest known outbreak of MERS outside of that area was in the Republic of Korea in 2015. Transmission was noted to be from those having close contact, such as caring for or living with an infected person. MERS patients ranged in age from younger than 1 to 99 years old. Public Health agencies continue to investigate clusters of MERS in several countries.

In late 2019, the new SARS-CoV-2 coronavirus, named “COVID-19”, has caused a quickly spreading, widespread outbreak. Within four months, the virus spread worldwide with close to one million cases and more than 50,000 deaths. Because of the dynamic situation related to this virus, the complete clinical picture with COVID-19 is not fully known.

Figure 4.3.2-2: Coronavirus Outbreak 2019

Coronavirus Outbreak – 2019

COVID-19 has been determined by the World Health Organization (WHO) to be a "pandemic" and is in progress during the 2020 RHMP update process. The timeliness of this outbreak has provided an opportunity to experience, first-hand, the impacts and consequences of what is developing into a worldwide, catastrophic disease outbreak. The full magnitude of the impacts and consequences of this pandemic are yet unknown; the full scope of preventive measures and mitigation steps that will prove to significantly slow the spread and severity of the virus or lower the risk are lessons yet to be learned.

Timeline of the COVID-19 Outbreak:

December 31, 2019 – A pneumonia of unknown cause is detected in Wuhan, China and first reported to the WHO Country Office in China.

January 30, 2020 – The outbreak is declared a Public Health Emergency of International Concern

February 11, 2020 – WHO announces a name for the new coronavirus disease: COVID-19.

March 11, 2020 – WHO announces that COVID-19 is now officially a "pandemic", the first to be caused by a coronavirus, and the first pandemic since the H1N1 "swine flu" in 2009. By this date, COVID-19 has swept into at least 114 countries, infecting more than 118,000 people and killing more than 4,000.

March 24, 2020 – The Centers for Disease Control (CDC) reports 54,443 cases of COVID-19 in the U.S.

March 31, 2020 – More than 186,000 cases in the U.S. are reported by the CDC. Much of the increase is contributed to increased testing around the country; however, the sharp increase in cases during this one-week period also reflects the aggressive rate of transmission of the virus and the delay in initiating social distancing measures during the two-to-three-week period prior to March 24.

April 1, 2020 – The Governor of Mississippi, Tate Reeves issues a statewide stay-at-home order to take effect on April 3, and remain in effect until April 20, 2020, in an effort to slow the spread of the COVID-19. At the time of the announcement, there are 1,073 cases and 22 deaths statewide.

Measures to Limit the Spread of COVID-19

Various methods to contain the spread can "flatten the curve" of the outbreak to reduce the number of patients that would threaten to overwhelm health and medical resources. Health officials have continually warned that measures are "urgent and aggressive" if there is hope of limiting the virus' spread. Current containment measures focus on preventing illness by "social distancing" that prevents close contact from individual-to-individual, thereby reducing the potential for infection through respiratory droplets produced when an infected person coughs or sneezes.

Some viruses are able to be contained through development of vaccines and mass vaccination of the population; however, development of effective vaccines takes months and is frequently a post-outbreak measure to prevent further development, or "waves" of the outbreak. In addition, many state and local governments are issuing "stay-at-home" orders for a specified period, along with cancellation of mass gatherings, and closure of schools and non-essential businesses. Many workers have transitioned to work from home locations that rely on access to internet and communication services.

Early "Lessons Learned"

- Spread of the COVID-19 virus may have been limited through early widespread access to accurate testing, and implementation of early social distancing measures, including travel restrictions.
- Health and medical systems are quickly being overburdened and lack vital equipment and supplies to respond to the number of critical patients.
- Coordination between multiple levels of government and agencies is essential to address the care capacities and availability of critical staff and other resources in hospitals and care centers.

Table 4.3.2-2: COVID-19 by the Numbers | Source: COVID Tracking Project, Center for Systems Science and Engineering, Johns Hopkins University; Centers for Disease Control; https://coronavirus.jhu.edu/map.html; dated accessed 04/02/20

COVID-19 By the Numbers* (as of April 2, 2020, 12:27.01 p.m. EDT)			
Cases Worldwide	***Deaths Worldwide***	***Cases in the U.S.***	***Deaths in the U.S.***
981,221	**50,230**	**226,374**	**4,595**
PROJECTED Total Deaths in the U.S. from COVID-19 (as of March 31, 2020)			**100,00 to 240,000**

*Because of limited testing capacity in some areas, the actual number of cases is believed to be higher. Hospitalized data is only collected for certain U.S. states.

Figure 4.3.2-3: Mississippi COVID-19 Cases and Deaths, by Race, as of April 20, 2020 | Source: Mississippi Department of Health, COVID-19 Update, date accessed April 21, 2020; https://msdh.ms.gov/msdhsite/_static/14,0,420.html#Mississippi

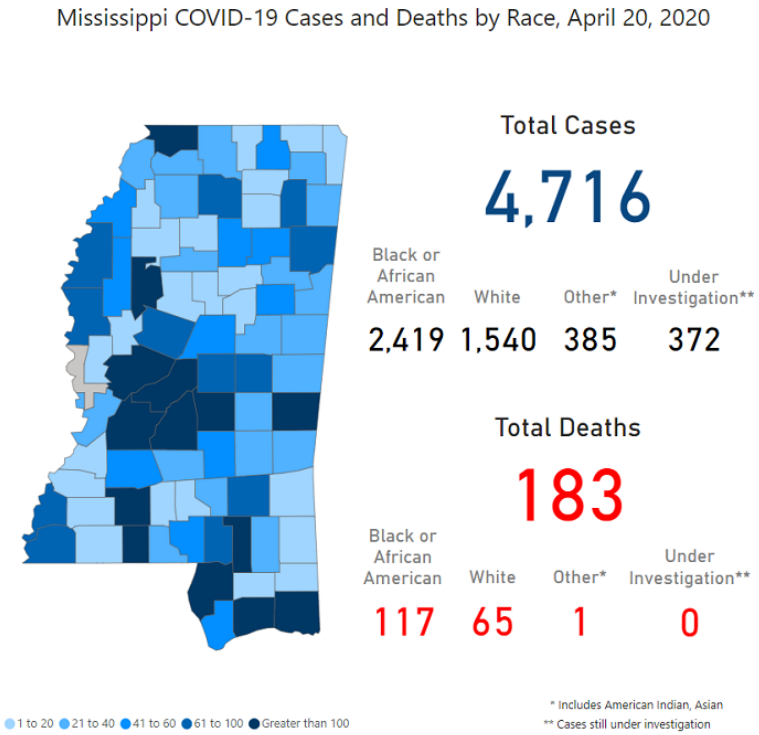


Table 4.3.2-3 presents two datasets for case numbers less than a month apart, which indicates how quickly cases multiplied within the jurisdictions.

Table 4.3.2-3 COVID-19 Cases to Date, Mississippi District 3 Counties (as of May 14, 2020) | Source: Mississippi Department of Health, COVID-19 Update, date accessed April 21, 2020; https://msdh.ms.gov/msdhsite/_static/14,0,420.html#Mississippi

County	Cases (April 20, 2020)	Cases (May 14, 2020)	Deaths (April 20/May 14)	Long-Term Care Facilities (April 20/May 14)
Attala	49	206	1/5	1/60
Bolivar	86	120	6/9	4/16
Carroll	14	105	1/4	0/45
Holmes	61	231	5/19	1/42
Humphreys	13	39	3/4	1/8
Leflore	109	192	6/21	2/50
Montgomery	17	69	1/1	0/0
Sunflower	48	64	2/3	0/0
Washington	71	87	3/4	1/4
TOTAL	**468**		**28**	**10**

Intervention and Prevention

Measures to contain or prevent human infectious disease outbreaks are *non-pharmaceutical* and *pharmaceutical*. In general, *non-pharmaceutical* measures are most effective in preventing spread of a viral outbreak due to the application of methods that limit the spread of the virus, unless a vaccination has been developed and is found to be effective in preventing infection. *Non-pharmaceutical* interventions include:

- Social Distancing (limiting public gatherings, restricting travel, instituting isolation or quarantine)
- Contact Tracing (investigating chains of exposure and potential transmission through individual and group contacts)
- Aggressive testing (confirming cases so that social distancing and/or medical treatment can limit or prevent transmission to additional people)

Medical countermeasures, or *pharmaceutical intervention*, emphasize prevention of influenza and corona-type viruses through immunization, and targeted use of appropriate antivirals for treatment. Limited use of prophylaxis may be carried out for specific exposed high-risk populations. The expected time required to develop vaccines that are effective to specific viruses may take six months or longer. Additional lag times associated with the development and availability of the vaccine in sufficient quantities for the total population must also be anticipated. The challenge to this measure is the almost certainty that a virus will mutate or undergo antigenic changes that require development of new vaccines that are effective in addressing these changes. In addition, antivirals may be of limited value as resistance to these drugs has been noted in many previous seasonal and novel virus causes.

Numerous Human Infectious Diseases outbreaks resulted in pandemics in the past or had the potential to be a pandemic, such as smallpox and measles, have been successfully controlled by comprehensive vaccination programs. Other diseases, such as Ebola and other hemorrhagic fever diseases, remain as a threat that is monitored through international, national and local surveillance systems.

Location and Extent

A pandemic human infectious disease outbreak, by the nature of its definition, has the potential to affect the entire country, including the State of Mississippi and all nine counties within District 3. Communities within the District 3 planning area would likely not be immune to the disease, and specific segments of the population may be defined as a higher risk group than others. With the interconnectedness of the country, and world, it is not reasonable to think any one location would be free from the threat of the pandemic. High population concentration areas, such as schools, retail locations, and special event venues are at the greatest risk of the pandemic hazard.

Based on the most recent COVID-19 outbreak data, residents of large metropolitan areas appear to be more susceptible to being infected, most probably due to closer interaction with other residents, or travelers from other locations, than those living in rural areas. As the virus progresses, the trending pattern for the location of outbreaks may also change.

Previous Occurrences

As described above, there were four major flu outbreaks in the United States. It was believed that in each of these flu pandemics approximately 30 percent of the population of the United States developed the flu and about 50 percent of those people sought medical care. In a press release dated September 22, 2009, the Mississippi State Department of Health reported 898 confirmed cases of Novel H1N1 (swine) flu in Mississippi with seven deaths reported in Jones, Jackson, Hancock, Washington, and Tippah Counties.

Table 4.3.21-4: Past Pandemic Influenza Events – Number of Deaths, United States | Source: Centers for Disease Control

Pandemic Influenza Event	Number of Deaths
1918 -1919 – "Spanish Flu"	675,000 (estimated)
1957-1958 – "Asian Flu"	116,000 (estimated)
1968 H3N2 Virus	100,000 (estimated)
2009 -2010 – H1N1 Virus	12,469

Statistics related to impacts of previous influenza events for the District 3 counties are not available.

In addition to previous influenza pandemics, the United State has been experienced several coronavirus events, which include the SARS outbreak in 2003 and the MERS outbreak in 20012. Both outbreaks were contained quickly with low numbers of U.S. cases. By contract, the number of cases of COVID-19 and related deaths have swelled within three months of the initial case and are expected to continue rising at least into early summer, 2020. The eventual number of cases and related fatalities will reflect how successful non-pharmaceutical measures have been in containing the spread of the disease. Beyond this time frame, containment of the COVID-19 may be most successful with yet-to-be-developed vaccines.

Probability of Future Occurrences

The probability of a pandemic influenza impacting the United States, and specifically Mississippi, is difficult to measure. Prior to the COVID-19 outbreak, pandemics, although expected at some point in the future and planned for by many health, medical and emergency management professionals, were rare occurrences. Information from officials who are overseeing the COVID-19 response is still uncertain about whether those who have confirmed cases of COVID-19 will be immune from future infections, or to what level the virus will spread throughout the world and individual communities in future months. Some scientists have indicated the possibility that the COVID-19 virus may become an ever-present virus, like the flu and colds, that can only be eradicated through an aggressive vaccination program, once a vaccination becomes available.

Assessing Vulnerability

People

There are many variables in Human Infectious Diseases which affect the vulnerability of the population, including by type of virus, demographics, environment (seasonality), individual medical conditions, and more. For the COIVD-19 outbreak, initial CDC report statistics[8] indicate illnesses have ranged from very mild to severe throughout all population groups; however, the elderly seem to be more susceptible to the severe effects of the virus, including illness resulting in death. Morbidity is found to be higher in elderly populations, with 80% of deaths among adults 65 years and older, and the highest percentage of severe outcomes occurring in people 85 years and older.

Property

Human infectious disease/pandemic outbreaks are unlikely to result in physical damage to homes, businesses or commercial properties.

Environment

Human infectious disease/pandemic outbreaks are unlikely to have a negative impact on the natural environment.

Economy

Human infectious disease/pandemic outbreaks are likely to have direct and indirect impacts on the economy through limiting travel and events; closing non-essential businesses; and creating high demand on health and medical systems and resources. Small businesses in rural areas may be at the highest risk to suffer economic damage due to a pandemic event, if orders to close all non-essential businesses or reduce hours for essential businesses (grocery/food, gas, home improvement supplies, most health/medical offices, banks/financial institutions) are put in place. These measures will likely have direct impacts on the economy by reducing the availability of goods and services. Additional in-direct economic losses may be incurred through reduction or loss of employee wages; limitation of access to health insurance and other employee benefits; and losses in financial markets and investments. Business closures initially temporary during the height of the pandemic may become permanent if containment measures are implemented for an extended period of time.

Impacts of Growth and Development

Infection rates from influenza tend to be higher in urban areas, or areas where people live in close proximity, such as apartment complexes, schools, multi-resident facilities, nursing homes and other residential care facilities. All counties within District 3 are considered to be rural, based on the population per square mile and have experienced declining populations over the past decade or longer. There is no significant planned development within District 3 counties and any growth that may occur during the next planning cycle is unlikely to have a negative impact on future pandemic outbreaks.

[8] CDC reporting as of April 2, 2020

Impacts of Climate Change

As of April 2020, no state-developed climate adaptation plan has been finalized; however, predictions from the U.S. Environmental Protection Agency (EPA), "What Climate Change Means for Mississippi", (EPA 430-F-16-026), dated August 2016, provides an overview of expected impacts in Mississippi related to weather-related events:

> Mississippi will become warmer, and both floods and droughts may be more severe. The changing climate is likely to produce more intense storms and increase the number of unpleasantly hot days. Tropical storms and hurricanes have become more intense during the past 20 years. Although warming oceans provide these storms with more potential energy, scientists are not sure whether the recent intensification reflects a long-term trend.
>
> Hot days can be unhealthy—even dangerous. Certain people are especially vulnerable, including children, the elderly, the sick, and the poor. High air temperatures can cause heat stroke and dehydration and affect people's cardiovascular and nervous systems. Warmer air can also increase the formation of ground-level ozone, a key component of smog. Ozone has a variety of health effects, aggravates lung diseases such as asthma, and increases the risk of premature death from heart or lung disease.
>
> Based on this assessment, it is likely that periods of increased temperatures and more intense storms as a result of changing climate conditions will increase the potential for human infectious disease outbreaks. For this reason, the mitigation strategy should consider initiatives and actions that will reduce the impacts from future disease outbreaks, such as:
>
> - Increasing pandemic preparedness by strengthening core public health infrastructure, including water and sanitation systems; increasing situational awareness through surveillance and monitoring and extinguishing sparks that could lead to epidemics or pandemics.
> - Ensuring that response plans are coordinated with multiple agencies and disciplines and focused on maintenance of public health and medical system sustainment, public health messaging, reduction of transmission and care for and treatment of the ill.
> - Developing contingency plans that address surge capacity – the ability to scale up the delivery of health interventions proportionately for the severity of the event, the pathogen, and the population at risk.

SECTION 5 CAPABILITIES ASSESSMENT

This section of the Plan discusses the capability of the D3 Region to implement hazard mitigation activities. It consists of the following four subsections:

- Overview and Purpose of Capability Assessment
- Methodology
- Conducting the Capability Assessment
- Capabilities and Resources
- Conclusion of Local Capability

5.0 Overview and Purpose of Capability Assessment

Implementing hazard mitigation initiatives involves working with an array of professionals, many of whom may not be trained in the four phases of emergency management. Stakeholders may include local planners, public works officials, economic development specialists and others. Similarly, hazard mitigation planning cuts across multiple disciplines. As a result, questions included in the Local Capability Assessment Survey regarding general regulatory and administrative capabilities were designed to measure the degree to which mitigation is integrated into other planning efforts. Table 5.1 provides an overview of several general implementation activities local communities traditionally use to assist with implementing mitigation strategies designed to reduce the long-term impacts of hazards on people and property.

Table 5.1: Activities Designed to Support Implementation of Hazard Mitigation Activities

Capability	*Relationship to Hazard Mitigation*
Floodplain Management Capability	Flooding is the greatest natural hazard facing the nation and the planning area. At the same time, the tools available to reduce flood-related impacts are numerous and among the most developed when compared to other hazard-specific mitigation techniques. The National Flood Insurance Program (NFIP) was created by Congress in 1968 to protect lives and property and to reduce the financial burden of providing disaster assistance. The NFIP is administered by the Federal Emergency Management Agency (FEMA). The NFIP is based on a mutual agreement between the federal government and communities. Communities that participate agree to regulate floodplain development according to certain criteria and standards. The partnership involves: • Flood Insurance: Property owners in participating communities are eligible to purchase federal flood insurance that covers both buildings and contents. • Flood Hazard Maps: Partnering with FEMA, the state produces flood maps based on FEMA standards for use by community regulatory bodies, insurance agents and others. • Regulations: Communities must adopt and enforce minimum floodplain management regulations so that development, is managed in ways that reduce exposure to flooding. The NFIP provides specific regulatory measures that enable officials to

Capability	Relationship to Hazard Mitigation
	determine where and how growth occurs relevant to flood hazards. The NFIP is a voluntary program but is strongly encouraged by FEMA as a means to implement sustainable solutions. The Towns of Kilmichael, Sallis and Silver City explained their respective decisions to participate in NFIP: • The Town of Sallis decided to opt out of the NFIP because there are no structures in the floodplain within the town limits. • Kilmichael explored the benefits of NFIP participation and added a mitigation action in the previous plan stating the idea would receive further consideration. However, Kilmichael has not yet made a decision to participate in the NFIP. • Similarly, Silver City is exploring the benefits of the NFIP and added a mitigation action in the previous plan should they decide to pursue participation.
Flood Damage Prevention Ordinance	A local Flood Damage Prevention Ordinance is a tool used by counties and municipalities to regulate the type of construction that occurs in the floodplain. If a community is an NFIP participant, it must adopt and enforce a Flood Damage Prevention Ordinance. The MEMA State Assistance Office for the NFIP has developed a Model Flood Damage Prevention Ordinance for use by all participating NFIP communities. For each NFIP participating community in the planning area, an emphasis will be placed on continued compliance with the NFIP. The following steps will be taken by each participating community in order to meet or exceed the following minimum requirements as set by the NFIP. • Issuing or denying floodplain development/building permits • Inspecting all development to ensure compliance with local ordinance • Maintaining records of floodplain development • Assisting in the preparation and revision of flood maps/updates • Assist residents in obtaining information on flood hazards, floodplain map data, flood insurance and proper construction measures.
Community Rating System (CRS)	The goal of the CRS program is to reduce flood damages to insurable property, strengthen and support the insurance aspects of the NFIP, and encourage a comprehensive approach to floodplain management. Benefits of the CRS not only include lower flood insurance rates, but also the following: • Citizens and property owners increase their knowledge of the risks associated with flood impacts and can evaluate their individual vulnerabilities and learn to take action to protect themselves and their property. • CRS floodplain management activities provide enhanced public safety, reduced damage to property and public infrastructure, and avoidance of economic disruption and loss. • Communities can evaluate the effectiveness of their flood programs against nationally recognized benchmark. • Technical assistance in designing and implementing some activities is available to communities at no charge • CRS communities have incentives to maintain and improve their flood programs over time.

Capability	Relationship to Hazard Mitigation
	Of the communities within District 3, only the Cities of Cleveland and Greenville participate in the CRS program.
Storm Water Management Plan	A storm water management plan is designed to address flooding associated with storm water runoff. The storm water management plan is typically focused on design and construction measures intended to reduce the impact of more frequently occurring minor urban flooding.
Zoning Ordinances	Zoning represents the means by which land use is controlled by local governments. As part of a community's police power, zoning is used to protect the public health, safety and welfare. A zoning ordinance is the mechanism through which zoning is typically implemented. Since zoning regulations enable municipal governments to limit the type and density of development, it can serve as a powerful tool when applied in identified hazard areas.
Subdivision Ordinances	A subdivision ordinance is intended to regulate the development of housing, commercial, industrial or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development.
Building Codes, Permitting and Inspections	Building codes regulate construction standards. Decisions regarding the adoption of building codes, the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community. Under Senate Bill 2378 of 2014, all counties and municipalities must enact the uniform building codes unless they opt out prior to Nov. 30, 2014
Historic Preservation Plan	A historic preservation plan is intended to preserve historic structures or districts within a community. An often-overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards to include the identification of the most effective way to reduce future damages. This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of harm's way.
Hazard Mitigation Plan	A hazard mitigation plan represents a community's blueprint for how they intend to reduce the impact of natural and human-caused hazards on people and the built environment. Elements of a hazard mitigation plan include a risk assessment, capability assessment and mitigation strategy. As this is a multi-jurisdictional hazard mitigation plan, each of the participating communities has developed a hazard mitigation plan.
Emergency Operations Plan	An emergency operations plan outlines responsibility and the means by which resources are deployed during or following an emergency or disaster.
Continuity of Operation Plan	A continuity of operations plan establishes a clear chain of command, line of succession, and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster.
Comprehensive Plan	A comprehensive plan establishes the overall vision for a community and helps to guide municipal decision-making.
Economic Development Plan:	An economic development plan serves as a road map for economic development decision making, based on the collection of statistical data,

Capability	Relationship to Hazard Mitigation
	historical perspective, and human potential.
Community Wildfire Protection Plan	The community wildfire protection plan is a strategic plan that identifies wild land fire issues facing the community and outlines prioritized mitigation actions.

Performing a Capability Assessment is one step of a FEMA approved hazard mitigation plan update. A mitigation planning Capability Assessment consists of taking an in-depth look at community mechanisms (such as plans, codes, ordinances, staffing, etc.) which can affect hazard mitigation activities. Performing the Capability Assessment helps communities identify the regulatory, administrative, technical, and fiscal capabilities of their jurisdiction and consider ways these tools can be used to further hazard mitigation and disaster resiliency goals. Capability Assessments were undertaken by each participating jurisdiction as part of the development of the previous plan.

5.1 Methodology

The Disaster Mitigation Act of 2000 requires local governments review and incorporate, if appropriate, existing plans, studies, reports and technical information into their hazard mitigation plans. IEM worked closely with the RHMC and distrusted copies of the Local Capabilities Survey to Officials in participating jurisdictions. The survey asked several detailed questions about existing local plans, policies, programs and ordinances that contribute to and/or hinder that community's ability to implement hazard mitigation actions. In addition, a series of questions were asked concerning each jurisdiction's technical, fiscal, and administrative capabilities. The survey results provided an inventory of existing local plans, policies, programs and ordinances. Just as important, local officials conducted a self-assessment of their capabilities.

As part of the assessment of jurisdictional capabilities, previous mitigation strategies were reviewed, along with the status of any actions taken to meet the goals and objectives of the strategies. Information on these findings can be found in **Section 6 – Mitigation Strategies**. The information from the survey was incorporated into a scoring system to provide an overall capability rating of "high", "moderate", or "limited". Documenting past mitigation measures can also serve to help assess the degree to which local governments are willing to adopt future mitigation actions.

5.2 Conducting the Capability Assessment

In order to gather the information necessary to update the capabilities assessment, the Capabilities Survey was sent out to each participating jurisdiction. The Consultant used information provided in the previous plan to populate the survey worksheet for each jurisdiction. Each jurisdiction within the planning area was asked to review the information from the previous plan and:

- certify all information previously provided was still current
- provide markups to the consultant noting any changes in capabilities which occurred since the previous plan, or
- perform a local capability assessment if one was not completed during the development of the initial plan for the plan update.

A follow up telephone call was made to participating jurisdictions to explain the purpose of the survey and offer assistance in completing the survey. The responses from the worksheets were used to update the capabilities section to reflect each jurisdiction's assessment of their current capabilities.

5.3 Capabilities and Resources

Planning and Regulatory Capabilities

Mississippi District 3 Counties and their incorporated jurisdictions have several policies, programs, and capabilities, which help to prevent and minimize future damages resulting from hazards. These tools are valuable instruments in pre- and post-disaster mitigation as they facilitate the implementation of mitigation activities through the current legal and regulatory framework. Table 5.4.1 provides a list of the Planning and Regulatory programs and policies included in the Capabilities Assessment Survey. The checkbox (✓) indicates the local government reported having that code, ordinance, or plan. In Mississippi, each community is required to adopt a Uniform Building Code.

Table 5.4.1: Planning and Regulatory Capabilities

Jurisdiction	Comprehensive/Master	Capital Improvement	Economic Development	Emergency Operations	Continuity of Operations	Transportation	Stormwater Management	Community Wildfire Protection	Historic Preservation	Building Codes (Year)	Fire Department ISO Rating	Site Plan Review Requirements	Land Use	Zoning	Subdivision Regulation	Flood Damage Prevention	Flood Insurance Study	NFIP	Community Rating System (Status)
Attala County				✓	✓	✓		✓			10					✓		✓	
Ethel				✓				✓			9					✓		✓	
Kosciusko	✓			✓					✓	'12	6	✓	✓	✓	✓	✓	✓	✓	
McCool				✓							9					✓		✓	
Sallis	✓			✓						'97	6								
Bolivar County	✓	✓		✓		✓	✓				8		✓	✓		✓	✓	✓	
Alligator				✓							8					✓	✓	✓	
Benoit				✓							8					✓	✓	✓	
Beulah			✓	✓							9					✓	✓	✓	
Boyle	✓	✓	✓	✓		✓	✓			✓	8	✓	✓	✓	✓	✓	✓	✓	
Cleveland	✓			✓		✓	✓		✓	'06	5	✓	✓	✓	✓	✓	✓	✓	8
Duncan				✓						'97	9		✓	✓	✓	✓	✓	✓	
Gunnison				✓							9					✓	✓	✓	
Merigold			✓	✓		✓				✓	8	✓		✓	✓	✓	✓	✓	
Mound Bayou				✓							8					✓	✓	✓	
Pace	✓	✓		✓							9	✓		✓		✓	✓	✓	
Renova				✓							8					✓	✓	✓	
Rosedale	✓	✓		✓	✓	✓				'71	8			✓	✓	✓	✓	✓	
Shaw				✓						✓	8		✓	✓		✓	✓	✓	
Shelby	✓			✓						✓	7	✓	✓	✓		✓	✓	✓	
Winstonville			✓	✓							8	✓	✓	✓	✓	✓	✓	✓	
Carroll County		✓	✓	✓	✓			✓			10							✓	
Carrolton	✓			✓	✓					'12	8		✓	✓				✓	
North Carrollton				✓	✓						8							✓	
Vaiden				✓	✓						8							✓	
Holmes County		✓	✓	✓		✓	✓		✓		10	✓				✓	✓	✓	
Cruger			✓	✓		✓	✓		✓					✓	✓	✓		✓	
Durant			✓	✓		✓	✓		✓					✓	✓	✓		✓	
Goodman			✓	✓		✓	✓		✓					✓	✓	✓		✓	
Lexington			✓	✓		✓	✓		✓					✓	✓	✓		✓	
Pickens			✓	✓		✓	✓		✓					✓	✓	✓		✓	
Tchula			✓	✓		✓	✓		✓					✓	✓	✓		✓	
West			✓	✓		✓	✓		✓					✓	✓	✓		✓	

Humphreys County	✓			✓	✓	✓	✓		✓	'12	10	✓				✓	✓	✓	
Belzoni	✓			✓		✓	✓			'03	7	✓	✓	✓	✓	✓	✓	✓	
Isola	✓			✓		✓				'12	8	✓				✓	✓	✓	
Louise	✓			✓		✓				'12	8						✓	✓	
Silver City				✓		✓				'12	10			✓	✓	✓	✓		
Leflore County	✓	✓	✓	✓		✓				'14	9			✓	✓	✓	✓	✓	
Greenwood	✓		✓	✓			✓		✓	'12	4		✓	✓	✓	✓	✓	✓	
Itta Bena	✓										7			✓	✓	✓	✓	✓	
Morgan City											9					✓		✓	
Schlater				✓							9					✓		✓	
Sidon											9					✓		✓	
Montgomery County	✓		✓	✓	✓	✓					10			✓		✓	✓	✓	
Duck Hill	✓			✓	✓	✓					9			✓	✓	✓	✓	✓	
Kilmichael	✓			✓	✓	✓					9			✓	✓	✓	✓		
Winona				✓	✓				✓	'02	7	✓	✓	✓	✓	✓		✓	
Sunflower County	✓			✓	✓						10				✓	✓	✓	✓	
Doddsville	✓			✓	✓						10		✓	✓		✓	✓	✓	
Drew	✓			✓	✓					'09	7		✓	✓	✓	✓	✓	✓	
Indianola	✓		✓	✓	✓	✓	✓	✓	✓	'09	6	✓	✓	✓	✓	✓	✓	✓	
Inverness	✓	✓		✓	✓			✓		'98	8	✓	✓	✓	✓	✓	✓	✓	
Moorhead	✓		✓	✓	✓	✓	✓			'09	8	✓	✓	✓	✓	✓	✓	✓	
Ruleville	✓		✓	✓	✓	✓	✓			'08	7		✓	✓	✓	✓	✓	✓	
Sunflower	✓		✓	✓	✓					'08	8		✓	✓	✓	✓	✓	✓	
Washington County	✓		✓	✓	✓				✓	'06	10	✓	✓	✓	✓	✓	✓	✓	
Arcola									✓	'06	9			✓		✓	✓	✓	
Greenville	✓	✓	✓	✓	✓	✓	✓	✓	✓	'06	5	✓		✓	✓	✓	✓	✓	8
Hollandale									✓	'06	8			✓		✓	✓	✓	
Leland	✓	✓		✓	✓		✓		✓	'06	8	✓		✓	✓	✓	✓	✓	
Metcalfe									✓	'06	8					✓	✓	✓	

Administrative and Technical Capability

The ability of a local government to develop and implement mitigation projects, policies, and programs is contingent upon its staff and resources. Administrative capability is determined by evaluating whether there is an adequate number of personnel to complete mitigation activities. Similarly, technical capability can be evaluated by assessing the level of knowledge and technical expertise of local government employees, such as personnel skilled in surveying and Geographic Information Systems. Table 5.4.2 provides a summary of the administrative and technical capabilities currently in place in each participating jurisdiction. The checkbox (✓) indicates the local government reported they maintain a staff member for the given function.

Table 5.4.2: Administrative and Technical Capabilities

Community Resource or Asset	Planning Commission	Local Emergency Planning Committee (or other)	Maintenance programs: tree trimming, drainage, etc.	Mutual Aid Compacts	Building Inspection	Floodplain Manager	Emergency Manager	Community Planner	Civil Engineer	GIS Coordinator	Warning System/Services (Reverse 911//Outdoor Warning)	Grant writer
Jurisdiction												
Attala County		✓	✓	✓		✓	✓		✓		✓	✓
Ethel		✓	✓	✓		✓	✓				✓	✓
Kosciusko	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓
McCool		✓		✓		✓	✓				✓	
Sallis		✓			✓	✓					✓	
Bolivar	✓	✓	✓	✓	✓	✓	✓		✓		✓	
Alligator		✓	✓	✓		✓	✓		✓		✓	✓
Benoit		✓	✓	✓		✓	✓		✓		✓	✓
Beulah				✓		✓	✓					
Boyle	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓
Cleveland	✓	✓	✓	✓	✓	✓	✓				✓	✓
Duncan			✓	✓		✓	✓		✓			✓
Gunnison		✓		✓		✓	✓					
Merigold		✓	✓	✓	✓	✓	✓		✓		✓	✓
Mound Bayou			✓	✓		✓	✓		✓		✓	✓
Pace			✓	✓		✓	✓					
Renova			✓	✓		✓	✓					
Rosedale	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Shaw		✓	✓	✓	✓	✓	✓		✓		✓	✓
Shelby		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Winstonville		✓		✓	✓	✓	✓				✓	✓
Carroll		✓	✓	✓			✓		✓		✓	✓
Carrolton		✓					✓				✓	✓
North Carrollton		✓					✓		✓		✓	✓
Vaiden		✓					✓		✓		✓	✓

Community Resource or Asset	Planning Commission	Local Emergency Planning Committee (or other)	Maintenance programs: tree trimming, drainage, etc.	Mutual Aid Compacts	Building Inspection	Floodplain Manager	Emergency Manager	Community Planner	Civil Engineer	GIS Coordinator	Warning System/Services (Reverse 911//Outdoor Warning)	Grant writer
Jurisdiction												
Holmes		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Cruger		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Durant		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Goodman		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Lexington		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Pickens		✓	✓	✓	✓	✓	✓		✓	✓		
Tchula		✓	✓	✓	✓	✓	✓		✓	✓	✓	
West		✓	✓	✓	✓	✓	✓		✓	✓	✓	
Humphreys County		✓	✓	✓	✓	✓	✓		✓		✓	✓
Belzoni		✓	✓	✓	✓	✓			✓		✓	✓
Isola		✓		✓	✓	✓			✓		✓	✓
Louise		✓		✓	✓	✓			✓		✓	✓
Silver City									✓		✓	
Leflore		✓		✓	✓		✓		✓		✓	
Greenwood		✓		✓	✓	✓	✓	✓				
Itta Bena		✓		✓			✓					
Morgan City		✓		✓			✓					
Schlater		✓		✓			✓					
Sidon		✓		✓			✓				✓	✓
Montgomery County	✓	✓	✓	✓		✓	✓		✓		✓	✓
Duck Hill	✓	✓	✓	✓	✓	✓	✓				✓	✓
Kilmichael	✓	✓	✓	✓		✓	✓		✓		✓	✓
Winona	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓

*Continued - Community Resource or Asset	Planning Commission	Local Emergency Planning Committee (or other)	Maintenance programs: tree trimming, drainage, etc.	Mutual Aid Compacts	Building Inspection	Floodplain Manager	Emergency Manager	Community Planner	Civil Engineer	GIS Coordinator	Warning System/Services (Reverse 911//Outdoor Warning)	Grant writer
Jurisdiction												
Sunflower County		✓	✓	✓		✓	✓		✓		✓	
Doddsville		✓	✓	✓		✓			✓		✓	
Drew		✓	✓	✓	✓	✓			✓		✓	
Indianola	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Inverness	✓	✓	✓		✓	✓	✓		✓		✓	✓
Moorhead		✓	✓		✓	✓	✓		✓		✓	✓
Ruleville		✓	✓	✓	✓	✓			✓		✓	
Sunflower		✓	✓	✓	✓	✓			✓		✓	
Washington County	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓
Arcola		✓	✓	✓	✓	✓	✓	✓	✓		✓	
Greenville	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Hollandale		✓	✓	✓					✓	✓	✓	✓
Leland	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Metcalfe		✓	✓	✓								

Fiscal Capability

The ability of a local government to implement mitigation activities is also associated with the funding available for policies and projects. Funding for such initiatives is often locally based revenue and financing, as well as outside grants. Costs associated with mitigation activities range from staffing and administrative costs to the actual cost of the mitigation project. Table 5.4.3 provides a summary of the fiscal capabilities currently in place in each participating jurisdiction. A checkbox (✓) indicates the financial resource was reported to be available in the local jurisdiction for mitigation purposes.

Table 5.4.3: Fiscal Capabilities

Currently Available Funding Mechanism Jurisdiction	Capital Improvement Funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric services	Impact fees for new development	Stormwater utility fees	Incur debt through general obligation bonds or	Incur debt through private activities	Community Development Block Grant	Other federal funding programs	State funding programs
Attala County	✓	✓				✓		✓	✓	✓
Ethel		✓	✓			✓		✓	✓	✓
Kosciusko		✓	✓			✓		✓	✓	✓
McCool	✓	✓				✓		✓	✓	✓
Sallis		✓	✓					✓		
Bolivar County	✓	✓				✓		✓	✓	✓
Alligator		✓	✓			✓		✓	✓	✓
Benoit		✓	✓			✓		✓	✓	✓
Beulah		✓	✓	✓		✓	✓	✓	✓	✓
Boyle	✓	✓	✓			✓		✓	✓	✓
Cleveland	✓	✓	✓			✓		✓	✓	✓
Duncan		✓	✓			✓		✓	✓	✓
Gunnison		✓	✓			✓		✓	✓	✓
Merigold		✓	✓			✓		✓	✓	✓
Mound Bayou		✓				✓		✓	✓	✓
Pace		✓	✓			✓	✓	✓	✓	✓
Renova		✓				✓		✓	✓	✓
Rosedale	✓	✓	✓	✓		✓	✓	✓	✓	✓
Shaw	✓	✓	✓	✓		✓		✓	✓	✓
Shelby	✓	✓	✓			✓		✓	✓	✓
Winstonville	✓	✓	✓			✓		✓	✓	✓
Carroll County	✓	✓	✓			✓		✓	✓	✓
Carrolton	✓	✓	✓			✓		✓	✓	✓
North Carrollton			✓						✓	✓
Vaiden			✓						✓	✓
Holmes County	✓	✓	✓			✓		✓	✓	✓
Cruger	✓	✓	✓			✓		✓	✓	✓
Durant	✓	✓	✓			✓		✓	✓	✓
Goodman	✓	✓	✓			✓		✓	✓	✓
Lexington	✓	✓	✓			✓		✓	✓	✓

Pickens	✓	✓	✓			✓		✓	✓	✓
Tchula	✓	✓	✓			✓		✓	✓	✓
West	✓	✓	✓			✓		✓	✓	✓
Humphreys County	✓	✓				✓		✓	✓	✓
Belzoni	✓	✓	✓			✓		✓	✓	✓
Isola			✓			✓		✓	✓	✓
Louise			✓			✓		✓	✓	✓
Silver City			✓			✓		✓	✓	✓
Leflore County										
Greenwood		✓	✓			✓		✓	✓	✓
Itta Bena										
Morgan City										
Schlater										
Sidon			✓							
Montgomery County	✓	✓					✓	✓	✓	✓
Duck Hill	✓	✓					✓	✓	✓	✓
Kilmichael	✓	✓					✓	✓	✓	✓
Winona	✓	✓					✓	✓	✓	✓
Sunflower County		✓				✓		✓	✓	✓
Doddsville		✓						✓	✓	
Drew		✓	✓			✓		✓	✓	
Indianola	✓	✓	✓	✓		✓		✓	✓	✓
Inverness		✓	✓		✓			✓	✓	✓
Moorhead	✓	✓	✓			✓		✓	✓	✓
Ruleville		✓	✓			✓		✓	✓	
Sunflower		✓	✓			✓		✓	✓	
Washington County		✓				✓		✓	✓	✓
Arcola		✓	✓			✓		✓	✓	✓
Greenville	✓	✓	✓			✓	✓	✓	✓	✓
Hollandale		✓	✓			✓		✓	✓	✓
Leland	✓	✓	✓		✓	✓	✓	✓	✓	✓
Metcalfe		✓	✓			✓		✓	✓	✓

In order to form an assessment of local capabilities, a quantitative scoring methodology was designed and applied to the results of the assessment survey. The methodology assesses the overall capability of the participating District 3 jurisdictions to implement hazard mitigation actions.

Table 5.4.4 shows the results of the Capability Assessment using the designed scoring methodology, which can be found in **Appendix F**. The capability score is based solely on the information provided by local officials in response to the Local Capability Assessment Survey. According to assessment, the average local capability score for all responding jurisdictions is 40, which falls into the moderate capability ranking.

Table 5.4.4: District 3 Capability Assessment Scoring

Jurisdiction	Overall Capability Score	Overall Capability Rating
Attala County	29	Moderate
Ethel	25	Moderate
Kosciusko	32	Moderate
McCool	21	Moderate
Sallis	15	Limited
Bolivar County	39	Moderate
Alligator	25	Moderate
Benoit	26	Moderate
Beulah	23	Moderate
Boyle	45	High
Cleveland	45	Moderate
Duncan	29	Moderate
Gunnison	22	Moderate
Merigold	35	Moderate
Mound Bayou	24	Moderate
Pace	28	Moderate
Renova	20	Moderate
Rosedale	45	High
Shaw	36	Moderate
Shelby	39	Moderate
Winstonville	33	Moderate
Carroll County	28	Moderate
Carrolton	27	Moderate
North Carrollton	18	Limited
Vaiden	18	Limited
Holmes County	39	Moderate
Cruger	37	Moderate
Durant	37	Moderate
Goodman	37	Moderate
Lexington	37	Moderate
Pickens	35	Moderate
Tchula	36	Moderate
West	36	Moderate
Humphreys County	40	Moderate
Belzoni	39	Moderate
Isola	31	Moderate
Louise	28	Moderate
Silver City	19	Limited
Leflore County	28	Moderate
Greenwood	40	Moderate

Jurisdiction	Overall Capability Score	Overall Capability Rating
Itta Bena	17	Limited
Morgan City	11	Limited
Schlater	13	Limited
Sidon	13	Limited
Montgomery County	36	Moderate
Duck Hill	36	Moderate
Kilmichael	34	Moderate
Winona	38	Moderate
Sunflower County	30	Moderate
Doddsville	28	Moderate
Drew	34	Moderate
Indianola	54	High
Inverness	42	Moderate
Moorhead	44	High
Ruleville	39	Moderate
Sunflower	34	Moderate
Washington County	41	Moderate
Arcola	20	Limited
Greenville	58	High
Hollandale	20	Limited
Leland	49	High
Metcalfe	19	Limited

The capability assessments determined the D3 Counties and the participating jurisdictions, who submitted completed capability assessment worksheets, collectively have a moderate level of planning, regulatory, administrative, technical and fiscal tools and resources necessary to implement hazard mitigation strategies. As shown in the preceding tables, the capabilities to implement hazard mitigation strategies varied by County and jurisdictions within the county.

SECTION 6 MITIGATION STRATEGY

This section of the Plan provides the blueprint for the participating jurisdictions in the MEMA District 3 Region to follow in order become disaster resistant communities by reducing their vulnerable to identified hazards. This will include discusses on how the MEMA District 3 Regional Mitigation Strategy and Mitigation Action Plan will be implemented and how these strategies will be incorporated into other ongoing planning mechanisms. This section includes the following:

- Introduction
- Goals and Objectives
- Previous Mitigation Actions
- Mitigation Action Plan
- Integrating Mitigation Strategies into Other Local Planning Mechanisms
- Grant Funding Opportunities

6.0 Introduction

The D3 RHMP Strategy includes goals and objectives, actions and initiatives designed to avoid, minimize, and mitigate the impacts of natural and manmade disasters on the people, property, environment and economy in the planning area. For example, communities strengthen resiliency by strengthening their building codes, zoning ordinances, land development policies, and other regulatory activities. When counties and their local jurisdictions review or update codes, plans and ordinances, the opportunity exists to identify whether mitigation strategies can be incorporated into policy changes. Such efforts go a long way to ensuring District 3 communities are resilient in the face of hazards known to affect the region.

During the 2020 update process, the Project Team held one-on-one conversations with County Emergency Management (EM) Directors and, as is feasible, members of local jurisdictions. Highlights of these conversations include:

- A review and update of the Goals and Objectives from the 2015 RHMP.
- Discussion of strategies included in the 2015 plan and the status of each mitigation action.
- Input about whether each 2015 action should be carried forward and included in the 2020 RHMP and, if not, the reason why.
- New mitigation strategies to be included in the updated plan.
- Developing a minimum of two action worksheets per jurisdiction to fully describe a current mitigation strategy, including community benefits from implementing the action.

These conversations suggested the mitigation priorities for the planning area remained the same, but it was felt the goals and objectives and list of mitigation actions could be streamlined. A set of refined goals and objectives was adopted by the participating jurisdictions.

6.1 Goals and Objectives

Based on input from the MEMA District 3 RHMC, the revised list of Goals and Objectives to be included in the 2020 Plan Update is presented below:

District 3 Regional Hazard Mitigation Plan Update
Adopted 2020 RHMP Goals and Objectives

Goal 1: Minimize loss of life, injury, damage to property, the economy and natural systems

Objective 1.1 - Protect existing / new critical facilities and infrastructure
Objective 1.2 - Provide protection for future / existing developments
Objective 1.3 - Provide backup power to critical facilities / infrastructure

Goal 2: Maintain and enhance emergency management/mitigation capabilities

Objective 2.1 - Update / develop plans / studies for all hazards
Objective 2.2 - Incorporate / improve hazard mitigation strategies into ordinances, plans and polices
Objective 2.3 - Promote the National Flood Insurance Program and Community Rating System

Goal 3 – Maintain public education and awareness activities

Objective 3.1 - Expand Public Outreach Campaigns for all hazards
Objective 3.2 - Promote disaster mitigation/preparedness planning activities for families and area businesses

These Goals and Objectives are broadly aligned with the goals of Mississippi's 2018 State Hazard Mitigation Plan (SHMP), without contradiction.

6.2 Previous Mitigation Actions

A thorough review of mitigation actions identified in the previous approved plan was conducted to determine the effectiveness of the action and the progress made to date. Each participating jurisdiction was asked to review and update each action to determine if: the action was completed; the strategy is no longer applicable; or it should be moved forward and included in the 2020 Plan Update. The updated status of previous mitigation actions is provided in the individual annex for each of D3's participating counties.

6.3 The Mitigation Action Plan

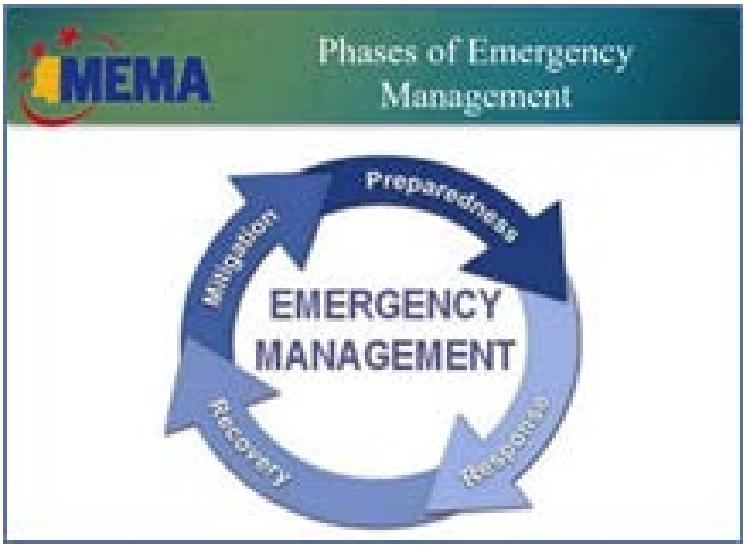
Each participating jurisdiction updated its list of mitigation actions based on the review of its risk assessment and existing capabilities. The actions include community-specific details and are included in each county's detailed mitigation action plan within the Annex section of this plan. The Mitigation Strategy for each Annex includes several changes, including those based on the streamlined list of 2020 Goals and Objectives. The table of action items includes mitigation actions identified in the 2015 plan; the outcome of each; and how the strategy was updated for the 2020 plan; and newly developed mitigation actions.

Previous plans included a large number of mitigation actions considering the size and available resources of some jurisdictions, including those with only a few hundred residents. An example of this is the fact that most County Emergency Management (EM) directors are the single departmental employee, or they perform their EM duties while functioning in one or more service roles in their

community. The same is often true for leadership at the city or town level, where those in leadership "wear many hats."

Several changes were made to streamline the Mitigation Strategy given the following considerations:

- Actions identified as falling into the Preparedness Phase of the Emergency Management Cycle were removed and recommended for consideration under Preparedness Planning. Examples of this include disaster preparedness initiatives (such as providing weather radios to residents) and NIMS training, which represent actions a community normally does to prepare for a hazard event.



The image above, developed for a MEMA presentation, clearly delineates EM agencies operationally function under four phases of emergency management, although sometimes the phases run concurrently. Professional emergency managers and their Emergency Support Functions (ESF) units called up during disaster response, develop specific plans and actions as appropriate for each event phase.

- Actions identified as being required as part of the FEMA Hazard Mitigation Planning Process were removed because these are fully spelled out under the Plan Maintenance section of this RHMP Update. Examples of this include reviewing the mitigation plan and meeting to discuss needed plan updates after a disaster occurs in the community.
- Actions that discussed similar activities were combined into one action. For example, there were previously separate action items for educating the public about natural hazards and for educating the public about manmade (technological, biological, health-related) hazards. A single outreach plan using multiple communications channels can incorporate education about all hazards to all audiences if the outreach plan is fully developed.
- In some instances, extensive description of previous actions was shortened.
- Most action items were identified by all jurisdictions. In these cases, a countywide action was developed that would be jointly implemented by all participating jurisdictions.

It is hoped the streamlined mitigation strategy will be more manageable for the District 3 Counties and its jurisdictions to implement.

Review/Identification of Mitigation Actions/Techniques

In addition to the streamlining activities discussed, as part of the update process the RHMC was asked to review and consider a wide range of activities in order to help develop any new mitigation actions to assist in achieving the revised mitigation goals as well as addressing any specific hazard concerns. In general, all activities considered by the RHMC can be classified under one of the following six (6) broad categories of mitigation techniques provided in Table 6.3-1.

Table 6.3-1: Mitigation Actions/Techniques

Mitigation Actions Techniques	Description
Prevention	Preventative activities are intended to keep hazard problems from getting worse and are typically administered through government programs or regulatory actions that influence the way land is developed and buildings are built. They are particularly effective in reducing a community's future vulnerability, especially in areas where development has not occurred, or capital improvements have not been substantial. Examples includes planning and zoning, building codes, Open space preservation, Floodplain regulations, Stormwater management regulations, Drainage system maintenance, Capital improvements programming, Riverine/fault zone setbacks.
Property Protection	Property protection measures involve the modification of existing buildings and structures to help them better withstand the forces of a hazard, or removal of the structures from hazardous locations. Examples include Acquisition, Relocation, Building elevation, Critical facilities protection, Retrofitting (e.g., wind proofing, floodproofing, seismic design techniques, etc.), Safe rooms, shutters, shatter-resistant glass, Insurance
Natural Resource Protection	Natural resource protection activities reduce the impact of natural hazards by preserving or restoring natural areas and their protective functions. Such areas include floodplains, wetlands, steep slopes, and sand dunes. Parks, recreation, or conservation agencies and organizations often implement these protective measures. Examples include floodplain protection, watershed management, riparian buffers, forest and vegetation management (e.g., fire resistant landscaping, fuel breaks, etc.), Erosion and sediment control, Wetland preservation and restoration, Habitat preservation, Slope stabilization
Structural Projects	Structural mitigation projects are intended to lessen the impact of a hazard by modifying the environmental natural progression of the hazard event through construction. They are usually designed by engineers and managed or maintained by public works staff. Examples include Reservoirs, Dams/levees/dikes/floodwalls, Diversions/detention/retention, Channel modification, Storm sewers
Emergency Services	Although not typically considered a "mitigation" technique, emergency service measures do minimize the impact of a hazard event on people and property. These commonly are actions taken immediately prior to, during, or in response to a hazard event. Examples include Warning systems, Evacuation planning and management, Emergency response training and exercises, Sandbagging for flood protection, Installing temporary shutters for wind protection
Public Education and Awareness	Public education and awareness activities are used to advise residents, elected officials, business owners, potential property buyers, and visitors about hazards, hazardous areas, and mitigation techniques they can use to protect themselves and their property. Examples of measures to educate and inform the public include Outreach projects, Speaker series/demonstration events, Hazard map information, Real estate disclosure, Library materials, School children educational programs, Hazard expositions.

The Mitigation Action Prioritization

The RHMC reviewed the project prioritization process from the previous plan and agreed to adopt the same process as part of the 2020 update. Each of the County's Emergency Management Directors assisted in coordinating the prioritization process using the criteria listed in Table 6.3-2. The Directors were asked to work with the lead agency/department in each of the respective jurisdictions to determine a priority for each recommended action.

Table 6.3-2: Mitigation Actions Prioritization Criteria

Category	Points	Criteria
Effect on overall risk to people	4	Likely to protect more than 50% of the population
	3	Likely to protect at least 50 % of the population
	2	Could potentially protect up to 25 % of the population
	1	Could potentially protect up to 10 % of the population
	0	Potential for protecting lives and critical infrastructure
Risk to facilities/infrastructure (loss of function)	4	Likely to protect more than 50% of the community's critical infrastructure and community assets.
	3	Likely to protect at least 50 % of the population community's critical infrastructure and community assets.
	2	Could potentially protect up to 25 % of the population community's critical infrastructure and community assets.
	1	Could potentially protect up to 10 % of the population community's critical infrastructure and community assets.
	0	Potential for protecting lives and critical infrastructure community's critical infrastructure and community assets.
Level of need and severity of problem	4	Proven to be technically feasible
	-	N/A
	2	Expected to be technically feasible
	-	N/A
	0	Technical feasibility unknown or additional information needed
Benefit(s) from completion of the problem	4	Likely to meet Benefit Cost Review
	-	N/A
	2	Benefit Cost Review not required
	-	N/A
	0	Benefit Cost Review unknown
Ease of implementation	4	1 year or less
	-	N/A
	2	2 – 5 years
	-	N/A
	0	More than 5 years
Availability of resources to complete the project	4	Funding match is available, or funding match not required
	-	N/A
	2	Partial funding match available
	-	N/A
	0	No funding match available or funding match unknown
Minimum = 0 **Maximum = 28**	**Ranking Level:** **Low: 0-10** **Medium: 11-20** **High: 21-28**	

While benefit cost analysis are fundamental to the decision-making process, vast projects are an overriding factor when determining which projects should be pursued. The jurisdictions within District 3 operate under tight budget constraints and must use prudence in the allocation of funds. They will continue to strive to justify implementation based on long-term financial investments regarding potential mitigation projects.

Table 6.3-3 provides a clarification of the priority classes used to rank each action as high, moderate, or low priority by the RHMC representatives and participating jurisdiction officials.

Table 6.3-3: Mitigation Actions Prioritization Classifications

MEMA District 3 Mitigation Actions Prioritization Classification	
Classification	Descriptions
High	Mitigation actions with "high" priority were determined to be the most cost effective and most compatible with the participating jurisdictions' unique needs.
Moderate	Actions with a "moderate" priority were determined to be cost-effective and compatible with jurisdictional needs but may be more challenging to complete administratively or fiscally than "high" priority actions.
Low	Actions with a "low" priority were determined to be important community needs, but the community likely identified several potential challenges in terms of implementation (e.g. lack of funding, technical obstacles).

A more detailed cost/benefit analysis will be applied to projects prior to the application for or obligation of funding, as appropriate.
Many actions that require continued efforts with no determined completion date have been given a timeline designation of "continuous action". Examples of these actions include public education, maintenance/upgrade of emergency service systems, RFC/NFIP, enforcement of regulations, training/education, etc.

6.4 Integrating Mitigation Strategies into Other Local Planning Mechanisms

Educating county and jurisdictional leadership, staff, and community members about the benefits of mitigation actions is the best way to ensure seamless integration between mitigation planning and other local planning efforts. The jurisdictions in District 3 continue to work on developing strategies and opportunities to better incorporate the mitigation actions from the previous plan into on-going local planning activities. Local plan integration will be carried forward as a new mitigation action for all of the jurisdictions within the region. To this end, a copy of the updated 2020 RHMP will be distributed to participating jurisdictions for the purpose of incorporating mitigation actions into the ongoing review and implementation of planning and development regulations.

It is recommended that the plan be publicly posted on county, city and town websites for review by the general public, State Planning and Development Districts, and those retained by the MEMA and other State agencies to support community mitigation efforts.

6.5 Sources of Grant Funding

Below is a list of the funding sources for mitigation projects, as well as program parameters and project eligibility.

- ***Federal Hazard Mitigation Assistance Grants***
  The Federal Emergency Management Agency (FEMA) provides funding for three Hazard Mitigation Assistance Grant Programs. These programs, described in detail in FEMA's *Hazard Mitigation Assistance Unified Guidance, February 27, 2015,* are summarized for future reference when mitigation activities are implemented. The grant programs are administered within the State of Mississippi by the Mississippi Emergency Management Agency, Office of Mitigation. A brief description of each program is provided below, followed by a list of eligible program activities and examples in Table 6.4.

- **Hazard Mitigation Grant Program (HMGP)** is authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The key purpose of HMGP is to ensure critical mitigation measures that reduce loss of life and property from future disasters are not lost during the reconstruction process following a disaster. HMGP funds are available when authorized under a Presidential disaster declaration in the jurisdictions of the State requested by the Governor.

- **Pre-Disaster Mitigation Program (PDM),** authorized by Section 203 of the Stafford Act, this program assists States, Tribal Governments, and local communities in implementing a sustained pre-disaster natural hazard mitigation program, its main purpose is to reduce risk to the population and structures from future hazard events. Another program goal is to reduce reliance on Federal funding from future disasters. Funding has traditionally been funded through an annual appropriation. As such, the PDM budget is subject to periodic fluctuations based on Congressional priorities. In 2019, FEMA began the process of transitioning PDM to a new program called **Building Resilience in Communities (BRIC)**, the goal of which is, like PDM, to reduce disaster risk, but will focus on projects with the potential for widespread community impact. In 2019 and 2020, FEMA secured widespread stakeholder input into the design of BRIC program requirements. Additional program information is forthcoming from FEMA.

- **Flood Mitigation Assistance (FMA)** is authorized by Section 1366 of the National Flood Insurance Act of 1968 (NFIA) with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP) by making available funds for flood mitigation projects for structures covered by flood insurance policies. The program focuses on retrofit of individual properties that have experienced one or more claim payments for losses received under flood insurance coverage. In the long run, increasing property resiliency will lead to reductions in NFIP property loss payouts. The Repetitive Flood Claims Program (RFC) and Severe Repetitive Loss Program (SRL) have been integrated into the FMA Program. As is the case with PDM, funding is announced annually and is subject to the level of funding appropriation.

Table 6.4 - Eligible Activities by Program - Source: FEMA Hazard Mitigation Assistance Unified Guidance, February 27, 2016

ELIGIBLE ACTIVITIES	HMGP	PDM	FMA
1. Mitigation Projects	√	√	√
Property Acquisition and Structure Demolition	√	√	√
Property Acquisition and Structure Relocation	√	√	√
Structure Elevation	√	√	√
Mitigation Reconstruction	√	√	√
Dry Floodproofing of Historic Residential Structures	√	√	√
Dry Floodproofing of Non-Residential Structures	√	√	√
Generators	√	√	
Localized Flood Risk Reduction Projects	√	√	√
Non-Localized Flood Risk Reduction Projects	√	√	
Structural Retrofitting of Existing Buildings	√	√	√
Non-Structural Retrofitting of Existing Buildings and Facilities	√	√	√
Safe Room Construction	√	√	
Wind Retrofit for One- and Two-Family Residences	√	√	
Infrastructure Retrofit	√	√	√
Soil Stabilization	√	√	√
Wildfire Mitigation	√	√	
Post-Disaster Code Enforcement	√		
Advance Assistance	√		
5 Percent Initiative Projects*	√		
Aquifer and Storage Recovery**	√	√	√
Flood Diversion and Storage**	√	√	√
Floodplain and Stream Restoration**	√	√	√
Green Infrastructure**	√	√	√
Miscellaneous/Other**	√	√	√
2. Hazard Mitigation Planning	√	√	√
3. Technical Assistance			√
4. Management Costs	√	√	√

*FEMA allows increasing the 5 percent initiative amount up to 10 percent for a Presidential Major Disaster Declaration under HMGP. The additional 5 percent initiative funding can be used for activities that promote disaster-resistant codes for all hazards. As a condition of the award, either a disaster-resident building code must be adopted, or an improved Building Code Effectiveness Grading Schedule is required.

**Indicates that any proposed action will be evaluated on its own merit against program requirements. Eligible projects will be approved provided funding is available.

Examples of Eligible Mitigation Projects

Property Acquisition and Structure Demolition: Voluntary acquisition of an existing at-risk structure and conversion of the land to open space through demolition of the structure.

Property Acquisition and Structure Relocation: Voluntary physical relocation of an existing structure to an area outside of a hazard-prone area.

Structure Elevation: Physically raising an existing structure to the Base Flood Elevation (BFE) or higher, if required by FEMA or local ordinance.

Mitigation Reconstruction: Construction of an improved elevated building on the same site where an existing building and/or foundation has been partially or completely demolished or destroyed.

Dry Floodproofing: Techniques applied to keep structures dry by sealing the structure to keep floodwaters out.

Dry Floodproofing of Historic Residential Structures: Permissible only when other techniques that would mitigate to the BFE causing the structure to lose its status as a Historic Structure.

Dry Floodproofing of Non-residential Structures: Must be performed in accordance with NFIP Technical Bulletin (TB) 3-93, *Non-Residential Floodproofing—Requirements and Certification*, and the requirements pertaining to dry floodproofing of non-residential structures found in 44 CFR Sections 60.3(b)(5) and (c)(4).

Minor Localized Flood Reduction Projects: Projects to lessen the frequency or severity of flooding and decrease predicted flood damages, such as the installation or modification of culverts and storm water management activities like creating retention and detention basins.

Structural Retrofitting of Existing Buildings: Modifications to the structural elements of a building to reduce or eliminate the risk of future damage and to protect inhabitants.

Non-structural Retrofitting of Existing Buildings and Facilities: Modifications to the non-structural elements of a building or facility to reduce or eliminate the risk of future damage and to protect inhabitants.

Safe Room Construction: Safe room construction projects are designed to provide immediate life-safety protection from tornado and severe wind events, including hurricanes for people in public and private structures.

Infrastructure Retrofit: Measures to reduce risk to existing utility systems, roads, and bridges.

Soil Stabilization: Projects to reduce risk to structures or infrastructure from erosion and landslides, including installing geo-textiles, stabilizing sod, installing vegetative buffer strips, preserving mature vegetation, decreasing slope angles, and stabilizing with rip rap and other means of slope anchoring.

Wildfire Mitigation: Projects to mitigate the vulnerability of at-risk structures and associated loss of life from the threat of future wildfire.

Post-Disaster Code Enforcement: Projects designed to support the post-disaster rebuilding effort by ensuring sufficient expertise is on hand ensuring appropriate codes and standards, including NFIP local ordinance requirements, are utilized and enforced.

5% Initiative Projects: Provide an opportunity to fund mitigation actions consistent with the goals and objectives of the State or Tribal (Standard or Enhanced), local mitigation plans and meets all HMGP program requirements, but may be difficult to conduct a standard benefit/cost analysis to prove cost effectiveness.

Hazard Mitigation Planning

Mitigation planning is the foundation for developing effective hazard mitigation programs and projects. A mitigation plan demonstrates the community's commitment to reduce risks from natural hazards. It also guides decision makers in developing a strategy to commit resources to mitigation projects and initiatives. The mitigation planning process includes hazard identification and risk assessment, which leads to the development of a comprehensive mitigation strategy reducing risks to life and property. The mitigation strategy section of the plan identifies a range of specific mitigation actions and projects being considered to reduce risks to new and existing buildings and infrastructure.

Management Costs

Management costs are any indirect costs and administrative expenses reasonably incurred by a Grantee or Subgrantee in administering a grant or sub grant award.

For more information concerning applications for FEMA Hazard Mitigation Assistance Grants, contact:

Mississippi Emergency Management Agency Office of Mitigation
601-933-6362

Other Grant Sources

FEMA Public Assistance (PA) 406 Mitigation Grant Program is available for counties included in a FEMA presidential disaster declaration. If they are eligible to receive PA funding, the community must develop a valid and eligible Project Worksheet in a timely manner, and the FEMA PA group administering the disaster must agree with the community on the importance of the project. Project types include, but are not limited to, floodproofing, wind protection, road elevation, drainage upgrades/improvements. The FEMA web site with information about this program may be found here: https://www.fema.gov/public-assistance-local-state-tribal-and-non-profit.

Department of Housing and Urban Development (HUD) Community Development Block Grant program Disaster Recovery (CDBG-DR) Program: CBDG-DR funding is made available on a case-by-case basis by the U.S. Congress and is usually authorized after larger disaster events that have received a presidential disaster declaration. The program generally covers projects related to acquisition or elevation of residential structures, but funding can also be made available to small businesses, including the elevation of rental properties. Funding can be used to enhance community code enforcement. For more information about CDBG-DR, and for additional information on this program, visit https://www.hudexchange.info/programs/cdbg-dr/.

Department of Housing and Urban Development (HUD) Community Development Block Grant program Disaster Recovery Program - Mitigation (CDBG-MIT): The U.S. Congress makes program funding available on a case-by-case basis. Funding is usually authorized after larger disaster events that already received a presidential disaster declaration. The program generally covers projects related to acquisition or elevation of residential structures, but funding can also be made available to small businesses, including the elevation of rental properties. Funding can be used to enhance community code enforcement. For more information about CDBG-MIT, visit the program web site at https://www.hudexchange.info/programs/cdbg-mit/.

US Army Corps of Engineers (USACE) Mitigation: The USACE Flood Control (Structural & Non-Structural), Section 205 of the 1948 Flood Control Act, as amended, authorizes the U.S. Army Corps of Engineers to develop and construct small flood control projects. Each project is limited to a Federal cost share of $7,000,000.00 and must be economically justified, environmentally sound, and technically feasible. Section 14 of the 1946 Flood Control Act, as amended, authorizes the USACE to develop and construct streambank protection to protect public facilities and non-profit public facilities.

Listed below are agencies providing programs that support communities developing and implementing a range of mitigation projects. As appropriate, communities should consider accessing programs managed by these agencies and other sources to further local, regional and state mitigation goals.

Mississippi Emergency Management Agency
FEMA Public Assistance (PA)
Office of Recovery
601-933-6886

Mississippi Development Authority
601-359-3179

Mississippi Department of Environmental Quality
601- 961-5171

Mississippi Office of Homeland Security
601-346-1500

Mississippi State Department of Health
601-576-7400

Mississippi Department of Marine Resources
228-374-5000

Mississippi Department of Transportation
601-359-7025

Mississippi Emergency Management Agency
FEMA/National Flood Insurance Program (NFIP)
Office of Mitigation
601-933-6362

Mississippi Department of Wildlife, Fisheries and Parks
601-432-2400

Mississippi Forestry Commission
601-359-1386

US Army Corps of Engineers
Vicksburg District 601-631-5000

USDA Natural Resources Conservation Service
National NRCS Office: 202-720-8851
State NRCS Conservationist: 601-965-5196

USDA Rural Development
601- 965-4316

HUD's National Disaster Resilience Competition
601-965-4757

Presenting Projects in Mitigation Action Worksheets

A participating jurisdiction is ready to develop a Mitigation Action Worksheet once the following steps outlined above have been completed. Information incorporated into the action worksheet comes from the following previously conducted hazard mitigation planning activities:

- Hazards which affect the community are identified and prioritized.
- A community risk assessment identifies persons and assets at risk to the hazard of concern.
- Several alternative mitigation activities are considered to address community risk.
- The most feasible mitigation action is selected, including benefits and costs associated with carrying out the activity.
- Position or department/agency with the capabilities necessary to complete the action.
- Potential funding source.
- How the mitigation action will be integrated into other community planning mechanisms.
- Progress report on action-related efforts to date.

In essence, the Action Worksheet serves as a “mini-grant proposal” where all basic information needed to begin a sub-grant application may be found in one document. Additional research may be needed to complete a full application, but the Action Worksheet provides a solid starting point for application development.

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:		
Risk / Vulnerability		
2. Problem being Mitigated:		
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:		
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:		
5. Action or Project Description:		
6. Summary of Evaluation[1] Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT	COST .
Plan for Implementation		
7. Responsible Organization:		
8. Action/Project Priority (STAPLEE Score):		
9. Timeline for Completion:		
10. Potential Fund Sources:		
11. Local Planning Mechanisms to be Used in Implementation, if any:		
Progress Report		
12. Date of Status Report: Report of Progress: Evaluation of Effectiveness:		

SECTION 7 PLAN MAINTENANCE

This section discusses how the Mississippi's District 3 Mitigation Strategy and Mitigation Action Plan will be implemented and how the Regional Hazard Mitigation Plan will be evaluated and enhanced over time. This section also discusses how the public will continue to be involved in a sustained hazard mitigation planning process. It consists of the following four subsections:

- Overview
- Monitoring, Evaluating and Updating
- Incorporation into Existing Planning Mechanisms
- Method for Continued Regional Public Participation

7.0 Plan Maintenance Overview

The Emergency Management Department in each of the 9 District 3 Counties will serve as the lead agency responsible for the implementation of the plan maintenance process for their responsible counties. Each county's Emergency Management Director and his or her designate will serve as a representative on the RHMC. The D3 Regional Hazard Mitigation Council (RHMC) will be responsible for implementing the strategies outlined within this Plan and update and maintain the Plan according to the guidelines set forth below. D3 jurisdictions will use the Plan's goals, as well as continued analysis of hazard risks and capabilities, to weigh the availability of community resources against the cost and benefit for each mitigation action. That is to say, the action will be reviewed against the staff time and financial resources needed to implement it. Participating jurisdictions understand the value of this Plan and the extent to which plan elements lend themselves to mitigating hazards of concern. Participants intend to maintain, update, and implement the 2020 D3 RHMP using the following method and schedule.

Monitoring, Evaluating and Updating the Plan

The RHMC will keep the Plan current by monitoring, evaluating, and updating the Plan. FEMA defines these efforts as follows:[9]

1. Monitoring: Tracking the implementation of the plan over time.
2. Evaluating: Assessing the effectiveness of the plan at achieving its stated purpose and goals.
3. Updating: Reviewing and revising the plan at least once every five years.

The Mississippi Emergency Management Agency (MEMA), Bureau of Mitigation Planning, is the oversight entity charged with ensuring that the plan maintenance process is carried out. The District 3 RHMC is the planning group responsible for on-going coordination and participation in the plan maintenance process and will coordinate this effort with MEMA.

[9]Local Mitigation Planning Handbook, FEMA March 2013.p.7-1

Monitoring the Plan

As directed by MEMA, RHMC jurisdictional representatives will collect information from their respective communities to monitor the Plan and revise it as needed. MEMA is responsible for the Plan's maintenance and oversight so that the plan remains compliant with the hazard mitigation grant program requirements, [This means that MEMA will maintain ongoing and necessary documentation and conduct routine Plan reviews. The MEMA lead on this effort will coordinate with jurisdictional representatives responsible carrying out administrative decisions, and also for integrating the RHMP with local planning efforts.

Each of the jurisdictions in D3 represented in this Plan will independently implement their own jurisdiction-specific mitigation actions and collaborate on the carrying out regional mitigation actions, including Plan monitoring, evaluation and updating. Each mitigation action in this Plan is prioritized and assigned to a specific department, agency, or position, who will carry out the action when staff time and funding are available to support the action. Timelines are given for each mitigation action, where appropriate, and potential funding sources are identified. In addition, each mitigation action is prioritized based on a common set of criteria, which enables jurisdictions to move specific actions forward as funding opportunities arise. Annual plan monitoring will help track progress on each proposed mitigation action.

The role of MEMA, working with D3 RHMC jurisdictional representatives, includes the carrying out following tasks:

- At a minimum, schedule an annual meeting of the D3 RHMC
- Develop meeting agendas
- Schedule post-disaster event meetings with the D3 RHMC for Federally- and/or State-declared disasters that result in significant damage, sustained or if the event-related hazard revealed planning area vulnerabilities that need to be addressed

The role of District 3 RHMC jurisdictional representatives includes carrying out the following tasks:

- Provide information related to recent hazard impacts and the current status of mitigation actions
- Invite other agencies/departments to participate in meetings
- Coordinate with other participating jurisdictions to communicate plan updates to the public when applicable. This may include activities such as, but not limited to, developing Plan amendments; completing mitigation actions; notifying the public of available mitigation programs, and related efforts.

During annual meetings, the RHMC will address issues that may have occurred since the most recent Plan update; assess events affecting the planning area to determine if changes in the plan are required; and complete the monitoring and evaluation worksheets developed for the purpose of documenting the monitoring process.

If significant changes, updates, or amendments to the Plan are suggested by the D3 RHMC, they will inform MEMA's Bureau of Mitigation Planning to determine if and what appropriate action that should be taken.

Evaluating the Plan

The MEMA Mitigation Bureau designee and the members of the D3 RHMC will use the *Plan Evaluation Checklist*, (which is included at the end of this section as Attachment A), to evaluate the Plan and make recommendations for future Plan updates and enhancements. The Checklist will be completed annually.

The *Plan Evaluation Checklist* includes the following components:

- Evaluate the goals and objectives ensuring they address current and expected conditions
- Determine any changes in the nature or magnitude of risks identified in the Plan
- Evaluate current resources for adequacy in implementing the Plan
- Document any implementation problems with other agencies, including technical, political, legal or coordination issues
- Evaluate the effectiveness of the D3 RHMC
- Evaluate the effectiveness of the participating jurisdiction's capabilities to further support the *Plan Evaluation Checklist* (Attachment A)

Three additional worksheets were developed and are also provided as attachments to this section.

- Attachment B: *Planning Considerations Worksheet*
- Attachment C: *Mitigation Action Implementation Worksheet* (listing status of mitigation actions identified by each jurisdiction); and
- Attachment D: *D3 RHMC Meetings and Public Involvement Activities Log*.

The *Plan Evaluation Checklist*, *Planning Considerations Worksheet*, and *Mitigation Action Implementation Worksheet* will be completed annually (at a minimum) and stored in Appendix H. The *District 3 RHMC Meetings and Public Involvement Activities Log* is completed by each sponsoring jurisdiction or agency as events and activities occur.

Updating the Plan

In accordance with federal regulations, the Mississippi District 3 Regional Hazard Mitigation Plan is updated every five years. The D3 RHMC Chairman will complete a yearly progress report, as described in the Evaluation Section above, to improve the documentation of the progress made by the participating jurisdictions on the strategies defined in this Plan. In doing so, the Plan will become more of a "living document" that is proactive and integrates with the planning area's future initiatives.

If a significant event or changes in regulations warrant an update of the Plan, the Chairman will meet with the RHMC and the MEMA Mitigation Bureau to determine the course of action to be used to update the Plan. If a Plan update is approved, the same procedures used in developing the original plan will be followed and will incorporate opportunities for the pubic to have input and provide comments.

Table 7.1 - Method and Schedule for Maintaining and Updating Mitigation Plan

Year 1	Year 2	Year 3	Year 4	Year 5
Annual MEMA-RHMC Meeting	Annual MEMA-RHMC Meeting	Annual MEMA-RHMC Meeting	Annual MEMA-RHMC Meeting	MEMA & District 3 RHMC lead Plan update process
District 3 jurisdictions proceed with mitigation action implementation.	District 3 jurisdictions proceed with mitigation action implementation	District 3 jurisdictions proceed with mitigation action implementation	District 3 jurisdictions proceed with mitigation action implementation and consider additional mitigation projects.	MEMA & District 3 RHMC host a minimum of 3 Mitigation Committee Planning meetings.
District 3 jurisdictions incorporate this Plan into other municipality plans.	District 3 jurisdictions incorporate this Plan into other municipality plans.	District 3 jurisdictions incorporate this Plan into other municipality plans.	District 3 jurisdictions incorporate this Plan into other municipality plans.	District 3 jurisdictions incorporate outreach strategy, which includes municipal meetings, public workshops and public surveys.
District 3 jurisdictions in coordination with MEMA seek funding for regional mitigation projects	District 3 jurisdictions in coordination with MEMA seek funding for regional mitigation projects	District 3 jurisdictions, in coordination with MEMA seek funding for regional mitigation projects	District 3 jurisdictions in coordination with MEMA seek funding for regional mitigation projects	District 3 jurisdictions in coordination with MEMA seeks funding for regional mitigation projects
MEMA & District 3 initiates mitigation planning review process for lessons learned.	MEMA & District 3 RHMC maintains communication with all municipalities to incorporate the Regional plan into other plans.	MEMA & District 3 RHMC maintains communication with all municipalities to incorporate the Regional plan into other plans.	MEMA & District 3 RHMC maintains communication with all municipalities to incorporate the Regional plan into other plans.	MEM & District 3 RHMC hosts meetings for additional stakeholders such private businesses and relevant speakers.
MEMA & District 3 will have a meeting following any large-scale disasters to discuss potential mitigation actions.	MEMA & District 3 will have a meeting following any large-scale disasters to discuss potential mitigation actions.	MEMA & District 3 will have a meeting following any large-scale disasters to discuss potential mitigation actions.	MEMA & District 3 will have a meeting following any large-scale disasters to discuss potential mitigation actions.	MEMA & District 3 will have a meeting following any large-scale disasters to discuss potential mitigation actions.

7.1 Incorporation into Existing Planning Mechanisms

Integrating components of this Plan with other plans is the responsibility of each participating jurisdiction. Whenever appropriate, the jurisdictions will integrate elements of this Plan into local planning mechanisms, including Development, Emergency Operations, Floodplain Management, Comprehensive/Growth Management, Zoning Regulations, and Capital Improvement Plans, etc. Additionally, D3 will integrate elements of this Plan into future regional planning documents. The integration process and schedule of incorporating elements of this Plan will vary based on the specific plan's update cycle. The yearly mitigation meetings will provide an opportunity to track the progress on the integration of this Plan into local planning mechanisms.

7.2 Method for Continued Regional Public Participation

The District 3 RHMC is committed to continuing public outreach and public involvement. If significant changes are required of the plan by MEMA/FEMA, the D3 RHMC will notify the public and encourage their participation in meetings to provide input and review any changes. The RHMC may also send notifications to the public on plan amendments, completion of mitigation actions, and notification of programs available for mitigation, etc. To this end, the public will remain involved in the importance of this plan. Public involvement during the plan's monitoring and evaluation process will be fostered through the strategies listed below:

- Each jurisdiction's website and/or social media outlets
- Public meetings advertised in local newspapers and local websites
- RHMC members will update their local constituency (officials, stakeholders and the public) of implementation and update progress
- Copies of this plan will be available for public view in each participating County's Emergency Management Office and/or other department(s) as deemed appropriate by each participating jurisdiction

During the five-year planning cycle, District 3 RHMC will meet with various local and state agencies/organizations to strengthen relationships; identify partnering opportunities to address identified mitigation actions; and increase awareness of the capabilities these groups can provide. It will also use conferences local and regional workshops, and seminars regarding emergency preparedness, response and recovery operations is another opportunity to meet with local agencies, surrounding communities and state agencies. These conferences are typically held each year and posted on the Mississippi Emergency Management Agency's web page. Below is a list of annual conferences:

- National Hurricane Conference
- Mississippi Preparedness Summit "Partners in Preparedness"
- Gulf States Hurricane Conference (MS, LA, TX, AL)
- Mississippi Civil Defense Emergency Management Association

ATTACHMENT A: PLAN EVALUATION CHECKLIST

GOAL/OBJECTIVE	Address Current Needs?	
	Yes	No
Regional Goal 1: Minimize loss of life, injury, damage to property, the economy and natural systems		
Objective 1.1 – Protect existing/new critical facilities and infrastructure		
Objective 1.2 – Provide protection for future/existing developments		
Objective 1.3 – Provide backup power to critical facilities/infrastructure		
Regional Goal 2: Maintain and enhance emergency management/mitigation capabilities		
Objective 2.1 – Update/develop plans/studies for all hazards		
Objective 2.2 – Incorporate/improve hazard mitigation strategies into ordinances, plans and policies		
Objective 2.3 – Promote the National Flood Insurance Program and Community Rating System Program.		
Regional Goal 3 – Maintain public education and awareness activities		
Objective 3.1 – Expand Public Outreach Campaigns for all hazards		
Objective 3.2 – Promote disaster preparedness planning for families and area businesses		

ATTACHMENT B: PLANNING CONSIDERATIONS WORKSHEET

PLANNING CONSIDERATIONS	Address Current Needs?	
	Yes	No
Have the nature or magnitude of the risks identified in the plan changed? If yes, comment below.		
Are the resources adequate for implementing the plan? If no, comment below.		
Have there been any implementation problems such as technical, political, legal or coordination issues with other agencies for the mitigation actions identified? If yes, reference action by selecting "Delayed" on the Project Implementation Worksheet with a comment describing issue in implementation.		
Have there been any personnel/agency changes be made to the D3 Regional Hazard Mitigation Committee? If yes, provide the name(s) and contact information below.		
Have there been changes to the participating communities' capabilities that improve or impair the progress of the mitigation strategies identified in the plan? If yes, please comment below.		

ATTACHMENT C: MITIGATION ACTION IMPLEMENTATION WORKSHEET

Jurisdiction Name: _____

ACTION (# and Title)	Project Status				Funding			Completion Date	*Comments (Insert comments to support delayed or no longer required.)
	In Progress	Delayed*	Completed	No Longer Required*	Budget	Apply for Grant	Grant Received		

ATTACHMENT D: *Mississippi District 3 RHMC Meetings and Public Involvement Activities Log*

Jurisdiction Name: _____

Date	Event/Activity	Sponsoring Agency or Individual	Type*	Purpose	Result/Outcome

***Event/Activity Type – Abbreviations**

Elected Officials Meeting/Event - EO
Funding Opportunity Meeting - FO
Media Event - ME
Planning Meeting - PM
Public Event – PE
Public Notice – PN

Other – O (describe type under "Purpose" column)

Mississippi District 3 Region – County Annexes

Annex A Attala County
Annex B Bolivar County
Annex C Carroll County
Annex D Holmes County
Annex E Humphreys County
Annex F Leflore County
Annex G Montgomery County
Annex H Sunflower County
Annex I Washington County

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A.2 Hazard Identification and Risk Assessment A-13
A.3 Capability Assessment A-67
A.4 Mitigation Strategy A-72
Mitigation Action Worksheets A-100

ATTALA COUNTY

A.1 Community Profile

Geography

Located in north-central Mississippi, Attala County is bordered by Montgomery County to the north; Choctaw County to the northeast; Winston County to the east; Leake County to the south; Madison County to the southwest; Holmes County to the west; and Carroll County to the northwest. Attala County is approximately 84 miles from Jackson, MS and 154 from Memphis, TN and includes the following communities (Figure A.1).

City	Towns	Unincorporated
Kosciusko	Ethel McCool Sallis	McAdams Williamsville Zama

Attala County covers an area of about 737 square miles, of which 735 square miles is land and 1.7 square miles is water. The county is located in the North Central Hill Region of Mississippi. Here the soils are mostly acidic, and the topography is characterized by both ridges and valleys.

The Town of Ethel is located east of Kosciusko, off Highway 12, about halfway between Kosciusko and the Town of McCool. Ethel covers 0.58 square miles of land.

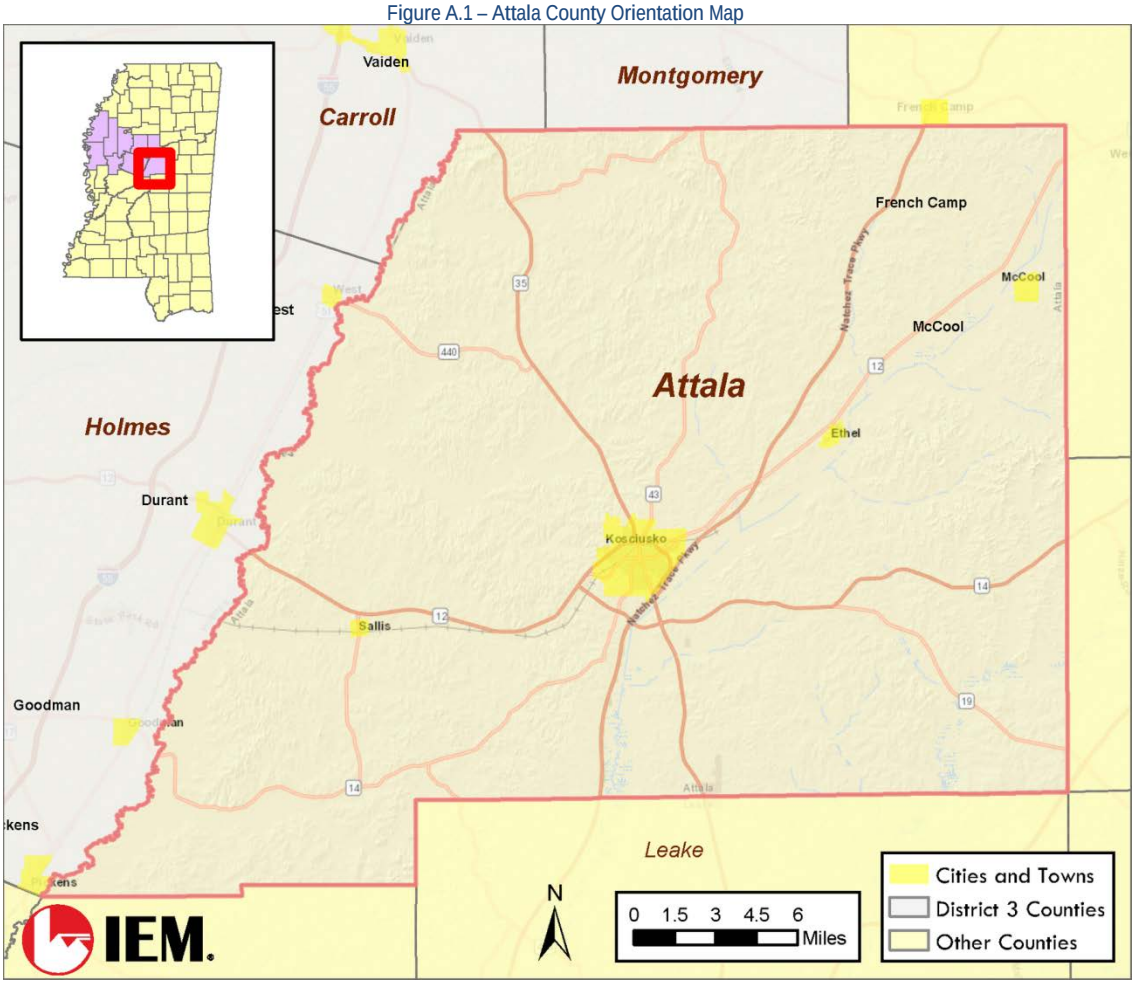
Kosciusko is the county seat in Attala County. The city is located near Highways 12, 19, 35 and 43, and the Natchez Trace Parkway. Kosciusko covers an area of about 7.6 square miles of which 7.5 square miles is land and 0.13% is water. Kosciusko has been designated as a Main Street America™ program for meeting rigorous performance standards set by the National Main Street Center and the Mississippi Main Street Association.

The Town of McCool is located in the northeast corner of Attala County, on Highway 12. McCool covers an area of about 0.9 square miles of land.

The Town of Sallis is located in the western region of Attala County, near Highway 12. Sallis covers an area of about 0.4 square miles of land.

The lowest elevations in Attala are along the Big Black River, in the southwestern part of the county (near Sallis), where elevations are approximately 200 feet.

Figure A.1 – Attala County Orientation Map



A.1.2 Population and Demographics

Attala County has seen an overall decrease in population as shown in Table A.1. Kosciusko and Sallis reported growth while Ethel, McCool and the unincorporated areas of the county reflect decreases.

Table A.1 - Jurisdiction Population and Demographics | Source: U.S. Census Bureau, American Community Survey 2014-2018

	Population				Demographics					
Jurisdiction	2010 Census	2018 Estimates	Net Change	Percent Change	White	Black	Hispanic	Asian	Native American	2 + Races
Attala	19,564	18,375	-1,189	-6.1%	53.9%	42.6%	2.1%	0.2%	0.2%	
Ethel	418	393	-25	-5.9%	44.9%	53.3%	-	0.6%	-	1.1%
Kosciusko	7,402	6,840	-862	-7.5%	44.7%	53.3%	1.01%	-	0.4%	1.3%
McCool	135	129	-6	-4.6%	89.3%	10.7%	-	-	-	-
Sallis	134	122	-12	-3.5%	63.4%	29.8%	-	6.7%	-	-

Special Populations (**elderly, disabled, and low income**): Poverty and other social factors were also considered in assessing the vulnerability of Attala County and its municipalities. The City of Kosciusko has the highest population who are reported as living below poverty level; Sallis has the highest elderly population, as well as the highest percent who are disabled. A summary of special population percentages is shown in Table A.2.

Other social factors, such as the number of single mother households living below the poverty level, may indicate areas where special childcare considerations may be necessary. Persons with disabilities and the elderly may not be able to evacuate or seek other preparedness measures during a disaster. These individuals may be most vulnerable to severe storms, tornadoes and severe winter storms/freezes.

Table A.2 – Special Populations | Source: U.S. Census Bureau, American Community Survey 2014-2018

Jurisdiction	Below Poverty	Elderly (65 and older)	Disabled (Non-institutionalized)
Attala County	23.7%	18.7%	22.2%
Ethel	23.3%	11.6%	21.3%
Kosciusko	35.3%	16.6%	19.0%
McCool	9.82%	17.0%	17.0%
Sallis	10.3%	20.6%	22.2%

The Centers for Disease Control and Prevention (CDC) produces a county-based Social Vulnerability Index (SoVi, 2016), which discusses social vulnerability overall, as well as vulnerability according to “themes” that include socioeconomic status. Images on the next two pages show the SOVI breakdown using these factors to measure vulnerability in Attala County.

Figure A.2a - Attala County Social Vulnerability Index | Source: CDC

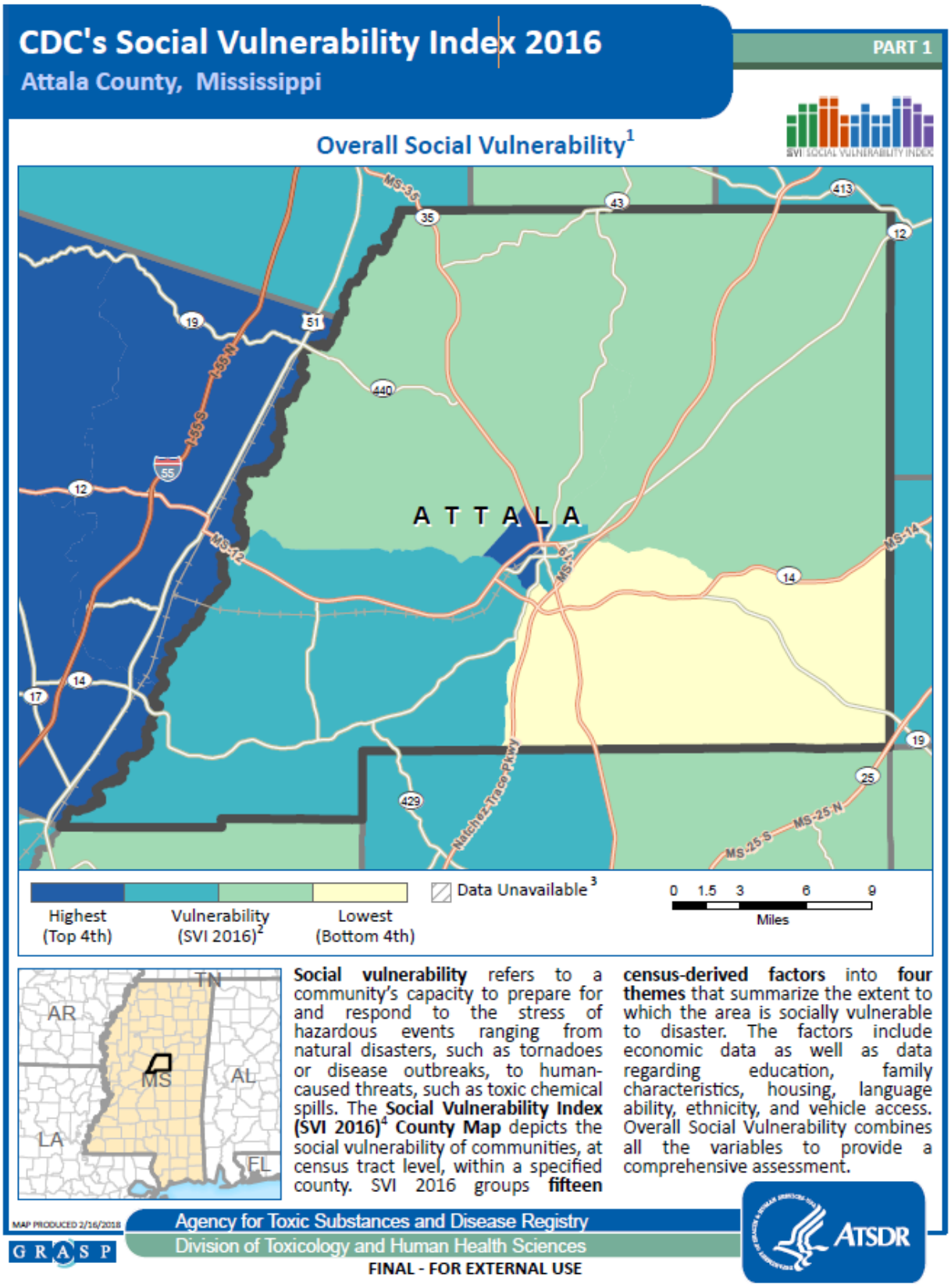
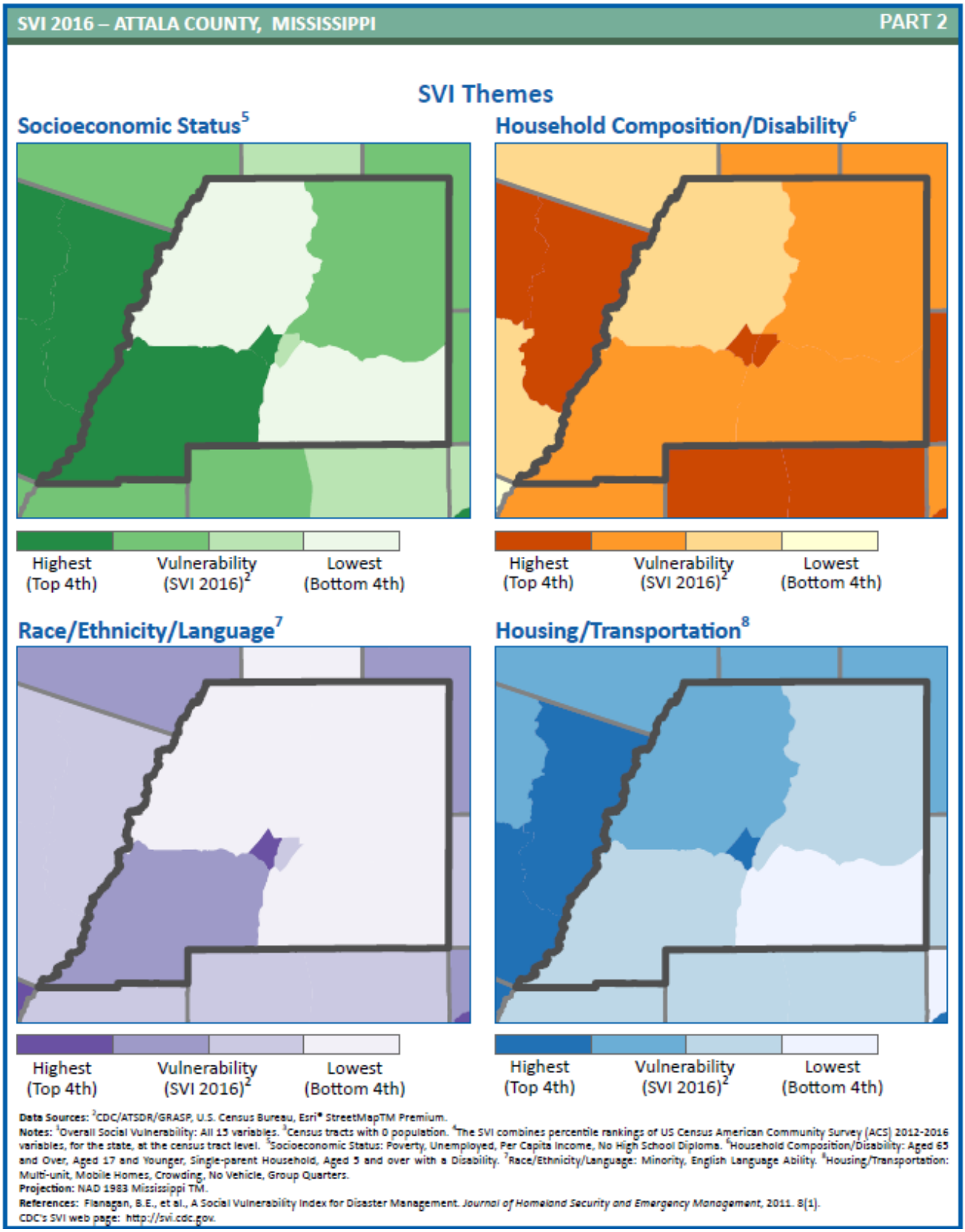


Figure A.2b - Attala County Social Vulnerability Index | Source: CDC



A.1.3 Housing, Growth Trends, and Land Use

Housing: Housing data obtained from the US Census Bureau 2018 American Community Survey 5-Year Estimates is shown below in Table A.3. In summary, 77.5 percent of housing is occupied; mobile home/manufactured housing makes up 22.7 percent of housing; and 15.3 percent of available housing was constructed in the year 2000 or later.

Table A.3 – Housing Statistics | Source: US Census Bureau 2018 American Community Survey 5-Year Estimates

Housing Statistics		Estimate	Percent
HOUSING OCCUPANCY			
Total housing units		9,200	100%
Occupied housing units		7,129	77.5%
Vacant housing units		2,071	22.5%
UNITS IN STRUCTURE			
1-unit, detached		6,216	67.6%
1-unit, attached		20	0.2%
2 units		178	1.9%
3 or 4 units		192	2.1%
5 to 9 units		276	3.0%
10 to 19 units		79	0.9%
20 or more units		103	1.1%
Mobile home		2.091	22.7%
Boat, RV, van, etc.		45	0.5%
YEAR STRUCTURE BUILT			
Built 2014 or later		114	1.2%
Built 2010 to 2013		109	1.2%
Built 2000 to 2009		1,190	12.9%
Built 1990 to 1999		1,558	16.9%
Built 1980 to 1989		1,457	15.8%
Built 1970 to 1979		1,744	19.0%
Built 1960 to 1969		933	10.1%
Built 1950 to 1959		717	7.8%
Built 1940 to 1949		405	4.4%
Built 1939 or earlier		973	10.6%
HOUSING TENURE			
Occupied housing units		7,129	100%
Owner-occupied		5,046	70.8%
Renter-occupied		2,083	29.2%
HOUSE HEATING FUEL			
Occupied housing units		7,129	100%
Utility gas		2,586	36.3%
Bottled, tank, or LP gas		1,914	26.8%
Electricity		2,345	32.9%
Fuel oil, kerosene, etc.		0	0.0%
Wood		271	3.8%
No fuel used		13	0.2%

Growth Trends: According to officials, moderate growth should continue on a stable path. There have been no significant changes in development since the previous plan. New construction and redevelopment have been minimal and there are no known changes in conditions that may affect the risks or vulnerabilities for the participating jurisdictions. However, Town of Ethel Mayor Gwen Sims, who was elected Mayor in 2017, believes modest growth would be a welcome way to spur economic development.[10]

Land Use: Kosciusko has a comprehensive land use plan and building code regulations. The 2020 RHMP Update will be made available to officials in the municipalities and unincorporated areas for use in future planning decisions. About 30 percent of the land area is in the floodplain along rivers, creeks and streams. As of 2010, about 390,000 acres, or 85 percent county land, was used for commercial timberland and agricultural use. A 2019 forestland report from the Mississippi Forestry Commission stated 284,817 acres of Attala County land (or 60.4%) was maintained as forestland. This figure and others from the report will be discussed in the Wildfire section of the Attala County Risk Assessment later in this document.

Employment and Industry

While there is a large agricultural economic segment in Attala County, several other large industries employ 2,000 people. Major employers include the following:

- Bluff Springs Paper Company
- Cheek Companies
- Interstate Industries of Mississippi
- Trinity Industries
- Atwood Fence
- Attala Steel
- Mitchell Metal Products

Kosciusko is one of central Mississippi's largest shopping areas with over 300 retail businesses and industries that provide employment for those living the greater region.

The Mississippi Department of Employment Securities (MDES) assists individuals in obtaining employment. Through their network of WIN Job Centers, MDES matches qualified, prospective employees with employers. Tables A.4 and A.5 summarize county employment statistics.

Table A.4 - Mississippi Department of Employment Security Annual Labor Force Report | Source: Mississippi Economic Development Council

County	Average Civilian Labor Force (2020)	Average No. Unemployed (2020)	Average No. Employed (2020)	Average Annual Wage (2020)	Per Capita Income (2020)	Percent Below Poverty (2020)
Attala	6,970	460	6,510	$31, 534	$33,809	22.6%
Mississippi				$38,099	$37,834	21.5%

[10] Stan Beall, New Ethel Mayor Seeks Town Growth, June 15, 2017, https://www.starherald.net/news-attala-county-front-page-slideshow/new-ethel-mayor-seeks-town-growth#sthash.wNnhGqH7.dpbs, accessed April 1, 2020.

Table A.5 - Mississippi Department of Employment Security Annual Labor Force Report | Source: Mississippi Economic Development Council

*Establishment-Based Amounts 2020 Attala County			
Manufacturing			3,950
Non-Manufacturing (total):			73
Agriculture, Forestry, Fishing & Hunting	10	Professional & Business Service	140
Mining	10	Management of Companies & Entertainment	0
Utilities	20	Administrative Support & Waste Management	560
Construction	360	Educational Services	10
Wholesale Trade	80	Health Care & Social Assistance	400
Retail Trade	700	Arts, Entertainment & Recreation	60
Transportation & Warehousing	130	Accommodation & Food Service	400
Information	60	Other Service (except public administration)	60
Finance & Insurance	150	Government	1,090
Real Estate, Rental & Leasing	40	Education	570
Note: *Establishment based amounts are estimates and do not include self-employed individuals, religious entities or nonprofit institutions. Amounts include a pro-rata share of unclassified employment.			

Critical Assets and Infrastructure

Certain assets and facilities are considered as being of importance for Attala County and the surrounding region. Those identified in the following tables are based on best available data and conversations with the Attala County Emergency Management Department. Shelters and outdoor warning sirens are also considered as essential and their locations are provided as a figure in the Mitigation Strategy section of this Annex.

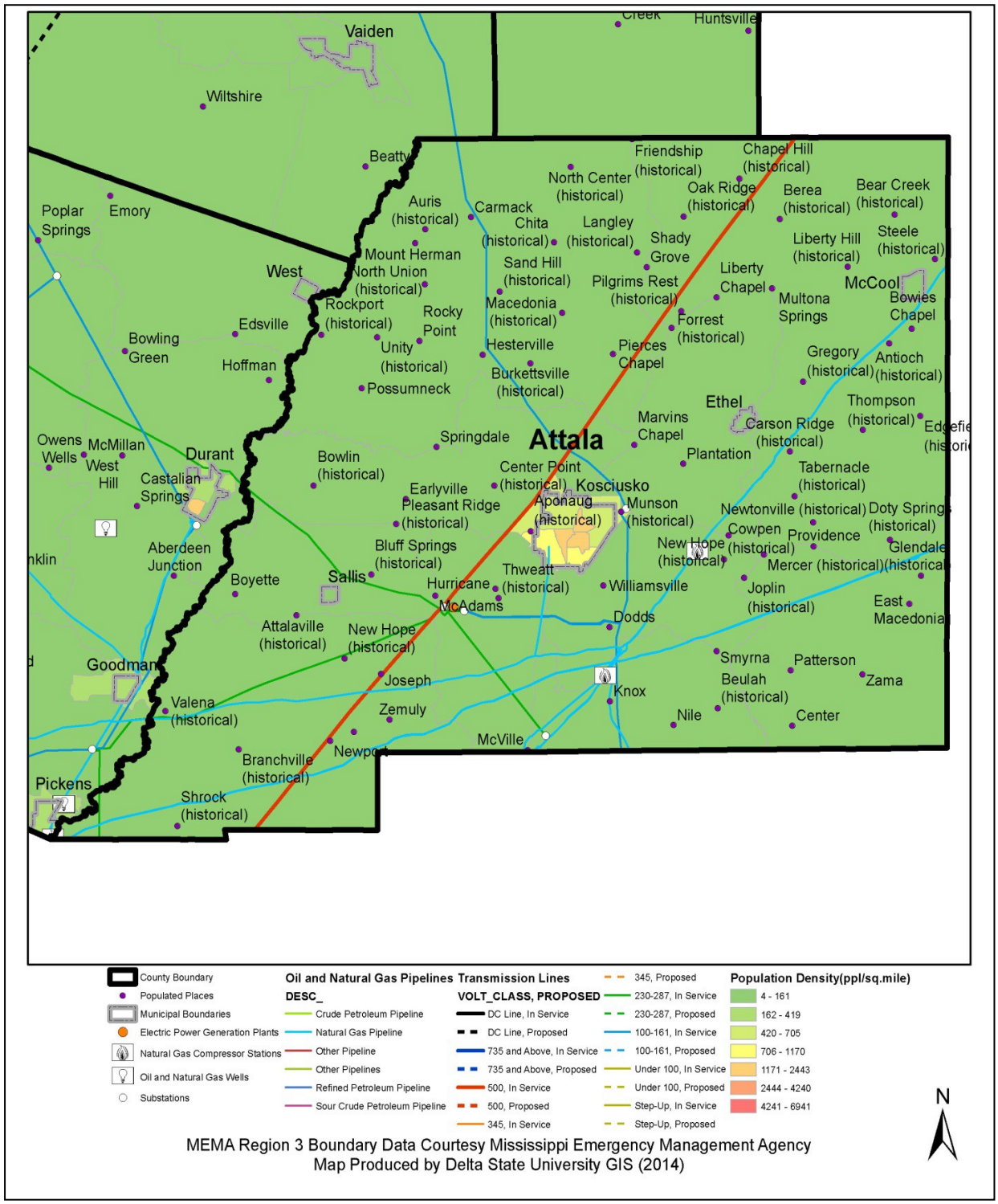
Transportation: As shown in Table A.6, Attala County includes major roadway thoroughfares, rail lines, and airport access.

Table A.6 – Attala County Transportation Routes

Roadway	Rail	Aviation
Mississippi Highway 12 Mississippi Highway 14 Mississippi Highway 19 Mississippi Highway 35 Mississippi Highway 43 Natchez Trace Parkway	Class I Major – Canadian National / Illinois Central (CN/ICRR) (This line is inactive)	Kosciusko-Attala County Airport

Energy Assets: Oil, natural gas pipelines and electric transmission lines transverse Attala County. Figure A.3 shows the location of these systems. The County Emergency Management Department confirmed the map of assets, produced for the 2015 RHMP, remains essentially accurate.

Figure A.3 - Energy Asset Map



Critical Assets and Facilities: Table A.7 provides a list of critical assets identified for Attala County. The 2020 Hazard Mitigation Strategy includes an action to send the local Critical Infrastructure Key Resource (CIKR) database to the Remote Sensing Council for inclusion in the statewide database.

Table A.7 – Attala County Summary of Critical Assets and Facilities

Attala County Facilities		Use
Attala County Courthouse Attala County Chancery Clerk Building Attala County Tax Collector/Assessor Attala County Coliseum Attala County Agent Attala County RSVP Program Attala County Central Maintenance	Attala County Housing Authority Attala County District 1 Barn Attala Beat #2 County Barn Attala County District 3 Barn Attala County District 4 Barn Attala County District 5 Barn	Government Facilities
Attala County Superintendent Office Attala Educational Building (HCC) Greenlee Elementary	Long Creek Elementary McAdams High	Educational Facilities
Attala County Health Department	Attala County Nursing Home	Health Care Facilities
Entergy Power Plant & Substation Entergy Substation Spectra Entergy Central Electric Substation Entergy Substation Conehoma Water Assn. #1 Conehoma Water Assn. #2	McAdams Water Association Mississippi Water Company Possumneck-Carmack W/A Springdale-Youth Center W/A Sugar Creek Water Association Town of McCool Zama Water Association	Public Utility
Attala County Fire Department Attala County Sheriff's Office Attala County Fire Department Attala County Civil Defense	Carmack VFD Friendship VFD Providence	Public Safety
Ethel Facilities		**Use**
Ethel Town Hall	U. S. Postal Service	Government Facilities
Ethel High School & Central Office		Educational Facilities
Town of Ethel Water & Sewer Dept. Water Well #1 Water well #2 Elevated Water Tank	Sewer Facilities (Lagoon) Lift Station #1 Lift Station #2 Lift Station #3	Public Utility
Town of Ethel Police Department	Town of Ethel Fire Department	Public Safety
Kosciusko Facilities		**Use**
Kosciusko City Hall Department of Human Services Kosciusko Street Department USDA Service Center United States Post Office National Guard Armory	Social Security Office Kosciusko Water and Light Plant Kosciusko Parks and Recreation Office Kosciusko Cemetery Office Ability Works	Government Facilities
Kosciusko Central Office Kosciusko High School Kosciusko Jr. High School Kosciusko Upper Elementary Kosciusko Middle Elementary	Kosciusko Lower Elementary Head Start Oprah Winfrey Boys and Girls Club Attala/Kosciusko Vo-tech	Educational Facilities

Montfort Jones Memorial Hospital Kosciusko Medical Clinic Mississippi State Veterans Home Atwood Personal Care Home Atwood	Trace Medical Clinic Hudspeth Group Home Central Dialysis Unit of Kosciusko Life Help	Health Care Facilities
Kosciusko Wastewater Facility Kosciusko Water Plant (Main Office) Kosciusko Water Plant Kosciusko Water Plant KWL Water Well #1	KWL Elevated Water Tank KWL Elevated Water Tank Kosciusko WW Lift Station #1 Kosciusko WW Lift Station #2 Kosciusko WW	Public Utility
Kosciusko Police Department Kosciusko Fire Department	Med Stat Ambulance Service	Public Safety
McCool Facilities		Use
McCool Town Hall	U. S. Postal Service	Government Facilities
Town of McCool Water System		Public Utility
McCool VFD		Public Safety
Sallis Facilities		Use
Sallis Town Hall	U. S. Postal Service	Government Facilities
Water Well #1 & #2/with 40,000 gallon) (Elevated Water Tank Water Well #4 Elevated Water Tank (100,000 gallon)	Water Well #5/with (75,000 gallon) Elevated Water Tank Water Well #6 Shrock Pumping Station	Public Utility
Town of Sallis Fire Department		Public Safety

As a complement to the previous table, researchers consulted the Mississippi Public Service Commission (PSC) website to review the list of utilities shown there. The following Attala County utilities companies are included on the website. Some of these are the same as the ones listed above, and others are not. It was decided that both tables should be incorporated into this annex for the sake of thorough documentation.

Table A.8: Mississippi Public Service Commission – County Utilities Listings | Source: Mississippi Public Service Commission – Attala County Utilities

Gas Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
GC-123-0081-00	Atmos Energy Corporation	Mathew B. Davidson V-Pres.	790 Liberty Road Flowood, MS 39232-9321	601.420.5020	601.420.5020

Electric Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
EA-103-0035-00	Central EPA	Brian Long Manager	P.O. Box 477 Carthage, MS 39051		601.267.5671
EA-103-0048-00	Delta EPA	Mr. David O'Bryan General Manager	P.O. Box 9399 Greenwood, MS 38930		662.453.6352
EA-123-0037-00	East Mississippi EPA	Mr. Randy Carroll, CEO	P.O. Box 5517 Meridian, MS 39302-5517		601.581.8602
EC-123-0082-00	Entergy Mississippi Inc.	Mr. Martin McGee Customer Service Support	P.O. Box 1640 Jackson, MS 39215-1640		601.969.2336

Sewer Utilities

There are no regulated Sewer Utilities in Attala County.

Water Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
WM-003-0708-00	City of McCool	Terry Dempsey Mayor	PO Box 115 McCool, MS 39108	662.547.6646	662.547.9973
WA-103-0475-00	Conehoma Water Assn. Inc.	William Dwayne Cochran	P. O. Box 280 Kosciusko, MS 39090	662.289.6554	662.289.6777
WA-003-0483-00	Ethel Rural Water Assn.	James Cagle President	P.O. Box 35 Ethel, MS 39067		662.674.5010
WA-003-0357-00	French Camp Water Assn. Inc.	Billy W. Thrailkill President	P. O. Box 43 French Camp, MS 39745	662.547.6331	662.547.6331
WM-003-1396-00	Kosciusko Light & Water Plant	David L. Clark Manager	P. O. Box 866 Kosciusko, MS 39090		662.289.1141
WA-003-0315-00	McAdams Water Assn. Inc.	Jan M. Deason	P.O. Box 1622 Kosciusko, MS 39090	662.289.3344	662.289.9127
WC-123-1938-00	Mississippi Water Company	Galen Shumaker Owner	36727 Hwy 14 Ethel, MS 39067		662.674.5353
WA-003-0654-00	Panhandle Water Assn. Inc.	Samuel Kennedy President	Mrs. Billy W. Hunt Sect'y 6742 Weir-Panhandle Rd. Weir, MS 39772	662.547.9435	662.547.9435
WA-003-0295-00	Poplar Creek Water Assn. Inc.	Harvey Overstreet	2711 Highway 407 Kilmichael, MS 39747-9612		662.262.7142
WA-003-0594-00	Possumneck-Carmack Water Assn. Inc.	Ronnie Armstrong	7195 Attala Road 3122 Vaiden, MS 39176	662.289.4389	662.289.5688
WA-003-0379-00	Simpson Water Assn. Inc.	Charles R. Bennett President	188 Greenhill Loop Weir, MS 39772	662.547.5064	662.547.5064
WA-003-0692-00	Springdale-Youth Center Water Association, Inc.	J. D. Mangrum President	P.O. Box 162 Kosciusko, MS 39090		662.289.7534
WA-003-0452-00	Sugar Creek Water Assn. Inc.	Paula Miller Secretary/Treasurer	P.O. Box 1048 Kosciusko, MS 39090		662.289.7662
WM-103-0485-00	Town of Sallis	Jack Ables Mayor	PO Box 73 Sallis, MS 39160	662.289.4909	662.289.4909
WA-103-0451-00	Zama Water Assn. Inc.	Dorcy Lawrence	5439 Attala Road - 5001 Koscuisko, MS 39090	662.674.5632	662.674.5632

Telecommunications Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
TC-123-0001-00	BellSouth Telecommunications, LLC	Mr. C. D. Smith Regulatory	2310 7th Street Meridian, MS 39301	601.592.6510	601.917.8787

A.2 Hazard Identification and Risk Assessment

This section includes a brief summary of hazards to which Attala County is prone, and includes the location and extent, historical events, and probability of future occurrence. Vulnerability assessments are included in this Annex only for hazards for which county-based data is available. Section 4 of the Base Plan includes hazard descriptions for hazards applicable to all jurisdictions covered by the 2020 RHMP Update. Health-related hazards, such as Pandemic Influenza and West Nile virus, are of concern to the County, but there is no county-level data to add to the discussion of this hazard as it is addressed in Section 4 of the Base Plan. That section also includes the most recently available information about Coronavirus Disease of 2019 (COVID-19) at the time of this plan's publication.

Hazard Ranking and Probability of Future Occurrence

As discussed in Section 4 of the Base Plan - Hazard Identification and Risk Assessment, each county evaluated the number of events and damage claims from impacts over the past 10 years to determine their hazard risk ranking.

Attala County determined their probability of future occurrence based on reported data and local input about previous events and local conditions. Definitions of the probability of future occurrence classifications are provided below:

- Highly Likely — More than 8 occurrences over last 10 years
- Likely: — 5-7 occurrences over last 10 years
- Low — 1-4 occurrences over last 10 years
- Susceptible — Conditions are favorable or there are historic events (greater than 50 years) or local knowledge of unreported events.

Table A.9 summarizes the hazard events for Attala County, and Table A.10 includes the results of the risk ranking exercise.

Table A.9 – Attala County Summary of Hazard Events 2000 – 2019 | Source: NCEI, MDEQ, USGS

Hazard Type	No of Events	Death	Injury	Property Damage	Crop Damage	Total Damage
Dam/Levee Failure	-	-	-	-	-	
Drought	7	-	-	$ 70,000	$ 4,400,000	$ 4,470.000
Earthquake	-	-	-	-	-	
Excessive Heat / Heat	5	-	-	-	-	
Expansive Soil	-	-	-	-	-	
Flood	12	-	-	$ 1,400,000	-	$ 1,400,000
Severe Storm	118	-	1	$ 1,708,000	$ 100,000	$ 1, 808.000
Severe Winter Weather	10	-	-	$ 1,123,000	-	$ 1,123,000
Tornado	12	-	10	$ 66,248,000	$ 7,116,000	$ 73,364,000
Tropical Storm / Hurricane	2	-	-	$ 50,000,000	$20,000,000	$ 70,000,000
Wildfire *	-	-	-	-	-	
Totals	166	0	11	$ 120,549,000	$ 31,616,000	$ 152,165,000
* Damage estimates not available						

Table A.10 – Attala County Risk Ranking Results

Hazard Type	Area Impacted	Health/Safety	Property Damage	Environmental Damage	Economic Disruption	Total	Future Occurrence	Risk	Risk Level
Dam/Levee Failure	4	0	4	4	4	16	2	32	Low
Drought	3	0	2	2	2	9	3	27	Low
Earthquake	1	0	2	2	1	6	2	12	Low
Expansive Soils	1	0	2	2	1	6	2	12	Low
Extreme Heat	1	0	0	1	1	3	3	9	Low
Flood	4	0	2	2	2	10	4	40	Medium
Severe Storm (thunderstorm, lightning, hail and high wind)	3	2	3	2	1	11	5	55	Medium
Severe Winter Weather	4	0	2	2	1	9	5	45	Medium
Tornado	3	4	4	3	2	16	5	65	High
Tropical Storm / Hurricane	4	0	2	2	2	10	2	20	Low
Wildfire	1	0	1	1	2	5	1	5	Low

Table A-11 summarizes the vulnerability of each jurisdiction to each hazard. This information is based on community input, NCEI data, and available resources that discuss each hazard. An example of the latter would be the Mississippi DEQ web site Dam Safety Division, which provides maps illustrating the number and types of dams in each jurisdiction.

Table A.11 – Summary of Hazard Ranking, All Jurisdictions in Attala County

Hazard Type	Unincorporated Attala County	Town of Ethel	City of Kosciusko	Town of McCool	City of Sallis
Dam/Levee Failure	*Medium*	*Low*	*Low*	*Low*	*Low*
Drought	*Medium*	*Low*	*Low*	*Low*	*Low*
Earthquake	*Low*	*Low*	*Low*	*Low*	*Low*
Excessive Heat/Heat	*Low*	*Low*	*Low*	*Low*	*Low*
Expansive Soils	*Low*	*Low*	*Low*	*Low*	*Low*
Flood	*Medium*	*Medium*	*High*	*High*	*Low*
Severe Storm	*Medium*	*Medium*	*Medium*	*Medium*	*Medium*
Severe Winter Weather	*Low*	*Low*	*Low*	*Low*	*Low*
Tornado	*High*	*High*	*High*	*High*	*High*
Tropical Storm/Hurricane	*Low*	*Low*	*Low*	*Low*	*Low*
Wildfire	*Low*	*Low*	*Low*	*Low*	*Low*

Mitigation planning researchers are fortunate to have access to the Data Visualization Tool included on the FEMA website. This site provides county-level data on the breakdown of flood events and hazards included in federal emergency and disaster declarations, as well as for flood events recorded by FEMA. The information is updated through June 2020 and shows the disaster name, event type, number of events, and occurrence date. The data includes information from the time FEMA first began recording disaster events in the format currently used. While this time frame is longer than is included in this RHMP Update, the following page provides a one-page snapshot of Attala County disasters that have been documented by FEMA.

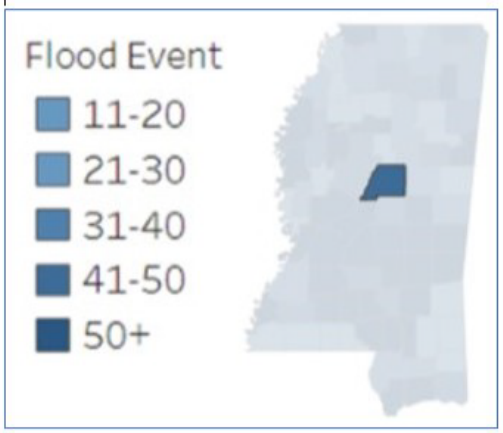
Figure A.4 – Attala County FEMA Declarations Statistics

FEMA Declarations: Attala County Statistics: 1953 - 2020 ***Source:*** FEMA Data Visualization Web Site

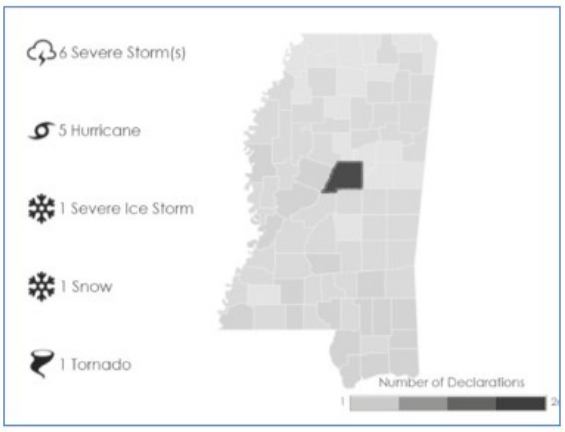
Not Included in data sourced 3/31/2020

- Mississippi COVID EM-3474 (Declared 3/13/2020)

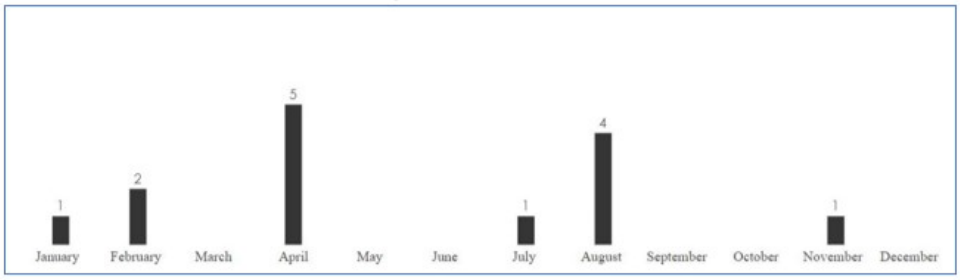
47 Flood Events

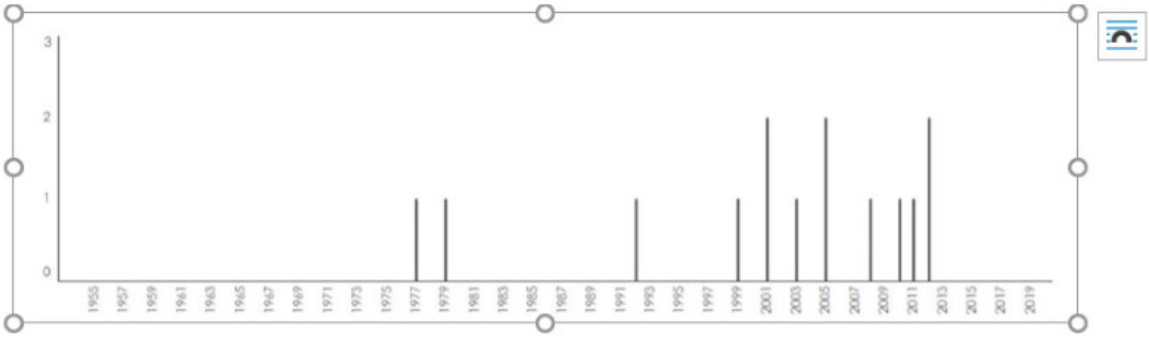


14 Declared Events



The charts below show the months and years in which disasters have occurred in Attala County.





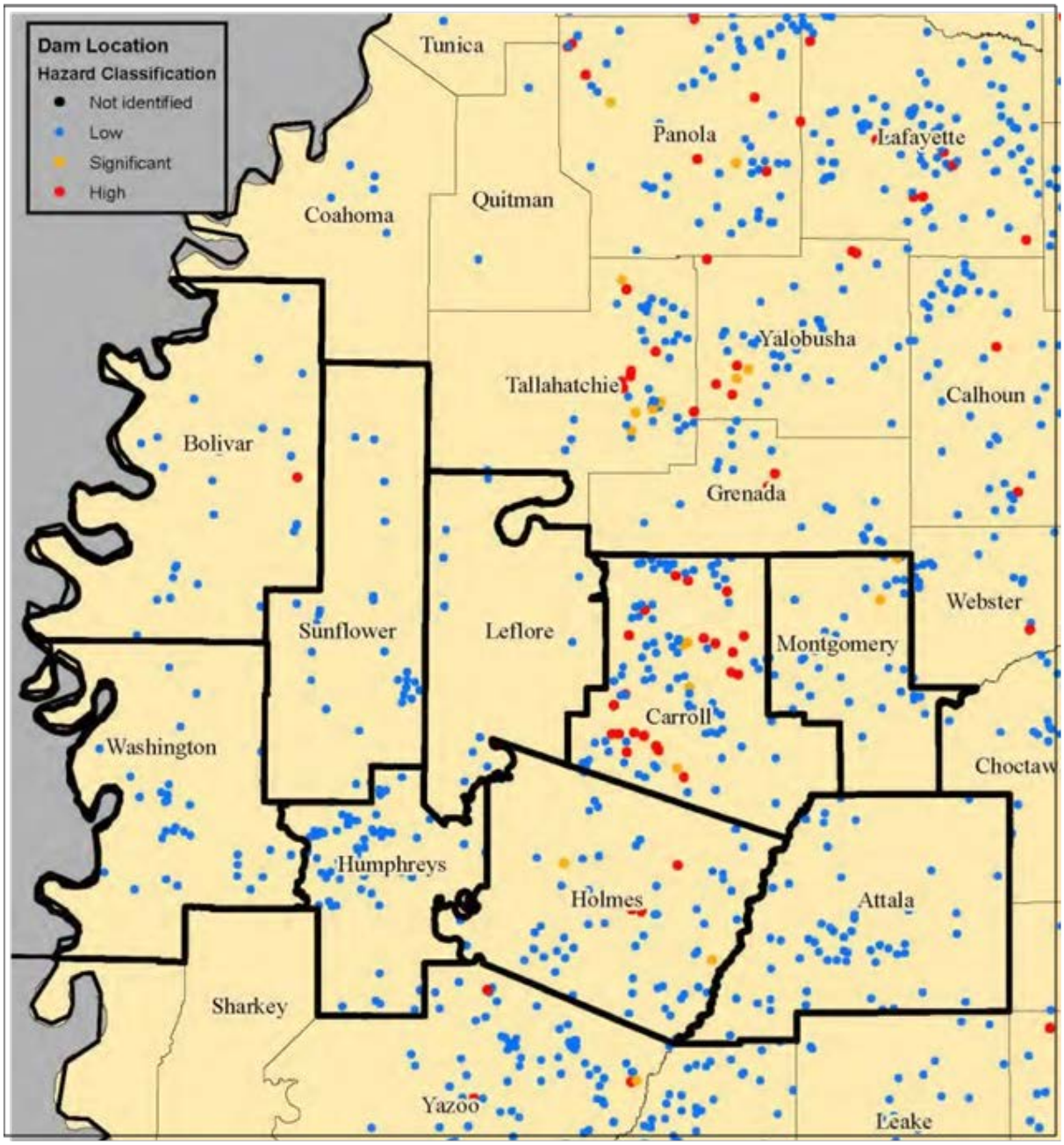
FEMA Declarations for Attala County (14)

Year	Declaration Name	Disaster Number	Year	Declaration Name	Disaster Number
1977	Drought and Freezing	3032	2005	Hurricane Dennis	1594
1979	Storms, Tornadoes, Floods	577	2005	Hurricane Katrina	1604
1992	Severe Storms, High Winds, Tornadoes	968	2008	Hurricane Gustav	3291
1999	Severe Winter Storms, Ice, Freezing Rain	1265	2010	Severe Storms, Tornadoes, Flooding	1906
2001	Severe Storms, Flooding	1365	2011	Severe Storms, Straight-line Winds, Flooding	1972
2001	Severe Storms, Tornadoes	1360	2012	Hurricane Isaac	4081
2003	Storms, Tornadoes, Floods	1459	2012	Tropical Storm Isaac	3348

Dam/Levee Failure

Figure A.5 shows a list of dams mapped based on 2015 data secured from the Mississippi Department of Environmental Quality (MDEQ) and included in the previous MEMA District 3 RHMP.

Figure A.5: Dams Mapped by the State of Mississippi | Source: MDEQ, Delta State University



A.3 Location and Extent

The 2018 SHMP included a MEMA Region 3 Dam Inventory by County, breaking the numbers down for low, high, and significant hazard dams. The numbers of dams for all nine counties in the District are included for the purpose of comparing Attala County's risk level to surrounding counties. The table shows fewer dams in Attala than in Carroll County; about the same as in neighboring Holmes County; and more than in Montgomery County, its northern neighbor.

Table A.12 – Dams Located in Attala County | Source: MDEQ

County	Significant	High	Low	Total
MEMA Region 3				
Atalla	1	2	44	47
Bolivar	-	-	14	14
Carroll	4	23	86	113
Holmes	1	5	39	45
Humphreys	-	-	4	4
Leflore	-	-	-	-
Montgomery	-	2	22	24
Sunflower	-	-	12	12
Washington	-	-	3	3

Until recently, no dams in Attala County were considered to be of significant or high hazard risk. However, two dams were reclassified from low to high risk since the 2015 RHMP was written: the Kenneth Lowe Lake Dam, and Albin Pond Dam. In addition, the School Lake Dam is classified as being of significant hazard, and its most recent Emergency Action Plan (EAP) was approved on December 15, 2010.

Table A.13 provides a list of all low hazard dams in the county. This list does not include dams whose structure has not been categorized.

Table A.13 – Attala County Low Hazard Dams | Source: MDEQ Dam Safety Division, March 2020

Dam Name	State ID	Latitude	Longitude
Aldy Lake Dam	MS03450	33.0149565307	-89.6520169951
Armstrong Lake Attala County Dam	MS00003	33.2401629224	-89.6735746081
Atwood Dam	MS03419	33.2006800242	-89.6704139334
Atwood Lake Dam	MS00011	33.0694440713	-89.6664616872
Bailey Lake Number 1 Dam	MS00012	33.0647164196	-89.65778611
Bailey Lake Number 2 Dam	MS00013	33.0651558491	-89.6235312872
Bailey Lake Number 3 Dam	MS00016	33.0534337931	-89.6396255869
Bates And Grantham Farm Dam	MS03343	32.9341559771	-89.5401569441
Belks Dam	MS03344	33.0571693327	-89.421220184
Brooks Lake MS00024 Dam	MS00024	33.0267076903	-89.519945333
Charles Green Pond Dam	MS02985	33.0854261677	-89.6178850054
Chipley Lake Dam	MS00030	32.9539612752	-89.5860392958
Clark Pond Ms00007 Dam	MS00007	33.1505299447	-89.643428676
Country Club Lake MS00021 Dam	MS00021	33.0298494093	-89.6318552745
Drake Lake Dam	MS03875	33.1277777777778	-89.7336111111111
Earl Sims Lake Dam	MS03632	33.2556689277	-89.6744870104

Dam Name	State ID	Latitude	Longitude
Francis Lake Dam	MS00028	32.9546030548	-89.8472304198
Gregory Lake Ms00031 Dam	MS00031	32.9475782164	-89.4042510207
Hedgepeth Lake Dam	MS03579	33.2452936933	-89.7124962052
I V Lake Dam	MS02907	32.9363801707	-89.5432491966
J Steed Lake Dam	MS00020	33.0310902185	-89.6880615794
Jesse Fleming Lake Dam	MS03685	33.0022814079	-89.7806285652
Kosciusko Sewage Lagoon Number 1 Dam	MS00018	33.0437785537	-89.5676626423
Kosciusko Sewage Lagoon Number 2 Dam	MS00022	33.0284050614	-89.5945519569
Lindsey Pond Dam	MS00019	33.0428490743	-89.5197940778
Lindstrom Dam	MS03309	33.0901127198	-89.6177641353
Long Creek Watershed Structure Y-11a-14 Dam	MS02741	33.0190849833	-89.7237234041
Long Creek Watershed Y-11a-07 Dam	MS00015	33.0510094721	-89.7068244798
Long Creek Watershed Y-11a-11 Dam	MS00025	33.014500829	-89.6345159116
Long Creek Ws Str Y-11a-04 Dam	MS02742	33.0488524628	-89.7549412992
McCrory Dam	MS03448	32.8926836214	-89.8587375358
McDaniel Lake Dam	MS00029	32.9513270692	-89.7764895159
McKay Lake Dam	MS00034	32.934999125	-89.5627484788
MS00014 Dam	MS00014	33.0527221128	-89.7801368598
MS06889 Lake Dam	MS06889	32.94276398	-89.49659204
MS06890 Lake Dam	MS06890	32.94760053	-89.51619311
MS06891 Lake Dam	MS06891	32.96433274	-89.48467602
MS06892 Lake Dam	MS06892	32.96207468	-89.49278433
MS06894 Lake Dam	MS06894	32.97181185	-89.54738022
MS06895 Lake Dam	MS06895	32.99036195	-89.53271464
MS06903 Lake Dam	MS06903	33.06271285	-89.47530381
MS06905 Lake Dam	MS06905	33.09508585	-89.40886689
MS06906 Lake Dam	MS06906	33.11427327	-89.45001638
MS06909 Lake Dam	MS06909	33.05708772	-89.62162235
MS06910 Lake Dam	MS06910	33.08381333	-89.61491036
MS06911 Lake Dam M	MS06911	33.08540499	-89.61943506
MS06913 LAKE DAM	MS06913	33.06963008	-89.64611561
MS06917 LAKE DAM	MS06917	33.12549424	-89.61038803
MS06918 Lake Dam	MS06918	33.14712026	-89.67806292
MS06920 Lake Dam	MS06920	33.15673125	-89.72319826
MS07074 Lake Dam	MS07074	33.23363484	-89.31906466
MS07075 Lake Dam	MS07075	33.19954828	-89.32590762
MS07078 Lake Dam	MS07078	33.14700345	-89.35132857
MS07079 Lake Dam	MS07079	33.20825204	-89.42544742
MS07091 Lake Dam	MS07091	33.14028669	-89.77587307
MS07104 Lake Dam	MS07104	33.00352917	-89.83703071
MS07106 Lake Dam	MS07106	32.95248694	-89.86562948
MS07224 Lake Dam	MS07224	33.26557409	-89.66625807
MS07232 Lake Dam	MS07232	32.99504113	-89.40715413

Dam Name	State ID	Latitude	Longitude
OAKES LAKE DAM	MS00002	33.2479934895	-89.705730968
River Hills Subdivision Lake Dam	MS02851	33.0362898521	-89.5488682591
Riverside Farm Lake Dam	MS00008	33.1348132254	-89.7736835219
Rone Lake Dam	MS00009	33.0924996434	-89.4210037739
Sandridge Lake Dam	MS00027	32.9658041953	-89.4869004168
Temple Lake Dam	MS00023	33.0248949542	-89.5367078972
W B Cross Lake Dam	MS00001	33.2805874532	-89.6413722787
Wade Lake Dam	MS00004	33.2438280442	-89.6147311722
Wildlands Lake Dam	MS03771	33.0958499682	-89.5117685641
Youth Center Lake Dam	MS00010	33.0759175796	-89.6822011632

Previous Occurrences

There is no record of a dam breach having occurred in Attala County.

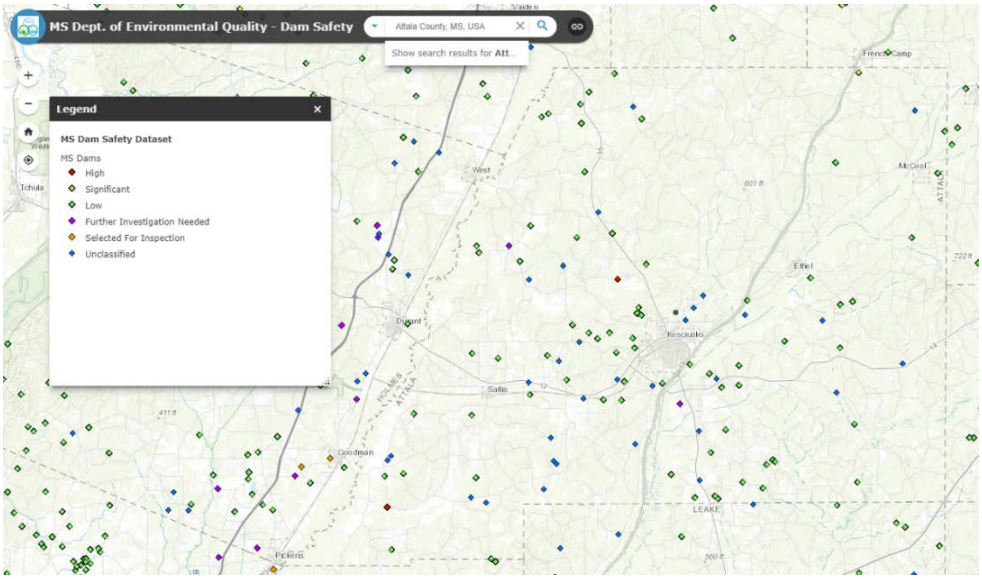
Probability of Future Occurrence

Dam failure is not considered to be among the highest hazards of concern in the county, but since the reclassification, there is increased awareness among officials about monitoring such structures. The probability of future occurrence of dam breach is classified as low. It is not possible to develop a statistical probability when there is no historical data.

Assessing Vulnerability

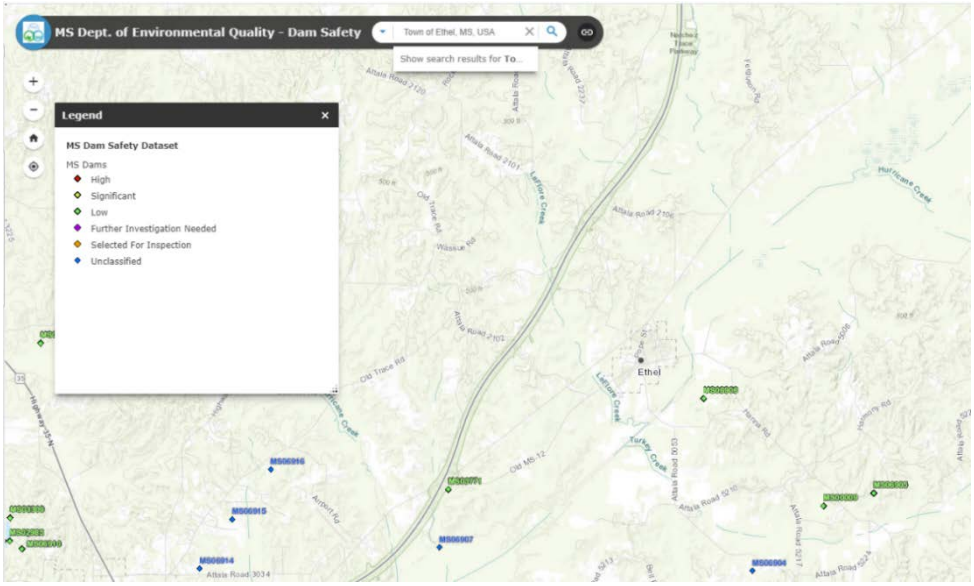
With the reclassification of two dams from low to high hazard, the County is working more closely with the MDEQ Dam Safety Division and dam owners to ensure that EAPs for both structures are updated. If breached, even a low hazard dam could cause damage to nearby property. The maps below, included as ***Figures A.6a through A.6e*** and taken from the MDEQ Dam Safety Division mapping website, show close up views of the location of dams in all of Attala County and for each of its jurisdictions. In each screen shot, the name of the community is shown in the Search Box, and a legend is included to show the degree of hazard for each identified dam.

Figure A.6a: Attala County Vulnerability to Dam Failure | **Source:** MDEQ



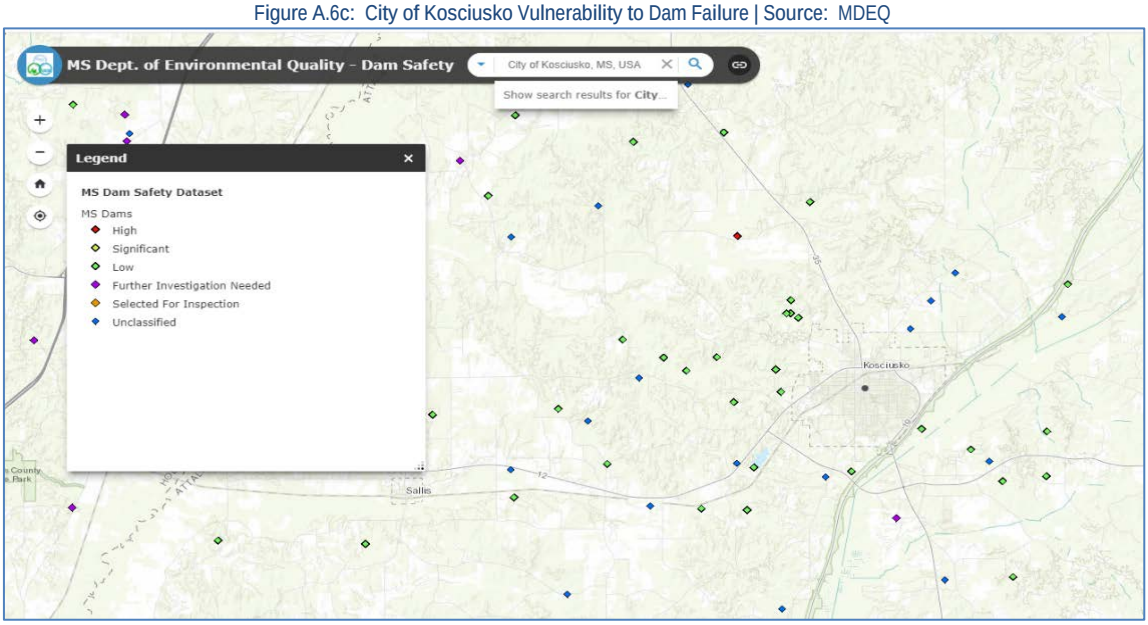
The locations of the two high hazard dams (marked in red, northwest of the City of Kosciusko and in the southwest corner of the county, at left) show that the structures are located away from the population centers, limiting vulnerability of the population and the built environment. The one significant hazard dam, School Lake Dam, is marked in yellow in the northeastern corner of the county, due south of the French Camp (in neighboring Choctaw County) and east of the Natchez Trace Parkway. Other dams show are low hazard dams and those for which additional information is needed to determine local risk. Data presented here suggests that unincorporated Attala County overall is at medium risk based on the presence of two high hazard dams and one significant hazard dam, though all are in relatively remote locations.

Ethel Figure A.6b: Town of Ethel Vulnerability to Dam Failure | *Source: MDEQ*



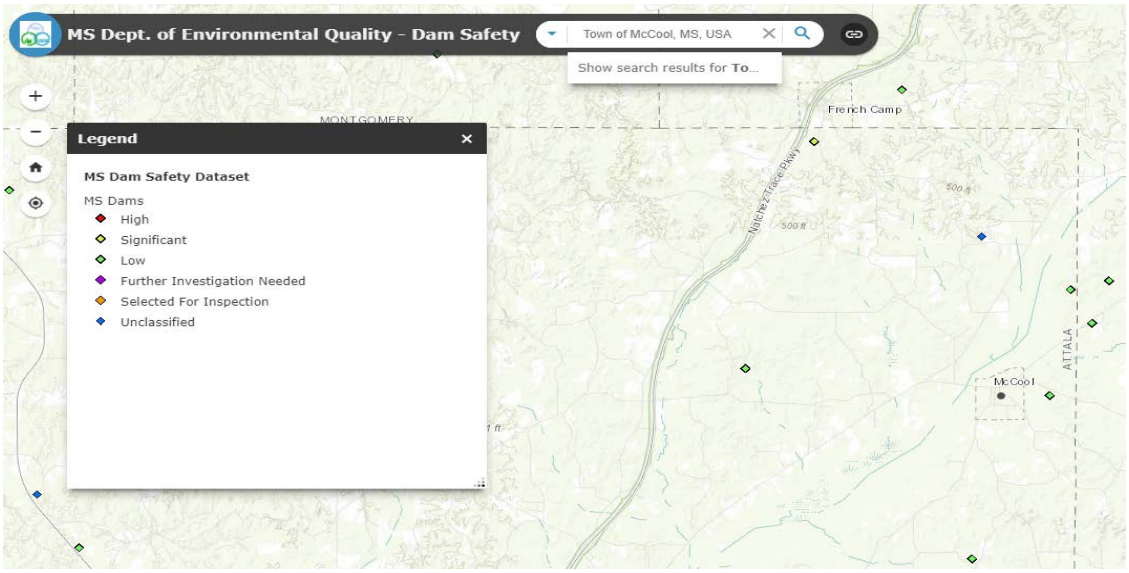
All dams within a short distance of the Town of Ethel are low hazard structures or ones that are unclassified. They are well away from the population center and appear to pose little risk to the community. As such, the Town determined it is at low risk to dam failure.

Figure A.6c: City of Kosciusko Vulnerability to Dam Failure | Source: MDEQ



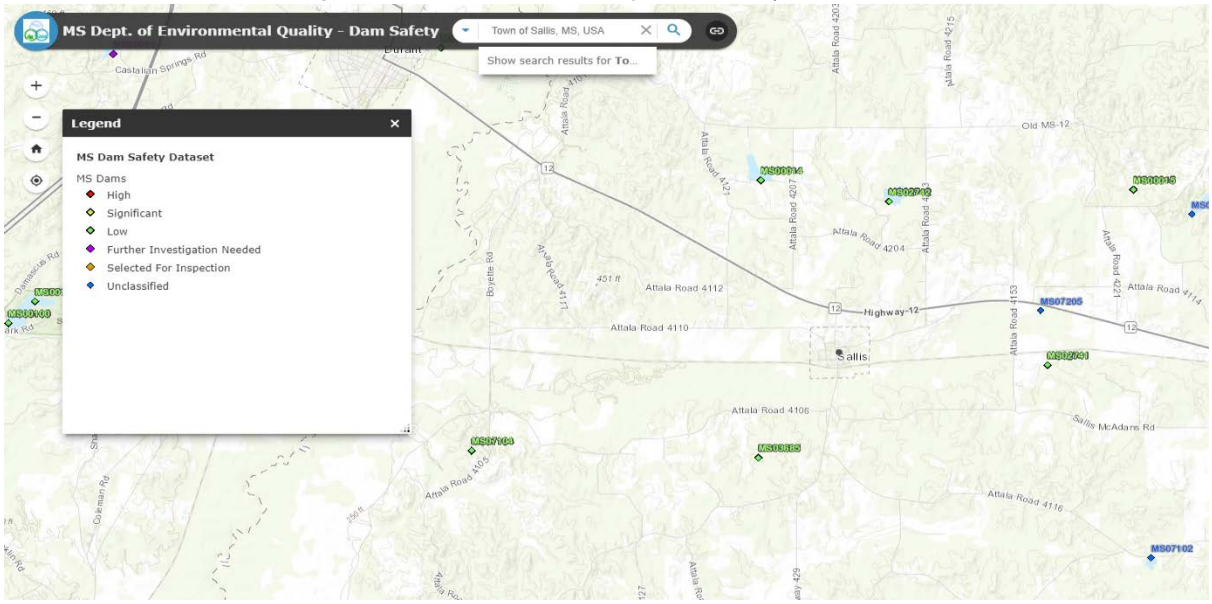
The one high hazard dam mentioned as being northwest of the city is distant enough, and in a remote enough location, to be of little concern to residents. All other structures located nearby are shown as being low hazard or unclassified, or additional information is required. For this reason, the City is determined to be at low risk to dam failure.

Figure A.6d: Town of McCool Vulnerability to Dam Failure | Source: MDEQ



The Town of McCool is located in the northeastern corner of the county, where relatively fewer dams are located in comparison to other areas of Attala County. The handful of dams shown on the map above are all low hazard dams and one is unclassified. The existence of structures such as these suggest the Town is at low risk to dam failure.

Figure A.6e: Town of Sallis Vulnerability to Dam Failure | Source: MDEQ



The Town of Sallis is located in western Attala County, where there are more dams than in the county's remote northeastern corner near the Town of McCool. As is the case with all other Attala municipalities, dams near the town are all listed as being low hazard or unclassified. The Town of Sallis determined that its level of vulnerability to dam failure is low.

Overall Vulnerability to Dam Failure

The following table summarizes the vulnerability of each jurisdiction to dam failure.

Table A.14 – Attala County Jurisdictional Vulnerability to Dam Failure | Source: MDEQ

Jurisdiction	Ranking
Unincorporated Attala County	Medium
Town of Ethel	Low
City of Kosciusko	Low
Town of McCool	Low
Town of Sallis	Low
Overall Vulnerability to dam failure	Low

The presence of one significant hazard and two high hazard dams in unincorporated Attala County suggests areas near these structures may at some point be at risk to dam failure so the overall vulnerability rating is medium. However, because most of the region is at low risk to the hazard, it is rated as low risk to Attala County overall.

Drought

Location and Extent

Drought covers a large area and is not geographically confined. As such, all of Attala County could be exposed to drought conditions. Drought typically does not pose a threat to property but can impact agricultural assets.

Previous Occurrences

Table A.15 lists 12 drought events reported in the years of 2000 through 2019 as shown in the National Weather Service Storm Events Database, housed at the National Center for Environmental Information (NCEI). It must be considered the lack of data during that given time frame does not mean drought conditions did not exist – they simply were not reported. NCEI reports drought on a countywide basis and not by jurisdiction, so community-based data is not available.

Table A.15 - Drought Occurrences 2000 to 2019 | Source: NCEI

Date	Death	Injury	Property Damage	Crop Damage
12/1/2016	-	-	$0.00	$50,000.00
11/1/2016	-	-	$50,000.00	$0.00
10/11/2016	-	-	$0.00	$40,000.00
10/1/2015	-	-	$0.00	$1,200.00
9/1/2015	-	-	$0.00	$400,000.00
10/1/2010	-	-	$0.00	$500,000.00
7/1/2007	-	-	$70,000.00	$0.00
6/1/2007	-	-	$0.00	$1,700,000.00
5/1/2007	-	-	$0.00	$700,000.00
4/25/2007	-	-	$0.00	$0.00
4/12/2007	-	-	$0.00	$0.00
10/1/2006	-	-	$0.00	$1,500,000.00
Total	-	-	$120,000	$4,891,200

Probability of Future Occurrences

Historical data listed in Table A.15 suggests that drought is likely. It may occur one or more times in a given year, or the community may experience a drought-free period of several years. It is also likely that drought may occur as a result of climate change throughout the United States, which would affect the region's significant agriculture holdings. Of the nineteen years included in recent NCEI research, drought has occurred in five years. A probability developed by dividing the number of drought years by the total number of years results in a 26% probability that a drought will occur in any given year.

Assessing Vulnerability

Drought occurs with advance warning because those in farm communities are able to tell when patterns of water availability change. Drought is also monitored by the National Weather Service and the State Mississippi State University Extension Service, the latter of which has offices in each county. Two tools are available for Extension staff and others who monitor drought: the Keetch-Bynum Drought Index and the Palmer Drought Severity Index, which are discussed in Section 4 of the Base Plan as tools for drought monitoring. Drought is not known to cost human lives, but it affects lifestyle and the economic effects may be felt countywide. The NCEI database indicates there have been no known deaths or injuries from drought in the planning area.

All NCEI events are listed as occurring in the Attala Zone, so it can be deduced that the entire county is equally at risk to the hazard. However, because the unincorporated areas, which include agricultural assets, are more affected by drought than municipalities, this area ranks the hazard as medium for unincorporated areas. Other areas of the county are determined to be at low vulnerability to drought, so the County overall is listed as having low vulnerability.

Table A.16 – Attala County Jurisdictional Vulnerability to Drought

Jurisdiction	Ranking
Unincorporated Attala County	Medium
Town of Ethel	Low
City of Kosciusko	Low
Town of McCool	Low
Town of Sallis	Low
Overall Attala County Vulnerability to Drought	Low

Earthquake

Location and Extent

Attala County, like most of North Central Mississippi, is located within the Modified Mercalli Zone VI. Should an event occur that has a 5.9 to 6.0 magnitude on the Richter Scale, some or all of the following may occur based on descriptions included in the Scale:

- The event would be felt by all or nearly everyone
- People may be awakened from sleep if the event occurs at night
- Widespread frightened population
- Some dishes and windows would be broken.
- Unstable objects would be overturned.
- Pendulum clocks may stop
- Heavy furniture moved
- Instances of fallen plaster
- Slight damage

Previous Occurrences

No earthquakes have been reported as having taken place in or affected Attala County.

Probability of Future Occurrences

In 2002, a study by the Center for Earthquake Research and Information (CERI) at the University of Memphis reported that, in any given 50-year interval, there is a seven to ten percent probability of the region experiencing an event at the level of the devastating 1811-1812 sequence of earthquakes in the New Madrid Zone. The study also estimated that there is an estimated 25 to 40 percent probability that a 6.0 magnitude event may occur in a 50-year time period. The community relies on studies such as this for probability estimates because there is no locally available occurrence data.

Assessing Vulnerability

The level of vulnerability is the same for all areas of the county given there is no substantive geographic variation in distance from one end of the county to the city of New Madrid, MO, the potential epicenter of the New Madrid Seismic Zone. The distance between New Madrid and the Town of McCool, in the northwest corner of the county, is an estimated 237 miles; and the distance to the Town of Sallis is an estimated additional 20 miles further south. There is not enough a distance in proximity to New Madrid to say that one community is more vulnerable than the other.

There are have been no recorded deaths, injuries, or property damage from earthquakes in Attala County. There is little likelihood of any detrimental effect on the County's economy, lifestyle, or physical structures. However, the effects on life and property in the area and low hazard dams could be significant if a large earthquake were to occur given the nature of the built environment. In estimates derived from a report by the U.S. Geological Survey (USGS) "New Madrid Earthquake Project," there is the potential for Attala County and other sectors of MEMA District 3 to experience a seismic event with a magnitude of between 3 and 4 on the Richter scale.

Research done by the USGS Earthquake Hazard Program suggests buildings constructed using load-bearing masonry walls are vulnerable to damage by earthquakes, while steel and wood-frame buildings have a lower seismic vulnerability. Low-rise reinforced concrete buildings are also in this lower seismic risk category. Damage expected in such an event within the unincorporated areas of

Attala County could include buildings not secured to a solid foundation being shaken off their supports, and chimneys falling away from houses. Multi-story structures built with un-reinforced masonry buildings could be substantially damaged.

In reviewing earthquake effects on dams, the SHMP overlaid significant high hazard dams with historic seismic recordings and developed a dam inventory for earthquake prone counties. Dam/levee systems are also vulnerable to earthquake events as shown by the table below, which were presented earlier as Table A.12.

Table A.17 - Dam Inventory in Relation to Earthquake Prone Counties by Dam Type | Source: 2018 Mississippi SHMP

MEMA DISTRICT 3				
County	Significant	High	Medium	Low
Attala	1	2	44	47
Bolivar	-	-	14	14
Carroll	4	23	86	113
Holmes	1	5	39	45
Humphreys	-	-	4	4
Leflore	-	-	-	-
Montgomery	2	22	24	2
Sunflower	-	-	12	12
Washington	-	-	3	3

The County is being proactive by maintaining open communications with the owners of the significant and high hazard dams and encouraging all of them to maintain a current EAP.

Extreme Heat / Heat

Location and Extent

Waves of heat may cover all of District 3, or a larger area that includes one or more states. The hazard is not geographically confined. As such, all of Attala County could be equally affected by excessive heat. Regarding hazard extent, such events typically do not include property damage, but heat can affect the elderly, infants, and disabled persons, and cause death in persons who are overexposed. It may cause crop damage and affect the livelihood of those working in the agricultural industry.

Previous Occurrences

Table A.18 shows there were five recorded heat events between 2005 to 2019, and none since the 2015 RHMP was written. There is no documented damage, loss of life, or injury resulting from these events.

Table A.18 - Extreme Heat / Heat Occurrences 2000 to 2019 | Source: NCEI

Date	Event	Death	Injury	Property Damage	Crop Damage
8/1/2010	Excessive Heat	-	-	-	-
8/5/2007	Heat	-	-	-	-
7/15/2006	Heat	-	-	-	-
8/17/2005	Heat	-	-	-	-
7/23/2005	Heat	-	-	-	-
Totals					

The National Weather Service narrative for the most recent occurrence (8/1/2010) is typical of how extent is described for the other events.

A four day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS Jackson, MS forecast area, 19 record highs were set between August 1st and 4th. On August 2nd, the 2nd warmest average temperature was recorded. The low was 78 and the high 105, resulting in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in 3 fatalities across the forecast area.

The deaths mentioned in this description occurred elsewhere in the region served by the Jackson, MS weather station, but they are a reminder that extreme heat affects the entire county and all populations. It is not feasible to discuss vulnerability broke down by jurisdiction because NCEI data for this hazard is reported countywide.

Probability of Future Occurrences

While five events are listed in the table of historic events, two appear to be from an extended event that occurred over a two-month period. As such, for the purpose of determining probability, it is accurate to say that four events took place over a 19-year period, so there is a 21% percent chance of occurrence in any given year.

Assessing Vulnerability

Heat can affect certain populations, but generally causes no property damage. During periods of extreme heat, there is little physical destruction, although roads can buckle, and livestock may perish. Extreme heat conditions can pose problems for those not accustomed to the climate or who are outside for prolonged periods of time. Excessive heat can also cause utility outages due to an increased demand for electricity.

All of the following populations are prone to heat-related conditions: the elderly; young children; those who are immobile; persons who live alone or without air conditioning; people without transportation; and people suffering from a serious illness. Because NWS reports are county-based and events described are often regional occurrences, it is safe to say the entire population of all county locations are vulnerable.

Expansive Soil

Location and Extent

Expansive soils are present statewide and have been known to cause considerable damage to housing and infrastructure. Less than 50 percent of soils in Attala County consist of clay that is susceptible to swelling.

Previous Occurrences

There are no recorded incidents of expansive soil in Attala County.

Probability of Future Occurrence

The probability of expansive soils is classified as low. While it may be realistic to say there is a zero percent chance of occurrence, it is not possible to document probability with no historical data. The fact the community chose to keep this hazard in the plan and to profile it despite the lack of occurrences, suggests there is cause for low-level concern.

Assessing Vulnerability

Expansive soils could cause damage to infrastructure and to both business and residential structures within Attala County. Community leaders agreed this is a hazard of low level concern but wanted to retain it in the 2020 RHMP update to document that a discussion about the hazard took place.

Flood

Location and Extent

The entire geographic region of Attala County is at risk to riverine flooding, flash flooding, and flooding caused by undersized stormwater management systems. All of the flood events cited from recent NCEI data below are documented as flash floods. Flood data shown below shows all locations in the county are susceptible to flooding, and the extent of some events is listed as countywide.

Flash floods often occur when rain falls on the built environment where impervious surfaces, gutters, and storm sewers hasten the flow of run-off. Flowing waters can become raging torrents of water that course through streambeds and streets, sweeping away everything in their path.

Previous Occurrences

Table A.19 provides a summary of the 23 flood events recorded from 2000 to 2019, and Table A.20 shows the events sorted by location within the county. While inadequate stormwater management capability likely contributes to flash flooding in all areas, it is noted where local creeks, rivers and their tributaries are located nearby and may be potential sources of overflow.

Table A.19 - Flood Events 2000 to 2019 | Source: NCEI

Location	Date	Event	Death	injury	Property Damage	Crop Damage
Wamba	10/30/2019	Flash Flood	-	-	$10,000	-
Wamba	9/5/2017	Flash Flood	-	-	$4,000	-
Kosciusko	6/6/2017	Flash Flood	-	-	$15,000	-
Williamsville	6/3/2017	Flash Flood	-	-	$50,000	-
Wamba	4/28/2014	Flash Flood	-	-	$15,000	-
Kosciusko	4/6/2014	Flash Flood	-	-	-	-
Possumneck	4/6/2014	Flash Flood	-	-	$50,000	-
Hesterville	8/16/2012	Flash Flood	-	-	$2,000	-
Sallis	5/8/2012	Flash Flood	-	-	-	-
Possumneck	7/23/2011	Flash Flood	-	-	$15,000	-
Possumneck	4/15/2011	Flash Flood	-	-	$150,000	-
McCool	1/1/2011	Flash Flood	-	-	$30,000	-
McCool	9/21/2009	Flash Flood	-	-	$3,000	-
Kosciusko	10/16/2006	Flash Flood	-	-	$400,000	-
Countywide	9/25/2005	Flash Flood	-	-	$50,000	-
East Portion	8/29/2005	Flash Flood	-	-	$200,000	-
Central Portion	4/6/2005	Flash Flood	-	-	$150,000	-
Sallis	4/6/2005	Flash Flood	-	-	$400,000	-
Kosciusko	6/26/2004	Flash Flood	-	-	--	-
Ethel	8/27/2003	Flash Flood	-	-	$10,000	-
Possumneck	7/11/2002	Flash Flood	-	-	$1,000	-
Countywide	9/1/2001	Flash Flood	-	-	-	-
Countywide	4/4/2001	Flash Flood	-	-	1,100,000	
Totals			0	0	$2,655,000	

Table A.20: Attala County Flood Events 20001 to 2019 – Sorted by Location | Source: NCEI

Location	# Events	Major Water Bodies
Central Portion	1	Yockanookany River
Countywide	3	Big Black River Yockanookany River
East Portion	1	Big Black River
Ethel	1	Yockanookany River Leflore Creek
Hesterville	1	Hospen Creek Sharkey Creek
Kosciusko	4	Yockanookany River
McCool	2	Yockanookany River Tibby Creek, Bear Creek
Possumneck	4	Big Black River
Sallis	2	Big Black River
Wamba	3	Lobutcha Creek
Williamsville	1	Kentawka Canal Little Kentawka Canal

Information from the same table can be further sorted to assess vulnerability for the jurisdictions and unincorporated areas of the Attala County. All unincorporated communities, or reference to part of the County, will be counted toward incidents not within an identified municipality.

While there is a section devoted to flood vulnerability further in this annex, vulnerability will also be addressed here, in proximity to the previous information.

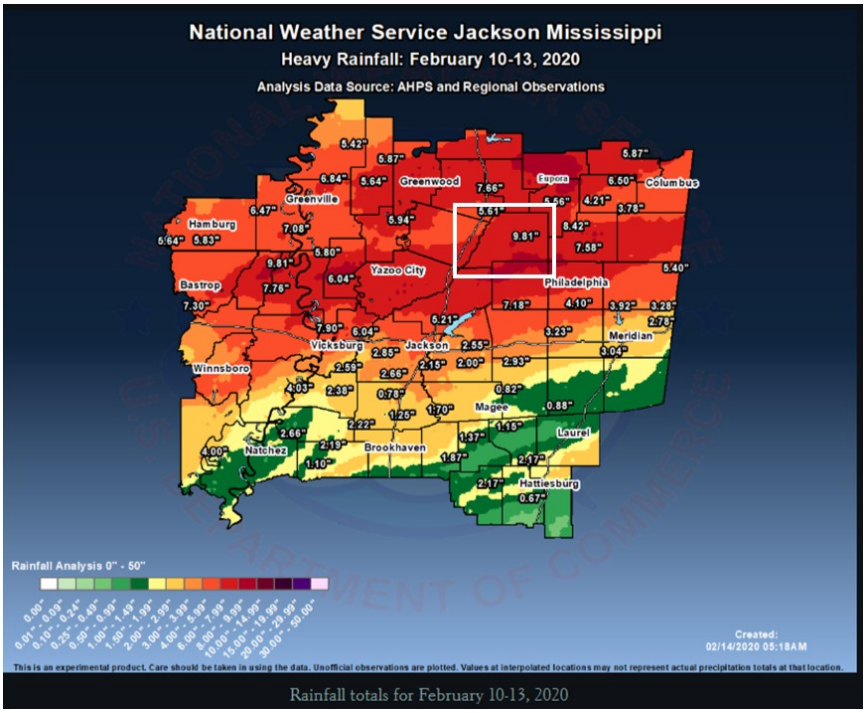
Table A.21: Geographic Vulnerability to Flood by Jurisdiction | Source: NCEI

Location	# Events	Vulnerability Level	Critical Points
Countywide Central Portion, East Portion	5	Moderate	Presence of major rivers and tributaries covering most of the county
Unincorporated Hesterville, Possumneck, Wamba, Williamsville	9	Moderate	Frequency and cost of events, but much of the impacted land does not include structures
Town of Ethel	1	High	Location near major river and tributaries
City of Kosciusko	4	High	Multiple events, flood gauge location
McCool	2	High	Location of major river running through town
Sallis	2	Low	No SFHAs located in the jurisdiction
Overall vulnerability of Attala County		Moderate	Number events, that do not affect structures, input from the Office of Emergency Management

The planning region overall rated the community as moderately vulnerable to flooding based on the fact most of the vulnerable land does not include at-risk structures. Also, the total dollar value of damages is relatively given the length of time studied.

In addition to the events documented as occurring through 2019, MEMA District 3 experienced significant rainfall in early 2020 that had not yet been fully documented by NCEI at the time of plan development. The visual included on the next page as Figure A.7 shows during the period of February 10-13, 2020, communities districtwide received between three to 14 inches of rain, and rain continued to fall – at times heavily – through the rest of the month. The Attala County Emergency Management Director said rainfall affected roadways and caused his department to recognize the need for road improvements in certain areas to mitigate against future flooding. The map shows that Attala County – the portion of the map inside the white text box – received 9.81 inches during the documented period.

Figure A.7 – Heavy Rainfall in MEMA District 3 in February 2020 | Source: National Weather Service



Atalla County and three of its four municipalities participate in the National Flood Insurance Program (NFIP). The Town of Sallis is the only non-participating community. A review of FEMA Flood Insurance Rate Maps updated in 2011 shows no sections of the Town of Sallis lie within a Special Flood Hazard Area (SFHA), or the flood zone.

Based on losses outlined in the 2018 SHMP, the following HAZUS Flood Results were listed for Attala County.

Table A.22 – Attala County HAZUS Flood Results | Source: 2018 Mississippi SHMP

Structural Damage	Contents Damage	Inventory Loss	Total Building Loss	Income loss	Total Building and Income Loss	Bldg. Loss Ratio
$1,418,000	$904,000	$4,000	$2,326,000	$20,000	$2,346,000	1.5%

Residential at Risk	Other at Risk	Total Bldgs. Risk	No. of Bldgs. Substantially Damaged	No. of house-holds	No. of people needing shelter	Countywide Building Exposure
4	0	4	1	36	45	$759,560,000

The next two tables were also taken from the 2018 SHMP and, respectively, show the number of RL/SRL properties for Attala County and the eight other counties included in MEMA District 3, as well as the number of NFIP participating communities for each county and number of properties mitigated.

Table A.23 - MEMA District 3 Repetitive Loss and Sever Repetitive Loss Properties – Over time and by County | Source: 2018 SHMP

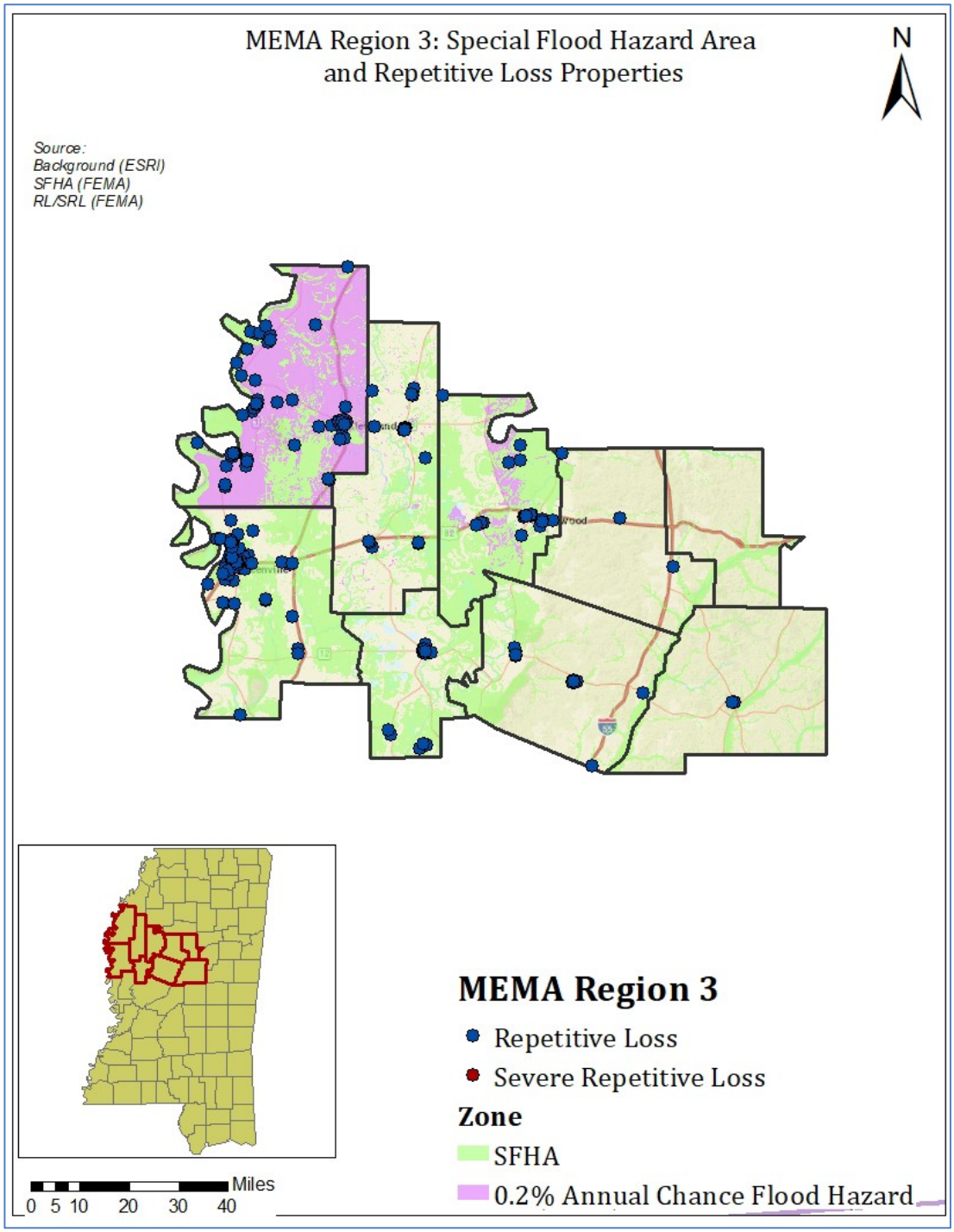
County	Repetitive Loss				Severe Repetitive Loss			
	No. of Properties 2009	No. of Properties 2011	No. of Properties 2016	No. of Flood Claims	No. of Properties 2009	No. of Properties 2011	No. of Properties 2016	No. of Flood Claims
Attala	0	0	1	2	0	0	0	0
Bolivar	155	108	210	631	2	48	2	228
Carroll	4	4	4	8	0	0	0	0
Holmes	11	12	12	27	0	0	0	0
Humphreys	40	31	46	161	2	10	1	61
Leflore	29	27	27	71	0	2	0	8
Montgomery	0	0	0	0	0	0	0	0
Sunflower	19	16	20	72	1	4	0	21
Washington	152	115	191	631	14	48	8	250
Totals	410	313	511	1,603	19	112	11	568

Table A.24 - MEMA District 3 Participating Communities and Number of Mitigated Properties by County | Source: 2018 SHMP

County	No. of NFIP Communities	No. of Mitigated Properties
Attala	5	0
Bolivar	16	20
Carroll	4	0
Holmes	8	0
Humphreys	5	1
Leflore	6	1
Montgomery	4	0
Sunflower	8	4
Washington	6	26
Totals	61	52

The Capabilities Assessment of this Annex identifies NFIP participation. A Flood insurance Study was conducted in 2011, when FEMA developed the most recently updated Flood Insurance Rate Maps (FIRMs). As of 2016, there was one repetitive loss property in the county. The map below, taken from the 2018 SHMP, shows the location of Special Flood Hazard Areas (SFHAs) and RL structures for each county in MEMA Region 3 (including the one in Attala County).

Figure A.8 - MEMA District 3 Special Flood Hazard Area (SHFA) and Repetitive Loss Structures | Source: 2018 SHMP



Probability of Future Occurrence

The probability of flooding in Attala County is listed as highly likely given the history of flood events; the presence of an overtaxed drainage system; and location in the region of the Big Black and Yockanookany Rivers and their many tributaries. NCEI data shows one or more portions of the County reported flooding in 12 of the 19 years of data being studied. This suggests there is a 63% chance of flooding in any given year. As such, it is highly likely the county will see flooding roughly once every 18 to 24 months.

Assessing Vulnerability

Two major rivers run through Attala County. The Big Black River, in the rural western section of the county, forms the boundary between Attala and Holmes Counties. The Yockanookany River is located near Kosciusko and the Natchez Trace Parkway, a historic and scenic roadway that runs between Nashville, Tennessee and Natchez, Mississippi. The extent of flooding can be measured against the identified values of the flood stages located in the chart below.

Table A.25 – Flood Stage figures for Major Rivers in Attala County | Source: NOAA Advanced Hydrologic Prediction Services

	Major Flood Stage	Moderate Flood Stage	Flood Stage	Action Stage
Big Black River	25.0 ft.	20.0 ft.	15.0 ft.	12.0 ft.
Yockanookany River	23.0 ft.	21.5 ft.	15.0 ft.	14.0 ft.

Flood Impacts on the City of Kosciusko from the Big Black River:

36.0 ft. - Major flooding, water is within a mile of downtown Kosciusko
25.5 ft. - High water affects many residents and hundred acres of land east of Kosciusko.
23.1 ft. - Water begins to affect a few residents in south Kosciusko who live north of Love Road and west of Tipton Street.
21.5 ft. - A large section of the Natchez Trace south of Kosciusko is under water.
20.5 ft. – Water reaches Munson Crossing and the bridge clearance of State Highway 35.
18.5 ft. - Small section of Natchez Trace is closed south of Kosciusko.
18.0 ft. - Natchez Trace Parkway Commission prepares to close parkway South of Kosciusko due to flood water approaching the road.
17.0 ft. - Water covers most land areas along the Natchez Trace Parkway.
16.0 ft. - Several homes (2) miles upstream of Gage are affected by water.
15.0 ft. - Water approaches the Natchez Trace Parkway south of Kosciusko and water floods lowlands near and around the Parkway.
10.0 ft. - Minor over bank flooding near the river.

Flood Impacts on Rural Attala County from the Yockanookany River:

29.5 ft. - Water is at the road surface of State Highway 19 bridge.
26.0 ft. - Water reaches the under clearance of the State Highway 19 bridge.
21.0 ft. - Extensive flooding of agricultural land.
19.0 ft. - Thousands of acres of agricultural land is under water.
17.0 ft. - Several thousands of acres of agricultural and lowland become inundated.
15.0 ft. - Lowlands and agricultural land near the river begin to flood.

Impact on Life and Property: The 23 events listed in Table A.18 show these incidents caused $2,655,000 in property damage. In April 2001, heavy rains caused a county-wide flash flood that caused over $1 million in property damage and caused several roads in Kosciusko to become impassable. Sixty homes, 15 mobile homes, 225 public roads, and seven bridges incurred major

damage, and 57 culverts on Attala County roads experienced damage severe enough they needed to be replaced. These reports suggest a serious flood incident may have far-reaching impacts.

Two years later, in August 2003, a flash flood caused a foot of water to accumulate on Main Street in front of City Hall and the Police Department in the Town of Ethel. Since then, flooding has become more severe, with water seeping into residents' homes during heavy and prolonged rains. Some areas of the county, including Ethel, are flood-prone even though they are not currently listed as being in a flood zone. This situation could stem from an overburdened drainage system, or because of erosion near roads and bridges.

Specific areas identified as high-risk areas for flash flooding prone include an Ethel mobile home park on Highway 12 East, and the City of Kosciusko. At-risk sites in Ethel include seven homes, six schools, two assisted living facilities, and the Montfort-Jones Hospital.

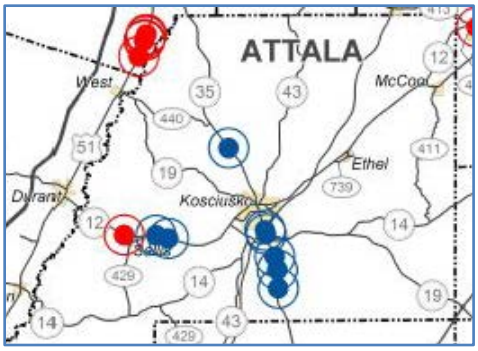
Impact on Transportation Systems: Attala County includes 58 state-owned bridges located on State Highways 12, 35, 19, and 43. These serve as vital transportation and evacuation routes for the county and surrounding areas. These bridges cross portions of delineated floodplains and are susceptible to flood damage. According to the 2012 National Bridge Inventory (NBI), there were 79 structurally deficient and 9 functionally obsolete bridges in the county. Below are 2019 figures for bridge structures rated on a scale from Good to Poor.

Table A.26 – Flood Stage figures for Major Rivers in Attala County | Source: Bridge Condition by County 2019, Bridges and Structures, Federal Highway Administration

Attala County	Bridge Counts				Bridge Area (Square Meters)			
	All	Good	Fair	Poor	All	Good	Fair	Poor
Includes Federal Bridges	249	152	46	51	76,913	57,703	14,026	5,184
Excludes Federal Bridges	229	145	33	51	73,566	56,937	11,444	5,184

The following map produced by the Mississippi Department of Transportation (MDOT) shows bridges identified as State-maintained deficient bridges. Red circles indicate the location of posted bridges and blue circles show the location of deficient bridges.

Figure A.9 - State Maintained Deficient Bridges in Attala County | Source: Mississippi Department of Transportation



The Scour Index is used to quantify the vulnerability of bridges to scouring during a flood. Bridges are assigned a scour index between 1 and 5. A scour index of 5 indicates a bridge has a foundation element determined to be unstable for the observed or evaluated scour condition. It is estimated that five of the state-owned bridges in Attala County are determined to be scour critical.

In addition to bridges, roadways are subject to inundation and overtopping by periods of heavy rain, which appear likely to occur more frequently given climate change observations. Storm events generally projected to occur as 100-year flood events are occurring more frequently. The potential loss could include up to the full replacement value of the bridge structure, if flooding results in bridge collapse. In severe cases, roadways could also be undermined, causing complete or partial washout of roadbed and collapse of the road surface. Bridges and roadways with a history of flood impact could benefit from mitigation projects.

Impact on Lifeline Utility Systems: Lifeline utility systems such as electric power, gas, utility and water distribution and telephone service are generally not significantly affected by flood events, although flooded lift stations could result in storm water infiltration into treatment facilities. A facility's power source could be interrupted during a flood and result in expensive repairs unless the supply is elevated.

Severe Weather (Lightning, Hail and Severe Wind)

Location and Extent

Severe storms include non-spacial elements and, therefore, can be described as equally affecting all areas of Attala County. All municipalities and unincorporated areas are susceptible to lightning, hail, and severe wind events. Of particular concern are persons who reside in a mobile/manufactured home, as well as the elderly, and disabled because of their potential lack of mobility to respond to an unexpected hazard situation. It is strongly recommended all manufactured housing be fastened to the ground The National Association of Certified Home Inspectors (NACHI) describes a housing tie downs as a system of "heavy-duty straps and anchors designed to stabilize manufactured homes (also known as mobile homes) during high winds." The organization points out failure to properly install and maintain tie-downs results in reduced capacity to resist sliding and overturning.

Previous Occurrences

The next four tables and subsequent two figures show numerous severe storm events have occurred countywide.

Table A. 27: Total Severe Storm Events in Attala County | Source: NCEI

Hazard Event	No of Events	Property Damage	Crop Damage	Deaths	Injuries
Lightning	1	80,0000	-	-	-
Hail	93	337,000	-	-	-
Severe Wind	135	3,481,250	100,000	-	-
Totals	229	$3,898,250	$100,000	-	-

Table A.28 – Lightning Events 2000 to 2019 | Source: NCDC

Location	Date	Time	Death	Injury	Property Damage	Crop Damage
Kosciusko	5/5/2006	3:00	0	1	$80,000	0

While research for this plan focused on identifying events taking place since 2000, the 2015 MEMA District 3 RHMP noted only one lightning event was documented as having occurred since 1960.

Between the years 2000 and 2019, 93 Attala County hail events were recorded by the National Weather Service. Captured in the table below, the data shows all incorporated and unincorporated areas of the county were affected, and the recorded hail magnitude ranged from 0.75" to 1.75" and total recorded damage was $337,000.

Table A.29 – Hail Events 2000 to 2019 | Source: NCEI

Location	Date	Magnitude	Death	Injury	Property Damage	Crop Damage
Ethel	2/23/2019	1	-	-		
Kosciusko	8/12/2018	0.75	-	-		
Ethel	3/10/2018	1.5	-	-	20,000	
Wamba	3/10/2018	1	-	-		
Williamsville	11/29/2016	1	-	-		
Kosciusko	3/31/2016	0.75	-	-		
McAdams	3/31/2016	1	-	-		
Hesterville	3/3/2016	1	-	-		
Possumneck	4/2/2015	1.75	-	-	7,000	
Boyette	4/28/2014	1	-	-		
Possumneck	4/28/2014	1.75	-	-	100,000	
Williamsville	4/28/2014	0.75	-	-		
Hesterville	4/24/2014	0.88	-	-		
Williamsville	3/23/2013	0.88	-	-		
Hesterville	3/18/2013	0.75	-	-		
Williamsville	5/21/2012	1.75	-	-	25,000	
McCool	5/6/2012	1	-	-		
Ethel	6/24/2011	1	-	-	10,000	
McCool	6/16/2011	1	-	-	20,000	
Newport	4/20/2011	1.5	-	-		
Hesterville	4/15/2011	2	-	-		
McCool	4/15/2011	1	-	-		
Possumneck	4/15/2011	1.25	-	-		
Williamsville	11/29/2010	1	-	-		
Ethel	5/2/2010	2	-	-	1,000	
Kosciusko	5/2/2010	1	-	-		
McCool	5/2/2010	2.5	-	-	2,000	
Newport	5/2/2010	1.5	-	-		
Ethel	5/1/2010	0.75	-	-		
Williamsville	5/1/2010	1	-	-		
Ethel	4/23/2010	1	-	-		
McCool	4/23/2010	1	-	-		
Newport	4/23/2010	1	-	-		
Wamba	4/23/2010	1	-	-		
Williamsville	4/23/2010	1	-	-		
Hesterville	3/11/2010	1	-	-		
Possumneck	3/11/2010	0.88	-	-		
Hesterville	5/9/2009	0.75	-	-		
Boyette	5/2/2009	0.75	-	-		
Ethel	5/2/2009	0.75	-	-		
Hesterville	5/2/2009	1	-	-	+	
McCool	5/2/2009	0.75	-	-		
Possumneck	5/2/2009	0.88	-	-		
Kosciusko	2/27/2009	0.88	-	-		
Possumneck	12/9/2008	0.75	-	-		
Boyette	8/2/2008	0.88	-	-		
ETHEL	7/5/2008	1	-	-		
McAdams	7/5/2008	0.75	-	-		
Wamba	7/5/2008	0.75	-	-		
Hesterville	2/26/2008	0.75	-	-		

Location	Date	Magnitude	Death	Injury	Property Damage	Crop Damage
Boyette	1/10/2008	1	-	-		
Ethel	12/28/2007	1	-	-		
Hesterville	11/14/2007	0.88	-	-		
McCool	4/14/2007	0.75	-	-		
Sallis	4/14/2007	1.75	-	-	50,000	
Kosciusko	4/4/2007	0.75	-	-		
Sallis	4/4/2007	0.75	-	-		
Kosciusko	2/24/2007	0.75	-	-		
McCool	2/24/2007	0.75	-	-		
Hesterville	6/21/2006	1	-	-		
Ethel	5/10/2006	1	-	-		
Ethel	3/9/2006	1	-	-		
Sallis	2/3/2006	1.75	-	-	20,000	
Sallis	5/20/2005	0.88	-	-		
Newport	4/22/2005	1.25	-	-		
Hesterville	4/11/2005	1.75	-	-	15,000	
Sallis	4/11/2005	1	-	-		
Hesterville	4/6/2005	0.75	-	-		
Kosciusko	4/6/2005	0.88	-	-		
Kosciusko	3/22/2005	0.88	-	-		
Ethel	10/19/2004	1.75	-	-		
McCool	10/19/2004	0.88	-	-		
Hesterville	4/29/2004	0.75	-	-		
Kosciusko	8/12/2003	0.88	-	-	1,000	
Ethel	7/13/2003	0.88	-	-	1,000	
McCool	5/3/2003	1	-	-	1,000	
Kosciusko	4/24/2003	0.75	-	-		
Kosciusko	11/10/2002	0.75	-	-		
Kosciusko	11/10/2002	1	-	-		
Kosciusko	11/10/2002	1	-	-		
McAdams	10/11/2001	0.75	-	-		
Kosciusko	6/5/2001	1.75	-	-	12,000	
Kosciusko	5/27/2001	0.75	-	-		
Kosciusko	5/27/2001	1.25	-	-	15,000	
Kosciusko	5/27/2001	1.75	-	-	25,000	
Possumneck	5/27/2001	0.88	-	-		
Kosciusko	4/4/2001	0.75	-	-	6,000	
Kosciusko	4/4/2001	1	-	-		
McAdams	4/4/2001	0.75	-	-		
Sallis	4/4/2001	0.75	-	-		
Sallis	2/16/2001	1.75	-	-	5,000	
Kosciusko	11/8/2000	0.75	-	-		
Kosciusko	8/25/2000	0.88	-	-		
Totals					$337,000	

Historic data for severe wind events shows they occur with great frequency in all incorporated and unincorporated sections of the county. While agricultural damage was reported in one instance, events primarily create general property damage.

Table A.30– Severe Wind Events 2000 to 2019 | Source: NCEI -- Note: Magnitude figure – (Nautical) Knots Per Hour

Location	Date	Event Type	Magnitude	Deaths	Injury	Property Damage	Crop Damage
Possumneck	6/19/2019	Thunderstorm Wind	56	-	-	60,000	-
McCool	4/13/2019	Thunderstorm Wind	50	-	-	10,000	-
McAdams	4/6/2019	Thunderstorm Wind	60	-	-	30,000	-
Newport	2/23/2019	Thunderstorm Wind	50	-	-	2,000	-
Kosciusko	1/19/2019	Thunderstorm Wind	50	-	-	3,000	-
Williamsville	1/19/2019	Thunderstorm Wind	50	-	-	10,000	-
Ethel	12/31/201	Thunderstorm Wind	50	-	-	3,000	-
McAdams	12/27/201	Thunderstorm Wind	50	-	-	6,000	-
McCool	11/1/2018	Thunderstorm Wind	50	-	-	3,000	-
McCool	11/1/2018	Thunderstorm Wind	50	-	-	3,000	-
Boyette	7/21/2018	Thunderstorm Wind	54	-	-	25,000	-
Hesterville	7/16/2018	Thunderstorm Wind	43	-	-	3,000	-
Kosciusko Airport	7/16/2018	Thunderstorm Wind	46	-	-	2,000	-
McAdams	7/16/2018	Thunderstorm Wind	50	-	-	2,000	-
Ethel	7/6/2018	Thunderstorm Wind	53	-	-	15,000	-
Kosciusko	7/6/2018	Thunderstorm Wind	50	-	-	5,000	-
Sallis	4/6/2018	Thunderstorm Wind	50	-	-	5,000	-
Kosciusko	4/3/2018	Thunderstorm Wind	52	-	-	20,000	-
Ethel	2/7/2018	Thunderstorm Wind	50	-	-	3,000	-
Ethel	2/7/2018	Thunderstorm Wind	50	-	-	25,000	-
	8/31/2017	Strong Wind	48	-	-	15,000	-
McAdams	4/30/2017	Thunderstorm Wind	55	-	-	25,000	-
Ethel	4/26/2017	Thunderstorm Wind	52	-	-	10,000	-
McAdams	4/22/2017	Thunderstorm Wind	50	-	-	5,000	-
Possumneck	11/28/201	Thunderstorm Wind	52	-	-	20,000	-
Wamba	8/9/2016	Thunderstorm Wind	43	-	-	500	-
Hesterville	8/5/2016	Thunderstorm Wind	50	-	-	12,000	-
Kosciusko Airport	6/17/2016	Thunderstorm Wind	52	-	-	12,000	-
Kosciusko	6/17/2016	Thunderstorm Wind	50	-	-	4,000	-
McCool	4/11/2016	Thunderstorm Wind	50	-	-	15,000	-
McAdams	3/31/2016	Thunderstorm Wind	50	-	-	5,000	-
Kosciusko Airport	3/10/2016	Thunderstorm Wind	50	-	-	2,000	-
Ethel	2/23/2016	Thunderstorm Wind	50	-	-	5,000	-
Kosciusko	2/23/2016	Thunderstorm Wind	50	-	-	5,000	-
Ethel	12/28/201	Thunderstorm Wind	50	-	-	3,000	-
Williamsville	12/13/201	Thunderstorm Wind	43	-	-	4,000	-
	7/15/2015	Thunderstorm Wind	50	-	-	4,000	-
Ethel	6/10/2015	Thunderstorm Wind	45	-	-	1,000	-
Ethel	4/25/2015	Thunderstorm Wind	50	-	-	2,000	-
McCool	10/13/201	Thunderstorm Wind	50	-	-	750	-
Williamsville	6/9/2014	Thunderstorm Wind	57	-	-	100,000	-
Ethel	4/24/2014	Thunderstorm Wind	50	-	-	2,000	-
McCool	4/24/2014	Thunderstorm Wind	55	-	-	35,000	-
Possumneck	4/24/2014	Thunderstorm Wind	50	-	-	2,000	-
Newport	4/14/2014	Thunderstorm Wind	50	-	-	3,000	-
Newport	6/1/2013	Thunderstorm Wind	53	-	-	-	-
McAdams	2/10/2013	Thunderstorm Wind	50	-	-	2,000	-
Ethel	1/30/2013	Thunderstorm Wind	50	-	-	3,000	-
Kosciusko	12/20/201	Thunderstorm Wind	50	-	-	1,000	-
Kosciusko	8/13/2012	Thunderstorm Wind	50	-	-	10,000	-
Hesterville	6/11/2012	Thunderstorm Wind	50	-	-	1,000	-

Location	Date	Event Type	Magnitude	Deaths	Injury	Property Damage	Crop Damage
Sallis	4/2/2012	Thunderstorm Wind	50	-	-	2,000	-
Hesterville	4/27/2011	Thunderstorm Wind	50	-	-	-	-
	4/26/2011	High Wind	60	-	-	150,000	100,000
Hesterville	4/20/2011	Thunderstorm Wind	50	-	-	-	-
Wamba	4/20/2011	Thunderstorm Wind	53	-	-	3,000	-
Kosciusko	2/24/2011	Thunderstorm Wind	50	-	-	3,000	-
Newport	12/11/201	Thunderstorm Wind	55	-	-	2,000	-
Newport	8/15/2010	Thunderstorm Wind	50	-	-	-	-
Kosciusko	8/5/2010	Thunderstorm Wind	53	-	-	10,000	-
Hesterville	7/25/2010	Thunderstorm Wind	53	-	-	1,000	-
McAdams	6/18/2010	Thunderstorm Wind	52	-	-	-	-
Williamsville	8/3/2009	Thunderstorm Wind	50	-	-	9,000	-
Ethel	7/30/2009	Thunderstorm Wind	55	-	-	-	-
Wamba	7/30/2009	Thunderstorm Wind	55	-	-	-	-
Kosciusko	6/23/2009	Thunderstorm Wind	60	-	-	20,000	-
Hesterville	5/6/2009	Thunderstorm Wind	65	-	-	200,000	-
Kosciusko	5/6/2009	Thunderstorm Wind	56	-	-	10,000	-
Weeks	5/6/2009	Thunderstorm Wind	60	-	-	35,000	-
Possumneck	5/2/2009	Thunderstorm Wind	52	-	-	-	-
	4/12/2009	High Wind	50	-	-	15,000	-
Sallis	12/9/2008	Thunderstorm Wind	65	-	-	60,000	-
Ethel	8/2/2008	Thunderstorm Wind	58	-	-	50,000	-
Ethel	7/5/2008	Thunderstorm Wind	53	-	-	-	-
Newport	4/4/2008	Thunderstorm Wind	53	-	-	-	-
Ethel	2/6/2008	Thunderstorm Wind	65	-	-	10,000	-
Kosciusko Airport	1/10/2008	Thunderstorm Wind	61	-	-	-	-
Sallis	1/10/2008	Thunderstorm Wind	78	-	-	300,000	-
Newport	7/12/2007	Thunderstorm Wind	50	-	-	-	-
Hesterville	6/19/2007	Thunderstorm Wind	50	-	-	-	-
Kosciusko	6/19/2007	Thunderstorm Wind	50	-	-	15,000	-
McCool	6/19/2007	Thunderstorm Wind	55	-	-	6,000	-
Sallis	6/19/2007	Thunderstorm Wind	55	-	-	6,000	-
Weeks	6/18/2007	Thunderstorm Wind	50	-	-	-	-
Ethel	4/14/2007	Thunderstorm Wind	60	-	-	10,000	-
Kosciusko	2/24/2007	Thunderstorm Wind	50	-	-	1,000	-
Hesterville	1/5/2007	Thunderstorm Wind	50	-	-	5,000	-
Kosciusko	11/15/200	Thunderstorm Wind	52	-	-	-	-
Hesterville	10/16/200	Thunderstorm Wind	50	-	-	-	-
Sallis	7/19/2006	Thunderstorm Wind	50	-	-	2,000	-
Kosciusko	3/9/2006	Thunderstorm Wind	50	-	-	-	-
Kosciusko	3/9/2006	Thunderstorm Wind	70	-	-	300,000	-
McCool	9/25/2005	Thunderstorm Wind	50	-	-	-	-
Sallis	5/20/2005	Thunderstorm Wind	60	-	-	100,000	-
Kosciusko	4/6/2005	Thunderstorm Wind	62	-	-	25,000	-
Kosciusko	1/13/2005	Thunderstorm Wind	55	-	-	10,000	-
McCool	1/13/2005	Thunderstorm Wind	55	-	-	10,000	-
McCool	12/7/2004	Thunderstorm Wind	57	-	-	5,000	-
Countywide	6/27/2004	Thunderstorm Wind	55	-	-	5,000	-
Kosciusko	6/27/2004	Thunderstorm Wind	60	-	-	5,000	-
Kosciusko	5/31/2004	Thunderstorm Wind	60	-	-	80,000	-
Kosciusko	3/5/2004	Thunderstorm Wind	58	-	-	3,000	-
Countywide	8/27/2003	Thunderstorm Wind	50	-	-	1,000	-

Location	Date	Event Type	Magnitude	Deaths	Injury	Property Damage	Crop Damage
Ethel	8/27/2003	Thunderstorm Wind	50	-	-	5,000	-
Kosciusko	8/12/2003	Thunderstorm Wind	53	-	-	30,000	-
Kosciusko	8/6/2003	Thunderstorm Wind	50	-	-	2,000	-
Kosciusko	8/2/2003	Thunderstorm Wind	53	-	-	15,000	-
Countywide	7/17/2003	Thunderstorm Wind	50	-	-	5,000	-
Countywide	6/2/2003	Thunderstorm Wind	55	-	-	10,000	-
Ethel	6/2/2003	Thunderstorm Wind	50	-	-	15,000	-
Kosciusko	6/2/2003	Thunderstorm Wind	50	-	-	5,000	-
WAMBA	6/2/2003	Thunderstorm Wind	55	-	-	100,000	-
Kosciusko	5/17/2003	Thunderstorm Wind	50	-	-	10,000	-
Kosciusko	11/10/200	Thunderstorm Wind		-	-	2,500	-
Kosciusko	11/10/200	Thunderstorm Wind	60	-	-	-	-
Kosciusko	11/10/200	Thunderstorm Wind		-	-	3,000	-
Kosciusko	11/10/200	Thunderstorm Wind	60	-	-	-	-
Kosciusko	11/10/200	Thunderstorm Wind		-	-	2,000	-
Countywide	10/3/2002	Thunderstorm Wind		-	-	2,500	-
Kosciusko	5/17/2002	Thunderstorm Wind		-	-	1,000	-
Kosciusko	5/3/2002	Thunderstorm Wind		-	-	1,000	-
McCool	1/24/2002	Thunderstorm Wind		-	-	1,000	-
Ethel	11/29/200	Thunderstorm Wind		-	-	25,000	-
Kosciusko	10/11/200	Thunderstorm Wind		-	-	3,000	-
McAdams	10/11/200	Thunderstorm Wind		-	-	1,000	-
Kosciusko	8/20/2001	Thunderstorm Wind		-	-	1,000	-
Possumneck	6/4/2001	Thunderstorm Wind		-	-	1,000	-
Kosciusko	5/27/2001	Thunderstorm Wind		-	-	1,000	-
Countywide	2/16/2001	Thunderstorm Wind		-	-	1,200,000	-
	12/16/200	High Wind		-	-	3,000	-
Sallis	8/25/2000	Thunderstorm Wind		-	-	2,000	-
Kosciusko	8/9/2000	Thunderstorm Wind		-	-	5,000	-
Countywide	5/27/2000	Thunderstorm Wind		-	-	5,000	-
Kosciusko	5/27/2000	Thunderstorm Wind		-	-	3,000	-
Kosciusko	4/3/2000	Thunderstorm Wind		-	-	8,000	-
Totals						$3,481,250	$100,00

Probability of Future Occurrences

Historic NCEI data suggests a there is a 5.2% of a lightning event annually since there has been one event in a 19-year period. Hail and severe wind events have also occurred annually, and often more than once in a given year, so there is a 100% probability of these events occurring annually.

Assessing Vulnerability

Severe weather events are non-special and may occur anywhere in the county. They caused total damages of $3,998,250. There were no deaths or injuries, and the dollar value for most events is relatively low. As such, the county is ranked as having medium vulnerability to severe weather

Impact on Life and Property: Severe storms (high wind, hail, and lightning) do not affect one geographical section of the County, but hail and heavy rain associated with such events would particularly impact the agricultural community. Critical county infrastructure is unlikely to be affected by this hazard.
Attala County's entire population is considered at medium risk to severe weather because there are

many events, but the level of damage per event is lower than for an event as potentially deadly as a tornado or hurricane. Those living in rural areas and special populations, such as those living in mobile homes, the elderly and disabled, may be most vulnerable.

Maps on the next two pages show a sampling of historic hail and severe wind events that have crossed the county.

Figure A.10 - Sample of Historic Hail Events | Source: NCEI

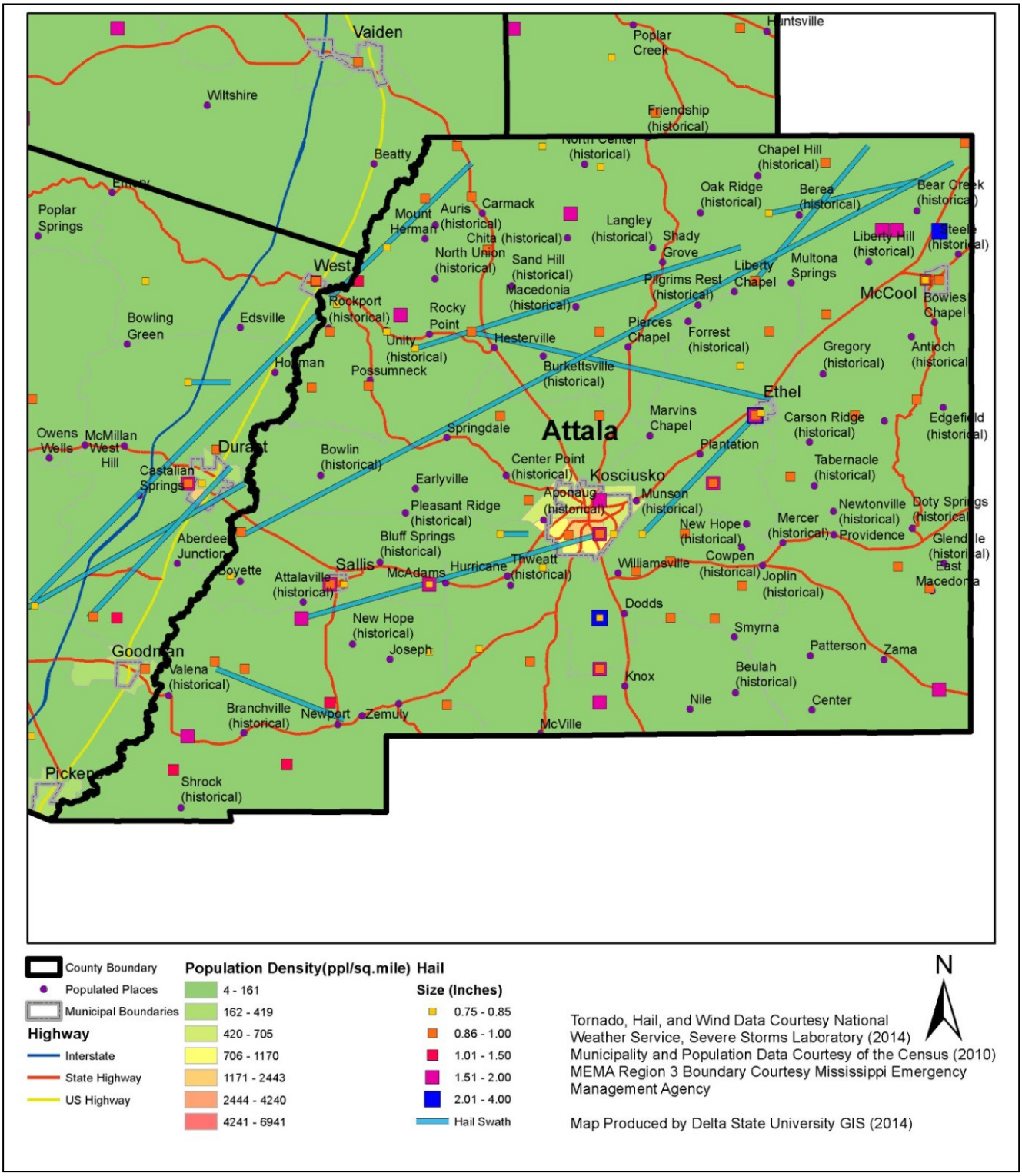
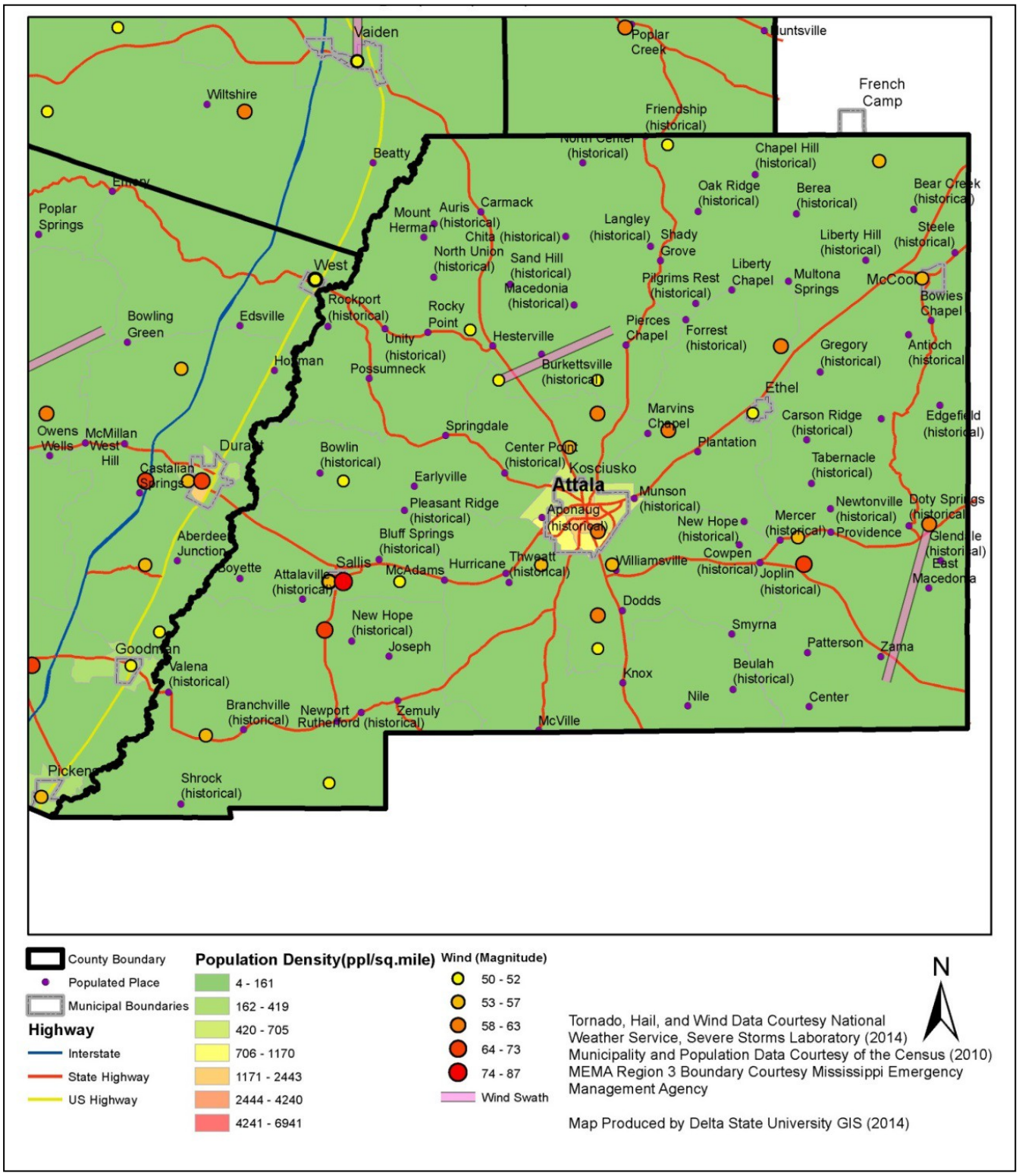


Figure A.11 - Sample of Historic Severe Wind Events | Source: NCEI



Severe Winter Weather

Location and Extent

Because they represent a non-special hazard, all geographic sectors of Attala County are susceptible to severe winter storm events. The extent of impact can include prolonged power outages and potential energy shortages. Severe winter weather may affect business operations, causing them to lose income. The same is true for workers, who may be unable to navigate roadways to travel to work or may lose hours if their workplace is closed due to loss of power. Ice buildup on roads and bridges creates dangerous driving conditions. When ice accumulates on power lines and trees, they can be pulled down from the weight of the ice. Heavy snow has been known to cause roof cave ins. Those who are elderly and disabled, and people with limited mobility, are vulnerable during severe winter weather events. Measures should be taken to ensure they are safe and warm.

Previous Occurrences

Table A.31 shows there have been 15 severe winter storm events recorded in Attala County between the years 2000 and 2019. These events include hazards such as sleet, cold/wind chill, heavy snow, and ice storm.

Table A.31 – Severe Winter Weather Events 2000 to 2019 | Source: NCEI

Date	Type	Death	Injury	Property Damage	Crop Damage
1/16/2018	Heavy Snow	-	-	10,000.00	-
12/8/2017	Winter Weather	-	-	-	-
3/5/2015	Sleet	-	-	-	-
2/25/2015	Heavy Snow	-	-	-	-
1/16/2013	Heavy Snow	-	-	-	-
2/9/2011	Heavy Snow	-	-	300,000.00	-
2/3/2011	Ice Storm	-	-	300,000.00	-
1/9/2011	Ice Storm	-	-	20,000.00	-
2/11/2010	Heavy Snow	-	-	50,000.00	-
1/7/2010	Winter Storm	-	-	3,000.00	-
1/1/2010	Cold/Wind Chill	-	-	150,000.00	-
3/1/2009	Winter Weather	-	-	-	-
3/7/2008	Heavy Snow	-	-	-	-
2/20/2006	Ice Storm	-	-	300,000.00	-
1/27/2000	Heavy Snow	-	-	20,000.00	-
Totals				$1,153,000	

The most severe winter storm event to impact the county was recorded in December 1998, when an ice storm struck the three-state region of Arkansas, Louisiana, and Mississippi just before Christmas. The NWS reported total estimated cost of damage in the region ranging from southeast Arkansas through central Mississippi was $23 million dollars, with most damage attributable to downed power lines and trees. Many counties were declared federal disaster areas, and homes and businesses were without electricity for weeks. Carroll County, along with seven other MEMA District 3 counties, was covered under federal declaration DR-1265, which covered the period December 23-26, 1998. Only Holmes County in District 3 was not covered by the declaration.

Probability of Future Occurrences

There were severe winter weather events in ten of the 19 years studied, which suggests there is a 52% chance of an occurrence in any given year. The region may experience an event several years in a row, but then not experience one for several years. No events occurred between the years 2000 and 2006, but events occurred each year between 2008 and 2011.

Assessing Vulnerability

Community assets at risk from a winter storm include the electrical and telephone utility systems and tree coverage and canopy. Vehicular accidents from icy conditions could cause injury, property damage, or death. Ice-laden tree limbs can fall, causing property damage. A hard freeze may also result in decreased water pressure as frozen and damaged pipes thaw and leak. Winter storms impact the entire community. Among essential services, critical facilities and infrastructure likely to be affected are the public safety on roadways and electric, telephone and water services.

The Mississippi Economic Development Council produced figures in March 2020 showing there were ten Attala County workers employed in the agriculture, forestry, fishing and hunting sector; ten employed in the mining sector; and 360 in the construction sector. Workers such as these, who spend a great deal of time outdoors, are most likely to be affected by severe winter weather.

Populations at Risk: The homeless, the elderly, young children, and those with chronic health conditions need protection from severe winter weather. Near-freezing temperatures, combined with strong wind, can cause hypothermia, illness, and death.

Property Damage: This hazard has caused roofs to cave in, trees to fall on houses, and prolonged power outages. It can create dangerous driving conditions. NCEI data shows three storms occurring during the study period each caused as much as $300,000 in damages. Over $1 million in total damages was incurred during the described 19-year period.

Critical Facilities and Essential Services: Essential services are not likely to be significantly impacted by a winter storm. Generators have been installed at most critical and essential facilities to ensure that continuity of electricity for dispatch and emergency services.

Transportation Systems: Some major transportation services could be temporarily interrupted should icing occur. Those include bridges and overpasses on the Natchez Trace Parkway, Highway's 12, 19, 35, 43, and other roads countywide.

Lifeline Utility Systems: The most likely lifeline utility system to be affected by a winter storm would be electric power, telephone and water line service. Power interruption could be anticipated by rural water systems without generators until power is restored.

Tornado

Location and Extent

Mississippi consistently ranks in the top 10 states with the most tornadoes in the nation. Event damages listed below show that even an EF1 magnitude tornado can cause millions of dollars in damage. Tornado is a non-spacial hazard, meaning that all jurisdictions in the county are equally likely to experience an event. Of particular concern are persons who reside in a mobile/manufactured home, the elderly and disabled. According to the 2010 Census, there are approximately 2,091 mobile/ manufactured housing units -- structures at high risk to wind events of any type. These units represent 22.7% of the housing stock in Attala County.

Previous Occurrences

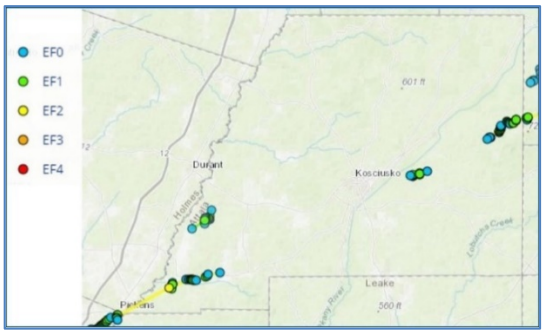
NCEI recorded 25 tornadoes for Attala County between the years 2000 and 2019. They are summarized below in Table A.33. The table is followed by a discussion of events mapped by the Jackson, MS office of the National Weather Service as having taken place in the year 2020. The table also includes two Funnel Cloud events because they are included in NCEI data results. A funnel cloud looks like a tornado from a distance, but the bottom of the vortex does not touch the ground.

Table A.33 – Tornado Events 2000 to 2019 | Source: NCEI

Location	Date	Event	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Bolatushue	12/29/2019	Tornado	EF0	0	0	2,000	-
Ethel	12/29/2019	Tornado	EF1	0	0	75,000	-
Kosciusko Airport	12/29/2019	Tornado	EF1	0	0	10,000	-
Newport	12/29/2019	Tornado	EF1	0	0	25,000	-
Hesterville	4/13/2019	Tornado	EF1	0	0	10,000	-
Possumneck	3/28/2018	Tornado	EF1	0	0	30,000	-
Possumneck	4/30/2017	Tornado	EF1	0	0	60,000	-
Ethel	4/28/2014	Tornado	EF2	0	0	100,000	-
Ethel	4/27/2011	Tornado	EF1	0	0	25,000	-
Sallis	4/27/2011	Tornado	EF2	0	0	550,000	250,000
Hesterville	4/15/2011	Tornado	EF0	0	0	-	1,000
Possumneck	4/15/2011	Tornado	EF2	0	2	35,000	-
Boyette	1/1/2011	Tornado	EF3	0	2	3,000,000	2,000,000
Newport	11/29/2010	Tornado	EF3	0	6	900,000	200,000
Boyette	4/24/2010	Tornado	EF2	0	0	60,000,000	4,000,000
Boyette	12/9/2008	Tornado	EF1	0	0	300,000	-
Boyette	1/10/2008	Tornado	EF1	0	0	20,000	150,000
Ethel	1/10/2008	Tornado	EF3	0	0	1,000,000	500,000
Kosciusko	9/25/2005	Tornado	F0	0	0	50,000	15,000
Kosciusko	9/24/2005	Funnel		0	0	-	-
Kosciusko	9/24/2005	Funnel		0	0	-	-
Ethel	12/7/2004	Tornado	F0	0	0	20,000	-
Boyette	11/10/2002	Tornado	F2	0	0	15,000	-
Kosciusko	11/10/2002	Tornado	F2	0	0	20,000	-
Sallis	10/11/2001	Tornado	F0	0	0	1,000	-
Totals:				0	10	$66,248,000	$7,116,000

In addition to the events listed above, NWS includes on its web site a map that shows the path of tornadoes that took place in the year 2020. The Attala County segment of this map is shown below, and it indicates several tornadoes have occurred since January 2020.

Figure A.12 - 2020 Attala County Tornado Events |
Source: National Weather Service



Of recent local importance is the series of tornadoes that struck the Southeastern states over the weekend of April 10-12, 2020, referred to as the Easter Weekend Tornado. The NCEI database does not show any damage estimates for Attala County as a result of this event. Other events occurring in Attala County are illustrated in the maps and discussion that follows.

Figure A.13 - New Year's Day 2011 Attala County Tornado

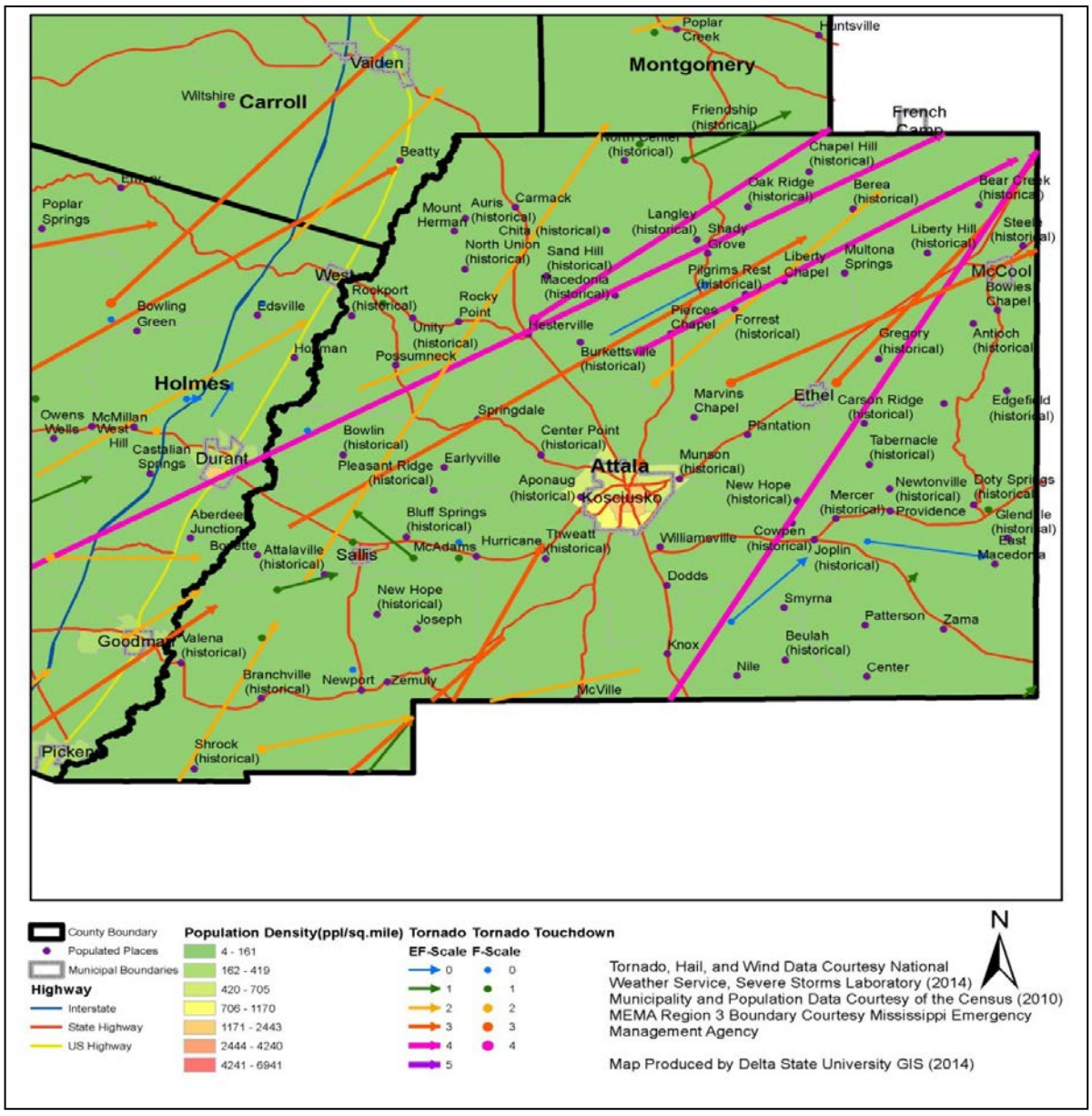
January 1, 2011 - The tornado began in the vicinity of State Highway 12E southeast of Durant (in Holmes County). It moved east-northeast to northeast, initially producing damage of EF1 intensity to trees, and damaging the roof of at least one home. As the tornado approached State Highway 19, it intensified and began causing extensive tree damage, snapping and uprooting hundreds of trees. After crossing highway 19, it caused extensive damage to a church conference center, heavily damaging the roof of the main church building and causing major damage to several camp buildings. In this area, the tornado also caused significant roof damage to several homes and destroyed a number of outbuildings.

From here, the tornado continued east northeast, continuing to cause major tree damage as it crossed state Highway 35 at Hesterville. As a wide, strong tornado moving through a heavily forested area, this tornado was a major destroyer of timber, snapping or uprooting thousands of trees. The tornado eventually weakened and dissipated to the north of Ethel.

Figure A.14 - April 15, 2011 Possumneck Tornado

April 15, 2011 - A strong tornado touched down along County Road 3011 in the Possumneck community and created significant damage. A mobile home was completely obliterated, with the remains of the structure scattered for 150 yards. Two men were seriously injured after each was picked up by the wind and thrown 75 yards. The tornado continued to the northeast and crossed MS Highway 19 before lifting. Numerous trees were snapped and uprooted along the path. The total path length was 3 miles. As a side note, this tornado occurred within the damage path of a long track tornado that occurred on April 24, 2010.

Figure A.15 - Sample Historical Tornado Events | Source: NCDC



Probability of Future Occurrences

NCEI data shows tornado events have occurred in 11 of the 19 years being studied as part of this mitigation planning process. This suggests there is roughly a 58% chance Attala County will be affected by a tornado in any given year. Equally likely is the possibility more than one such event will occur within proximity to others – proximity in terms of time and geography.

Assessing Vulnerability

Although technology and warning system capabilities have improved significantly in recent years, tornadoes can still occur with little or no warning, and cause severe destruction, personal injury, and possible loss of life. The list of affected communities included in Table A.33 shows the entire county is vulnerable to tornado impacts. Particularly vulnerable are those living in mobile/manufactured housing units, as previously discussed. The Attala County Emergency Management Department recognizes

the degree to which its population is vulnerable to tornado and other severe weather events and has included a mitigation action worksheet in this Annex that discusses its interest in building additional safe rooms.

Impacts to Life and Property: Perhaps most vulnerable to this hazard are those population segments consisting of (elderly, disabled, and poor) who may not have the ability to seek shelter in a timely manner. Older frame houses and mobile homes are particularly vulnerable to tornadoes. represents 22.7% of total housing units. If other structures are not built to withstand high winds, roof damage or roof failure may occur. Mobile homes should be firmly anchored to a foundation or the force of tornado winds may lift and overturn the structure. Severely damaged mobile homes may not be later habitable.

Impacts to Natural Resources: Tree canopy and decorative vegetation are subject to tornado damage. Tornado winds are strong enough to uproot trees and vegetation and deposit the debris in standing water, which could result in pollution. Wildlife and farm animals standing in open lands are not likely to survive a tornado and may be carried to distant ground or deposited in a body of water, which creates a pollution problem. Streams can become clogged with windblown debris and downed trees, causing flooding. If debris is not removed from vacant land it could become a threat to health and safety, create a fire hazard, or create a haven for unwanted vermin or pests.

Impacts to Critical Facilities: A tornado may affect any critical facility or infrastructure. The County and its municipalities require all new buildings and infrastructure, such as water tanks and towers, be built to high wind-resistant standards. All public and essential service buildings in Attala County are still at risk from a direct tornado strike, but there is nothing to indicate those buildings are more vulnerable than any other buildings in the area. Given the unpredictable nature of tornadoes and high damage potential, it is essential to designate safe rooms in all public and essential service buildings.

Tropical Storm / Hurricane

Location and Extent

While Attala County is situated over 200 miles from the Mississippi Gulf Coast, the area is vulnerable to the effects of tropical storms/hurricanes that make landfall and continue to inland away from the coast. Storms moving inland have been known to produce violent winds, torrential rains, tornadoes, and flash flooding. Damage levels may be significant or low, depending on the hurricane path and whether it picks up strength before reaching land.

Previous Occurrences

Two storms documented by the National Weather Service are listed in Table A.34. They were included in the 2015 MEMA District 3 RHMP and records indicate no subsequent events have affected the region. Hurricane Katrina caused substantial damage to all 82 Mississippi counties.

Table A.34 – Tropical Storm / Hurricane Events 2000 to 2019 | Source: NCEI

Event Name	Date	Death	Injury	Property Damage	Crop Damage
Hurricane Katrina	8/29/2005	-	-	50,000,000	20,000,000
Hurricane Lily	10/3/2002	-	-	-	-
Total		0	0	$50,000,000	$20,000,000

Probability of Future Occurrence

Based on past events, the probability of tropical storm events is classified as low. Two events occurred in the past 19 years which, yields a 10.5% probability of an event occurring in a given year. While climate change may increase the number and ferocity of hurricane events making landfall, the fact remains that no other events are documented for the period since NCEI began keeping records in the year 1950.

Assessing Vulnerability

Hurricanes affecting the Gulf Coast usually lose strength after making landfall. They generally move northward without hurricane force winds impacting inland counties. However, due to the speed, size, and magnitude of the storm, the County could still be affected by strong winds not designated at the hurricane level, or 64 miles per hour. The entire population is at risk to tropical storms and hurricanes. Damage may occur as a of hurricane-spawned tornadoes and flooding from heavy rain.

Table A.35 includes the most recently available data secured from a HAZUS run for tropical storm/ hurricane events to evaluate the potential economic losses for Attala County.

Table A.35 – Direct Economic Losses for Buildings Annualized Losses | Source: 2018 State of Mississippi SHMP

Capital Stock Losses				Income Losses				
Cost Building Damage	Cost Contents Damage	Inventory Loss	Loss Ratio %	Relocation Loss	Capital Related Loss	Wages Loss	Rental Income Loss	Total Loss
$52,000	$18,000	0	.01	$4,000	0	0	$1,000	$75,000

The greatest threat to life and property in Attala County would occur in a Category 5 Hurricane directly striking the coastline of Harrison County, Hancock County, St. Bernard Parish, or Plaquemine Parish, Louisiana. A strike at these locations could place Attala County, located approximately 200 miles north, directly in the path of the highest winds and heaviest rain bands produced by such a storm.

Impacts to People and Property: Healthy and frail populations are all vulnerable to the effects of a hurricane in an area such as Attala County, where trees may fall on homes, businesses, crops, and people. In addition to concern about those living in mobile homes, those living in substandard housing are susceptible to the hazard if their structures are unable to withstand high winds. During a discussion of the Tornado hazard, it was mentioned that Attala County would like to build additional safe rooms for residents who may need to evacuate their homes in the event of a potentially deadly hazard event.

Impact on Critical Facilities: Properties at risk may include hospitals, nursing homes and housing likely to contain occupants who may not be sufficiently mobile to avoid death and injury during a flood or other emergency. Public safety facilities such as fire stations, vehicle and equipment storage facilities and emergency operations centers could also be at risk if not properly mitigated.

Impacts on Natural Resources: The most significant risk to natural resources in tropical storms and hurricanes in Attala County is damage to forests canopy and timberlands. Inland rivers and lakes can become clogged with wind-blown debris and trees, slowing recovery from a hurricane. Obstructions, if not removed can become a cause of flooding. Trees toppled onto the forest floor quickly become a target for infestation from insects that may spread to healthy trees. Water quality may suffer due to unwanted debris and vegetation blown in a hurricane. Potential debris from fallen trees can create fuel for wildfires when the area dries sufficiently to allow for burning through lightning or intervention by mankind. The Mississippi State Forest Commission, through proactive cutting and prescribed burns, ensures fallen trees and debris will not serve as fuel for wildfire. Where timber is a significant part of the economy, hurricane winds wreak havoc with growing trees, causing damage that lessens the quality of the timber and increases the likelihood of insect infestation.

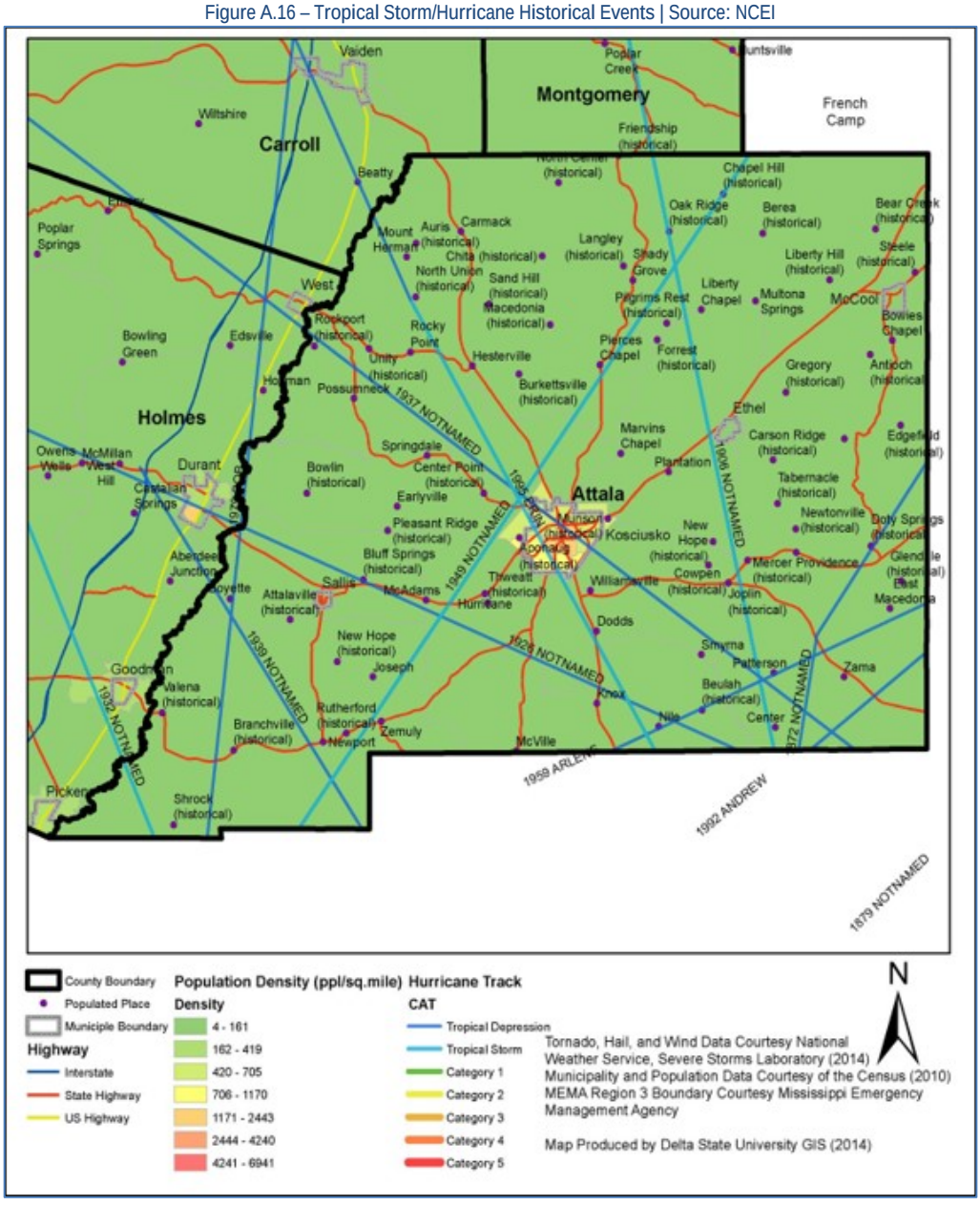
Impacts on Transportation Systems: Hurricane and/or high winds from tornadoes could result in power poles blown over or broken off onto roadways result in hazardous driving conditions until they can be cleared away. Overhead lines are energized until linemen are able to cut power to the lines, resulting in hazardous driving conditions. In heavily populated areas, lack of electricity causes traffic signals to fail, creating driving hazards. Rail traffic could be interrupted by damage to railroad lines caused by flooding and damage to bridges and overpasses.

Impact on Lifeline Utility Systems: It was mentioned that overhead electric and telephone lines may be damaged by downed trees and debris, or power poles and lines by hurricane force or tornado winds. In some instances, electric power may not be restored for many days or even weeks.
In the aftermath of Hurricane Katrina, the entire grid of Mississippi Power Company was affected and, in some areas, land lines for telephones were down for weeks or months. This situation affected electrical cooperatives such as Central Electric Power Association (Carthage, Mississippi), which serves a portion of rural Attala County.

The hurricane also damaged cell phone transmission towers and radio and television transmission towers, many of which were out of service due to electric power failure. Lack of electricity also left some water systems and sewage treatment plants unable to operate until generators could be brought in to restore partial power. Gas service to the City of Kosciusko and Ethel was not interrupted and residents with liquified petroleum (LP) storage tanks or natural gas were able to use this fuel for cooking and other needs.

To further demonstrate how tropical storms have penetrated inland over a longer period of time (since the 1959s), the map below shows the tracks Attala County hurricane crossings for roughly the past 70 years, although only the two events below are documented by NCEI.

Figure A.16 – Tropical Storm/Hurricane Historical Events | Source: NCEI



Wildfire

Location and Extent

The Attala County land area includes approximately 284,817 acres of forested land, which is equal to 60.4% coverage as a percent of total land area. County forestland data was derived from the 2019 Forestland Inventory conducted by Mississippi Forestry Commission's and is shown in the table below.

Table A.36 – 2019 Forestland Inventory | Source: www.mfc.ms.gov

	Total Land Area	Forestland			
County	(Acres)	Acres	Coverage (%)	Pine	Hardwood
Attala	471,597	284,817	60.4	49.1	41.3
Bolivar	279,658	86,465	30.9	0.0	100.0
Carroll	405,982	263,067	64.7	22.5	68.5
Holmes	488,932	197,380	40.3	15.1	84.8
Humphreys	275,892	30,268	10.9	0.0	100.0
Leflore	387,967	57,537	14.8	0.0	100.0
Montgomery	260,948	161,110	61.7	36.1	54.2
Sunflower	452,541	23,174	0.05	0.0	100.0
Washington	487,198	74,984	15.3	0.0	100.0

The Wildfire discussion in the Base Plan mentioned that an analysis of the change in total forestland area from the previous plan shows the total acreage and percent of coverage has continued on a declining trend in all MEMA District 3 counties, with Attala (-23.2%) and Holmes (-22.8%) Counties showing the greatest decline in forested land. The average loss of the other seven District 3 counties was 5.43 percent. Most forested land in the planning area is under private ownership.

Information provided by the Mississippi Forestry Commission indicates wildfires may occur during any season, but since 2012, the worst fires (determined by the number of acres burned) have occurred in late Summer and early Fall. Data presented in the table above also shows the potential for county-level differences in the total number of fires and acreage burned from year to year based on the percentage of forestland in the county.

Past wildfires have threatened and destroyed property. The next table shows the number of residences, commercial buildings and outbuildings, broken down by county, that have been threatened or destroyed since 2015. Attala County has seen 149 residences and four businesses threatened and three residences destroyed; 75 outbuildings were threatened and eight destroyed.

Table A.37 – Attala County Structures Threatened and or Destroyed by Wildfire Since 2015 | Source: Mississippi Forestry Commission

County	Residences Threatened	Residences Destroyed	Commercial Building Threatened	Commercial Building Destroyed	Outbuilding Threatened	Outbuilding Destroyed
Attala	**149**	**3**	**4**	**-**	**75**	**8**
Bolivar	-	-	-	-	-	-
Carroll	113	-	45	-	33	1
Holmes	116	-	3	-	98	2
Humphreys	-	-	-	-	0	-
Leflore	2	-	-	-	6	-
Montgomery	33	-	4	-	43	4
Sunflower	-	-	-	-	0	-
Washington	1	-	-	-	1	-
TOTALS	**414**	**3**	**56**	**-**	**256**	**15**

Fortunately for Attala County stakeholders, there is a strong fire protective services component between the local fire department and the presence of State forest rangers. These forces are strong and likely able to prevent most fires from reaching catastrophic levels.

Previous Occurrences

A combination of local weather, drought conditions, vegetative cover and topographic conditions may affect the development of wildfires. Documenting fire events is not consistent across the planning region with the local fire departments. The NOAA National Centers for Environmental Information (NCEI), Storm Events Database shows no reported wildfires by municipality in the fifty-nine years between January 1, 1960 and December 1, 2019 for any of the MEMA District 3 counties. All available wildfire data is on a county level.

Table A.38 captures wildfire data for each MEMA District 3 county for the period 2014 to 2019. Attala County data is highlighted.

Table A.38 – Wildfire Data 2014 to 2019 | Source: www.mfc.ms.gov

County	2019		2018		2017		2016		2015		2014	
	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned
Attala	28	782	21	392	38	468	59	1,170	52	597	32	187
Bolivar							1	80				
Carroll	5	18	4	32	13	172	24	387	24	268	16	83
Holmes	13	87	15	522	27	532	39	432	43	441	36	486
Humphreys												
Leflore	-	-	-	-	-	-	1	22	6	150	-	-
Montgomery	4	34	-	-	1	7	14	139	12	154	8	135
Sunflower	-	-	-	-	-	-	1	-	-	-	-	-
Washington	1	5	-	-	1	32	-	-	1	8	1	40

Information provided by the Mississippi Forestry Commission indicates that wildfires may occur during any season; however, since 2012 the worst fires (determined by acres burned) have occurred in late Summer and early Fall. The data presented in table above also indicates the differences in total fires and acreage burned from year to year and county to county.

Probability of Future Occurrences

Table A.39 below shows the number of fires and acres burned each year between 2014 and 2019, along with mean and median averaged for each.

Table A.39 – Mean and Median Averages for Attala County, Number of Fires and Acres Burned | Source: Mississippi Forestry Commission

Total Fires	2019	2018	2017	2016	2015	2014	Total	Mean	Median
Total Fires	28	21	38	59	52	32	230	38	11
Acres Burned	782	392	468	1,170	597	187	960	160	491

Excluding the outliers, the median number of events (38) falls in the middle where a cluster of figures range between 21 and 59 events annually. It has been stated it is difficult to develop probability of wildfire occurrence due to the range of elements that "set the stage" for a wildfire to occur. Looking at historical data for Attala County and selecting the lowest figures, it can be stated that in any given year there is a potential for at least 21 fires to develop and for these fires to burn 187 acres.

Assessing Vulnerability

Wildfires pose a threat to all areas of Attala County, where just over 60% of acreage is forestland. Current mitigation of the fire hazard includes regular thinning of vegetative fuel, but the County Emergency Management Department works closely with County and local fire departments to educate the public about issues such as backyard burning that can lead to wildfire. Figures A.17a through A.17e are screen shots from the web site of the Southern Wildfire Risk website established by the Southern Group of State Foresters (www.southernwildfirerisk.com). The images show the overall risk of Attala County and its jurisdictions located in the Wildfire Urban Interface (WUI).

Figure A.17a: Jurisdictional Wildfire Vulnerability- Attala County | Source: Southern Wildfire Risk

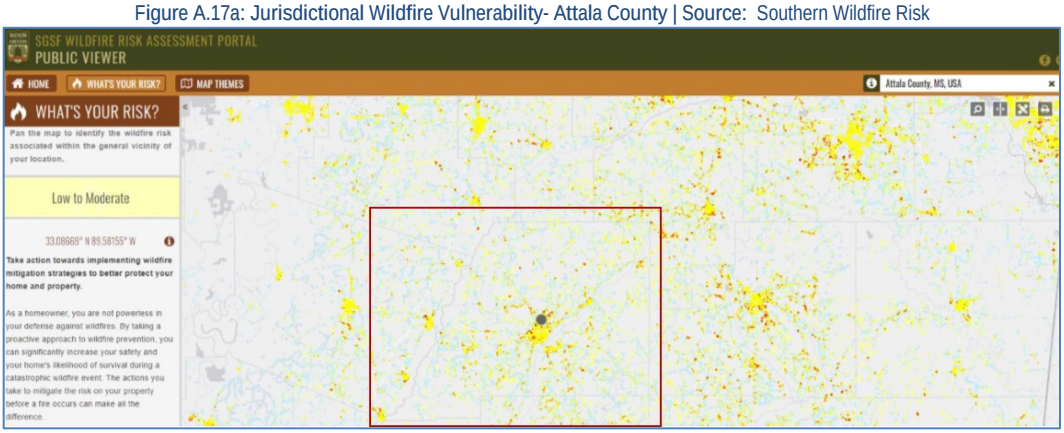


Figure A.17b: Jurisdictional Wildfire Vulnerability- Town of Ethel | Source: Southern Wildfire Risk

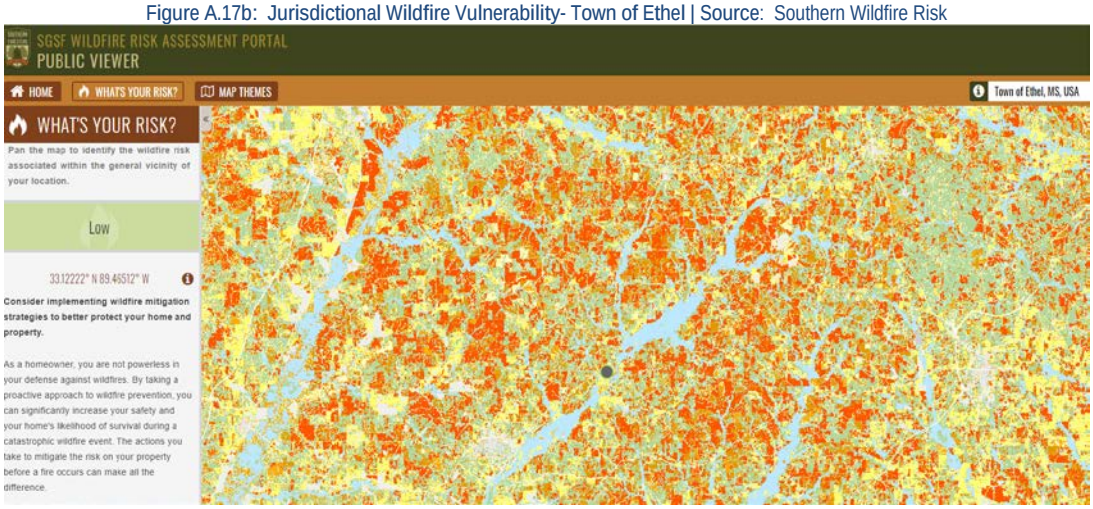


Figure A.17c: Jurisdictional Wildfire Vulnerability- City of Kosciusko | Source: Southern Wildfire Risk

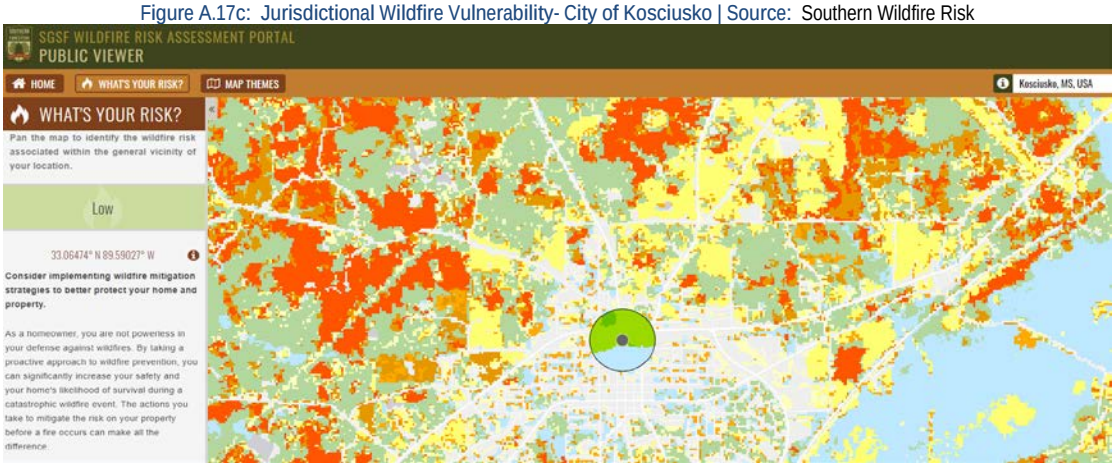


Figure A.17d: Jurisdictional Wildfire Vulnerability- Town of McCool | Source: Southern Wildfire Risk

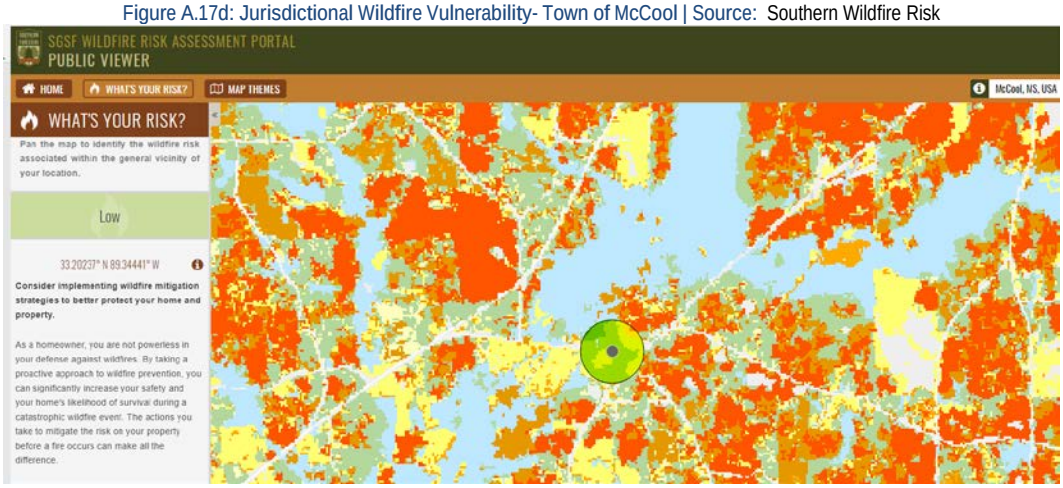
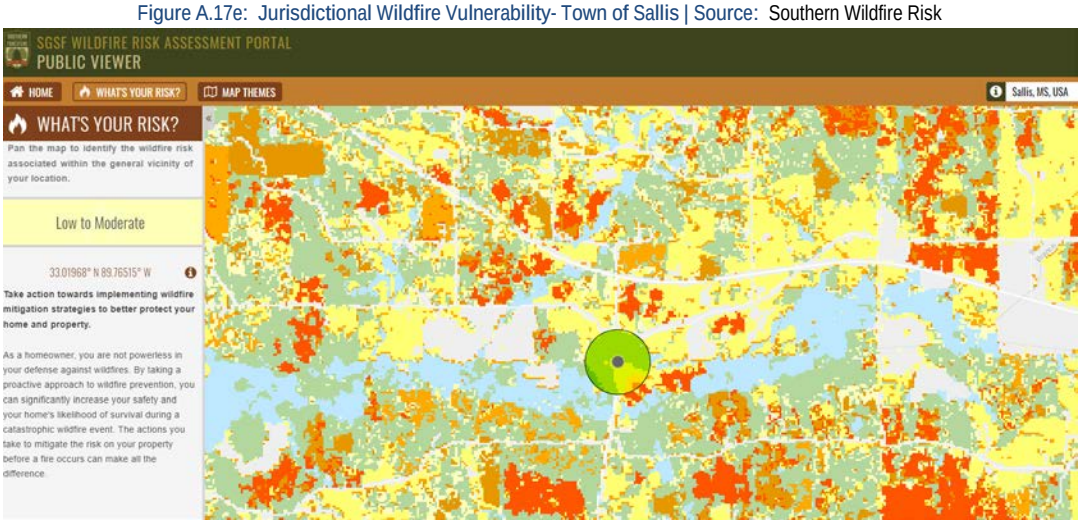


Figure A.17e: Jurisdictional Wildfire Vulnerability- Town of Sallis | Source: Southern Wildfire Risk



The following table summarizes the risk of Attala County and each of its jurisdictions to wildfire based on information from the SGSF portal.

Table 40: Geographic Vulnerability to Wildfire by Jurisdiction | *Source: MFC*

Jurisdiction	Ranking
Unincorporated Attala County	Low (to Medium)
Town of Ethel	Low
City of Kosciusko	Low
Town of McCool	Low
Town of Sallis	Low (to Medium)
Overall Attala County Vulnerability to Wildfire	Low

The hazard was rated as being low overall in the 2015 RHMP, and the average number events hovers around the 38 per year mark, so the vulnerability of the overall county appears to be maintained at the existing level.

The places most vulnerable to wildfires are forested areas in unincorporated areas of Attala County. Current mitigation of fire hazard includes regular thinning of trees and removal of dead limbs and underbrush of the 284,817 acres of forestland.

Impacts to Life and Property: Wildfire could impact the community by overextending personnel and financial resources of local emergency response crews and create a need to evacuate residences and businesses. The County's vulnerability to county-wide wildland fire hazard is mitigated somewhat by the presence of fire stations in most parts of the county, as well as the presence of a Sheriff's Office, which serves as an alternate EOC and personnel to augment those resources of fire stations.

Impacts to Critical Facilities: Electrical power could be impacted by wildfire and service could be temporarily interrupted by wildfire. It is doubtful that wildfire would have a lasting impact on water and sewer systems. The Texas Eastern Pipeline crosses Highways 35, 19, 43, and 14 in Attala County. Although the county has never experienced a disaster connected with this hazard, the presence of these pipelines increases the risk for residents in the southern and eastern parts of the county to explosions, fires, and release of poisonous gases in the event the pipeline is disturbed. These lines are present in the Sallis, Center, Providence, McCool and Williamsville communities. They pose a potential threat to three schools, approximately 1,900 homes, and large sections of highway.

It is estimated a major disaster involving a pipeline could result in 24 deaths and dozens of injuries and could cost between $17 and $900 million dollars in property damage. Indirect consequences of such a disaster could include the loss of primary transportation routes to the Montfort-Jones Hospital and to local employers.

Impact on Future Development: The efforts of public and non-profit water associations ensure there will always be water available for firefighting and structural protection, particularly in rural areas of the County. Fire stations and districts (except in the City of Kosciusko) are not manned on a full-time basis but rely on volunteers, assisted by the Forestry Service, to fight wildfires. Firefighting capacity may need to be enhanced should the community reach a point where future development includes significant numbers of residents or large industrial assets.

Hazardous Material Incidents

Location and Extent

Many hazardous and toxic materials are transported through areas of Attala County on 18- wheelers via Mississippi State Highways 12, 35, 19, and 43. The proximity of these transportation routes to residential and commercial areas of Attala County increases the risk to residents in a five-mile radius (extent) for hazards involving transportation accidents and hazardous materials spills. A secondary risk to a transportation accident involving hazardous materials is the hazard of explosions and fires. There may also be occurrences where such materials are stored.

Previous Occurrences

There are no recorded incidents of hazardous materials incidents in Attala County.

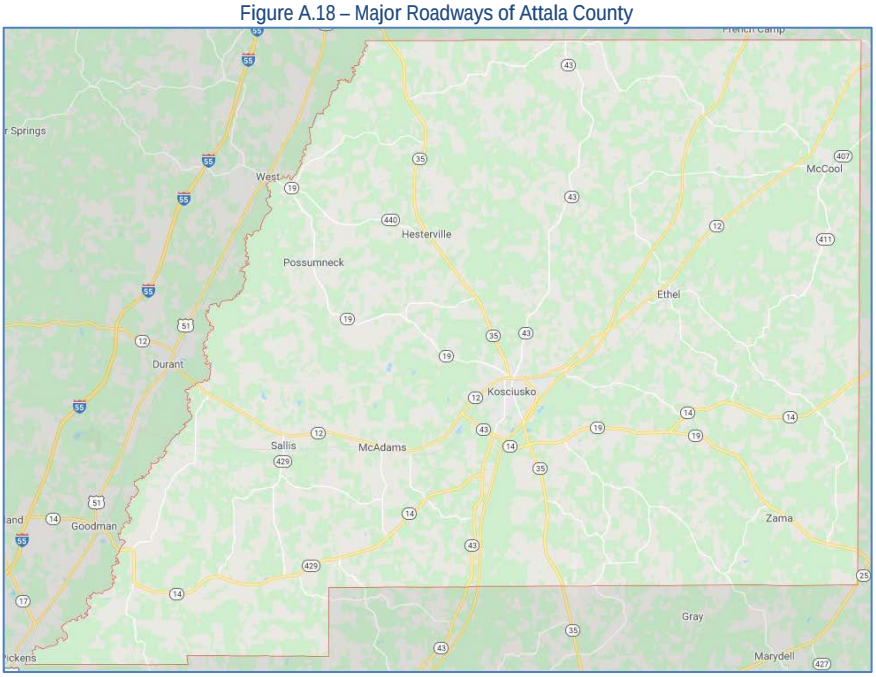
Probability of Future Occurrence

It is likely an event of this type will occur in Attala County at some point in the future given the fact that a major interstate highway and other major state and local roadways pass through the county. Specific areas where such incidents may occur are discussed under Addressing Vulnerability. The most recent figures available from the US Environmental Protection Agency (EPA) Toxic Release Inventory show there were no events for the most recent years available (through 2018).

Assessing Vulnerability

The Google map below shows the locations where the interstate and other major roadways cross Attala County.

Figure A.18 – Major Roadways of Attala County



Interstate 55 runs parallel to the western boundary of Attala County at a distance of three to five miles at any given point along the boundary. The Town of Sallis, located ten miles from I-55, is the closest population center. Although there are small hamlets in western Attala County, there is low population density. Since most transportation-related incidents generally affect an area within a five-mile radius, most of the population and its assets appear to be located sufficiently distant from this major roadway to remain unaffected.

Should an incident occur, persons and property located within a half-mile buffer of a hazardous material incident are most vulnerable to exposure. Transportation systems could be shut down and lifeline utilities systems such as storm water conveyance systems, wastewater and water systems could be affected. The Big Black River forms the boundary between Attala and Holmes Counties and tributaries cross under I-55 in several places. Environmental damage could ensue from a large enough spill or other incident.

Most of the manufacturing operations located in the county fall into the category of light manufacturing (such as making portable buildings and furniture). There is a cross-section of major roadways that circle or cross through the City of Kosciusko, but the city's first responder and preparedness mechanisms are likely sufficient to address incidents of concern. Because there have been no events to date and there are strong preparedness and response measures in place, the county's vulnerability to hazardous materials incidents, both countywide and in each jurisdiction, is considered low.

Summary of Risk Assessment

Table A.9, shown at the beginning of discussion of Attala County hazards, is presented here as a summary of all hazards discussed.

Table A.41 - Total of Attala County Hazard Events and Damages | Source: NCEI

Hazard Type	No of Events	Death	Injury	Property Damage	Crop Damage	Total Damage
Dam/Levee Failure	-	-	-	-	-	
Drought	7	-	-	$ 70,000	$ 4,400,000	$ 4,470.000
Earthquake	-	-	-	-	-	
Excessive Heat / Heat	5	-	-	-	-	
Expansive Soil	-	-	-	-	-	
Flood	12	-	-	$ 1,400,000	-	$ 1,400,000
Severe Storm	118	-	1	$ 1,708,000	$ 100,000	$ 1, 808.000
Severe Winter Weather	10	-	-	$ 1,123,000	-	$ 1,123,000
Tornado	12	-	10	$ 66,248,000	$ 7,116,000	$ 73,364,000
Tropical Storm / Hurricane	2	-	-	$ 50,000,000	$20,000,000	$ 70,000,000
Wildfire *	-	-	-	-	-	
Totals	166	0	11	$ 120,549,000	$ 31,616,000	$ 152,165,000
* Damage estimates not available						

This data shows, in terms of number and frequency, severe storms are the most regularly occurring and the most damaging to Attala County property and crops. Of the $152,165,177 in total damages from 166 events occurring between 2000 and 2019, crop damage represents roughly one -fourth the dollar amount of damage as to personal property. Figures show tornadoes and the rare hurricanes that affected Attala County were responsible for much of the damage listed.

The Mississippi Department of Revenue 2018 Annual Report showed a 2017 total property assessment value, which equaled $ 200,374,919. A severe hazard event causing damage to 10 percent of property would cause damage in the amount of $ 20,037,492. Assuming crop damage associated with such an event might run four times this amount, it can be anticipated crop damage would run approximately $80,149,967. As such, overall combined damage from such an event could run as high as $100,187,459. Figures could vary widely depending on event type, location, magnitude, and extent.

A.3 Capability Assessment

This section assesses Attala County's capability to implement hazard mitigation activities. More detailed information on the purpose and methodology used to conduct the capability assessment can be found in the Base Plan in Section 5 - Capability Assessment.

Planning and Regulatory Capability

The findings of the Planning and Regulatory section of capability assessment are described below in Table A.42. This table provides a jurisdictional overview of the plans and programs in place, followed by summary statistics of the Local Capability Assessment Surveys. Each county and municipality were asked to self-assess their capabilities. The planning and regulatory capabilities in Attala County and it participating jurisdictions has not changed since the previous plan, although the Town of Sallis recently rejoined the National Flood Insurance Program.

Table A.42: Relevant Plans, Ordinances and Programs

Jurisdiction	Comprehensive / Master Plan	Capital Improvements Plan	Economic Development Plan	Emergency Operations Plan	Continuity of Operations Plan	Transportation Plan	Stormwater Management Plan	Community Wildfire Protection Plan	Historic Preservation Plan	Building Codes	Fire Department ISO (Rating)	Site Plan Review Requirements	Land Use Plan	Zoning Ordinance	Subdivision Regulation	Flood Damage Prevention Ordinance	Flood Insurance Studies	National Flood Insurance Program	Community Rating System (Rating)
Attala County				✓	✓	✓		✓			10					✓		✓	
Ethel				✓				✓			9					✓		✓	
Kosciusko	✓			✓					✓	'12	6	✓	✓	✓	✓	✓	✓	✓	
McCool				✓							9					✓		✓	
Sallis	✓									'97	8							✓	

Emergency Management Capabilities

Hazard Mitigation Plan: A hazard mitigation plan is a community's blueprint for reducing the impact of natural and human-caused hazards on people and the built environment. Plan elements include a risk assessment, capability assessment and mitigation strategy. Attala County jurisdictions participated in the development of the 2020 Regional Hazard Mitigation Plan (RHMP) Update and are committed to its implementation.

Emergency Operations Plan: An emergency operations plan outlines responsibility and means by which resources are deployed during and following an emergency or disaster. Survey results indicate Attala County and the municipalities of Ethel, Kosciusko and McCool all have emergency operations plans. Municipalities work closely with the County Emergency Management Department.

Continuity of Operation Plan: A continuity of operations plan establishes a clear chain of command, line of succession, and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster. Survey results indicate Attala County has a continuity of operations plan.

General Planning Capabilities

The implementation of hazard mitigation activities often involves individuals beyond the emergency management profession. Stakeholders may include local planners, public works officials, economic development specialists and others. Similarly, hazard mitigation planning cuts across multiple disciplines. As a result, the questions asked in the Local Capability Assessment Survey regarding general planning capabilities were designed to measure the degree to which mitigation is integrated into other planning efforts.

Comprehensive Plan: A comprehensive plan establishes the overall vision for a community and helps to guide municipal decision-making. Survey results indicate only the City of Kosciusko and the Town Sallis have comprehensive plans.

Economic Plan: An economic plan serves as a road map for economic development decision making, based on the collection of statistical data, historical perspective, and human potential.
Survey results indicate no jurisdictions have an economic plan.

Community Wildfire Protection Plan: The Community Wildfire Protection Plan (CWPP) identifies wild land fire issues facing the community and outlines prioritized mitigation actions. Survey results indicate Attala County and Town of Ethel each have a Community Wildfire Protection Plan (CWPP).

Transportation Plan: A transportation plan identifies the means to gauge transportation demands and the options to meet those needs, while considering the social, economic and environmental characteristics of the area. The development of transportation networks can significantly impact the amount, type and location of future growth. As a result, transportation planning can have a dramatic impact on future hazard vulnerability. Survey results indicate Attala County has a transportation plan.

Capital Improvements Plan: A capital improvements plan guides the scheduling of spending on public improvements. A capital improvements plan can serve as an important mechanism to guide future development away from identified hazard areas. Limiting public spending in hazardous areas is one of the most effective long-term mitigation actions available to local governments.
Survey results indicate no jurisdictions have capital improvement plans.

Historic Preservation Plan: A historic preservation plan is intended to preserve historic structures or districts within a community. An often overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards to include the identification of the most effective way to reduce future damages. This may involve retrofitting or relocation techniques accounting for the need to protect buildings that do not meet current building standards or are within a historic district, which cannot easily be relocated out of harm's way.
Survey results indicate the City of Kosciusko has a historic preservation plan.

Zoning Ordinances: As part of a community's police power, zoning is used to protect the public health, safety and welfare. A zoning ordinance is the mechanism through which zoning is typically implemented. Since zoning regulations enable municipal governments to limit the type and density of development, it can serve as a powerful tool when applied in identified hazard areas.
Survey results indicate the City of Kosciusko has a zoning ordinance.

Subdivision Ordinances: A subdivision ordinance is intended to regulate the development of housing, commercial, industrial or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development.
Survey results indicate City of Kosciusko has a subdivision ordinance.

Building Codes, Permitting and Inspections: Building codes regulate construction standards. Decisions regarding the adoption of building codes, the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community. Survey results indicate City of Kosciusko and the Town Sallis have building codes, permitting and inspections.

Floodplain Management Capability: Flooding is a significant natural hazard facing both the nation and the planning area. The County maintains several assets that foster floodplain management and flood mitigation. Information contained in this section has been gathered through community surveys, the NFIP Community Status Book, and using the FEMA Map Service Center to review local Flood Insurance Rate Maps (FIRMS).

Storm Water Management Plan: A storm water management plan addresses flooding associated with storm water runoff. Such a plan is typically focused on design and construction measures intended to reduce the impact of more frequently occurring minor urban flooding.
Survey results indicate no jurisdictions have storm water management plans.

Flood Damage Prevention Ordinance/NFIP Participation: A local Flood Damage Prevention Ordinance is a tool used by counties and municipalities to regulate the type of construction that occurs in the floodplain. If a community is an NFIP participant, a Flood Ordinance or Court Order must be in place.

Survey results indicate Attala County, the City of Kosciusko, and the Towns of McCool, Ethel, and Sallis have flood damage prevention ordinances plans. Below is a summary from the NFIP database of the participating jurisdictions within Attala County. Only Attala County and City of Kosciusko data experienced losses as shown in data taken from the 2018 SHMP.

Table A.43 - Attala County NFIP Communities | Source: NFIP Policy and Loss Statistics as of 3/31/2018, 2018 State Hazard Mitigation Plan (CWOP: Closed Without Payment)

Jurisdiction	NFIP Date	Total Losses	Closed Losses	Open Losses	CWOP Losses	Total Payments to Date ($)
Attala County	6/1/1988	1	1	0	0	$32,860.88
Ethel	10/6/2009	0	0	0	0	$0
Kosciusko	7/2/1979	19	16	0	3	$316,802.02
McCool	8/2/2011	0	0	0	0	$0
Totals		20	17	0	3	$349,662.90

Administrative and Technical Capability

Table A.44 provides a summary of the capability assessment results for Attala County with regard to administrative and technical capabilities.

Table A.44: Relevant Staff/Personnel Resources

Jurisdiction	Planning Commission	Participation in Emergency Management Committee (LEPC or other)	Maintenance program to reduce risk (i.e., tree trimming, clearing drainage systems)	Mutual Aid Compacts	Building Inspection Department	Floodplain Manager	Emergency Manager	Community Planner	Civil Engineer	GIS Coordinator	Warning Systems / Services (i.e., reverse 911 / outdoor warning systems)	Grant Writing Capabilities
Attala County		✓	✓	✓		✓	✓		✓		✓	✓
Ethel		✓	✓	✓		✓	✓				✓	✓
Kosciusko	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓
McCool		✓		✓		✓	✓				✓	
Sallis		✓			✓	✓					✓	

Fiscal Capability

Table A.45 provides a summary of the results of the local capability assessment for Attala County with regard to relevant fiscal resources.

Table A.45 - Relevant Fiscal Resources

Jurisdiction	Capital Improvements Project Funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric services	Impact fees for new development	Stormwater utility fee	Incur debt through general obligation bonds or tax bonds	Incur debt through private activities	Community Development Block Grant (CDBG)	Other federal funding programs	State funding programs
Attala County	✓	✓				✓		✓	✓	✓
Ethel		✓	✓			✓		✓	✓	✓
Kosciusko		✓	✓			✓		✓	✓	✓
McCool	✓	✓				✓		✓	✓	✓
Sallis			✓					✓		

Education and Outreach

Table A.46 provides the results for the education and outreach capability for Attala County.

Table A.46 - Relevant Education Programs

Jurisdiction	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Ongoing public education or information programs (e.g. responsible water use, fire safety, household preparedness, environmental education)	Natural disaster or safety-related school programs	StormReady Certification	Firewise Community Certification	Public / Private partnership initiatives addressing disaster-related issues
Attala County	✓	✓	✓	✓		
Ethel	✓	✓		✓	✓	
Kosciusko		✓		✓		
McCool	✓	✓		✓		
Sallis						

The lack of coordinated jurisdictional and countywide mitigation education and outreach resources was identified as a need by all jurisdictions. As such, communities and the County Emergency Management Department have agreed to approach the North Central Mississippi Planning and Development District to help develop a communications and information program using the County web site as its platform. A web page dedicated to this effort would include information on all natural and manmade hazards to which the region is prone. Each jurisdiction could include a hyperlink on its own web site that takes the user to information posted on the County site.

Mitigation action worksheet for this project are included at the end of this annex as a show of support for this countywide mitigation strategy. This approach to communications and outreach is reasonable in light of the Incident Command Structure used in the event of an emergency. Should a major hazard incident occur, the office of MEMA District 3 would contact the Emergency Management Director of each county who, in turn, provides status reports to jurisdictional elected officials. Because communities come together to plan for and respond to disasters, they will use this same approach to collectively develop relevant education and outreach programs that educate communities about how to mitigate against regional hazards of concern.

Conclusions on Local Capability

Table A.47 shows the results of the capability assessment using the scoring system included in Section 5 of the base plan. The scoring for Attala County was based on information from the local capability survey and from reviewing existing community plans. According to the assessment, the average local capability score for the county and its communities is 31.6 which means their capabilities level is rated as moderate.

Table A.47 - Capability Results Summary

Jurisdiction	Overall Capability Score	Overall Capability Rating
Attala County	38	Moderate
Ethel	32	Moderate
Kosciusko	45	Moderate
McCool	27	Moderate
Sallis	16	Limited

A.4 Mitigation Strategy

The participating jurisdictions reviewed the mitigation goals and priorities identified in the County's previous plan. Common elements of the previous mitigation goals were used to develop regional goals designed to achieve the implementation of mitigation actions. These refined goals were adopted by the participating jurisdictions. It was determined the priorities for each of the participating jurisdictions had not changed, although the regionwide mitigation goals and objectives were streamlined as discussed in the base plan.

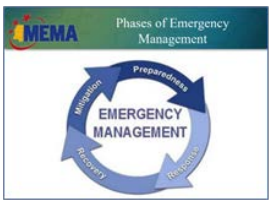
The Mitigation Strategy for Attala County includes several changes, including those based on the streamlined list of 2020 Regional Goals and Objectives. The table of action items includes mitigation actions identified in the 2015 plan; the outcome of each; and how the strategy was updated for the 2020 plan; and newly developed mitigation actions. The 2015 plan included two separate tables of mitigation actions: one table to provide a status update on actions mentioned in the previous plan; and a second table outlining the current mitigation strategy. These have been combined into one table in the current plan update.

Previous plans included a large number of mitigation actions considering the size and available resources of some jurisdictions, including those with only a few hundred residents. An example of this is the fact most County Emergency Management (EM) directors are the single departmental employee, or they perform their EM duties while functioning in one or more service roles in their community. The same is often true for leadership at the city or town level, where those in leadership "wear many hats."

Several changes were made to streamline the Mitigation Strategy given the following considerations.

Actions identified as falling into the Preparedness Phase of the Emergency Management Cycle were removed and recommended for consideration under Preparedness Planning. Examples of this include disaster preparedness initiatives (such as providing weather radios to residents) and NIMS training, which represent actions a community normally does to prepare for a hazard event.

- The image at right, developed for a MEMA presentation, clearly delineates EM agencies operationally function under four phases of emergency management, although sometimes the phases run concurrently. Professional emergency managers and their Emergency Support Functions (ESF), units called up during disaster response, develop specific plans and actions appropriate for each event phase.



- Actions identified as being required as part of the FEMA Hazard Mitigation Planning Process were removed because these are fully spelled out under the Plan Maintenance section of the Base Plan. Examples of this include, reviewing the mitigation plan and meeting to discuss needed plan updates after a disaster occurs in the community.

- It was recommended that actions identifying similar activities be combined into one action. For example, there were previously separate action items for educating the public about natural hazards and for educating the public about manmade (technological, biological, health-related) hazards. A single outreach plan using multiple communications channels can incorporate education about all hazards to all audiences if the outreach plan is fully developed.

- In some instances, extensive description of previous actions was shortened for plan readability.

- Most action items were identified by all jurisdictions. In two cases, a countywide action was recommended developed that would be jointly implemented by all participating jurisdictions.

It is hoped that the streamlined mitigation strategy will be a useful tool for the District 3 Counties and its jurisdictions to implement.

Progress Made on Mitigation Strategies and Updated Mitigation Strategy

Attala County jurisdictions have been proactive in implementing mitigation strategies identified in their previous plan. Actions included in Table A.48 have been sorted so that deleted actions appear at the end of each jurisdictional listing. They are highlighted, and a reason for deletion is listed in the column labeled "2020 Status." This column includes use of the following designations to show action status:

Designation	Meaning	Description
D	Deleted	Action was deleted from the plan for the reason described under the Column 2020 Status Description
N	New	New action for the 2020 Plan Update
R	Retained	Action previously included in the 2015 plan, with a description of how it will be continued in the 2020 plan

In the column labeled *Implementation Timeframe*, initiatives listed as "Continuous Action" refers to an ongoing action that has been initiated but not completed.

The participating jurisdictions reviewed the mitigation goals and priorities identified in the County's previous plan. Common elements of the previous mitigation goals were used to develop regional goals designed to achieve the implementation of mitigation actions. These refined goals were adopted by the participating jurisdictions. It was determined that the priorities for each of the participating jurisdictions had not changed.

Table 48: Hazard Mitigation Strategy for Attala County and its Jurisdictions

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS C=Completed; D=Deleted R=Retain N=New	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
AC-1	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Maintain continuity of emergency services and governmental to protect staff and county property. Existing facilities may lack protective measures and adequate building standards.	Attala County	BOS, County EMA, MEMA	All	Undetermined	R	Conduct a study of public critical structures and infrastructure to determine needs and cost; prioritize projects according to need, and consider options such as shatterproof glass, enhanced frames, roofing, and elevation.	2020-2025	1.1	H	HMGP, CGBG, General budget	2015
AC-2	Mitigate deficient/obsolete bridges	Bridges throughout District 3 are unable to withstand seismic activity and/or are classified by the national bridge inventory as structurally deficient or functionally obsolete. Work with applicable local, federal and state agencies to develop a priority system for improvements.	Attala County	County EMA, Engineers, MDOT	All	Undetermined	R	Study area roadways to identify priority road and bridge improvements; prioritize based on community need.	2020-2025	1.1	M	MDOT, FHWA, State Aid	2015
AC-3	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintenance to water conveyance systems	Attala County	Public Works	Flooding	Undetermined	R	Develop a countywide stormwater management plan that includes improvements to all structures -- culverts, drainage, stormwater conveyance, detention ponds, and related installations.	Continuous Action	1.1	M	CDBG, CIAP, General Budget	2015
AC-4	Create defensible space around structures and infrastructure	Implement defensible space programs to reduce risk to structures and infrastructure such as replacing flammable vegetation with less flammable species to create defensible zones around buildings, gas lines and other infrastructure.	Attala County	Public Works, BOS	Wildfire	Undetermined	R	Develop Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.1	M	Public Works, BOS	2015
AC-5	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Lightning strikes can create outages to essential county water and sewer services as well as invite unnecessary damage to county facilities. The county should consider a program to establish lightning grounding systems on critical water and sewer system elements and other facilities prone to strikes to ensure that essential county services continue.	Attala County	Public Works, BOS	Severe Storm	Undetermined	R	Identify and prioritize critical facilities requiring installation of lightning protection system, starting with water and sewer facilities and government buildings.	2020-2025	1.1	M	General budget	2015
AC-6	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	Attala County	BOS, Public Works	Human Infectious Disease	Undetermined	R	Incorporate community education under overall mitigation public outreach	Continuous Action	1.1	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS C=Completed; D=Deleted R=Retain N=New	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
AC-7	Upgrade drainage system and culverts.	Countywide drainage systems and culverts are frequently impacted by flash flood and severe weather events	Attala County	BOS, Road Department, Public Works, Drainage Districts	Flooding	Undetermined	R	Develop a countywide stormwater management plan that includes improvements to all structures -- culverts, drainage, stormwater conveyance, detention ponds, and related installations.	2020-2025	1.1	H	HMGP, CDBG, CIAP funding or as part of developer agreement	2015
AC-8	Storm proof/retrofit new critical facilities and infrastructure	New public buildings/infrastructure should include advanced mitigation techniques when practical, such as roof and foundation supports, shutters, shatter-proof windows/doors, etc. .	Attala County	BOS, County EMA, MEMA	All	Undetermined	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meet IBC standards to withstand all hazards.	2020-2015	1.2	H	HMGP, CDBG, General budget	2015
AC-9	Insta safe rooms in unserved areas of the county.	Work with the Fire Department and the Towns of McCool and Sallis to discuss project locations, logistics, funding, and timetable. Anticipated new structures to be erected in the two towns and in four fire stations throughout the county.	Attala County	County EMA, Mayors of McCool and Sallis, and the County Fire Department	Tornado, Severe Storm	Undetermined	N	The County and local jurisdictions have for some time discussed the need to install safe rooms and priority locations.	2020-2025	1.2	H	HMGP, General budget	2020
AC-10	Install generators to support existing or new facilities/infrastructure.	Generators are essential for providing continual operations in the event of a disaster.	Attala County	Attala County EMA, BOS	All	Undetermined	R	Seek funding in install generators for the 911 office, fire station and Attala County Coliseum (shelter)	2020-2025	1.3	H	HMGP, General budget	2015
AC-11	Develop Critical Infrastructure and Key Resources database (CIKR)	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards.	Attala County	County EMA and Town Mayors	All	Undetermined	R	Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	2.1	L	General budget	2015
AC-12	Develop/update Stormwater Management Plan	Include six measures, including: Public Education and Outreach, Public Participation and Involvement, Managing Illicit Discharge Detection and Elimination, Controlling Construction Site Runoff Control, Controlling Post-Construction Runoff, and Pollution Prevention/Good Housekeeping.	Attala County	Public Works	Flooding	Undetermined	R	Develop a countywide stormwater management plan that includes improvements to all structures -- culverts, drainage, stormwater conveyance, detention ponds, and related installations.	2020-2025	2.1	M	General budget	2015
AC-13	Develop/Update the Comprehensive Plan to include hazard mitigation strategies/goals	County ordinances and regulations guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the County and includes any changes in future development areas.	Town of Vaiden	Mayor, Applicable Departments	All	Undetermined	R	Review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	2020-2025	2.1	M	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS C=Completed; D=Deleted R=Retain N=New	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
AC-14	Become a Firewise Community	The Firewise program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in the effort to protect people and property from wildfire risks. Obtain a wildfire risk assessment from the state Firewise liaison, form a committee and create an action plan based on assessment, conduct a Firewise day event, and submit an application to State Firewise liaison.	Attala County	Fire Department, BOS, MFC	Wildfire	Undetermined	R	Review requirements to become a Firewise community and encourage non-participating communities to join.	2020-2025	2.1	L	General budget	2015
AC-15	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies.	The County has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the County and includes any changes in future development areas.	Attala County	Public Works	Flooding	Undetermined	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	Continuous Action	2.2	H	General budget	2015
AC-16	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analyses, etc. Provide a copy of the MEMA 3 Regional Hazard Mitigation Plan to county departments responsible for the enforcement or development of policies and planning initiatives.	Attala County	County EMA	All	None	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	Continuous Action	2.2	M	General budget	2015
AC-17	Improve/maintain participation in the National Flood Insurance Program and the Community Rating System	Attala County participates in NFIP but not the CRS.	Attala County	County EMA, Floodplain Manager, Building Official, MEMA	Flood	Undetermined	R	Consider reviewing actions necessary to join CRS.	Continuous Action	2.3	M	General budget	2015
AC-18	Continue efforts on public information and awareness for natural hazards.	The County has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public the public's self-sufficiency. Continue to provide information on all hazards that may include but not be limited to	Attala County	County EMA, Applicable Departments, MEMA, NWS, FEM, North Central MS PDD Council	All	Undetermined	R	Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS C=Completed; D=Deleted R=Retain N=New	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
		educational information, evacuation routes/procedures, workshop/ training programs, alert systems, etc.											
AC-19	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the County that are prone to technological, man-made and health- related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the County's web page.	Attala County	County EMA, MSDH, Applicable Departments, North Central MS PDD Council	Infectious Diseases, West Nile, Pandemic, Hazardous Materials	Undetermined	R	Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015
AC-20	Promote workshops for emergency preparedness and continuity of operation plans	Foster family emergency preparedness to include how families reach a safe locations, stay connected during disaster, and how to respond to various hazard . Continuity of operation plans establishes a clear chain of command, line of succession, and procedures for backup or alternate emergency facilities in case of extreme emergency or disaster.	Attala County	County EMA, BOS	All hazards	N/A	R	Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	M	General budget	2015
AC-21	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their own interests or for the interest of the whole community is needed.	Attala County	County EMA, Applicable Departments	All hazards	N/A	R	Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	L	General budget	2015
AC-22	Update the Comprehensive Emergency Preparedness Plan (CEMP)	A CEMP provides for the preparation for and the carrying out of all emergency functions to mitigate, prepare for, respond to, and recover from emergencies and disasters, and to aid victims suffering from injury or damage, resulting from disasters caused by all hazards, whether natural, technological, or human caused, and to provide support for search and rescue operations for persons and property in distress.	Attala County	County EMA, Police and Fire Departments	All	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	2020-2025		M	DHS, EMPG	2015
AC-23	Install/maintain severe weather warning systems.	Weather warning system(s) complement the methods of warning already used by the County Emergency Operations Center and the National Weather Service. Identify site locations and develop cost estimates as needed. For installed sirens,	Attala County	County EMA, BOS, MEMA	Severe Storm, Tornado	$35,000	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action		H	HMGP, General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS C=Completed; D=Deleted R=Retain N=New	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
		provide routine testing and inspection.											
AC-24	Support the installation of a NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from the Doppler radar sites located in Little Rock, AR; Memphis, TN; and Jackson, MS.	Attala County	County EMA, BOS, MEMA, NWS, DOD	Severe Storm, Tornado	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action		H	National Weather Service	2015
AC-25	Develop a weather radio program for vulnerable populations	Public Education and Awareness	Attala County	County EMA, MEMA, Private Industry	All	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action		L	MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	2015
AC-26	Implement and maintain tree trimming or removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and roadways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter- weather events. Minimize extent of unnecessary debris.	Attala County	Road Department, Public Works, BOS	Severe Storm, Tornado, Winter Weather	Undetermined	D	Action is considered routine maintenance. Develop tree trimming plan and schedule for implementation.	Continuous Action		M	General budget	2015
AC-27	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District 3	Hazards have cascading affects which should also be further explored. Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Attala County	County EMA, Planning Department, Building Officials	All	Undetermined	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action		M	General budget	2015
AC-28	Update the Comprehensive Emergency Preparedness Plan (CEMP)	A CEMP guides communities through all phases of emergency management.	Attala County	County EMA, Police and Fire Departments	All	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	2020-2025		M	DHS, EMPG	2015
AC-29	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Attala County	County EMA	All	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action. Access available free online training through FEMA web site.	Continuous Action		M	General budget	2015
AC-30	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local agency level. Conduct training and verify new employees are integrated into the training programs as necessary	Attala County	County EMA	All	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action. Access available free online training through FEMA web site.	Continuous Action		M	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS C=Completed; D=Deleted R=Retain N=New	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
AC-31	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44 §206 – communities are required to update their hazard mitigation plan every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	Attala County	County EMA , District 3 Communities, MEMA Mitigation Bureau	All	Undetermined	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action		H	HMGP, General budget	2015
AC-32	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Convene as soon as appropriate after an event to conduct an after action report and document this in the appendix of the mitigation plan.	Attala County	County EMA	All	N/A	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action		H	General budget	2015
AC-33	Conduct annual reviews of the MEMA District 3 Regional Hazard Mitigation Plan	As defined in the plan maintenance section of this plan, the chairman of the hazard mitigation committee will schedule a meeting with the committee to review progress made on mitigation actions & identify needs.	Attala County	County EMA, Applicable Departments	All	N/A	D	Remove as a mitigation action. Required element of RHMP.	2020-2025		H	General budget	2015
AC-34	Pursue training and funding opportunities for mitigation actions	Funding options for actions identified in this plan should be explored and pursued. Coordination with public works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate.	Attala County	County EMA, Applicable departments	All	N/A	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action		H	HMGP, General budget	2015
Town of Ethel Hazard Mitigation Plan													
Ethel-1	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations needed to protect staff and city property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include shatterproof glass, frame enhancements, strengthening roofs to withstand high winds, and elevating or flood proofing, etc. Potential hardening projects may include any municipal building and public infrastructure.	Town of Ethel	Mayor, Board of Aldermen, County EMA and BOS	All	Undetermined	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need	2020-2015	1.1	H	HMGP, CDBG, general budget	2015
Ethel-2	Create defensible space around structures and infrastructure	Trees and other vegetation can encroach overhead power lines and roadways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter- weather events. Minimize extent of unnecessary debris.	Town of Ethel	Road Department	Wildfire	Undetermined	R	Work with County to develop Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2015	1.1	M	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS C=Completed; D=Deleted R=Retain N=New	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
Ethel-3	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	Town of Ethel	Public Works	Human Infectious Disease	Undetermined	R	Incorporate community education under overall mitigation public outreach	Continuous Action	1.1	H	General budget	2015
Ethel-4	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the Town are frequently impacted by flash flood and severe weather events. During the planning process, no specific areas were identified. The town will monitor their existing drainage systems and address systems in need of upgrades as funding becomes available.	Town of Ethel	Mayor, Board of Aldermen, Drainage Districts, County Public Works	Flooding	Undetermined	R	Develop a countywide stormwater management plan that includes improvements to all structures -- culverts, drainage, stormwater conveyance, detention ponds, and related installations.	2020-2015	1,1	H	HMGP, CDBG, CIAP funding or as part of a developer agreement	2015
Ethel-5	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical. Measures may include, but are not limited to roof and foundation supports, shutters, shatter-proof windows/doors, etc. During the planning process, no new facilities or infrastructure were identified.	Town of Ethel	Mayor, Board of Aldermen, County EMA	All	Undetermined	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2015	1.2	H	HMGP, CDBG, General Budget	2015
Ethel-6	Install safe rooms in unserved areas of the county.	Work with the County EMA and Fire Department and the other towns to discuss project locations, logistics, funding, and timetable. Anticipated new structures to be erected in towns and in countywide fire stations.	Town of Ethel	County EMA, Town Mayors, and the County Fire Department	Tornado, Severe Storm	Undetermined	N	The County and local jurisdictions have for some time discussed the need to install safe rooms and priority locations.	2020-2025	1.2	H	HMGP, General budget	2020
Ethel-7	Secure generators for existing and new critical facilities and infrastructure	Generators are essential for providing continual operations in the event of a disaster. As funding becomes available, the city will apply for grants to install generators to support existing or new facilities/infrastructure. The Town is in need of a generator to support their water system.	Town of Ethel	Mayor, Board of Aldermen, County EMA and BOS	All	Undetermined	R	Seek funding to install generators for municipal offices, safe rooms, and critical facilities.	2020-2015	1.3	H	HMGP, General Budget	2015
Ethel-8	Action: Develop Critical Infrastructure and Key Resources database (CIKR)	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities and infrastructure for the County and its jurisdictions.	Town of Ethel	Mayor, Board of Aldermen, Public Works, County EMA	All	Undetermined	R	Determine status of State CIKR initiative. Action would enhance database of community CIKR assets. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.	2020-2025	2.1	L	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS C=Completed; D=Deleted R=Retain N=New	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
Ethel-9	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The City has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the City and includes any changes in future development areas.	Town of Ethel	Mayor, Board of Aldermen, Public Works and Department Heads	All	Undetermined	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	Continuous Action	2.2	H	General Budget	2015
Ethel-10	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analyses, etc. Provide a copy of the MEMA 3 Regional Hazard Mitigation Plan to city departments responsible for the enforcement or development of policies and planning initiatives.	Town of Ethel	Mayor, Board of Aldermen, Public Works and Department Heads	All	None	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	Continuous Action	2.2	M	General budget	2015
Ethel-11	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) programs	The Town participates in NFIP but not the CRS.	Town of Ethel	Mayor, Board of Aldermen, Floodplain Manager, County EMA	Flood	Undetermined	R	Consider actions necessary to join CRS.	Continuous Action	2.3	M	General budget	2015
Ethel-12	Continue efforts on public information and awareness for natural hazards	The Town has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Continue to work with the County to provide information on all hazards which may include but not be limited to educational information, evacuation routes/ procedures, workshop/ training programs, alert systems and such.	Town of Ethel	Mayor, Board of Aldermen, Department Heads, County HMA	All	N/A	R	Work with the County and PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	L	General budget	2015
Ethel-13	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the County that are prone to technological, man-made and health- related hazards. Develop or acquire suitable materials.	Town of Ethel	Mayor, Board of Aldermen, Department Heads, County EMA	Infectious Disease/ Pandemic	N/A	R	Work with the County and PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015
Ethel-14	Promote workshops for emergency preparedness/continuity of operation plans	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations.	Town of Ethel	Mayor, Board of Aldermen, Department Heads, County EMA	All	N/A	R	Work with the County and PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including	Continuous Action	3.1	M	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS C=Completed; D=Deleted R=Retain N=New	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
								families and private businesses, using all communications resources.					
Ethel-15	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their own interests or for the interest of the whole community is needed. The city will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives.	Town of Ethel	Mayor, Board of Aldermen, Department Heads, County EMA	All	N/A	R	Work with the County and PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	L	General budget	2015
Ethel-16	Support the installation of a NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from the Doppler radar sites located in Little Rock, AR; Memphis, TN; and Jackson, MS.	Town of Ethel	Mayor, County EMA, BOS, MEMA, NWS, DOD	Severe Storm, Tornado	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action		H	National Weather Service	2015
Ethel-17	Develop a weather radio program for vulnerable populations	Develop and participate in a committee to explore the benefits of providing weather radios to vulnerable populations who do not have adequate communication devices (television, cell phone, in range of outdoor warning sirens, etc.) to alert them of potential storms. Work with stakeholders and vendors to establish program and funding options.	Town of Ethel	Mayor, Board of Aldermen, County EMA	Tornado, Severe Weather	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action		L	MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	2015
Ethel-18	Implement / maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and roadways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris.	Town of Ethel	Mayor, Board of Aldermen, Public Works, County EMA	Severe Storms, Tornado, Winter Weather	Undetermined	D	Action is considered routine maintenance. Develop tree trimming plan and schedule for implementation.	Continuous Action		M	General budget	2015
Ethel-19	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District 3	Hazards have cascading affects which should also be further explored. Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Town of Ethel	Mayor, Board of Aldermen, Public Works, County EMA	All	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Ongoing		M	General budget	2015
Ethel-20	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures	Town of Ethel	Town Police and Fire Departments, County EMA	All	Staff time	D	Moved to Preparedness Planning. Not a mitigation action. Access available free online training through FEMA web site.	Continuous Action		L	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS C=Completed; D=Deleted R=Retain N=New	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
Ethel-21	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local agency level. Conduct training and verify new employees are integrated into the training programs as necessary	Town of Ethel	All Departments	All	Staff time	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action		L	General budget	2015
Ethel-22	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44 §206 – communities are required to update their hazard mitigation plan every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	Town of Ethel	Mayor, Board of Aldermen, County EMA	All	None	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action		H	General budget	2015
Ethel-23	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Each disaster presents varying degrees of impacts - no two storms are alike. The city can gain valuable data and insight into impacts as they occur to assess and define appropriate actions in the way of implementing an existing mitigation action or identifying a new need. Convene as soon as appropriate after an event to conduct an after action report and document this in the appendix of the mitigation plan.	Town of Ethel	Mayor, Board of Aldermen, County EMA	All	None	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action		H	General budget	2015
Ethel-24	Conduct annual reviews of the MEMA District 3 Regional Hazard Mitigation Plan	As defined in the plan maintenance section of this plan, the chairman of the hazard mitigation committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs.	Town of Ethel	Mayor, Board of Aldermen, County EMA	All	None	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action		H	General budget	2015
Ethel-25	Pursue training and funding opportunities for mitigation actions	Funding options for actions identified in this plan should be explored and pursued. Coordination with public works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the city from obtaining grants through the HMA.	Town of Ethel	Mayor, Board of Aldermen, County EMA	All	N/A	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action		H	General budget	2015
City of Kosciusko Hazard Mitigation Action Plan													

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS C=Completed; D=Deleted R=Retain N=New	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
Kosc-1	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations needed to protect staff and city property. Existing facilities may be lacking protective measures and adequate building standards.	City of Kosciusko	Mayor, Board of Aldermen, County EMA and BOS	All	Undetermined	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need	2020-2015	1.1	H	HMGP, CDBG, general budget	2015
Kosc-2	Mitigate deficient/obsolete bridges	Bridges throughout MEMA District 3 are not designed to withstand seismic activity and/or are classified as structurally deficient or functionally obsolete by the national bridge inventory. Work with applicable local, federal and state agencies to develop a priority system for improvements.	City of Kosciusko	Public Works, Mayor's Office, Community Officials/Engineers, County EMA, MEMA	Earthquake, Flooding	Undetermined	R	Study County and Local roadways to identify priority road and bridge improvements; prioritize based on community need	2020-2015	1.1	M	MDOT, FHWA, State Aid	2015
Kosc-3	Defensible zones around buildings, power and gas lines and other infrastructure may be lacking throughout the County.	Implement defensible space programs to reduce risk to structures and infrastructure such as replacing flammable vegetation with less flammable species	City of Kosciusko	Public Works, Board of Aldermen	Wildfire	Undetermined	R	Develop Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.1	M	Public Works, BOS	2015
Kosc-4	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Lightning strikes can create outages to essential county water and sewer services as well as invite unnecessary damage to county facilities. The county should consider a program to establish lightning grounding systems on critical water and sewer system elements and other facilities prone to strikes to ensure that essential county services continue.	City of Kosciusko	Public Works, Board of Aldermen	Severe Storm	Undetermined	R	Identify and prioritize critical facilities requiring installation of lightning protection system, starting with water and sewer facilities	2020-2025	1.1	M	General budget	2015
Kosc-5	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	City of Kosciusko	Public Works, Board of Aldermen	Human Infectious Disease (WNV/ other vector-borne illnesses	Undetermined	R	Incorporate community education under overall countywide mitigation public outreach	Continuous Action	1.1	H	General budget	2015
Kosc-6	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintenance to water conveyance systems	City of Kosciusko	Public Works	Flooding	Undetermined	R	Develop a countywide stormwater management plan that includes improvements to all structures -- culverts, drainage, stormwater conveyance, detention ponds, and related installations.	Continuous Action	2.1	M	CDBG, CIAP, General Budget	2015
Kosc-7	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the Town are frequently impacted by flash flood and severe weather events. During the planning process, no	City of Kosciusko	Mayor, Board of Aldermen, Drainage Districts, Public Works	Flooding	Undetermined	R	Develop a countywide stormwater management plan that includes improvements to all structures -- culverts,	2020-2015	1.1	H	HMGP, CDBG, CIAP funding or as part of	2015

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		specific areas were identified. The town will monitor their existing drainage systems and address systems in need of upgrades as funding becomes available.						drainage, stormwater conveyance, detention ponds, and related installations.				a developer agreement	
Kosc-8	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical. Measures may include, but are not limited to roof and foundation supports, shutters, shatter-proof windows/doors, etc. During the planning process, no new facilities or infrastructure were identified.	City of Kosciusko	Mayor, Board of Aldermen, County EMA	All	Undetermined	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2015	1.2	H	HMGP, CDBG, General Budget	2015
Kosc-9	Install safe rooms in unserved areas of the county.	Work with the County EMA and Fire Department and the other towns to discuss project locations, logistics, funding, and timetable. Anticipated new structures to be erected in towns and in countywide fire stations.	City of Kosciusko	Mayor, Fire Departments, County EMA, Board of Aldermen,	Tornado, Severe Storm	Undetermined	N	The County and local jurisdictions have for some time discussed the need to install safe rooms and priority locations.	2020-2025	1.2	H	HMGP, Local budget	2020
Kosc-10	Build/promote stormwater detention ponds when appropriate	Use ponds as a vehicle for stormwater management	City of Kosciusko	Public Works, Engineers	Flood	Undetermined	R	Develop a countywide stormwater management plan that includes improvements to all structures -- culverts, drainage, stormwater conveyance, detention ponds, and related installations.	Continuous Action	2.2	L	General budget	2015
Kosc-11	Secure generators for existing and new critical facilities and infrastructure	Generators are essential for providing continual operations in the event of a disaster. As funding becomes available, the city will apply for grants to install generators to support existing or new facilities/infrastructure. The Town is in need of a generator to support their water system.	City of Kosciusko	Mayor, Board of Aldermen, County EMA and BOS	All	Undetermined	R	Seek funding to install generators for municipal offices, safe rooms, and critical facilities.	2020-2015	1.3	H	HMGP, General Budget	2015
Kosc-12	Develop Critical Infrastructure and Key Resources database (CIKR)	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities and infrastructure for the County and its jurisdictions. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and	City of Kosciusko	Mayor, County EMA, Planning Department, Building Officials	All	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	2.1	L	General budget	2015

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		Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.											
Kosc-13	Develop/update Stormwater Management Plan	Include six measures, including: public Education and Outreach, Public Participation and Involvement, Managing Illicit Discharge Detection and Elimination, Controlling Construction Site Runoff Control, Controlling Post-Construction Runoff, and Pollution Prevention /Good Housekeeping	City of Kosciusko	Public Works	Flooding	Undetermined	R	Develop a countywide stormwater management plan that includes improvements to all structures -- culverts, drainage, stormwater conveyance, detention ponds, and related installations.	2020-2025	2.1	M	General budget	2015
Kosc-14	Become a Firewise Community	The Firewise program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in the effort to protect people and property from wildfire risks. Obtain a wildfire risk assessment from the state Firewise liaison, form a committee and create an action plan based on assessment, conduct a Firewise day event, and submit an application to State Firewise liaison.	City of Kosciusko	Fire Department, Board of Aldermen, MFC	Wildfire	Undetermined	R	Review requirements to become a Firewise community and encourage non-participating communities to join.	2020-2025	2.1	L	General budget	2015
Kosc-15	Update the Comprehensive Plan to include hazard mitigation goals and strategies.	The comprehensive plan is an overarching way to plan for community resilience.	City of Kosciusko	County EMA, BOS, Applicable Departments	All	Undetermined	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms.	Continuous Action	2.1	H	General budget	2015
Kosc-16	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The City has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the City and includes any changes in future development areas.	City of Kosciusko	Mayor, Board of Aldermen, Public Works and Department Heads	All	Undetermined	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	Continuous Action	2.2	H	General Budget	2015
Kosc-17	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analyses, etc. Provide a copy of the MEMA 3 Regional Hazard Mitigation Plan to county departments responsible for the	City of Kosciusko	Mayor, Board of Aldermen, Public Works, Department Heads	All	None	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	Continuous Action	2.2	M	General budget	2015

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		enforcement or development of policies and planning initiatives.											
Kosc-18	Improve/maintain participation in the National Flood Insurance Program and the Community Rating System	The City participates in NFIP but not the CRS.	City of Kosciusko	Floodplain Manager, Building Official, County EMA, MEMA	Flood	Undetermined	R	Consider actions necessary to join CRS.	Continuous Action	2.3	M	General budget	2015
Kosc-19	Continue efforts on public information and awareness for natural hazards.	The County has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public the public's self-sufficiency. Continue to provide information on all hazards that may include but not be limited to educational information, evacuation routes/procedures, workshop/ training programs, alert systems, etc.	City of Kosciusko	Mayor, Board of Aldermen, County EMA, Applicable Departments, MEMA, NWS, FEM, North Central MS PDD Council	All	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	L	General budget	2015
Kosc-20	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the County that are prone to technological, man-made and health- related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the County's web page.	City of Kosciusko	Mayor, Board of Aldermen, County EMA, MSDH, Applicable Departments, North Central MS PDD Council	Infectious Diseases, West Nile, Pandemic, Hazardous Materials	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	Local budget	2015
Kosc-21	Promote workshops for emergency preparedness and continuity of operation plans	Foster family emergency preparedness to include how families reach a safe locations, stay connected during disaster, and how to respond to various hazard . Continuity of operation plans establishes a clear chain of command, line of succession, and procedures for backup or alternate emergency facilities in case of extreme emergency or disaster. Provide applicable support to non-profit agencies, Chamber of Commerce, North Delta Planning and Development District and other organizations that assist families and business owners with the development of disaster plans.	City of Kosciusko	Police and Fire Departments, County EMA, Board of Aldermen	All hazards	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	M	Local budget	2015
Kosc-22	Develop public-private partnerships that promote community	Local business is important to all jurisdictions as they provide goods and services to support the	City of Kosciusko	Mayor, Police and Fire Departments,	All hazards	N/A	R	Work with the PDD to develop and implement public awareness &	Continuous Action	3.2	L	Local budget	2015

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	hazard mitigation and assist in reaching hazard mitigation goals	community. Identifying businesses that have interest in hazard mitigation due to their own interests or for the interest of the whole community is needed.		County EMA, Board of Aldermen, Applicable Departments				education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.					
Kosc-23	Install/maintain severe weather warning systems.	Weather warning system(s) complement the methods of warning already used by the County Emergency Operations Center and the National Weather Service. Identify site locations and develop cost estimates as needed. For installed sirens, provide routine testing and inspection.	City of Kosciusko	Mayor, Board of Aldermen, County EMA and BOS, MEMA and BOS	Severe Storm, Tornado	$35,000	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action		H	HMGP, Local budget	2015
Kosc-24	Support the installation of a NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the Delta region are not always detected due to limitations in range from the Doppler radar sites located in Little Rock, AR; Memphis, TN; and Jackson, MS.	City of Kosciusko	Mayor, Board of Aldermen, County EMA and BOS, MEMA, NWS, DOD	Severe Storm, Tornado	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action		H	National Weather Service	2015
Kosc-25	Develop a weather radio program for vulnerable populations	Develop and participate in a committee to explore the benefits of providing weather radios to vulnerable populations who do not have adequate communication devices (television, cell phone, in range of outdoor warning sirens, etc.) to alert them of potential storms. Work with stakeholders and vendors to establish program and funding options.	City of Kosciusko	Mayor, Board of Aldermen, County EMA	Tornado, Severe Weather	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action		L	MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	2015
Kosc-26	Implement and maintain tree trimming or removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and roadways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter- weather events. Minimize extent of unnecessary debris.	City of Kosciusko	Road Department, Public Works, Board of Aldermen	Severe Storm, Tornado, Winter Weather	Undetermined	D	Action is considered routine maintenance. Develop tree trimming plan and schedule for implementation.	Continuous Action		M	General budget	2015
Kosc-27	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District 3	Hazards have cascading affects which should also be further explored. Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	City of Kosciusko	Mayor, County EMA, Planning Department, Building Officials	All	Undetermined	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action		M	General budget	2015
Kosc-28	Update the Comprehensive Emergency Preparedness Plan (CEMP)	A CEMP provides for the preparation for and the carrying out of all emergency functions to mitigate, prepare for, respond to, and recover from emergencies and disasters, and to aid victims suffering from injury or damage,	City of Kosciusko	Mayor, County EMA, Police and Fire Departments	All	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action. Update the CEMP to include procedures for all hazards prone to the County. The CEMP should be evaluated following major	2020-2025		M	DHS, EMPG	2015

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		resulting from disasters caused by all hazards, whether natural, technological, or human caused, and to provide support for search and rescue operations for persons and property in distress.						events to ensure the effectiveness of the procedures outlined in the plan. After the plan is updated, work with the communities to adopt this revised plan.					
Kosc-29	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	City of Kosciusko	Police and Fire Departments, County EMA	All	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action. Access available free online training through FEMA web site.	Continuous Action		M	General budget	2015
Kosc-30	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local agency level. Conduct training and verify new employees are integrated into the training programs as necessary	City of Kosciusko	Police and Fire Departments, County EMA	All	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action. Access available free online training through FEMA web site.	Continuous Action		M	General budget	2015
Kosc-31	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44 §206 – communities are required to update their hazard mitigation plan every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	City of Kosciusko	Mayor, Board of Aldermen, County EMA , District 3 Communities, MEMA Mitigation Bureau	All	Undetermined	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action		H	HMGP, General budget	2015
Kosc-32	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Each disaster presents varying degrees of impacts - no two storms are alike. The county can gain valuable data and insight into impacts as they occur to assess and define appropriate actions in the way of implementing an existing mitigation action or identifying a new need.	City of Kosciusko	Mayor, Board of Aldermen, Applicable Departments, County EMA, District 3 Communities, MEMA Mitigation Bureau	All	N/A	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action		H	General budget	2015
Kosc-33	Conduct annual reviews of the MEMA District 3 Regional Hazard Mitigation Plan	As defined in the plan maintenance section of this plan, the chairman of the hazard mitigation committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted into the appendix of this plan once completed.	City of Kosciusko	Mayor, Board of Aldermen, Applicable Departments, County EMA, District 3 Communities, MEMA Mitigation Bureau	All	N/A	D	Remove as a mitigation action. Required element of RHMP.	2020-2025		H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS C=Completed; D=Deleted R=Retain N=New	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
Kosc-34	Pursue training and funding opportunities for mitigation actions	Funding options for actions identified in this plan should be explored and pursued. Coordination with public works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the city from obtaining grants through the HMA.	City of Kosciusko	Mayor, Board of Aldermen, Applicable Departments, County EMA, District 3 Communities, MEMA Mitigation Bureau	All	N/A	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action		H	HMGP, General budget	2015
Town of McCool Hazard Mitigation Plan													
McCool-1	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and city property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include the provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevating or flood proofing, etc. Potential hardening projects may include any municipal building and public infrastructure.	Town of McCool	Mayor, Board of Aldermen , County EMA	All	Undetermined	R	Conduct a study of public critical structures and infrastructure to determine needs, cost; prioritize projects according to need.	2020-2015	1.1	H	HMGP, CDBG, general budget	
McCool-2	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the Town are frequently impacted by flash flood and severe weather events. During the planning process, no specific areas were identified. The town will monitor their existing drainage systems and address systems in need of upgrades as funding becomes available.	Town of McCool	Mayor, Board of Aldermen, Public Works, Drainage Districts, County EMA	Flooding	Undetermined	R	Develop a stormwater management plan that includes improvements to all structures -- culverts, drainage, stormwater conveyance, detention ponds, and related installations.	2020-2015	1.1	H	HMGP, CDBG, CIAP funding or as part of a developer agreement	2015
MCCool-3	Create defensible space around structures and infrastructure	Defensible zones around buildings, power and gas lines and other infrastructure may be lacking throughout the City. Implement defensible space programs to reduce risk to structures and infrastructure such as replacing flammable vegetation with less flammable species	Town of McCool	Mayor, Board of Aldermen, Public Works, County EMA	Wildfire	Undetermined	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2015	1.1	M	General budget	2015
MCCool-4	Develop mitigation program for mosquito-breeding areas	Mosquitoes can be found in a wide variety of habitats/breeding sites forming gutter, refuse dump, stagnant waters, etc. Because of	Town of McCool	Mayor, Board of Aldermen, Public Works, County EMA	Infectious Disease/ Pandemic	N/A	R	Work with the PDD to develop and implement countywide public awareness & education campaign about	Continuous Action	1.1	H	DOH Budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS C=Completed; D=Deleted R=Retain N=New	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
		their bloodsucking habits, mosquitoes are prone to vector and transmit disease-causing organisms such as viruses, protozoans, and filarial nematodes from their vertebrate hosts to humans and animals. Consider developing a program to address mosquito-breeding areas.						all hazards, across stakeholders, including families and private businesses, using all communications resources.					
MCCool-5	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical. Measures may include, but are not limited to roof and foundation supports, shutters, shatter-proof windows/doors, etc. During the planning process, no new facilities or infrastructure were identified.	Town of McCool	Mayor, Board of Aldermen , County EMA	All	Undetermined	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2015	1.2	H	HMGP, CDBG, General Budget	2015
MCCool-6	Install safe rooms in unserved areas of the county.	Work with the County EMA and Fire Department and the other towns to discuss project locations, logistics, funding, and timetable. Anticipated new structures to be erected in towns and in countywide fire stations.	Town of McCool	Mayor, Board of Aldermen, Fire Departments, County EMA	Tornado, Severe Storm	Undetermined	N	The County and local jurisdictions have for some time discussed the need to install safe rooms and priority locations.	2020-2025	1.2	H	HMGP, Local budget	2015
MCCool-7	Secure generators for existing and new critical facilities and infrastructure	Generators are essential for providing continual operations in the event of a disaster. As funding becomes available, the city will apply for grants to install generators to support existing or new facilities/infrastructure. The Town is in need of a generator to support their water system.	Town of McCool	Mayor, Board of Aldermen, County EMA, MEMA	All	Undetermined	R	Review need for generators at County and local facilities and prioritizing funding and acquisition.	Continuous Action	1.3	H	HMGP, General Budget	2015
MCCool-8	Action: Develop Critical Infrastructure and Key Resources database (CIKR)	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities and infrastructure for the County and its jurisdictions.	Town of McCool	Mayor, Board of Aldermen, Public Works, County EMA	All	Undetermined	R	Determine status of State CIKR initiative. Action would enhance database of community CIKR assets. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.	2020-2025	2.1	L	General budget	2015
MCCool-9	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The City has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the City and includes any	Town of McCool	Mayor, Board of Aldermen, Public Works and Department Heads	All	N/A	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	Continuous Action	2.2	H	General Budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS C=Completed; D=Deleted R=Retain N=New	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
		changes in future development areas.											
MCCool-10	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analyses, etc. Provide a copy of the MEMA 3 Regional Hazard Mitigation Plan to city departments responsible for the enforcement or development of policies and planning initiatives.	Town of McCool	Mayor, Board of Aldermen, Public Works and Department Heads	All	N/A	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	Continuous Action	2.2	M	General budget	2015
MCCool-11	Improve/maintain participation in the National Flood Insurance Program and the Community Rating System	The Town participates in NFIP but not the CRS.	Town of McCool	Mayor, Board of Aldermen, Floodplain Manager, County EMA	Flood	Undetermined	R	Consider actions necessary to join CRS.	Continuous Action	2.3	M	General budget	2015
MCCool-12	Continue efforts on public information and awareness for natural hazards	The County has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient. Continue to work with the County to provide information on all hazards which may include but not be limited to educational information, evacuation routes/procedures, workshop/training programs, alert systems and the like.	Town of McCool	Mayor, Board of Aldermen, County EMA, Applicable Departments, MEMA, NWS, FEMA, North Central MS PDD Council	All	Undetermined	R	Work with the PDD to develop and implement countywide public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2015
MCCool-13	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the County that are prone to technological, man-made and health- related hazards. Develop or acquire suitable materials.	Town of McCool	Mayor, Board of Aldermen, County EMA, Applicable Departments, MEMA, NWS, FEMA, North Central MS PDD Council	Infectious Disease/ Pandemic/Hazardous Materials	Undetermined	R	Work with the PDD to develop and implement countywide public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015
MCCool-14	Promote workshops for emergency preparedness and continuity of operation plans	Foster family emergency preparedness to include how families reach a safe locations, stay connected during disaster, and how to respond to various hazard . Continuity of operation plans establishes a clear chain of command, line of succession, and procedures for backup or alternate	City of Kosciusko	Police and Fire Departments, County EMA, Board of Aldermen	All hazards	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	L	Local budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS C=Completed; D=Deleted R=Retain N=New	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
		emergency facilities in case of extreme emergency or disaster. Provide applicable support to non-profit agencies, Chamber of Commerce, North Delta Planning and Development District and other organizations that assist families and business owners with the development of disaster plans.											
MCCool-15	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their own interests or for the interest of the whole community is needed.	City of Kosciusko	Mayor, Police and Fire Departments, County EMA, Board of Aldermen, Applicable Departments	All hazards	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	L	Local budget	2015
MCCool-16	Support the installation of a NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from the Doppler radar sites located in Little Rock, AR; Memphis, TN; and Jackson, MS.	Town of McCool	Mayor, County EMA, BOS, MEMA, NWS, DOD	Severe Storm, Tornado	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action		H	National Weather Service	2015
MCCool-17	Develop a weather radio program for vulnerable populations	Develop and participate in a committee to explore the benefits of providing weather radios to vulnerable populations who do not have adequate communication devices (television, cell phone, in range of outdoor warning sirens, etc.) to alert them of potential storms. Work with stakeholders and vendors to establish program and funding options.	Town of McCool	Mayor, Board of Aldermen , County EMA	Tornado, Severe Weather	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action		L	MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	2015
MCCool-18	Implement / maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and roadways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	Town of McCool	Mayor, Board of Aldermen, Public Works, County EMA	Severe Storms, Tornado, Winter Weather	Undetermined	D	Action is considered routine maintenance and not a mitigation action. Recommend developing a tree trimming schedule to address this as a Prevention Planning initiative.	Continuous Action		M	General budget	2015
MCCool-19	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District 3	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the city. Furthermore, we realize hazards have cascading affects which should also be further explored. Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives	Town of McCool	Mayor, Board of Aldermen, Public Works, County EMA	All		D	Moved to Preparedness Planning. Not a mitigation action.	Ongoing		M	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS C=Completed; D=Deleted R=Retain N=New	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
MCCool-20	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county/city.	Town of McCool	Town Police and Fire Departments, County EMA	All	N/A	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action		L	General budget	2015
MCCool-21	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local agency level. Conduct training and verify new employees are integrated into the training programs as necessary	Town of McCool	All Departments	All	N/A	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action		L	General budget	2015
MCCool-22	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44 §206 – communities are required to update their hazard mitigation plan every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	Town of McCool	Mayor, Board of Aldermen	All	N/A	D	Remove as a mitigation action. Required element of RHMP.	Annually		H	General budget	2015
MCCool-23	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Each disaster presents varying degrees of impacts - no two storms are alike. The city can gain valuable data and insight into impacts as they occur to assess and define appropriate actions in the way of implementing an existing mitigation action or identifying a new need. Convene as soon as appropriate after an event to conduct an after action report and document this in the appendix of the mitigation plan.	Town of McCool	Mayor, Board of Aldermen	All	None	D	Remove as a mitigation action. Required element of RHMP.	Ongoing		H	General budget	2015
MCCool-24	Conduct annual reviews of the MEMA District 3 Regional Hazard Mitigation Plan	As defined in the plan maintenance section of this plan, the chairman of the hazard mitigation committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs.	Town of McCool	Mayor, Board of Aldermen	All	N/A	D	Remove as a mitigation action. Required element of RHMP.	Ongoing		H	General budget	2015
MCCool-25	Pursue training and funding opportunities for mitigation actions	Funding options for actions identified in this plan should be explored and pursued.	Town of McCool	Mayor, Board of Aldermen	All	N/A	D	Remove as a mitigation action. Required element of RHMP.	Ongoing		H	General budget	2015
Town of Sallis													

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS C=Completed; D=Deleted R=Retain N=New	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
Sallis-1	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and city property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include the provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevating or flood proofing, etc. Potential hardening projects may include any municipal building and public infrastructure.	Town of Sallis	Mayor, Board of Aldermen supported by Attala County EMA and BOS	All	Undetermined	R	Conduct a study of public critical structures and infrastructure to determine needs, cost; prioritize projects according to need	2020-2025	1.1	M	HMGP, CDBG, general budget	2015
Sallis-2	Create defensible space around structures and infrastructure	Defensible zones around buildings, power and gas lines and other infrastructure may be lacking throughout the City. Implement defensible space programs to reduce risk to structures and infrastructure such as replacing flammable vegetation with less flammable species	Town of Sallis	Mayor, Board of Aldermen, Public Works, County EMA	Wildfire	Undetermined	R	Develop a Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.1	M	General budget	2015
Sallis-3	Develop mitigation program for mosquito-breeding areas	Mosquitoes can be found in a wide variety of habitats/breeding sites forming gutter, refuse dump, stagnant waters, etc. Because of their bloodsucking habits, mosquitoes are prone to vector and transmit disease-causing organisms such as viruses, protozoans, and filarial nematodes from their vertebrate hosts to humans and animals. Consider developing a program to address mosquito-breeding areas	Town of Sallis	Mayor, Board of Aldermen, Public Works, County EMA	Infectious Disease/ Pandemic	Undetermined	R	Work with the PDD to develop and implement countywide public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.1	H	DOH Budget	2015
Sallis-4	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the Town are frequently impacted by flash flood and severe weather events. During the planning process, no specific areas were identified. The town will monitor their existing drainage systems and address systems in need of upgrades as funding becomes available.	Town of Sallis	Mayor, Board of Aldermen, Public Works, Drainage Districts	Flooding	Undetermined	R	Develop a stormwater management plan that includes improvements to all structures -- culverts, drainage, stormwater conveyance, detention ponds, and related installations.	2020-2025	1.1	L	HMGP, CDBG, CIAP funding or as part of a developer agreement	2015
Sallis-5	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical. Measures may include, but are not limited to roof and foundation	Town of Sallis	Mayor, Board of Aldermen supported by Attala County EMA and BOS	All	Undetermined	R	Participate in countywide and municipal efforts to update regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	L	HMGP, CDBG, General Budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS C=Completed; D=Deleted R=Retain N=New	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
		supports, shutters, shatter-proof windows/doors, etc.											
Sallis-6	Install safe rooms in unserved areas of the county.	Work with the County EMA, Fire Departments, and the other towns to discuss project locations, logistics, funding, and timetable. Anticipated new structures to be erected in towns and in countywide fire stations.	Town of Sallis	Mayor, Board of Aldermen, Fire Departments, County EMA	Tornado, Severe Storm	Undetermined	N	The County and local jurisdictions have for some time discussed the need to install safe rooms and priority locations.	2020-2025	1.2	H	HMGP, Local budget	2015
Sallis-7	Secure generators for existing and new critical facilities and infrastructure	Generators are essential for providing continual operations in the event of a disaster. As funding becomes available, the city will apply for grants to install generators to support existing or new facilities/infrastructure. The Town is in need of a generator to support their water system.	Town of Sallis	Mayor, Board of Aldermen supported by Attala County EMA and BOS	All	Undetermined	R	Participate in countywide study of generator needs and prioritize projects based on need.	2020-2025	1.3	M	HMGP, General Budget	2015
Sallis-8	Develop Critical Infrastructure and Key Resources database (CIKR)	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities and infrastructure for the County and its jurisdictions.	Town of Sallis	Mayor, Board of Aldermen, Public Works, County EMA	All	Undetermined	R	Determine status of State CIKR initiative. Action would enhance database of community CIKR assets. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.	2020-2025	2.1	L	General budget	2015
Sallis-9	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The City has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the City and includes any changes in future development areas.	Town of Sallis	Mayor, Board of Aldermen, Public Works and Department Heads	All	None	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	Continuous Action	2.1	L	General Budget	2015
Sallis-10	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analyses, etc. Provide a copy of the MEMA 3 Regional Hazard Mitigation Plan to city departments responsible for the enforcement or development of policies and planning initiatives.	Town of Sallis	Mayor, Board of Aldermen, Public Works and Department Heads	All	None	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	Continuous Action	2.2	L	General budget	2015
Sallis-11	Improve/maintain participation in the	Attala County participates in NFIP but not the CRS.	Town of Sallis	County EMA, Floodplain	Flood	Undetermined	R	Consider reviewing actions necessary to join CRS.	Continuous Action	2.3	M	General budget	2015

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	National Flood Insurance Program and the Community Rating System			Manager, Building Official, MEMA									
Sallis-12	Continue efforts on public information and awareness for natural hazards	The County has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient. Continue to work with the County to provide information on all hazards which may include but not be limited to educational information, evacuation routes/procedures, workshop/training programs, alert systems and the like.	Town of Sallis	Mayor, Board of Aldermen, Department Heads, Attala County HMA	All	None	R	Work with the PDD to develop and implement countywide public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2015
Sallis-13	Continue efforts on public information and awareness for natural hazards	The County has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient. Continue to work with the County to provide information on all hazards which may include but not be limited to educational information, evacuation routes/procedures, workshop/training programs, alert systems and the like.	Town of Sallis	Mayor, Board of Aldermen, Department Heads, Attala County HMA	All	None	R	Work with the PDD to develop and implement countywide public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2015
Sallis-14	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the County that are prone to technological, man-made and health- related hazards. Develop or acquire suitable materials.	Town of Sallis	Mayor, Board of Aldermen, Department Heads, Attala County EMA	Infectious Disease/ Pandemic	None	R	Work with the PDD to develop and implement countywide public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015
Sallis-15	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their own interests or for the interest of the whole community is needed. The city will work with these	Town of Sallis	Mayor, Board of Aldermen, Department Heads, Attala County EMA	All	None	R	Work with the PDD to develop and implement countywide public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	L	General budget	2015

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		businesses to develop additional strategies to meet hazard mitigation goals and objectives.											
Sallis-16	Install/maintain severe weather warning systems.	Weather warning system(s) complement the methods of warning already used by the County Emergency Operations Center and the National Weather Service. Identify site locations and develop cost estimates as needed. For installed sirens, provide routine testing and inspection.	Town of Sallis	Mayor, Board of Aldermen, County EMA, Supported by MEMA and BOS	Severe Storm, Tornado	$35,000	D	Preparedness Activity, Move to Preparedness planning					2015
Sallis-17	Support the installation of a NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from the Doppler radar sites located in Little Rock, AR; Memphis, TN; and Jackson, MS. Develop and participate in a committee to further advance the development of this project.	Town of Sallis	Mayor, Board of Aldermen supported by Attala County EMA and BOS	Tornado, Severe Weather	Undetermined	D	Preparedness Activity, Move to Preparedness planning			H	NWS	2015
Sallis-18	Develop a weather radio program for vulnerable populations	Develop and participate in a committee to explore the benefits of providing weather radios to vulnerable populations who do not have adequate communication devices (television, cell phone, in range of outdoor warning sirens, etc.) to alert them of potential storms. Work with stakeholders and vendors to establish program and funding options.	Town of Sallis	Mayor, Board of Aldermen supported by Attala County EMA and BOS	Tornado, Severe Weather	Undetermined	D	Preparedness Activity, Move to Preparedness planning			L		2015
Sallis-19	Implement / maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and roadways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	Town of Sallis	Mayor, Board of Aldermen, Public Works, County EMA	Severe Storms, Tornado, Winter Weather	General budget	D	Action is considered routine maintenance and not mitigation. Town will develop tree trimming plan and schedule for implementation.	2021		M	General budget	2015
Sallis-20	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District 3	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the city.	Town of Sallis	Mayor, Board of Aldermen, Public Works, County EMA	All		D	Moved to Preparedness Planning	Ongoing		M	General budget	2015
Sallis-21	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and addressed in applicable plans and SOPs to improve preparedness	Town of Sallis	Town Police and Fire Departments, County EMA	All	Staff time	D	Move to Preparedness Planning. Not a mitigation action.			L	General budget	2015

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		and response procedures carried out by the county/city.											
Sallis-22	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local agency level. Conduct training and verify new employees are integrated into the training programs as necessary	Town of Sallis	All Departments	All	Staff time	D	Move to Preparedness Planning. Not a mitigation action.			L	General budget	2015
Sallis-23	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44 §206 – communities are required to update their hazard mitigation plan every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	Town of Sallis	Mayor, Board of Aldermen	All	None	D	Remove as Action Item. This is an RHMP Requirement.	Annually		H	General budget	2015
Sallis-24	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Convene as soon as appropriate after an event to conduct an after action report and document this in the appendix of the mitigation plan.	Town of Sallis	Mayor, Board of Aldermen	All	None	D	Remove as Action Item. This is an RHMP Requirement.	Ongoing		H	General budget	2015
Sallis-25	Conduct annual reviews of the MEMA District 3 Regional Hazard Mitigation Plan	As defined in the plan maintenance section of this plan, the chairman of the hazard mitigation committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs.	Town of Sallis	Mayor, Board of Aldermen	All	None	D	Remove as Action Item. This is an RHMP Requirement.	Ongoing		H	General budget	2015
Sallis-26	Pursue training and funding opportunities for mitigation actions	Funding options for actions identified in this plan should be explored and pursued.	Town of Sallis	Mayor, Board of Aldermen	All	None	D	Remove as Action Item. This is an RHMP Requirement.	Ongoing		H	General budget	2015
Sallis-27	Promote workshops for emergency preparedness/continuity of operation plans	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations.	Town of Sallis	Mayor, Board of Aldermen, Department Heads, Attala County EMA	All	None	D	Move to Preparedness Planning. Not a mitigation action.	Ongoing		M	General budget	2015

Mitigation Action Worksheets

Attala County elected to more fully describe two mitigation actions on a Mitigation Action Worksheet. The two worksheets address the following initiatives:

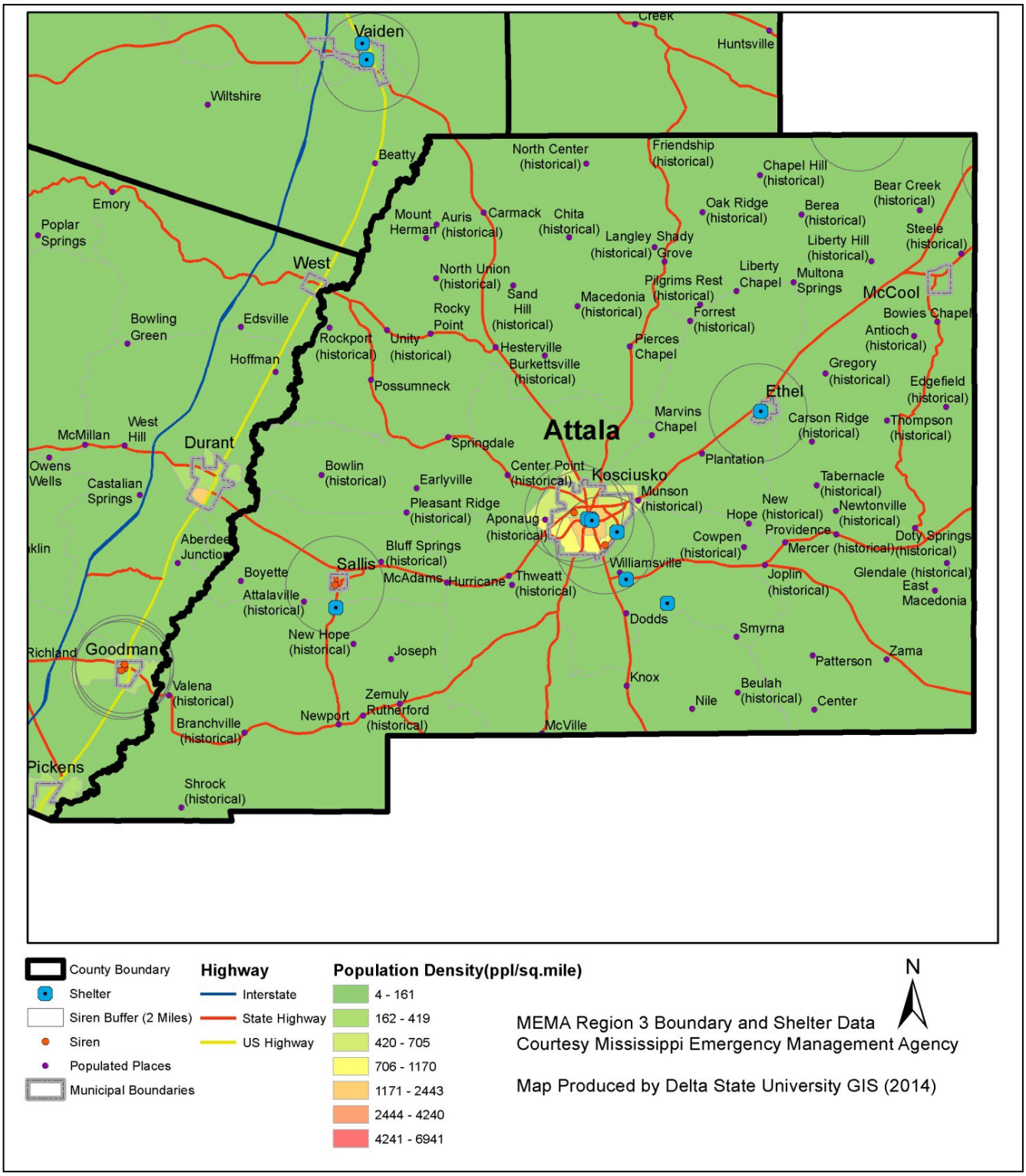
1. Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms.

2. Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others.

It was decided all jurisdictions within the county will work on these two actions, so a separate action worksheet for each jurisdiction working on both is included in the Actions Worksheets section. The Action Worksheets for Attala County are included first, and then jurisdictional worksheets follow.

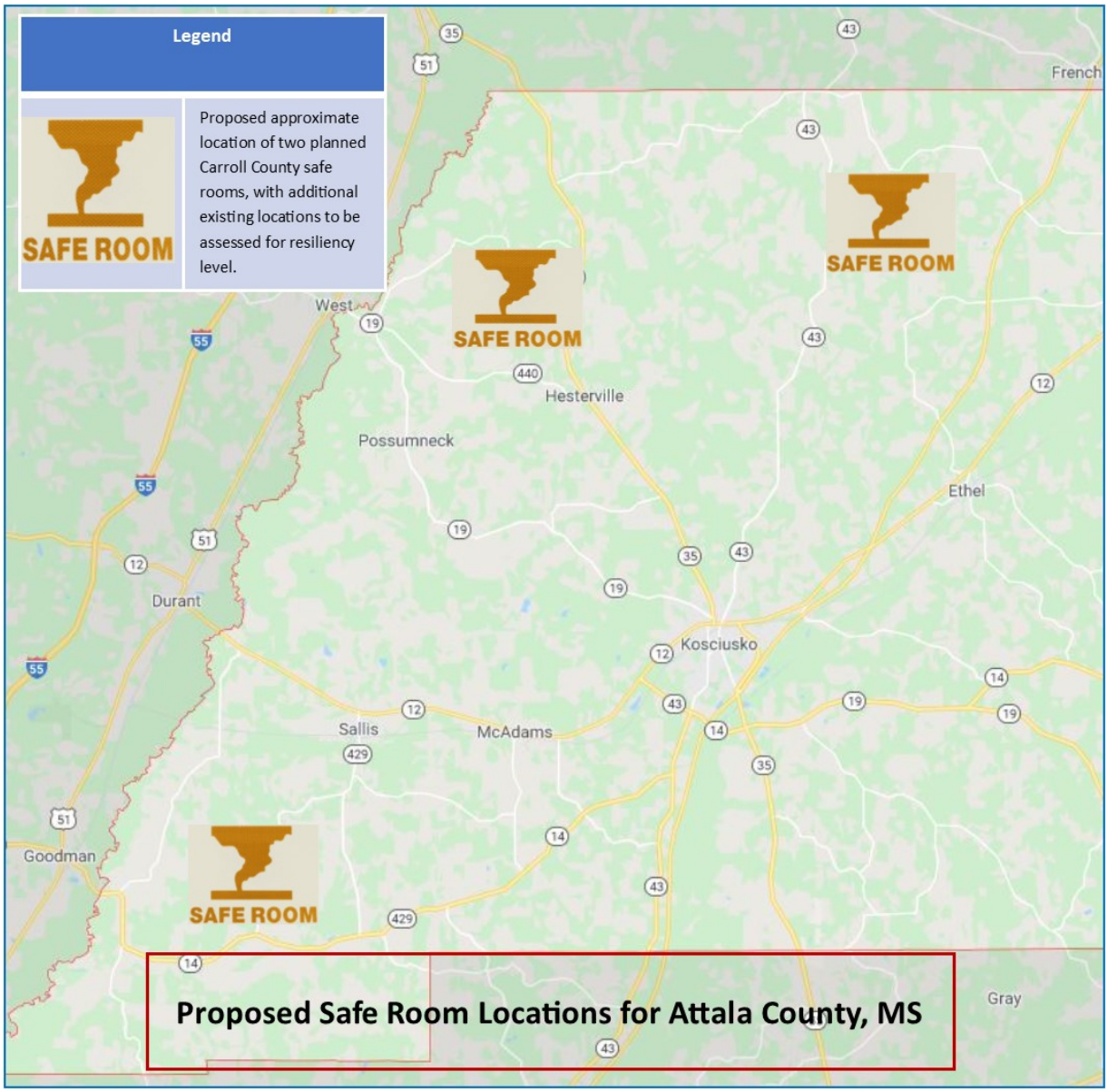
Mitigation Action Worksheet		
Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Attala County, Mississippi MEMA District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Protect vulnerable residents, many of whom are elderly and live in manufactured housing and must seek a safe location during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach a safe location. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home. See maps that follow showing the project locations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms. Alternative: Incorporate safe room space into current government structures. These spaces are not large or secure enough to serve in this function. Alternative: Situation remains as is, leaving residents exposed to severe weather.	
Action or Project Intended for Implementation		
4. Action/Project Number: **Name of Action or Project:**	**Action #: Attala-1** Construct safe rooms near several fire stations located throughout the county so that vulnerable population could reach a structure after a short drive (or walk). Inspect current safe rooms to confirm security and resiliency.	
5. Action or Project Description:	The Emergency Management Director has identified locations where safe rooms would adequately serve the target population. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Confirming site locations. • Acquire property and develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval. • Discuss to duration for which residents are expected to be housed: one or two hours versus a period of several days.	
6. Summary of Evaluation1 **Benefits (losses avoided)** **Estimated Cost** **Other Factors Considered** **(see STAPLEE Worksheet)**	**BENEFIT** • Protect vulnerable residents from exposure to tornado, severe storms, & other hazards. Minimize need for residents to drive in bad weather.	**COST** Undetermined, depends on safe room size for new structures, and on level of improvements needed for existing safe rooms (if any).
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 - High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Attala County Emergency Management Plan	
Progress Report		
13. Date of Status Report: **Report of Progress:** **Evaluation of Effectiveness:**	06/2020 – Project first discussed during a conference in which the Attala County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Figure 19: Current Attala County Siren and Safe Room Locations



Safe rooms planned for several county locations in the unincorporated communities of Friendship, Carmack, Providence and Zama will allow all residents access to nearby safe rooms so they would not need to travel a distance either before or during severe weather. These locations allow this living in rural areas to quickly reach safe harbor, while also being located near the population centers of Ethel, Kosciusko, McCool, and Sallis.

Figure 20: Proposed Attala County Safe Room Locations



NOTE: Maps shown for the Attala County mitigation action worksheet are not repeated for the jurisdictional action worksheets that follow.

Jurisdictional Action Worksheets Demonstrating
Cooperative efforts with Attala County
on Mitigation Action Attala-1

Community Need

Protect vulnerable residents, many of whom are elderly and live in manufactured housing, who must seek a safe location during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach a safe location. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home.

Solution:

Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms.

Action Worksheet		
Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Town of Ethel, Mississippi MEMA District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Protect vulnerable residents, many of whom are elderly and live in manufactured housing and must seek a safe location during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach a safe location. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms. Alternative: Incorporate safe room space into current government structures. These spaces are not large or secure enough to serve in this function. Alternative: Situation remains as is, leaving residents exposed to severe weather.	
Action or Project Intended for Implementation		
4. Action/Project Number: **Name of Action or Project:**	**Action #: Ethel 1** Support construction of safe rooms near several fire stations located throughout the county so that vulnerable population could reach a structure after a short drive (or walk). Inspect current safe rooms to confirm security and resiliency.	
5. Action or Project Description:	Work in cooperation with the County Emergency Management Director, who has identified locations where safe rooms would adequately serve the target population. Funding availability may limit construction. Steps to complete the action include: • Confirming site locations. • Acquire property. • Develop a project budget. • Present recommendation to the Board of Aldermen for consideration and approval. • Discuss to duration for which residents are expected to be housed: one or two hours versus a period of several days.	
6. Summary of Evaluation1 **Benefits (losses avoided)** **Estimated Cost** **Other Factors Considered** **(see STAPLEE Worksheet)**	**BENEFIT** • Protect vulnerable residents from exposure to tornado, severe storms, & other hazards. Minimize need for residents in inclement weather.	**COST** Undetermined, depends on safe room size for new structures, and on level of improvements needed for existing safe rooms (if any).
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, Police and Fire Departments	
8. Action/Project Priority (STAPLEE Score):	20 - High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of Ethel Operations Plan, Attala County Emergency Management Plan	
Progress Report		
13. Date of Status Report: **Report of Progress:** **Evaluation of Effectiveness:**	06/2020 – Project first discussed during a conference in which the Attala County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	City of Kosciusko, Mississippi MEMA District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Protect vulnerable residents, many of whom are elderly and live in manufactured housing and must seek a safe location during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach a safe location. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms. Alternative: Incorporate safe room space into current government structures. These spaces are not large or secure enough to serve in this function. Alternative: Situation remains as is, leaving residents exposed to severe weather.	
Action or Project Intended for Implementation		
4. Action/Project Number: **Name of Action or Project:**	**Action #: Kosciusko-1** Support the effort to construct safe rooms near several fire stations located throughout the county so that vulnerable population could reach a structure after a short drive (or walk). Inspect current safe rooms to confirm security and resiliency.	
5. Action or Project Description:	Work in cooperation with the County Emergency Management Director, who has identified locations where safe rooms would adequately serve the target population. Funding availability may limit construction. Steps to complete the action include: • Confirming site locations. • Acquire property. • Develop a project budget. • Present recommendation to the Board of S\Aldermen for consideration and approval.	
6. Summary of Evaluation1 **Benefits (losses avoided)** **Estimated Cost** **Other Factors Considered** **(see STAPLEE Worksheet)**	**BENEFIT** • Protect vulnerable residents from exposure to tornado, severe storms, & other hazards. Minimize need for residents in inclement weather.	**COST** Undetermined, depends on safe room size for new structures, and on level of improvements needed for existing safe rooms (if any).
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, Police and Fire Departments, Public Works Department	
8. Action/Project Priority (STAPLEE Score):	20 - High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP	
12. Local Planning Mechanisms to be Used in Implementation, if any:	City of Kosciusko Emergency Management Plan, City Operations Plan, Attala County Emergency Management Plan	
Progress Report		
13. Date of Status Report: **Report of Progress:** **Evaluation of Effectiveness:**	06/2020 – Project first discussed during a conference in which the Attala County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Town of McCool, Mississippi MEMA District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Protect vulnerable residents, many of whom are elderly and live in manufactured housing and must seek a safe location during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach a safe location. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms. Alternative: Incorporate safe room space into current government structures. These spaces are not large or secure enough to serve in this function. Alternative: Situation remains as is, leaving residents exposed to severe weather.	
Action or Project Intended for Implementation		
4. Action/Project Number: **Name of Action or Project:**	**Action #: McCool-1** Support the effort to construct safe rooms near several fire stations located throughout the county so that vulnerable population could reach a structure after a short drive (or walk). Inspect current safe rooms to confirm resiliency.	
5. Action or Project Description:	The County Emergency Management Director Management Director has identified locations where safe rooms would adequately serve the target population. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Confirming site locations. • Acquire property. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval. • Discuss to duration for which residents are expected to be housed: one or two hours versus a period of several days.	
6. Summary of Evaluation1 **Benefits (losses avoided)** **Estimated Cost** **Other Factors Considered (see STAPLEE Worksheet)**	**BENEFIT** • Protect vulnerable residents from exposure to tornado, severe storms, & other hazards. Minimize need for residents in inclement weather.	**COST** Undetermined, depends on safe room size for new structures, and on level of improvements needed for existing safe rooms (if any).
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, Police and Fire Departments, County Emergency Management Department	
8. Action/Project Priority (STAPLEE Score):	20 - High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town Operations Plan, Attala County Emergency Management Plan	
Progress Report		
13. Date of Status Report: **Report of Progress:** **Evaluation of Effectiveness:**	06/2020 – Project first discussed during a conference in which the Attala County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet

Mitigation Action Worksheet

Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Town of Sallis, Mississippi MEMA District 3 Multi-Jurisdictional Hazard Mitigation Plan
Risk / Vulnerability	
2. Problem being Mitigated:	Protect vulnerable residents, many of whom are elderly and live in manufactured housing and must seek a safe location during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach a safe location. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home.
Potential Actions/Projects (not being Implemented at this time)	
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms. Alternative: Incorporate safe room space into current government structures. These spaces are not large or secure enough to serve in this function. Alternative: Situation remains as is, leaving residents exposed to severe weather.
Action or Project Intended for Implementation	
4. Action/Project Number: **Name of Action or Project:**	**Action #: Sallis-1** Support the effort to construct safe rooms near several fire stations located throughout the county so that vulnerable population could reach a structure after a short drive (or walk). Inspect current safe rooms to confirm resiliency.
5. Action or Project Description:	Work in cooperation with the County Emergency Management Director Management Director, who has identified locations where safe rooms would adequately serve the target population. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Confirming site locations. • Acquire property. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval
6. Summary of Evaluation1 **Benefits (losses avoided)** **Estimated Cost** **Other Factors Considered (see STAPLEE Worksheet)**	**BENEFIT** • Protect vulnerable residents from exposure to tornado, severe storms, & other hazards. Minimize need for residents in inclement weather. **COST** Undetermined, depends on safe room size for new structures, and on level of improvements needed for existing safe rooms (if any).
Plan for Implementation	
7. Responsible Organization:	Mayor's Office, Board of Aldermen, Police and Fire Departments, County Emergency Management Department
8. Action/Project Priority (STAPLEE Score):	20 - High
9. Timeline for Completion:	Two years
10. Useful Life:	50 years
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town Operations Plan, Attala County Emergency Management Plan
Progress Report	
13. Date of Status Report: **Report of Progress:** **Evaluation of Effectiveness:**	06/2020 – Project first discussed during a conference in which the Attala County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

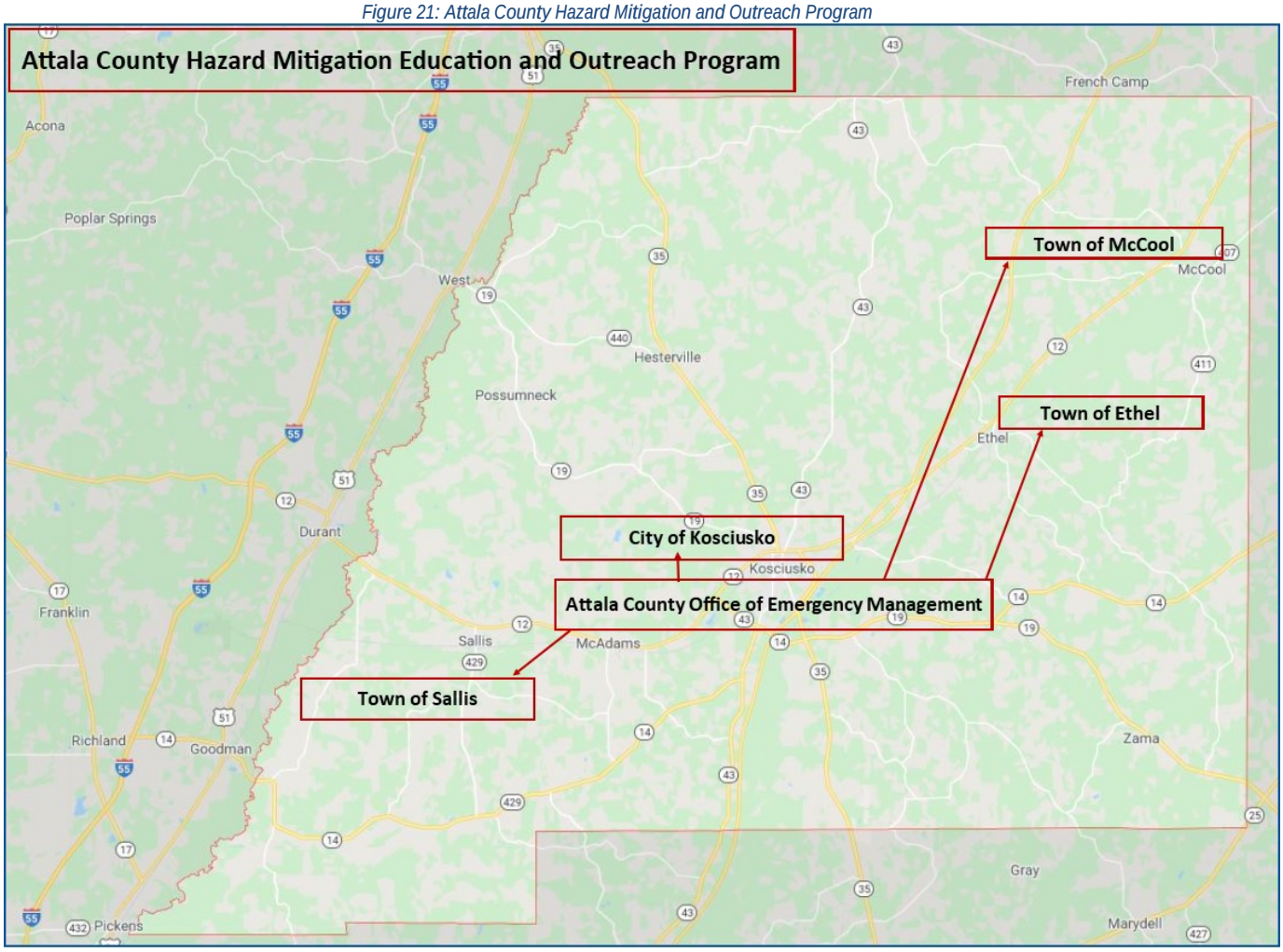
Attala County Mitigation Action Worksheet 2

Action Worksheet

Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Attala County, Mississippi MEMA District 3 Multi-Jurisdictional Hazard Mitigation Plan
Risk / Vulnerability	
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.
Potential Actions/Projects (not being Implemented at this time)	
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Attala County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education/outreach program, leaving stakeholders vulnerable to hazards.
Action or Project Intended for Implementation	
4. Action/Project Number: Name of Action or Project:	Action #: Attala-2 Work with the North Central MS Planning and Development Council to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.
5. Action or Project Description:	Led by the Attala Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT • Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property. COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation	
7. Responsible Organization:	Emergency Management Department, Board of Supervisors, Mayors, City/Board of Aldermen, PDD
8. Action/Project Priority (STAPLEE Score):	20 - High
9. Timeline for Completion:	Two years
10. Useful Life:	Five years – revisit as local needs require
11. Potential Fund Sources:	County and local budgets, PDD
12. Local Planning Mechanisms to be Used in Implementation, if any:	Attala County Emergency Management Plan, Town/City Communications Plans
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Disaster communications originates with the Attala County Emergency Management Department. As such, it is appropriate to work with EM staff and the North Central Mississippi Planning and Development District to develop an education and outreach campaign that uses County communications as a touchstone for information about all hazards shared at the local level, included unincorporated and hard-to-reach communities.

Figure 21: Attala County Hazard Mitigation and Outreach Program



NOTE: Map shown for the Attala County mitigation action worksheet is not repeated for the jurisdictional Mitigation Action Worksheets that follow.

Jurisdictional Action Worksheets

Demonstrating Cooperative efforts with Attala County on Mitigation Action Attala-2

Community Need

Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.

Solution:

Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Attala County Annex of the MEMA District 3 RHMP.

Action Worksheet		
Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Town of Ethel, Mississippi MEMA District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Attala County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Ethel-2 Work with the County and Regional Planning and Development Council to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Supporting efforts led by the Attala Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommended plan to the Board of Supervisors and local legislative bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT • Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 - High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of Ethel Operations Plan, Attala County Emergency Management Plan,	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	City of Kosciusko, Mississippi MEMA District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Attala County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Kosciusko-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital	
5. Action or Project Description:	Supporting efforts led by the Attala Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommended plan to the Board of Supervisors and local legislative bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT • Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 - High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	City Communications Plan, City Emergency Management Plan, Attala County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Town of McCool, Mississippi MEMA District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Attala County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: McCool-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Supporting efforts led by the Attala Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommended plan to the Board of Supervisors and local legislative bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT • Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 - High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of McCool Operations Plan, Attala County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Town of Sallis, Mississippi MEMA District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Attala County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Sallis-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Attala Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT • Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 - High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of Sallis Operations Plan, Attala County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

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BOLIVAR COUNTY
B.1 Community Profile

Geography (NOW)

Located in northwestern Mississippi, Bolivar County is adjacent to Coahoma County to the north, Sunflower County to the east, and Washington County to the south and is bordered to the west by the Mississippi River. Bolivar County is 134 northwest of Jackson, Mississippi and 120 miles southwest of Memphis, Tennessee. It includes the following communities (Figure B.1):

Cities	Towns		Unincorporated		
Cleveland	Alligator	Gunnison	Bolivar	Litton	Scott
Rosedale	Benoit	Merigold	Choctaw	Malvina	Skene
Mound Bayou	Beulah	Pace	Deeson	O'Reilly	Stringtown
Shaw	Boyle	Renova	Hushpuckena	Perthshire	Symonds
Shelby	Duncan	Winstonville	Lamont	Round Lake	Waxhaw

The total area of the county is 906 square miles, of which 877 square miles is land and 29 square miles is water. It is the largest county in Mississippi by land area and the fourth largest by total area. Bolivar County is in the Delta region and the soil is characterized as mildly acidic to mildly alkaline. In terms of topography, Bolivar County is one of the flattest places in the United States. Generally, the highest area of the County is located at the northern end and the lowest at the southern and decreasing in elevation in accordance with base height changes in the Mississippi River. The net effect is that the grade traversed along the north south axis of the County is less than 0.05 percent.

Alligator is located at the northern end of Bolivar County, west of U.S. Highway 61/278N and north of MS State Highway 444. With an approximate total area of 1.04 square miles, of which 0.98 square miles is land and 0.058 square miles is water, Alligator's elevation is about 157 feet above sea level.

Benoit is located on MS State Highway 1. With an approximate total area of 1.0 square mile, of which 0.012 square miles is water, Benoit's elevation is about 141 feet above sea level.

Beulah is located on MS State Highway 1. With an approximate land area of 0.05 square miles, Beulah's elevation is about 144 feet above sea level.

Boyle is located on U.S. Highway 61/278N and MS State Route 446. With an approximate total area of 1.5 square miles, of which 1.4 square miles is land and 0.077 square miles is water, Boyle's elevation is about 141 feet above sea level.

Cleveland is one of two county seats in Bolivar County. It is located near U.S. Highway 61/278N and MS State Route 8. With an approximate land area of 7.3 square miles, Cleveland's elevation is about 141 feet above sea level. Delta State University is located within the city and has a fairly large commercial economy, with numerous restaurants, stores, and services.

Duncan is located near U.S. Highway 61/278N on MS State Highway 444. With an approximate land area of 0.9 square miles, Duncan's elevation is about 154 feet above sea level.
Gunnison is located on MS State Highway 1. With an approximate total area of 1.0 square miles, of which 0.019 square miles is water, Gunnison's elevation is about 151 feet above sea level.

Merigold is located near U.S. Highway 61/278N. With an approximate land area of 1.0 square miles, Marigold's elevation is about 144 feet above sea level.

Mound Bayou is located near U.S. Highway 61/278N. With an approximate land area of 1.9 square miles, Mound Bayou's elevation is about 144 feet above sea level.

Pace is located near MS State Highway 8. With an approximate total area of 0.16 square miles, of which 0.077 square miles is water, Pace's elevation is about 141 feet above sea level.

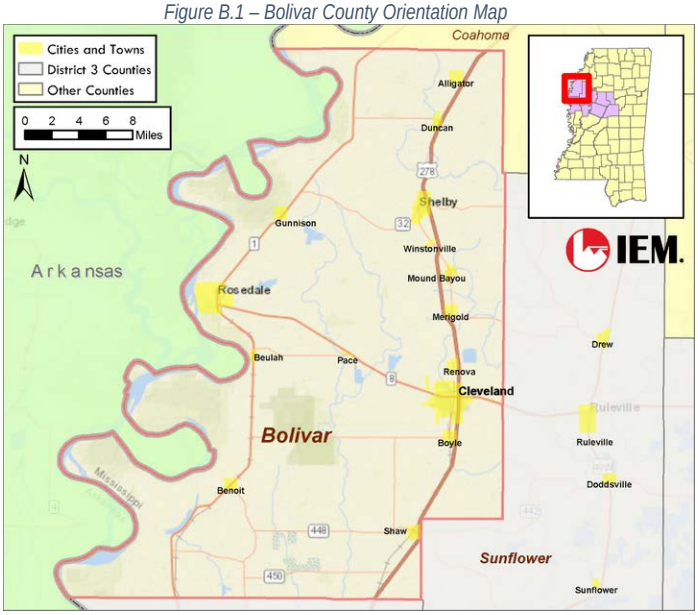
Rosedale is the other county seat in Bolivar County. It is located along MS State Route 1. With an approximately total area of 5.5 square miles, of which 5.4 square miles is land and 0.08 square miles is water, Rosedale's elevation is about 151 feet above sea level.

Renova is located near U.S. Highway 61/278N just north of Cleveland. With an approximate land area of 0.85 square miles, Renova's elevation is about 141 feet above sea level.

Shaw is located on U.S. Highway 61/278N and MS State Highway 448. The city is almost entirely in Bolivar County, with a small portion extending east into adjacent Sunflower County. With an approximate land area of 1.1 square miles, Shaw's elevation is about 131 feet above sea level.

Shelby is located on U.S. Highway 61/278N. With an approximate total area of 2.7 square miles, of which 0.012 square miles is water, Shelby's elevation is about 154 feet above sea level.
Winstonville is located near U.S. Highway 61/278N between Shelby and Mound Bayou. With an approximate land area of 0.29 square miles, Winstonville's elevation is about 144 feet above sea level.

Figure B.1 – Bolivar County Orientation Map



Population and Demographics

Bolivar County has seen an overall decline in population as shown in Table B.1 between 2010 and the 20108 American Community Survey Five Year Estimates. The largest decline in population occurred in Winstonville with a loss of 40 percent of their population. Renova had an increase in population of approximately seven percent. To further demonstrate the changes in population, Figures B.2 and B.3 are is provided showing the current population based on census block data.

Table B.1 - Jurisdiction Population and Demographics | Source: US Census Bureau 2010 and 2018 American Community Survey 5-Year Estimate

	Population				Demographics					
Jurisdictions	2020 Census	2010 Census	Net Change	Percent Change	White	Black	Hispanic	Asain	Native American	+ Races
Bolivar County	32,259	34,145	-1,886	-0.05		64.3	2.2	76	0.1	0.7
Alligator	119	208	-89	-0.43	10.1	89.9	0.0	0.0	0.0	0.0
Benoit	477	477	0	0	20.5	79.5	0.0	0	0	0
Beulah	503	348	±155	0.45	2.4	95.8	0.0	0.0	0	1.8
Boyle	987	650	±337	-0.52	43.4	56.1	0.0	0.6	0.6	0.0
Cleveland	11,998	12,334	-346	-0.03	47.3	49.3	1.5	1.5	0.0	1.2
Duncan	386	423	-37	-0.09	24.6	73.3	0.0	2.1	0	0
Gunnison	416	452	-36	-0.08	5.8	90.8	0.0	0	0.9	3.6
Merigold	402	439	-32	-0.07	46.0	52.5	0.0	1.5	0.0	0.0
Mound Bayou	1728	1,533	±195	-0.13	1.3	99.7	0.0	0.0	0.0	0.0
Pace	183	274	-91	-0.33	21.3	67.8	0.4	9.8	1.1	0.7
Renova	668	668	45	0.07	3.0	95.4	2.1	0.1	0.0	0.4
Rosedale	1678	1,873	-195	-0.10	7.6	92.4	0.0	0.0	0.0	0.0
Shaw	1733	1,952	-219	-0.11	9.3	90.7	0.0	0.0	0.0	0.0
Shelby	2107	2,229	-122	-0.05	2.7	97.1	0.0	0.0	0.0	0.2
Winstonville	153	191	-38	-0.20	0.0	100	0.0	0.0	0.0	0.0

Special Populations (elderly, disabled, and low income): Poverty and other social factors were also considered in assessing the vulnerability of Bolivar County and its municipalities. Within the unincorporated areas of Bolivar County, there are some areas of extreme poverty, where individual resources for dealing with hazards are extremely limited. These are neighborhoods in which residents would be most dependent on public resources after a disaster and could therefore be considered as good investment areas for hazard mitigation activities. By focusing on these areas, Bolivar County can not only help to reduce the vulnerability of individuals but can also help reduce the future impacts on public services. A summary of the percent of population falling into the special populations' category are listed in Table B.2.

Other social factors, such as single mother households living below the poverty level, and children living with elderly grandparents may indicate areas where special childcare considerations may be necessary. Many communities within Bolivar County have at least 30 percent of the total number of grandparents responsible for the basic needs of their grandchildren. Persons with disabilities and the elderly may not be able to evacuate or seek other preventive measures during a disaster. These individuals may be most vulnerable to severe storms, tornadoes and severe winter storms/freezes.

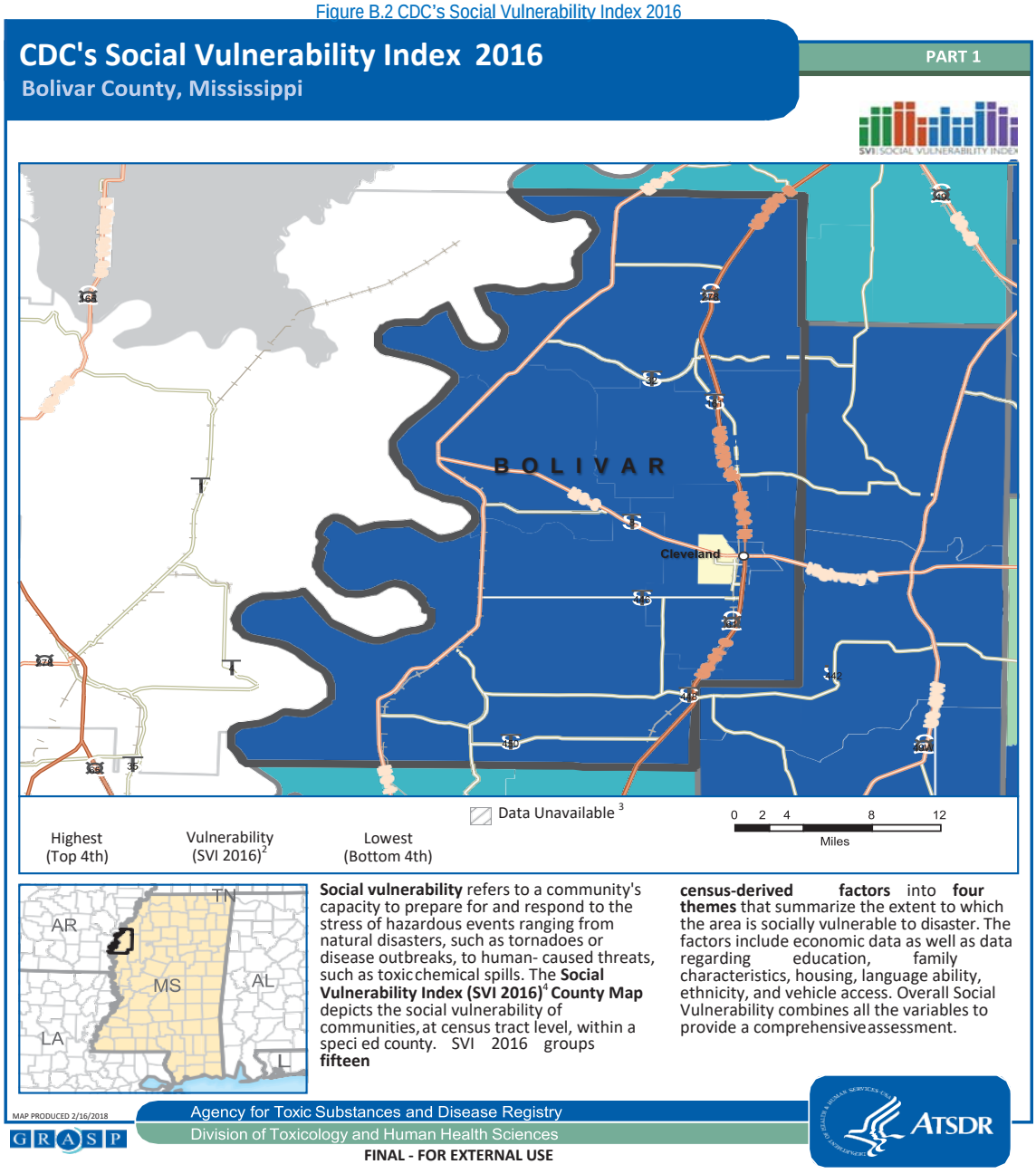
Table B.2 – Special Populations | Source: US Census Bureau 2010 and 2008-2012 American Community Survey 5-Year Estimates

Jurisdiction	Below Poverty	Elderly (65 and older)	Disabled (non-institutionalized)
Bolivar County	34.2%	14.5%	19.4%
Alligator	40.5%	13.4%	30.3%
Benoit	48.8%	20.3%	21.0%
Beulah	17.3%	12.7%	13.1%
Boyle	24.1%	7.7%	17.3%
Cleveland	32.1%	14.0%	18.0%
Duncan	44.2%	15.3%	20.6%
Gunnison	67.6%	9.6%	15.6%
Merigold	21.2%	12.9%	17.2%
Mound Bayou	39.9%	11.3%	21.5%
Pace	33.2%	30.6%	25.1%
Renova	16.1%	12.5%	18.9%
Rosedale	54.7%	13.6%	20.2%
Shaw	52.0%	14.4%	22.6%
Shelby	46.9%	13.1%	15.8%
Winstonville	54.9%	21.6%	33.3%

The Centers for Disease Control and Prevention (CDC) produces a county-based Social Vulnerability Index (SOVI, 2016), which discusses social vulnerability overall, as well as vulnerability according to "themes" that include socioeconomic status. Images on the next two tables show the SOVI breakdown using these factors to measure vulnerability in Bolivar County.

Overall Social Vulnerability[1]

Figure B.2 CDC's Social Vulnerability Index 2016



Housing, Growth Trends, and Land Use

Housing: Housing data was obtained from the 2018 Population estimates from the 2010 Census and presented below in Table B.3. In summary, between 2014 and 2018 there were 14,362 housing units, with 12,159 households in Bolivar County and an average household size of 2.55 people. In addition, 84.7 percent of housing is mobile home/manufactured housing, and the majority of the homes were constructed prior to 2000. The percentage of unoccupied housing units rose from 12.2 percent in 2010 to15.3 percent in 2018.

Table B.3 – Housing Statistics | Source: US Census Bureau 2010 and 2018 American Community Survey 5-Year Estimates

Housing Statistics	Estimate	Percent
HOUSING OCCUPANCY		
Total housing units	14,362	100%
Occupied housing units	12,159	84.7%
Vacant housing units	2203	15.3%
UNITS IN STRUCTURE		
1-unit, detached	9945	69.2%
1-unit, attached	206	1.4%
2 units	770	5.4%
3 or 4 units	893	6.7%
5 to 9 units	704	4.9%
10 to 19 units	262	1.9%
20 or more units	242	1.7%
Mobile home	1335	13.4%
Boat, RV, van, etc.	0	0.0%
YEAR STRUCTURE BUILT		
Built 2014 or later	224	1.0
Built 2010 or later	372	2.6%
Built 2000 to 2009	1194	8.3%
Built 1990 to 1999	1582	11.0%
Built 1980 to 1989	2700	18.8%
Built 1970 to 1979	2999	20.9%
Built 1960 to 1969	1947	13.6%
Built 1950 to 1959	1722	12.0%
Built 1940 to 1949	857	6.0%
Built 1939 or earlier	969	6.7%
HOUSING TENURE		
Occupied housing units	12,159	100%
Owner-occupied	6587	54.2%
Renter-occupied	5,677	45.8%
HOUSE HEATING FUEL		
Occupied housing units	12,159	100%
Utility gas	6164	50.7%
Bottled, tank, or LP gas	1390	11.4%
Electricity	4581	37.7%
Fuel oil, kerosene, etc.	3	0.0%

Wood	0	0.0%
Other fuel	3	0.1%
No fuel used	8	0.1%

Growth Trends: There have been no significant changes in development since the previous plan. New construction and redevelopment have been minimal and there are no known changes in conditions that may affect the risks or vulnerabilities for the participating jurisdictions. The communities in Bolivar County have all experienced a decline in population. Population projects for the county indicates an overall 10 percent drop in population since 2015. This trend my continue unless strategies are put in place and actively pursued. The majority of the land in Bolivar County is in rural areas and is primarily used for agriculture.

Land Use: By total land area, Bolivar County is the second largest county in Mississippi. The vast majority of this land is used for agronomic purposes. Five major crops dominate the landscape and are planted based on market price and soil suitability: cotton and corn in lighter, well-draining soils; soybeans and corn in medium density (buckshot) type soils; and rice in heavy (rich clay) soils. Wheat is frequently sown as a winter rotation crop. Significant tracts of woody wetlands exist between the Mississippi River and its levee and at Dahomey National Wildlife Refuge, a 10,000-acre tract located in south central Bolivar County. These wetlands are of significant economic importance to the area as they support large populations of game animals and tremendous flocks of migrating game foul.

Employment and Industry

For the purposes of this plan, service assets include those related to sales of goods and commodities, restaurants and hotels/motels, the provision of healthcare, and higher education. The two largest employers in this asset category, Delta State University and Bolivar Medical Center, provide jobs for approximately ten percent of the workforce. The economic contribution beyond the need for services provided (e.g., Delta State University is one of only two accredited universities in the region), is difficult to assess.

Service sector employers provide the largest block of jobs in Bolivar County. The top five industries creating growth include other general merchandise stores, home health care services, limited service eating places (fast food), health and personal care stores, and used merchandise stores.

The Mississippi Department of Employment Securities (MDES) assists individuals in obtaining employment. Through their network of WIN Job Centers, MDES matches qualified, prospective employee with employment. Table B.4 and B.5 summarizes county employment status.

Table B.4 - Mississippi Department of Employment Security Annual Labor Force Report-Bolivar | Source: Mississippi Economic Development Council

Residence Based Amounts – 2018						
County	Average Civilian Labor Force (2018)	Average No. Unemployed (2018)	Average No. Employed (2018)	Average Annual Wage (2018)	Per Capita Income (2018)	Percent Below Poverty (2018)
Bolivar	11,900	940	10,960	$34,524	$38,213	37.4%
Mississippi				$38,099	$37,834	21.5

Table B.5 - Mississippi Department of Employment Security Annual Labor Force Report-Bolivar | Source: Mississippi Economic Development Council

*Establishment Based Amounts 2018			
Manufacturing Total			1310
Non-Manufacturing Total			9280
Agriculture, Forestry, Fishing & Hunting	0	Professional & Business Service	230
Mining	0	Management of Companies & Enter	50
Utilities	30	Admin Support & Waste Management	470
Construction	310	Educational Services	80
Wholesale Trade	260	Health Care & Social Assistance	1660
Retail Trade	1560	Arts, Entertain & Recreation	60
Transportation & Warehousing	450	Accommodation & Food Service	1000
Information	90	Other Service (except public admin)	150
Finance & Insurance	250	Government	2500
Real Estate, Rental & Leasing	140	Education	1730
*Note: *Establishment based amounts are estimates and do not include self-employed individuals, religious entities or non-profit institutions. Amounts include a pro-rata share of unclassified employment.*			

Critical Assets and Infrastructure

Lifeline Sectors, Critical Assets and Infrastructure

Lifeline sectors provide the framework from which individual critical assets and infrastructure are identified. A lifeline is a sector that provides an indispensable service which enables the continuous operation of critical business and government functions and is critical to human health and safety or economic security. Infrastructure associated with lifelines is a mix of public and private ownership and has many interdependencies. As an example, maintaining the function of a hospital during an event that results in a power failure is dependent on communication infrastructure and access to temporary power to prevent interruption of services. Assessing these sectors helps to identify root causes of impacts and consequences from previous hazard events and prioritizes the highest issue areas and interdependencies in order to create effective mitigation solutions.

This section provides a listing of those assets and facilities considered as critical in nature to the planning area. These facilities are identified in tables and figures based on best available data. Shelters and outdoor warning sirens are also considered as essential and their locations are provided as a figure in the Mitigation Strategy section of this Annex.

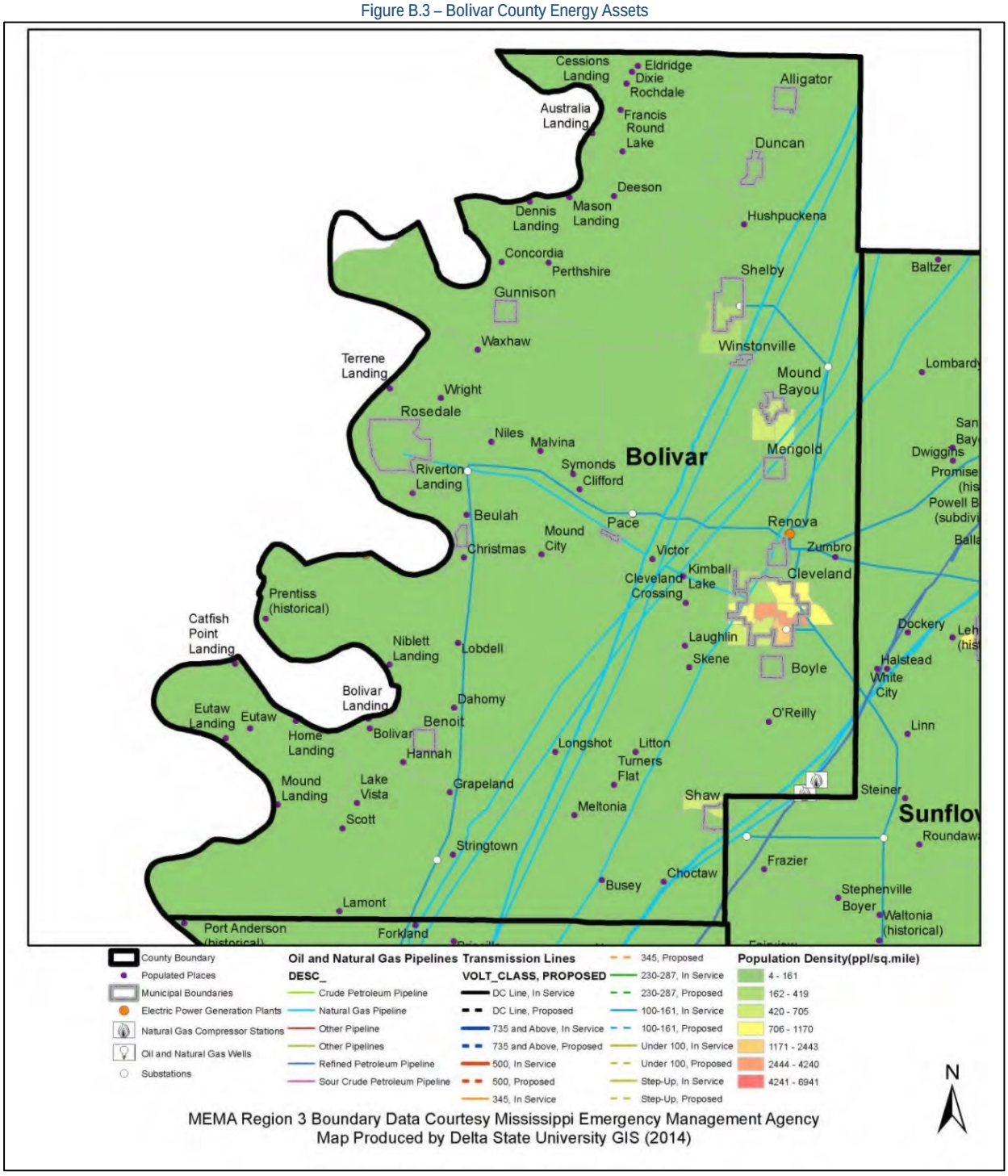
Transportation: The transportation network in Bolivar County is of higher importance than that typical of most rural counties. It includes the heavily traveled US Highway 61, a 4-lane, north-south transportation route used most heavily between Interstates 40 and 55 in Memphis (a major national distribution point for goods) and Interstate 20 in Vicksburg. The local transportation network is also of extreme local and national importance because it is used to move agricultural products from the fields to storage/distribution points and eventually to market. The Port of Rosedale is also located in Bolivar County and provides a 3.3-mile slack-water channel which is maintained by the Corps of Engineers to a minimum of 9 feet. Table B.6 provides a summary of the county's major thoroughfares, rail lines and airport access.

Table B.6 – Bolivar County Transportation Routes

Roadway	Rail	Aviation	Port
61 U.S. Route 61 1 Mississippi Highway 1 8 Mississippi Highway 8 32 Mississippi Highway 32	Class III Local - Columbus Greenville (CGAY) Great River (GTR)	Cleveland Municipal Airport	Port of Rosedale

Energy Assets: The energy asset grouping includes those features which service both local and larger interests. For example, the seven major oil product transmission pipelines crossing the Bolivar area are of national importance. Other significant assets include an electric generation facility, major electric transmission lines, and several significant natural gas transmission pipelines. Figure B.3 details critical energy infrastructure Bolivar County.

Figure B.3 – Bolivar County Energy Assets



***Critical Assets and Facilities*:** Critical supply and logistic assets in Bolivar County are primarily associated with agriculture and/or associated with water/wastewater management. Other critical supply and logistic assets include the hundreds of agricultural product storage sites located throughout the county. Their exact number and location are not well known and change frequently due to changes in the agricultural marketplace. With exception of Cleveland, the water/wastewater systems in Bolivar County are fragile at best. Although many generators have

been secured through hazard mitigation funding over the past few years, there is still a need for generators in many of the rural systems. Many facilities are composed of aging elements that are not regularly serviced and were designed to meet minimum requirements at the time of construction rather than with a view to the future. For example, many rural water mains are no larger than 2 inches in diameter, have not been replaced since their original installation, and cannot provide adequate water supply in the event of fire.

Table B.7 provides a listing of the critical assets identified for Bolivar County. A mitigation action has been included to expand the Critical Infrastructure Key Resource (CIKR) database and send to the Remote Sensing Council for inclusion in the statewide CIKR database.

Table B.7 – Bolivar County Summary of Critical Assets and Facilities

Bolivar County Facilities		**Use**
Bolivar County Courthouse		Government Facilities
Bolivar County Medical Center	Bolivar County Health Department	Health Care Facilities
Sheriff's Department Bolivar County EOC	Fire Station (Scott)	Public Safety
Delta Electric Power Company and Yale Drive Extended Yard/Substation Delta Electric Power Company and Pace Substation	Entergy Stringtown Substation Atmos Gas, Highway 8 Scenting Station Entergy Delta Plant Substation	Public Utilities
Alligator Facilities		**Use**
Town Hall		Government Facilities
Benoit Facilities		**Use**
Ray Brooks School		Educational Facilities
Town Hall/Bolivar County Fire Station		Government Facilities/ Public Safety
Beulah Facilities		**Use**
Town Hall		Government Facilities
Bolivar County Fire Station		Public Safety
Boyle Facilities		**Use**
Town Hall		Government Facilities
Bell Magnet School		Educational Facilities
Cleveland Facilities		**Use**
Delta State University Bell Elementary School Cleveland Central High School Cypress Park Elementary School D.M. Smith Middle School Cleveland Career Development and Technology Center	Cleveland Central Middle School Hayes Cooper Center Nailor Elementary School Parks Elementary School Pearman Elementary School Walter C Robinson Achievement Center	Educational Facilities
City Hall		Government Facilities
Cleveland Medical Clinic Walgreen's Pharmacy	Delta Community Mental Health Services	Health Care Facilities
Police Department	Fire Department	Public Safety

Entergy Rosemary Rd/North Cleveland Substation	Entergy Cleveland Yard Entergy South Cleveland Substation	Public Utilities
Duncan Facilities		**Use**
Brooks Elementary School		Educational Facilities
Town Hall		Government Facilities
Bolivar County Fire Station		Public Safety
Gunnison Facilities		**Use**
Town Hall		Government Facilities
Bolivar County Fire Station		Public Safety
Merigold Facilities		**Use**
Town Hall		Government Facilities
Hayes Cooper Magnet School		Educational Facilities
Bolivar County Fire Station		Public Safety
Mound Bayou Facilities		**Use**
Town Hall		Government Facilities
Mount Bayou Elementary Mount Bayou Middle School	Mount Bayou High School	Educational Facilities
Mound Bayou Hospital	Delta Health Center	Health Care Facilities
Pace Facilities		**Use**
Town Hall/Fire Station		Government Facilities/ Public Safety
Renova Facilities		**Use**
Town Hall/Fire Station		Government Facilities/ Public Safety
Rosedale Facilities		**Use**
Joe Barnes Career Technical Center West Bolivar District High School	West Bolivar Middle School West Bolivar Elementary School	Educational Facilities
Town Hall		Government Facilities
Fire Station		Public Safety
Entergy Rosedale Substation		Public Utilities
Shaw Facilities		**Use**
Shaw High School	McEvans Elementary School	Educational Facilities
Town Hall		Government Facilities
Bolivar County Fire Station		Public Safety
Shelby Facilities		**Use**
Shelby Elementary School	Broad Street High School	Educational Facilities
Town Hall		Government Facilities
Volunteer Fire Department		Public Safety
Entergy Shelby Substation		Public Utilities
Winstonville Facilities		**Use**
Town Hall		Government Facilities
Fire Station		Public Safety
Additional Facilities		**Use**

WCLD Cleveland Radio Transmission Tower WCLD Rosedale Radio Transmission Tower WXVT Shaw Transmission Tower Mound Bayou/Winstonville Telephone Switching Station Cleveland Telephone Switching Station	Duncan Telephone Switching Station Rosedale Telephone Switching Station Gunnison Telephone Switching Station Pace Telephone Switching Station Shaw Telephone Switching Station Benoit Telephone Switching Station Shelby Telephone Switching Station Merigold Telephone Switching Station	Communications Infrastructure
Bolivar County Roads Dept. Maintenance Yard (Cleveland)	MS Highway 446 Bridge at Bogue Phalia MS Highway 8 Bridge at Bogue Phalia	Transportation Critical Infrastructure
Kroger (Cleveland)	Walmart (Cleveland)	Grocery
Farm Services Administration Office	Social Security Administration Office	Other (Cleveland)

As a complement to the previous table, researchers consulted the Mississippi Public Service Commission (PSC) web site to review the list of utilities shown there. The following Bolivar County utilities companies are included on the web site. Some of these are the same as the ones listed above, and others are not included. It was decided that both tables should be incorporated into the Annex for the sake of thorough documentation.

Table B.8: Mississippi Public Service Commission – County Utilities Listings | Source: Mississippi Public Service Commission – Bolivar County Utilities

Gas Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
GC-123-0081-00	Atmos Energy Corporation	Mr. Mathew B. Davidson V-Pres.	790 Liberty Road Flowood, MS 39232-9321	601.420.5020	601.420.5020
GC-123-0861-00	CenterPoint Energy Resources Corp.	Ms. Christie Singleton, VP	525 Milam Street, 14th Floor Shreveport, LA 71101	501.377.4740	763.214.6883

Electric Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
EA-103-0031-00	Coahoma EPA	Mr. W. Keith Hurt Manager	P.O. Box 188 Lyon, MS 38645	662.624.8321	662.624.8321

EA-103-0048-00	Delta EPA	Mr. David O'Bryan Gen. Mgr.	P.O. Box 9399 Greenwood, MS 38930		662.453.6352
EC-123-0082-00	Entergy Mississippi Inc.	Mr. Martin McGee Customer Service Support	P.O. Box 1640 Jackson, MS 39215-1640		601.969.2336

Sewer Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
SA-100-0128-01	Lamont Water Corp.	Mr. Milton Robinson	99 Lamont Road Greenville, MS 38703		662.332.8743
SD-100-2405-00	Noblin Utility District	Ms. Myra Foster President	P. O. Box 698 Cleveland, MS 38732		601.985.4402
SD-100-2404-00	Stanton Utility District	Mr. Floyd Arbuckle President	P. O. Box 698 Cleveland, MS 38732		601.985.4402

Water Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
WA-100-0764-00	Bolivar Water Assn. Inc.	Mr. C. E. Williams Pres.	P. O. Box 194 Benoit, MS 38725		662.742.3243
WA-100-0855-00	Boyle-Skene Water Corp.	Mr. Todd Holder Pres.	P. O. Box 475 Boyle, MS 38730	662.588.7061	662.843.2320
WM-100-0054-00	City of Cleveland	Ms. Dominique Green City Clerk	P. O. Box 1439 Cleveland, MS 38732		662.843.5365
WM-100-0738-00	City of Pace	Ms. Mae Rosie Williams Mayor	P. O. Box 216 Pace, MS 38164		662.723.6292
WA-103-1092-00	Deeson-Round Lake Water Corp. Inc.	Mr. Cameron Dakin Mngr.	673 Laughlin Road Cleveland, MS 38732		662.721.2658
WA-100-0444-00	Delta Choctaw Water Corp.	Mr. Cameron Dakin Mngr.	673 Laughlin Road Cleveland, MS 38732		662.843.4662
WA-100-0591-00	FMH Water Assn. Inc.	Mr. Carlis Lyon President	P. O. Box 1107		662.686.7150

			Indianola, MS 38751		
WA-100-0128-00	Lamont Water Corp.	Mr. Charles Wright Pres.	40 Lamont Road Greenville, MS 38703	662.931.2792	662.335.5901
WA-100-1624-00	North Bolivar County Water Assn., Inc.	Mr. Mitchell Williams President	13 Gentry Road Mound Bayou, MS 38762		662.398.7504
WA-003-0704-00	Pine Grove Community Water Assn. Inc.	Mr. Henry Shetler President	520 Gelston Road Clarksdale, MS 38614	662.902.1185	662.624.4680
WA-100-1134-00	Sunflower Water Association Inc.	Mr. Robert Andrews Sec./Treasurer	342 Drew-Merigold Road Merigold, MS 38759	662.721.0571	662.721.0571
WA-100-0730-00	Symonds Water Assn. Inc.	Mr. Robert Johnson President	P. O. Box 268 Pace, MS 38764		662.402.5484
WM-100-0759-00	Town of Renova	Mr. Maurice F. Lucas Mayor	5 Second Street Cleveland, MS 38732		662.843.8233

Telecommunications Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
TC-123-0001-00	BellSouth Telecommunications, LLC	Mr. C. D. Smith Regulatory	2310 7th Street Meridian, MS 39301	601.592.6510	601.917.8787
TC-100-0866-00	Mound Bayou Telephone & Communications, Inc.	Ms. Stephanie Hand Controller	P.O. Box 1720 Bay Springs, MS 39422	662.862.5001	601.764.3463

B.2 Hazard Identification and Risk Assessment

This section includes a brief summary of hazards to which Bolivar County is prone, and includes the location and extent, historical events, and probability of future occurrence. Vulnerability assessments are included in this Annex only for hazards for which county-based data is available. Section 4 of the Base Plan includes hazard descriptions for hazards applicable to all jurisdictions covered by the 2020 RHMP Update. Health-related hazards, such as Pandemic Influenza and West Nile virus, are of concern to the County, but there is no county-level data to add to the discussion of this hazard as it is addressed in Section 4 of the Base Plan. That section also includes the most recently available information about Coronavirus Disease of 2019 (COVID-19) at the time of this plan's publication.

Hazard Ranking and Probability of Future Occurrence

As discussed in Section 4 of the Base Plan - Hazard Identification and Risk Assessment, each county evaluated the number of events and damage claims from impacts over the past 10 years to determine their hazard risk ranking.

Bolivar County determined their probability of future occurrence based on reported data and local input about previous events and local conditions. Definitions for the probability of future occurrences classifications are provided below:

- Highly Likely – More than 8 occurrences over last 10 years
- Likely – 5 - 7 occurrences over last 10 years
- Low – 1 - 4 occurrences over last 10 years
- Susceptible – Conditions are favorable or there are historic events (greater than 50 years) or local knowledge of unreported events.

Table B.8 provides a summary of the hazard events for Bolivar County and Table B.9 includes the results of their risk ranking exercise.

Table B.8 – Bolivar County Summary of Hazard Events 2004 - 2013 | Source: NCEI, MDEQ, USGS

Hazard Type	No of Events	Death	Injury	Property Damage	Crop Damage
Dam/Levee Failure	-	-	-	-	-
Drought	8	-	-	-	$**$7,251,000**
Earthquake	-	-	-	-	-
Extreme Heat	5	2	-	-	-
Expansive Soil	-	-	-	-	-
Flood	44	-	-	$ 2,817,000	1,205,000
Severe Storm	252	-	-	$ 6,251,000	$ 720,000
Severe Winter Weather	24	-	-	$ 1,957,000	-
Tornado	10	-	37	$ 13,192,000	$ 705,000
Tropical Storm / Hurricane	2	-	-	$ 710,000	$5,200,000
Wildfire	-	-	-	-	-
Totals	345	2	37	$ 24,927,000	$ 15,081,000

* Damage estimates not available

Table B.9 – Bolivar County Risk Ranking Results

Hazard Type	Area Impacted	Health/Safety	Property Damage	Environmental Damage	Economic Disruption	Total	Probability of Future Occurance	Risk	Risk Level
Dam/Levee Failure	4	0	4	3	4	15	2	30	Low
Drought	3	0	2	2	2	9	3	27	Low
Earthquake	4	0	3	3	4	14	2	28	Low
Expansive Soils	4	0	3	3	4	14	2	28	Low
Extreme Heat	4	0	1	0	3	8	3	24	Low
Flood	4	0	4	3	4	15	5	75	High
Severe Storm (thunderstorm, lightning, hail and high wind)	2	2	2	2	2	10	5	50	High
Severe Winter Weather	3	0	1	2	1	7	5	35	Medium
Tornado	3	2	3	3	2	13	5	65	Medium
Tropical Storm / Hurricane	1	0	0	0	1	2	2	4	Low
Wildfire	1	0	2	2	1	6	1	6	Low

Table B-10 summarizes the vulnerability of each jurisdiction to each hazard. This information is based on community input, NCEI data, and available resources that discuss each hazard. An example of the latter would be the Mississippi DEQ web site Dam Safety Division, which provides maps illustrating the number and types of dams in each jurisdiction.

Table B.10 – Summary of Hazard Ranking, All Jurisdictions in Bolivar County

Hazard Type	Dam/Levee Failure	Drought	Earthquake	Extreme Heat	Flood	Severe Storm	Severe Winter Weather	Tornado	Tropical Storm/Hurricane	Wildfire
Unincorporated Bolivar County	Medium	Medium	Medium	Medium	High	Medium	High	High	Medium	Medium
Town of Alligator	Low	Low	Low	Low	Low	Medium	High	Low	Low	Low
Town of Benoit	Low	Low	Low	Low	Low	Medium	High	Medium	Low	Low
Town of Beulah	Low	Low	Low	Low	Low	Medium	High	Low	Low	Low
Town of Boyle	Low	Low	Low	Low	Low	Medium	High	Medium	Low	Low
City of Cleveland	Low	Low	Low	Low	High	Medium	High	Medium	Low	Low
Town of Duncan	Low	Low	Low	Low	Low	Medium	High	Low	Low	Low
Town of Gunnison	Low	Low	Low	Low	Low	Medium	High	Low	Low	Low
Town of Merigold	Low	Low	Low	Low	Low	Medium	High	Low	Low	Low
City of Mound Bayou	Low	Low	Low	Low	Low	Medium	High	Low	Low	Low
Town of Pace	Low	Low	Low	Low	Low	Medium	High	Low	Low	Low
Town of Renova	Low	Low	Low	Low	Low	Medium	High	Low	Low	Low
City of Rosedale	Low	Low	Low	Low	Low	Medium	High	Low	Low	Low
City of Shaw	Low	Low	Low	Low	Low	Medium	High	Medium	Low	Low
City of Shelby	Low	Low	Low	Low	Low	Medium	High	Low	Low	Low
Town of Winstonville	Low	Low	Low	Low	Low	Medium	High	Low	Low	Low

Mitigation planning researchers are fortunate to have access to the Data Visualization Tool included on the FEMA website. This site provides county-level data on the breakdown of flood events and hazards included in federal emergency and disaster declarations, as well as for flood events recorded by FEMA. The information is updated through June 2020 and shows the disaster name, event type, number of events, and occurrence date. The data includes information from the time FEMA first started recording disaster events in the format currently used. While this time frame is longer than that included in this RHMP Update, the following page provides a one-page snapshot of Bolivar County disasters that have been documented by FEMA.

Figure B.4 – FEMA Declarations Statistics-Bolivar County

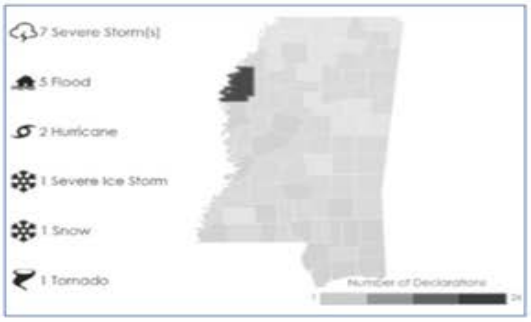
FEMA Declarations: Bolivar County Statistics: 1953-2019 *Source:* FEMA Data Visualization Web Site

Not Included in data sourced 3/31/2020

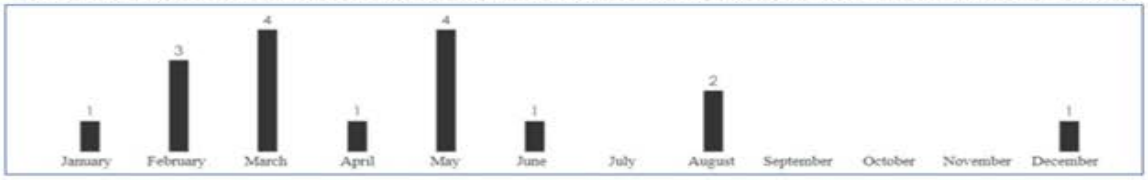
- Mississippi COVID EM-3474 (Declared 3/13/2020)

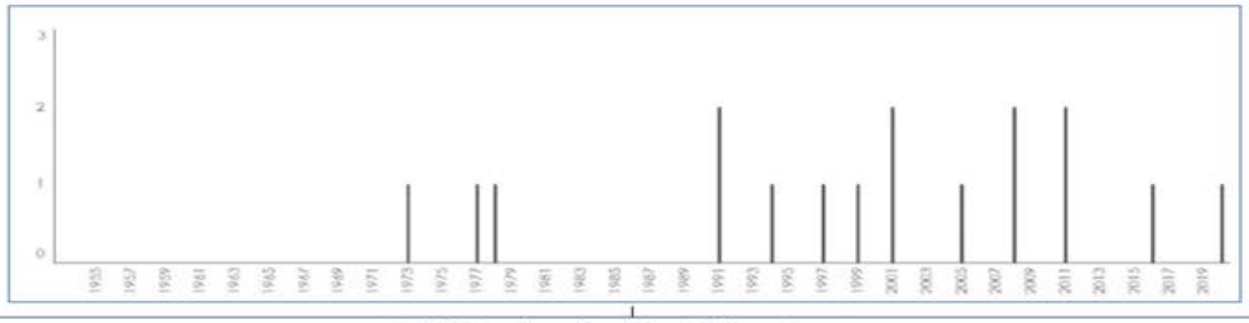
57 Flood Events

17 Declared Events



The charts below show the months and years in which disasters have occurred in Bolivar County.





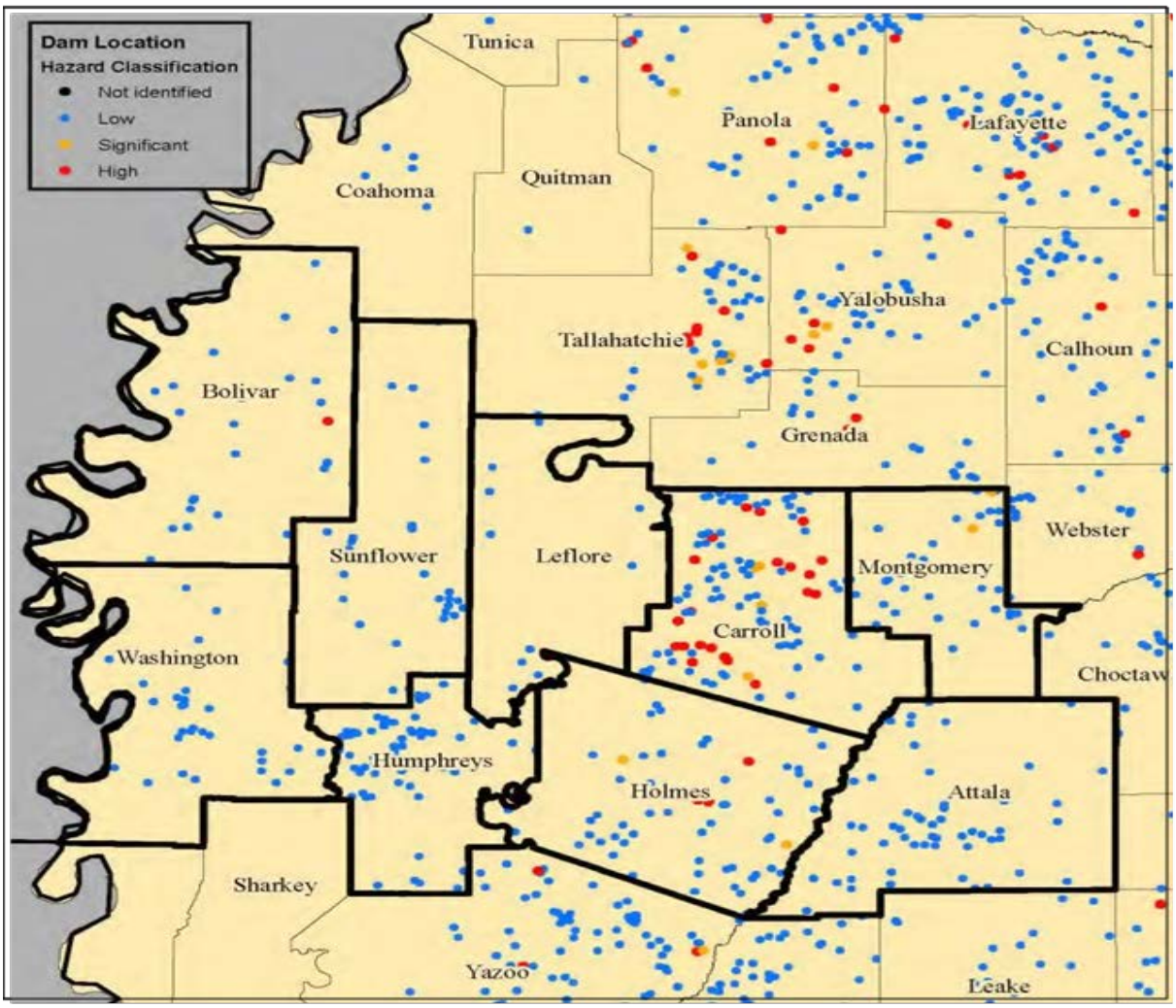
FEMA Declarations for Bolivar County

Year	Declaration Name	Disaster Number	Year	Declaration Name	Disaster Number
1973	Heavy Rains, Tornadoes and Flooding	368	2001	Severe Storms, Tornadoes and Flooding	1398
1977	Drought and Freezing	3032	2005	Hurricane Katrina	1604
1978	Tornadoes	3063	2008	Hurricane Gustav	3291
1991	Severe Storms and Flooding	895		Severe Storms and Flooding	1753
	Severe Storms, Tornadoes and Flooding	906	2011	Flooding	1983
1994	Severe Winter Storm, Freezing Rain, Sleet	1009		Flooding	3320
1997	Flooding	1178	2016	Severe Storms and Flooding	4268
1999	Severe Winter Storms, Ice, Freezing Rain	1265	2020	Severe Storms, Tornadoes, Straight-line Winds, Flooding	4478
2001	Severe Storms and Tornadoes	1360			

Dam/Levee Failure

Figure B.5 below shows a list of dams mapped based on 2015 data secured from the Mississippi Department of Environmental Quality (MDEQ) and included in the previous District 3 RHMP.

Figure B.5: Dams Mapped by the State of Mississippi | Source: MDEQ, Delta State University



Location and Extent

The 2018 SHMP included a MEMA Region 3 Dam Inventory by County, breaking the numbers down for low, high, and significant hazard dams. The numbers of dams for all nine counties in the District are included for the purpose of comparing Bolivar County's level of risk to that of surrounding counties. The table shows fewer dams in Bolivar than other District 3 counties except for Humphreys, Sunflower or Washington Counties.

Table B.11: MEMA Region 3 Dam Inventory by County – Bolivar County | *Source:* 2018 Mississippi State Hazard Mitigation Plan

County	Significant	High	Low	Total
District 3				
Atalla	1	2	44	47
Bolivar	-	-	14	14
Carroll	4	23	86	113
Holmes	1	5	39	45
Humphreys	-	-	4	4
Leflore	-	-	-	-
Montgomery	-	2	22	24
Sunflower	-	-	12	12
Washington	-	-	3	3

There are no significant or high hazard dams in Bolivar County.

Table B.12 - Low Hazard Dams | *Source throughout Bolivar County* | *Source*: MDEQ Dam Safety Division

Dam Name	State ID	Latitude	Longitude
Alford Butler Lake Dam	MS00035	34.0917	-90.7300
Charles Heinz Catfish Pond Dam	MS00038	33.9683	-90.6967
Delta Stream Electric Station Dam	MS00053	33.7983	-90.7050
Mound Bayou Recreation Dam	MS00043	33.8783	-90.7733
Mound Bayou Sewage Lagoon Dam	MS00045	33.8733	-90.7267
Merigold Sewage Lagoon Dam	MS00048	33.8333	-90.7167
Bob Malone Catfish Pond Dam	MS00051	33.8133	-90.9667
Cleveland Sewage Lagoon Dam	MS00055	33.7200	-90.7050
Cleveland Fisheries Dam	MS00056	33.7100	-90.7100
Shaw Sewage Lagoon Dam	MS00064	33.5883	-90.7733
Cleveland Sewage Lagoon Number 2 Dam	MS00690	33.7233	-90.7050
Lake Lanett Dam	MS01099	33.5383	-91.0133
Charlie Capps Lake Dam	MS01392	33.8617	-90.9783
Rosedale Sewage Lagoon Dam	MS02492	33.8517	-91.0100

Previous Occurrences

There is no record of dam breaches in Bolivar County. The County has had significant impacts from levee failures the late 1800's and early to mid-1900's. Below is a summary of these events. Details of these events are also provided in Section 4 – Hazard Identification and Risk Assessment of the Base Plan.

On April 21, 1927, a levee failure along the Mississippi River near Mound Landing overflowed all of the land from Beulah to Vicksburg. A majority of the alluvial valley was under water. This devastating event caused the loss of more than 246 lives; drowned out hundreds of cities, towns, and villages; drove 700,000 people from their homes, rendering them objects of charity dependent upon the Red Cross and other agencies; inundated 1,800 square miles; destroyed 1.5 million farm animals; caused losses amounting to many hundreds of millions of dollars; suspended interstate freight and passenger traffic; prevented telegraph and telephone communication; delayed the United States postal service; and paralyzed industry and commerce. As a result of this disaster to the valley, the Federal Congress on May 15, 1928 passed a general flood control act, wherein the government assumed the cost of all construction and for the first time enunciated the policy of the Federal Government assuming the construction of levees necessary for the protection of the valley.

Some examples of levee failures along the Mississippi River prior to the General Flood Control Act of 1928 are recounted by Walter Sillers below:

- In 1882, the entire line of levee in Bolivar County, about 85 miles, seemed to snap in a hundred places in one night, during a terrible storm on the night of February 28th, and the whole county was under water.

- A section of the levee a mile long caved into the river just south of the town of Prentiss in 1865, and other levees, north and south, in Bolivar County, either caved in or broke; and as the stage of water was high for that day, a disastrous overflow swept over the country, drowning stock, sweeping away fences, destroying crops, and carrying destruction and disaster in its wake.

- A private levee along Lake Vermillion from Lake Beulah to Neblett's Landing was adopted as a part of the main levee system, in lieu of the abandoned levee. In spite of all the work and care given to this levee proper, there were many breaks in it; 1867, 1882, 1884, 1874 and 1897. A break occurred in the Catfish Point Levee in 1890, causing this entire Point with its improved plantations to be thrown outside the levee and abandoned. The most disastrous of all was in 1912 in which the water was the highest on record and caused a disastrous break in the levee four miles below Beulah.

- In 1922 the closure of the Cypress Creek levees on the Arkansas side of the Mississippi River raised the flood line to the extent that carried the water over the top of the Mississippi Levees from Kentucky Ridge to Mound Landing, causing a desperate struggle and a vast expenditure of money to top it off and hold it against the increased flood line of the river.

- In 1926 Bolivar County was operating under the second Flood Control Act of 1923, under which act all the levee boards contributed one-third of the cost of construction of the levees and maintained the works after they were constructed.

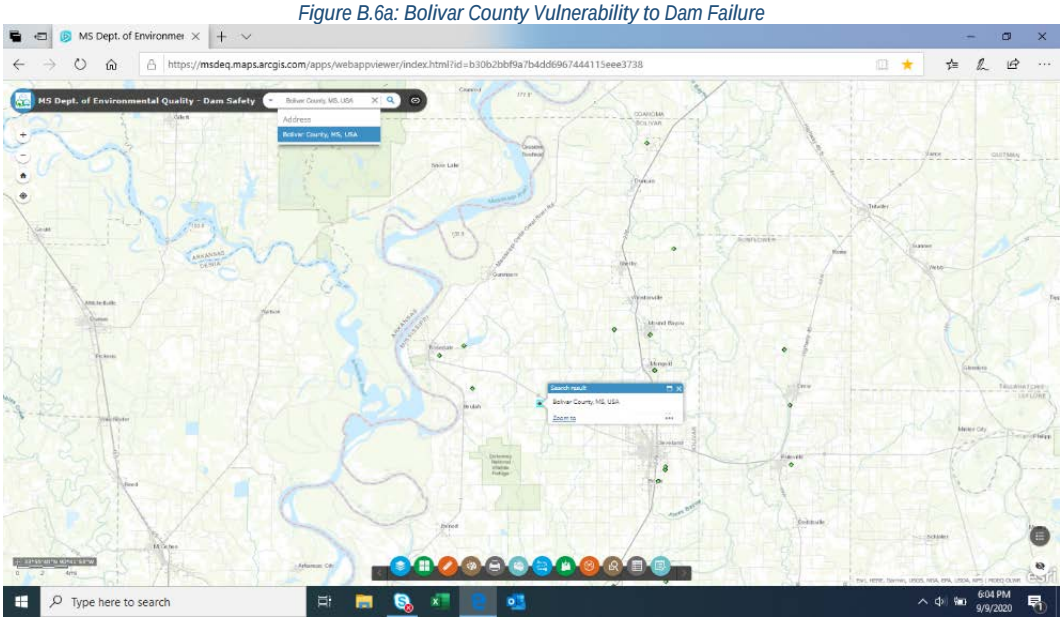
Probability of Future Occurrence

Dam failure is not considered to be among the highest hazards of concern in the county but, since the reclassification there is increased awareness among officials about monitoring such structures. The probability of future occurrence of dam breach is classified as low. It is not possible to develop a statistical probability when there is no recent historical data.

Assessing Vulnerability

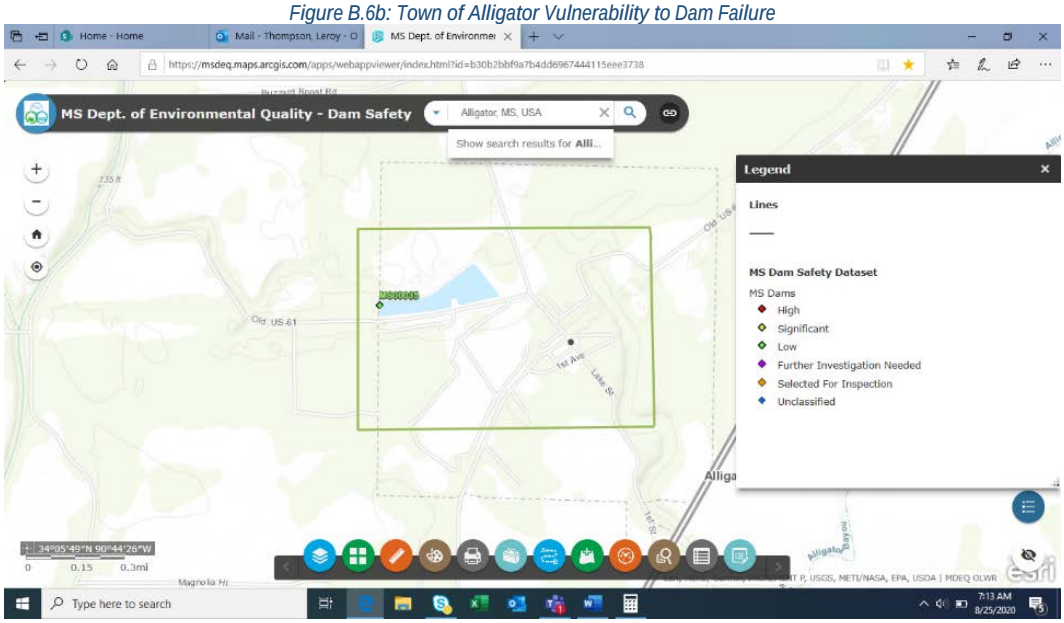
If breached, even a low hazard dam could cause damage to nearby property. The maps below, included as Figures B.6a through B.6p, and taken from the MDEQ mapping web site, show the close-up views of the location of dams in all of Bolivar County and for each of its jurisdictions. In each screen shot, the name of the community is shown in the Search Box, and a legend is included to show the degree of hazard for each identified dam.

Figure B.6a: Bolivar County Vulnerability to Dam Failure



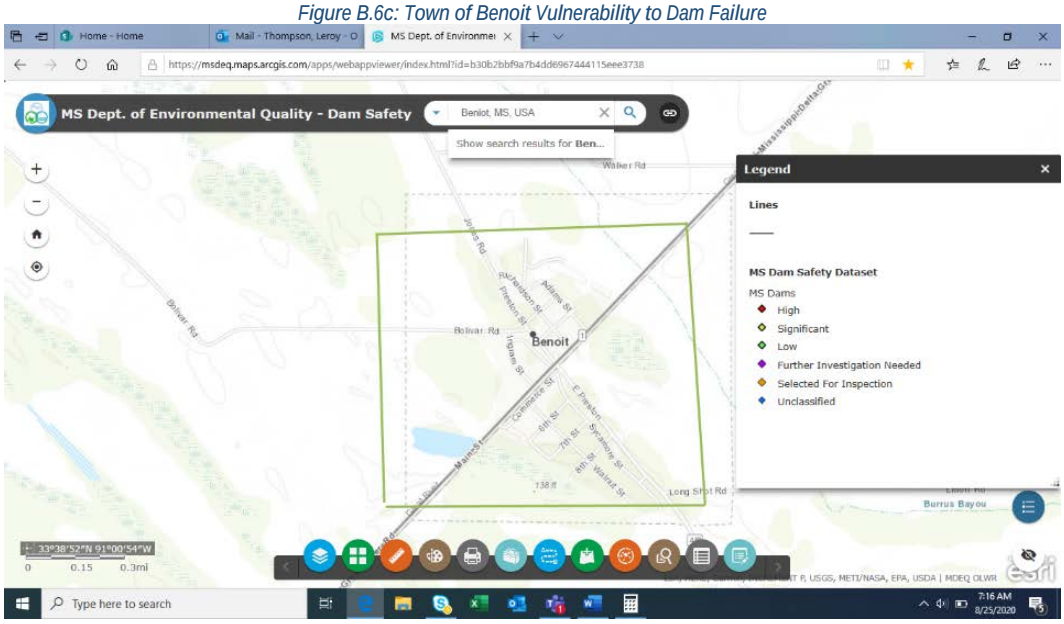
There are no significant or high hazard dams located in Bolivar County. The data presented here suggests that unincorporated Bolivar County overall is at a low risk.

Figure B.6b: Town of Alligator Vulnerability to Dam Failure



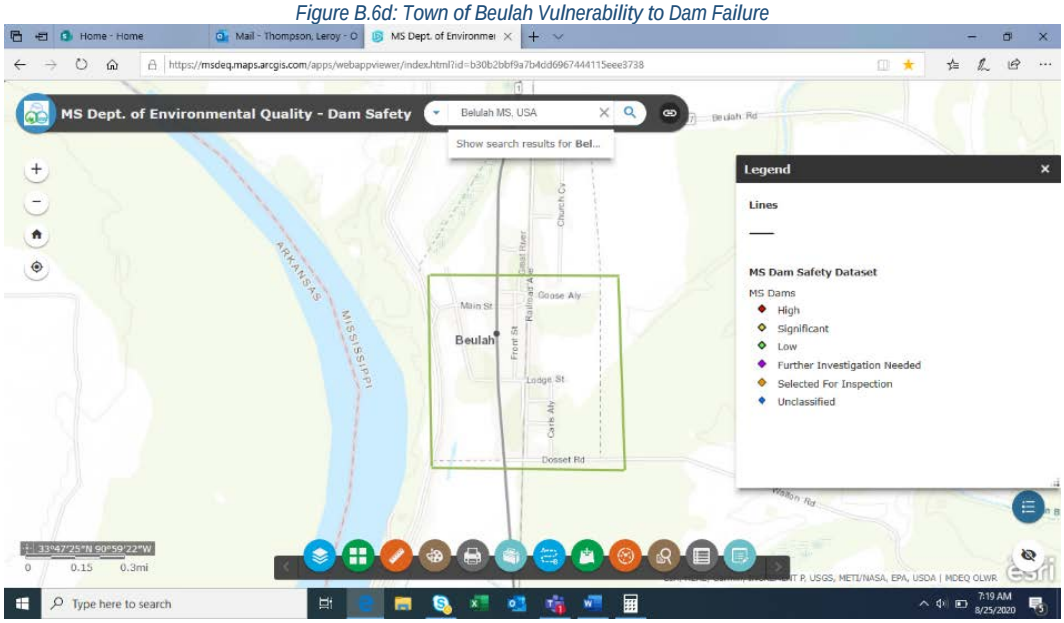
There are no dams within in a short distance of the Town of Alligator. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Figure B.6c: Town of Benoit Vulnerability to Dam Failure



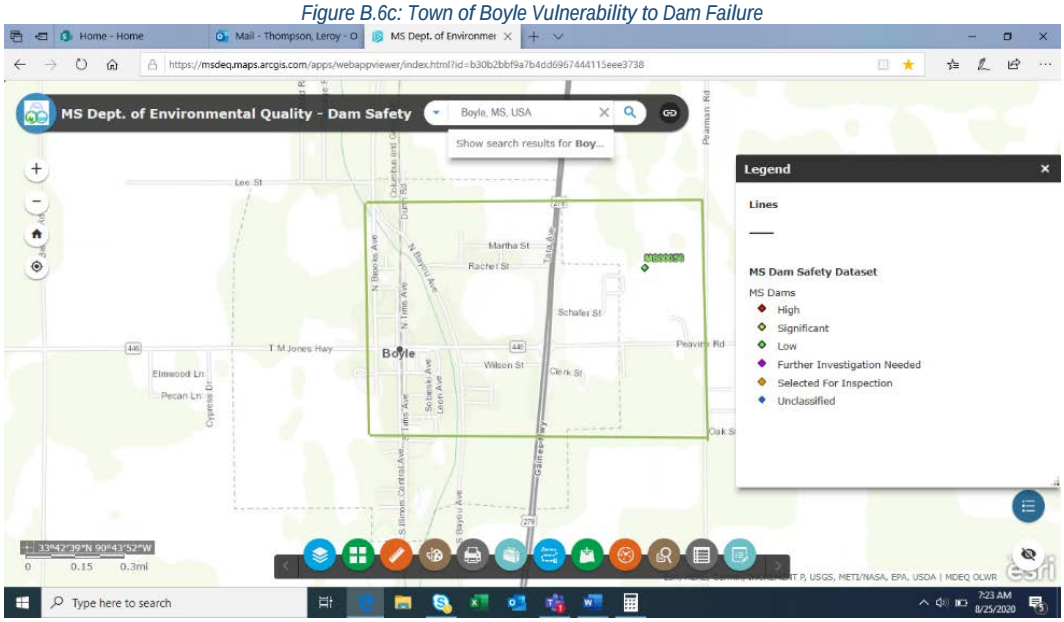
There are no dams within in a short distance of the Town of Benoit. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Figure B.6d: Town of Beulah Vulnerability to Dam Failure



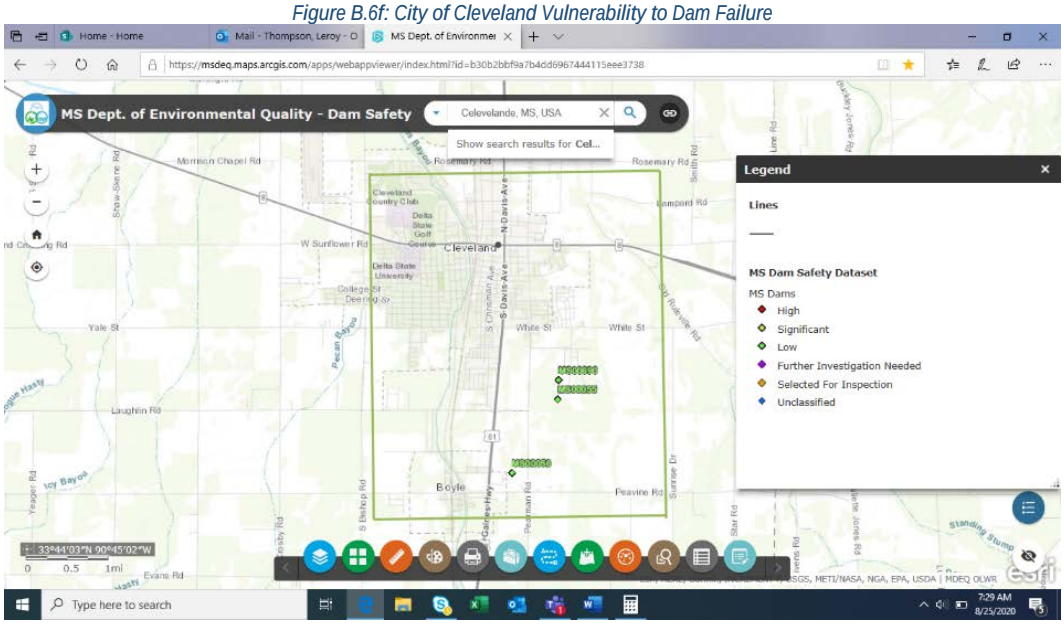
There are no dams within in a short distance of the Town of Beulah. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Figure B.6c: Town of Boyle Vulnerability to Dam Failure



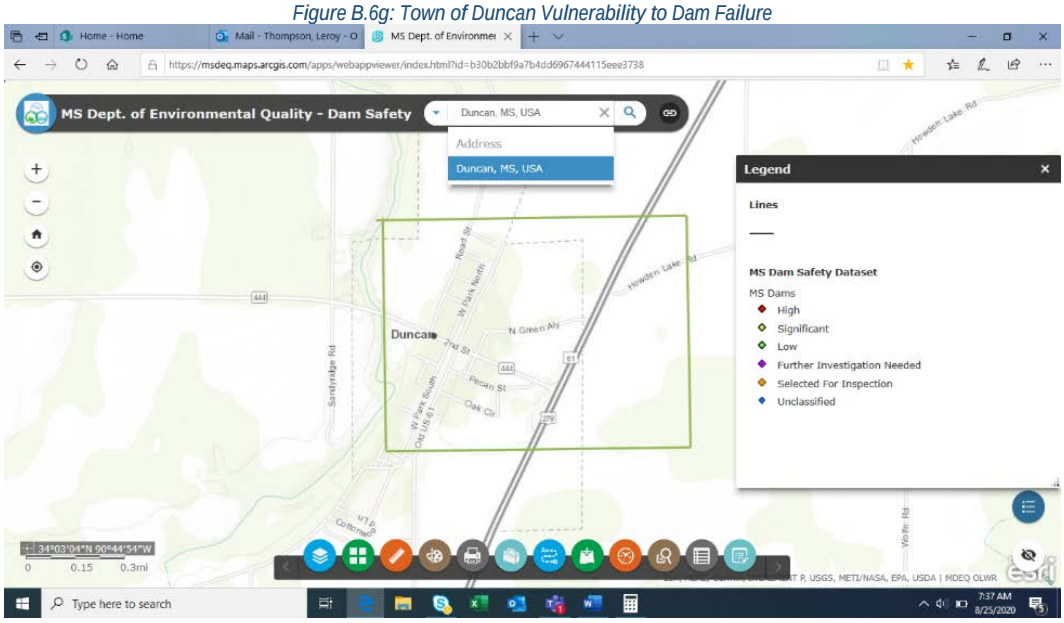
There are no dams within in a short distance of the Town of Boyle. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Figure B.6f: City of Cleveland Vulnerability to Dam Failure



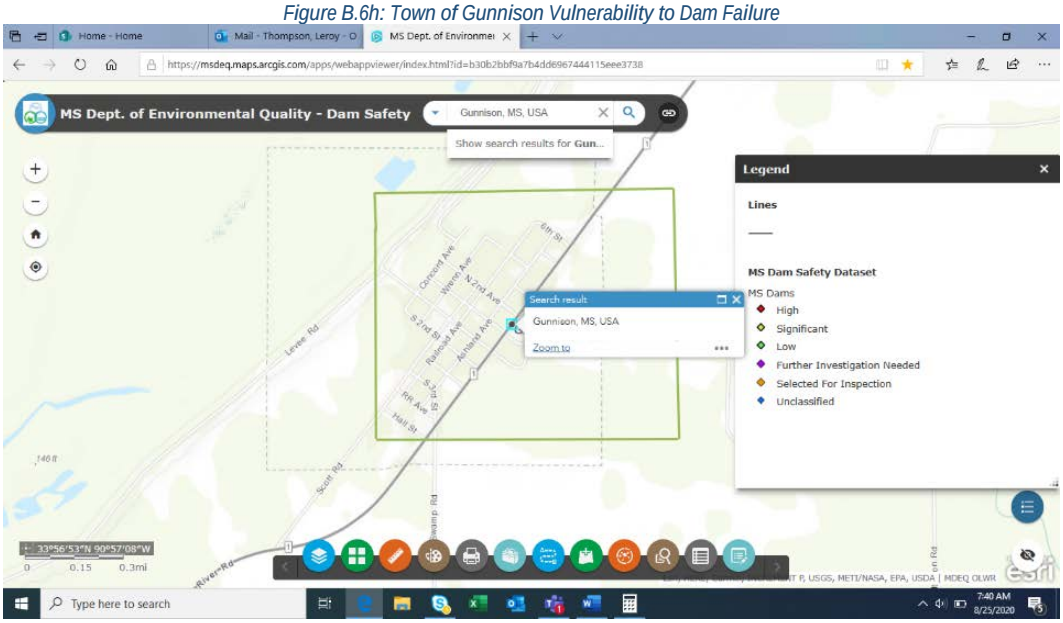
The dam vulnerability map for Cleveland shows the Cleveland Fisheries Dam, and Cleveland Sewage Lagoon Dam are located near the city and they are classified as a low hazard dam.

Figure B.6g: Town of Duncan Vulnerability to Dam Failure



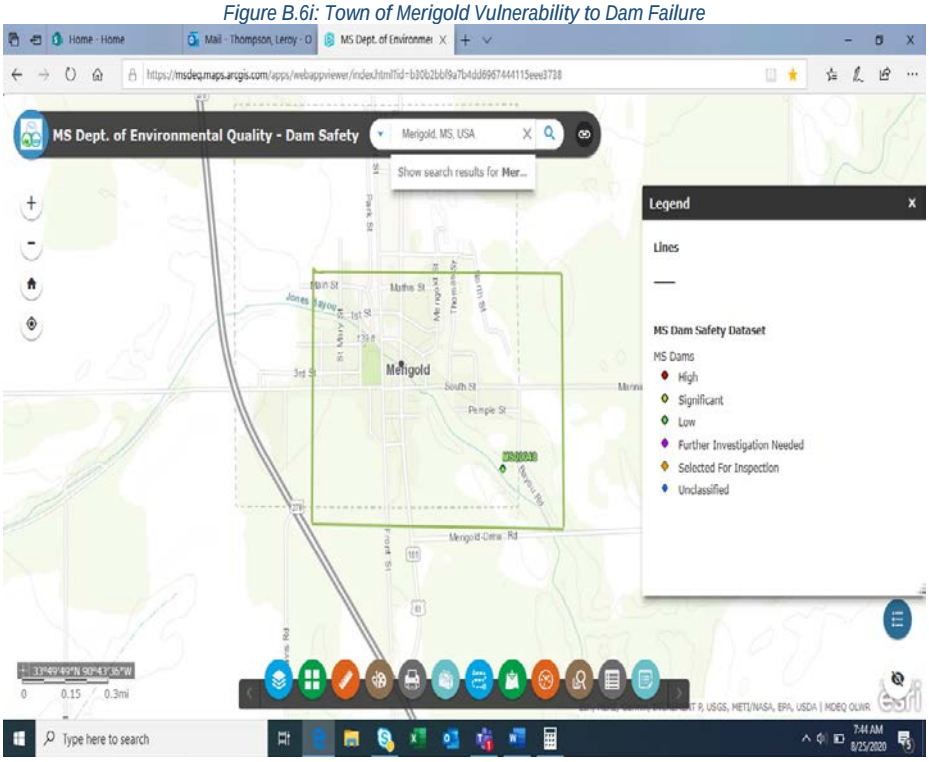
There are no dams within in a short distance of the Town of Duncan. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Figure B.6h: Town of Gunnison Vulnerability to Dam Failure



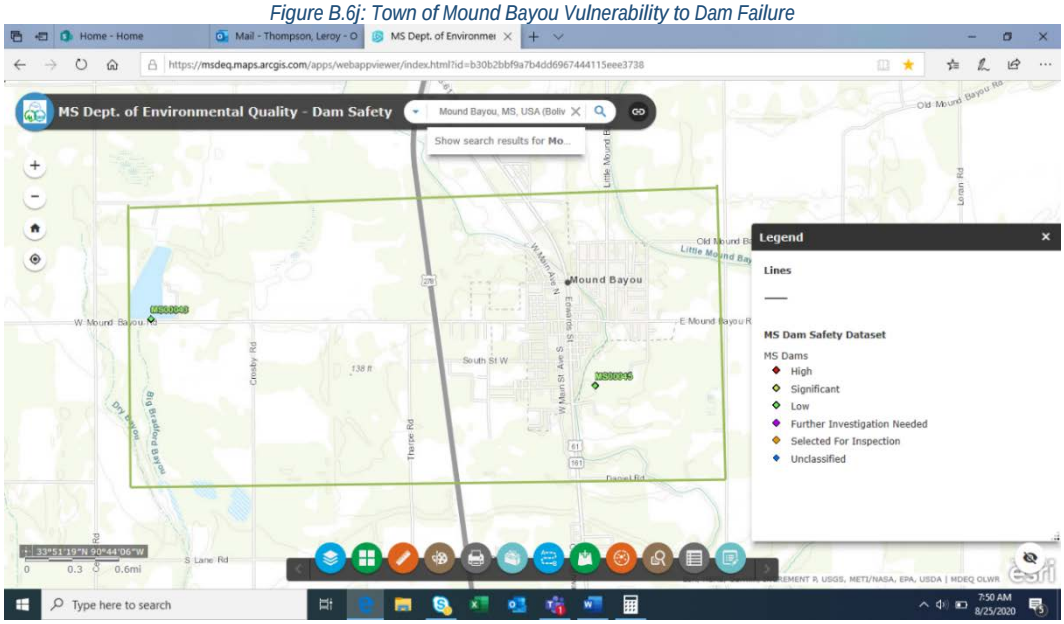
There are no dams within in a short distance of the Town of Gunnison. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Figure B.6i: Town of Merigold Vulnerability to Dam Failure



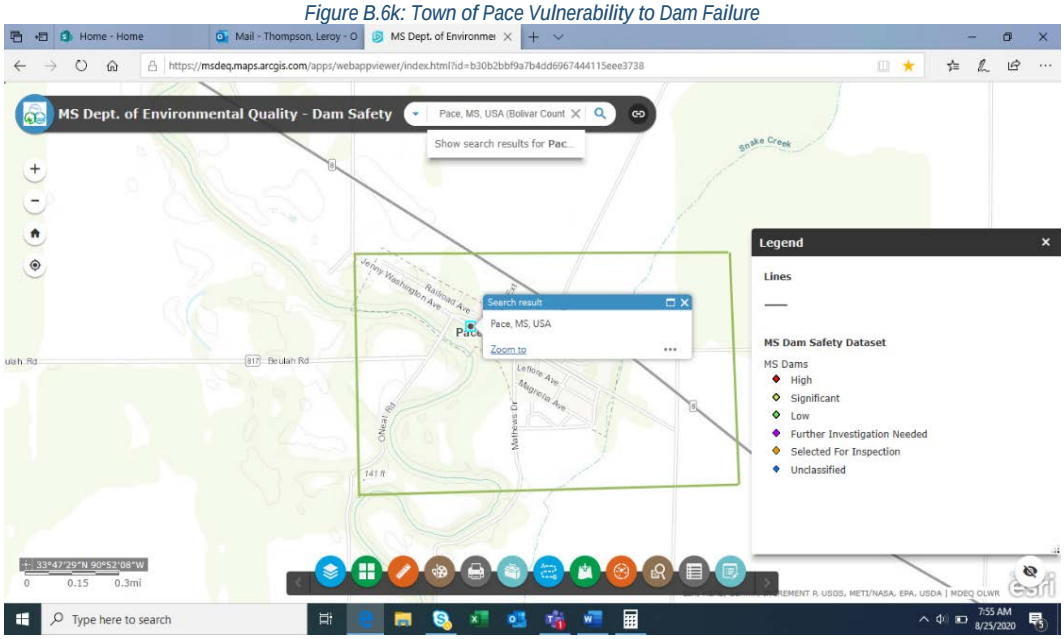
There are no dams within in a short distance of the Town of Merigold. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Figure B.6j: Town of Mound Bayou Vulnerability to Dam Failure



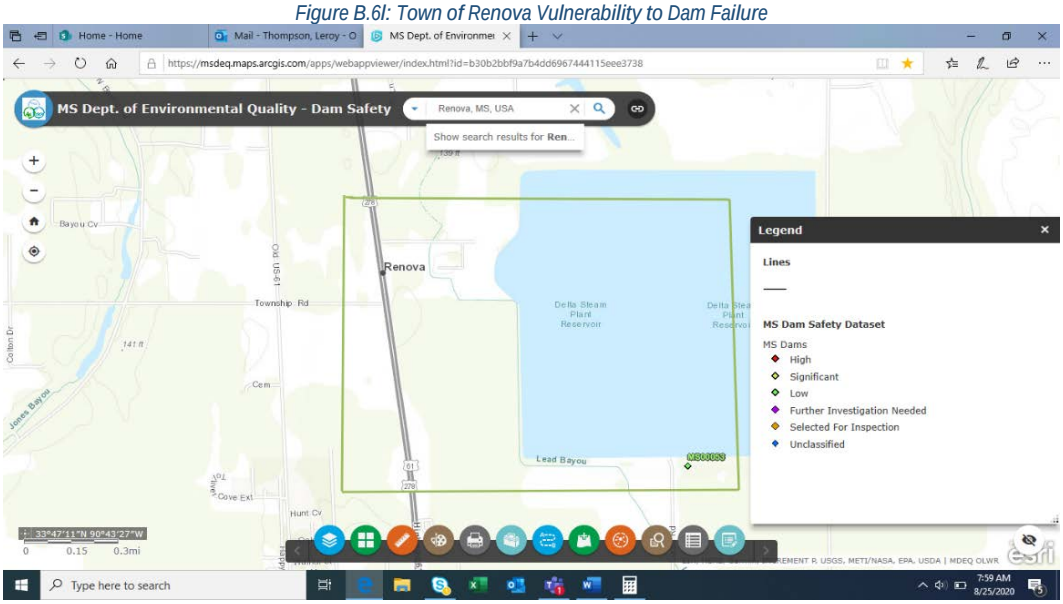
There are no dams within in a short distance of the Town of Mound Bayou. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Figure B.6k: Town of Pace Vulnerability to Dam Failure



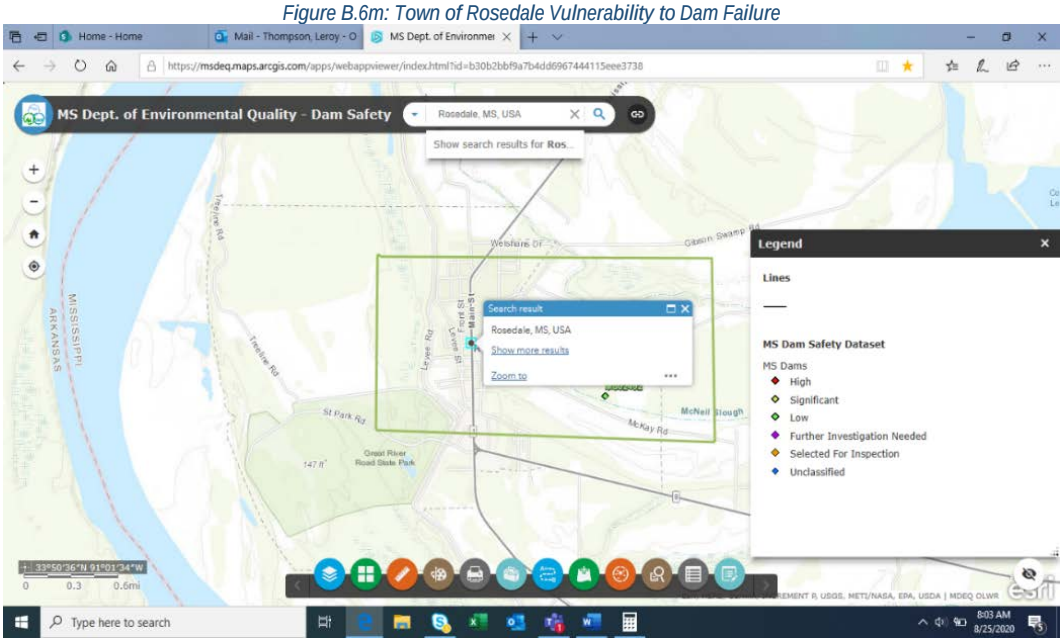
There are no dams within in a short distance of the Town of Pace. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Figure B.6l: Town of Renova Vulnerability to Dam Failure



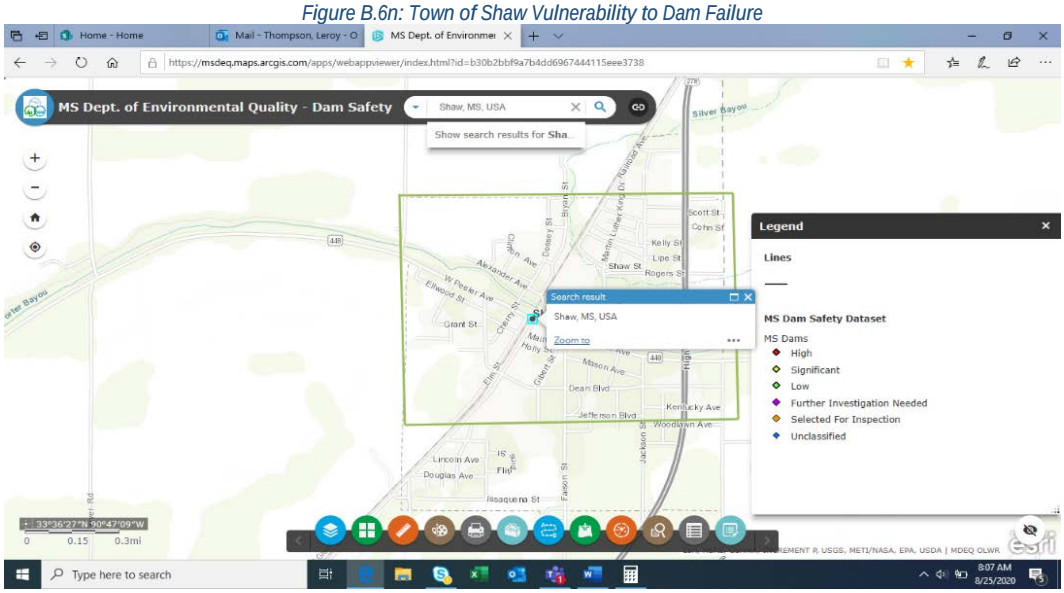
There are no dams within in a short distance of the Town of Renova. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Figure B.6m: Town of Rosedale Vulnerability to Dam Failure



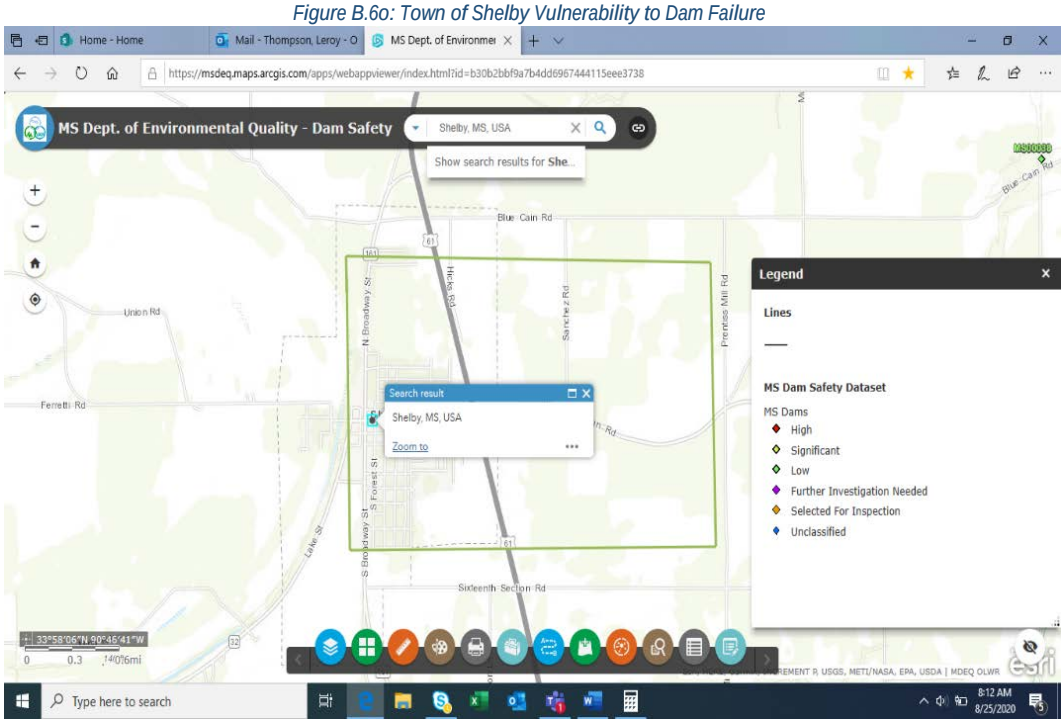
There are no dams within in a short distance of the Town of Rosedale. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Figure B.6n: Town of Shaw Vulnerability to Dam Failure



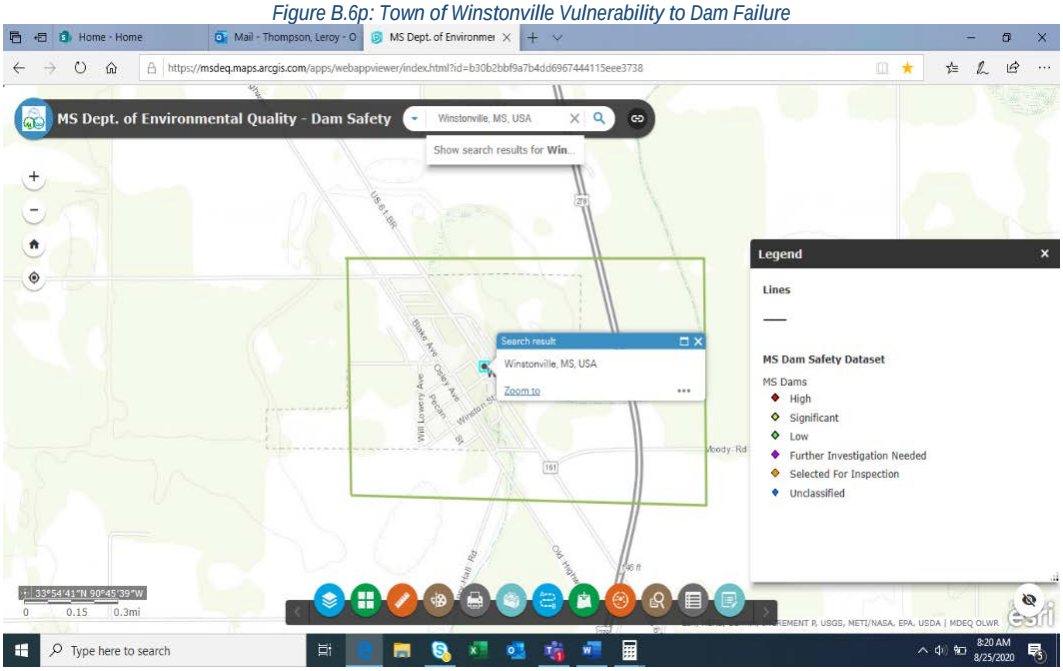
There are no dams within in a short distance of the Town of Shaw. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Figure B.6o: Town of Shelby Vulnerability to Dam Failure



There are no dams within in a short distance of the Town of Shelby. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Figure B.6p: Town of Winstonville Vulnerability to Dam Failure



There are no dams within in a short distance of the Town of Shaw. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Overall Vulnerability to Dam Failures

Table B.13 Geographic Vulnerability to Dam Failure by Jurisdiction-Bolivar County

Jurisdiction	Rankings
Unincorporated Bolivar County	Medium
Town of Alligator	Low
Town of Beniot	Low
Town of Beulah	Low
Town of Boyle	Low
City Cleveland	Low
Town of Duncan	Low
Town of Gunnison	Low
Town of Merigold	Low
Town of Mound Bayou	Low
Town of Pace	Low
Town of Renova	Low
City of Rosedale	Low
City of Shaw	Low
City of Shelby	Low
Town of Winstonville	Low
Overall Vulnerability Bolivar County to Dam Failure	Low

There are no significant or high hazard dams in Bolivar County. Therefore, dam failure is rated as low risk to Bolivar County overall.

Drought

Location and Extent

Drought covers a large area and cannot be confined within geographic boundaries. Therefore, all of Bolivar County could be exposed to drought conditions. The extent of damage from drought typically does not pose a threat to property but can impact agricultural assets within the county.

Previous Occurrences

Table B.14lists 8 events reported in the years of 2000 through 2019 as shown in the National Weather Service Storm Events Database, housed at the National Center for Environmental Information (NCEI). It is important to note that the lack of data during that a given time frame does not mean drought conditions did not exist-they simply were not reported. NCEI reports drought on a countywide basis and not by jurisdiction. The figures show that most drought-related damage is related to agricultural losses.

Table B.14 - Drought Occurrences 2000 to 2019 | Source: NCEI

Date	Death	Injury	Property Damage	Crop Damage
11/15/2016	-	-	-	50,000
10/01/2015	-	-	-	1,200
9/15/2015	-	-	-	400,000
10/1/2010	-	-	-	500,000
9/1/2010	-	-	-	500,000
8/1/2010	-	-	-	500,000
7/15/2010	-	-	-	300,000
10/1/2006	-	-	-	5,000,000
Total	**-**	**-**	**-**	**$7,251,000**

Probability of Future Occurrences

Historical data listed in Table B.14 suggest that drought is likely. It may occur one or more times in a given year or may experience a drought-free period of several years. It is also likely that drought may occur as a result of climate change throughout the United States, which would affect the region's significant agriculture holdings. Of the nineteen years included in NCEI research, a drought has occurred in five years. A probability developed by dividing the number of drought years by the total number of years results in a 21% probability that a drought will occur in any given year.

Assessing Vulnerability

Drought occurs with advance warning because those in a farm community are able to tell when patterns of water availability change. Drought is monitored by the National Weather Service and the Mississippi State University Extension Service, which has offices in each county. Two tools are available for Extension staff and others who monitor drought: the Keetch-Bynum Drought Index and the Palmer Drought Severity Index, which are discussed in Section 4 of the Base Plan

as tools for drought monitoring. Drought is not known to cost human lives, but it affects lifestyles and the economic effects may be felt countywide. The NCEI Database indicates there have not been any known deaths or injuries from drought in the planning area.

All NCEI events are listed as occurring in the Bolivar Zone, so it can be deducted that the entire county is equally at risk to the hazard. However, because the unincorporated areas, which include agricultural assets, are more affected by drought than municipalities, this are ranks as medium for unincorporated areas. Other areas of the county are determined to be low vulnerability to drought, so the County overall is listed as having low vulnerability.

Table B.15 Bolivar County Jurisdictional Vulnerability to Drought

Jurisdiction	Ranking
Unincorporated Bolivar County	Medium
Town of Alligator	Low
Town of Beniot	Low
Town of Beulah	Low
Town of Boyle	Low
City Cleveland	Low
Town of Duncan	Low
Town of Gunnison	Low
Town of Merigold	Low
Town of Mound Bayou	Low
Town of Pace	Low
Town of Renova	Low
City of Rosedale	Low
City of Shaw	Low
City of Shelby	Low
Town of Winstonville	Low
Overall Bolivar County Vulnerability to Drought	Low

Earthquake

Location and Extent

Bolivar County, like most of North Central Mississippi, is located within the Modified Mercalli Zone VI. Should an event occur that has a 5.9 to 6.0 magnitude on the Richter Scale, some or all of the following may occur based on descriptions included in the Scale:

- The event would be felt by all or nearly everyone
- People may be awakened from sleep if the event occurs at night
- Widespread frightened population
- Some dishes and windows would be broken.
- Unstable objects would be overturned.
- Pendulum clocks may stop.
- Heavy furniture moved
- Instances of fallen plaster
- Slight damage

Previous Occurrences

No earthquakes have been reported as having taken place in or affected Bolivar County since the last plan update.

Probability of Future Occurrence

In 2002, a study by the Center for Earthquake Research and Information (CERI) at the University of Memphis reported that, in any given 50-year interval, there is a seven to ten percent probability of the region experiencing an event at the level of the devastating 1811-1812 sequence of earthquakes in the New Madrid Zone. The study also estimated that there is an estimated 25 to 40 percent probability that a 6.0 magnitude event occurring a 50-year time period. The probability of future earthquake occurrence is, therefore, classified as susceptible. The community relies on studies such as this for probability estimates because there is no locally available occurrence data.

Assessing Vulnerability

The level of vulnerability is the same for all areas of the county given that there is no substantive geographic variation in distance from one end of the county to the city of New Madrid, MO, the epicenter of the New Madrid Seismic Zone. The distance between New Madrid and the Town of Alligator, in the northwest corner of the county, is an estimated 209.5 miles, and the distance to the Town of Shaw is an estimated additional 35 miles further south. There is not enough a distance in proximity to New Madrid to say that one community is more vulnerable than the other.

There are recorded deaths, injuries, or property damage from earthquakes in Bolivar County. There is little likelihood of any detrimental effect on the County's economy, residents' lifestyle, or physical structures. However, the effects on life and property in the area and low hazard dams could be significant if a large earthquake were to occur given the nature of the built environment. In estimates derived from a report by the U.S. Geological Survey (USGS) "New Madrid Earthquake Project," the relative risk for Bolivar County and other sectors of MEMA District 3 for a potential seismic event could have a magnitude of between 3 and 4 on the Richter scale.

Based on research completed by the USGS Earthquake Hazard Program suggests buildings constructed using load-bearing masonry walls are vulnerable to damage by earthquakes, while steel and wood-frame buildings have a lower seismic vulnerability. Low-rise reinforced concrete buildings are also in this lower seismic risk category. Damage expected in such an event within the unincorporated areas of Bolivar County could include buildings not secured to a solid foundation being shaken off their supports, and chimneys falling away from houses. Multi-story structures built with un-reinforced masonry buildings could be substantially damaged.

In reviewing earthquake effects on dams, the SHMP overlaid significant high hazard dams with historic seismic recordings and developed a dam inventory for earthquake prone counties. Dam/levee systems are also vulnerable to earthquake events as shown by the table below, which was presented earlier as Table B.11.

Table B.16: Dam Inventory in Relation to Earthquake Prone Counties by Dam Type | Source: 2018 Mississippi SHMP

MEMA DISTRICT 3				
County	Significant	Hight	Medium	Low
Attala	1	2	44	47
Bolivar	-	-	14	14
Carroll	4	2	86	113
Holmes	1	5	39	45
Humphreys	-	-	4	4
Leflore	-	-	-	-
Montgomery	2	2	24	2
Sunflower	-	-	12	12
Washington	-	-	3	3

Extreme Heat

Location and Extent

Heat waves cover a large area and cannot be confined within geographic boundaries. Therefore, all of Bolivar County could be exposed to excessive heat conditions. The extent of damage from heat events typically does not pose a threat to property or crops but can impact people with heat-related injuries or fatalities. The elderly, infants and disabled are most vulnerable to excessive heat conditions. It may cause crop damage and effect the livelihood of those working in the agricultural industry.

Previous Occurrences

As shown in Table B.17, there have been five recoded heat events from 2000 to 2019. There were no property or crop damages reported, however one fatality was contributed to excessive heat temperatures in 2005 and second death in 2010.

Table B.17: Extreme Heat Occurrences 2000 to 2020 | Source: NCEI

Date	Event Type	Death	Injury	Property Damage	Crop Damage
8/1/2010	Excessive Heat	1	-	-	-
8/5/2007	Heat	-	-	-	-
7/15/2006	Heat	-	-	-	-
8/17/2005	Heat	-	-	-	-
7/23/2005	Heat	1	-	-	-
Totals		**2**	**-**	**-**	**-**

The National Weather Service event narrative for the most recent occurrence (8/1/2010) is typical of how extent is described in the other four events.

> A four day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS Jackson, MS forecast area, 19 record highs were set between August 1st and 4th. On August 2nd, the 2nd warmest average temperature was recorded. The low was 78 and the high 105, this resulted in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in 3 fatalities across the forecast area.

One of the deaths mentioned in this description occurred in Bolivar County a man was found lying near a tree in his yard in Cleveland. Bolivar County officials said the man lived alone and had been dead at least a day. A jug of water was found near his body. It is not feasible to discuss vulnerability broke down by jurisdiction because NCEI data for this hazard is all reported countywide.

Probability of Future Occurrences

While five events are listed in the table of historical events, two are from an extended event that occurred over a two-month period. The probability of future occurrences for extreme heat events is likely with a 21% chance of occurring in any given year.

Assessing Vulnerability

Heat can affect certain populations but generally causes no property damage. During periods of extreme heat, there is little physical destruction, although roads can buckle, and livestock die. Extreme heat conditions can pose problems for those not accustomed to the climate or who are outside for prolonged periods of time. Extreme heat can create a threat even to individuals and communities that are accustomed to high temperatures. Excessive heat can also cause utility outages due to an increased demand for electricity.

All of the following populations are prone to heat-related conditions: the elderly; young children; those who are immobile; persons who live alone especially without air conditioning; people without transportation; and people suffering from serious illnesses. Because the National Weather Service reports are county based and events described are often regional occurrences, the entire population throughout the county is vulnerable.

Expansive Soil

Location and Extent

Expansive soils are present throughout Mississippi and have been known to cause considerable damage to housing and infrastructure. Less than 50 percent of soils in Bolivar County consist of clay having high swelling potential.

Previous Occurrences

There has been no record of expansive soil issues in Bolivar County.

Probability of Future Occurrence

The probability of expansive soils is classified as low. While it may be realistic to say that there is a 0% chance of occurrence, it is not possible to document probability with no historical data.

Assessing Vulnerability

Expansive soils could cause damage to infrastructure and both business and residential structures within Bolivar County. Community leaders agreed that this is a hazard of low level concern but wanted to retain it in the 2020 RHMP update to document that a discussion about the hazard took place.

Flood

Location and Extent

The entire geographic region of Bolivar County is at risk to riverine, flash flooding, and flooding caused by undersized overburdened stormwater management systems. All of the flood events cited from recent NCEI data below are documented as flash floods. Flood data shown below shows that all locations in the county are susceptible to flooding, and the extent of some events is listed as countywide.

Flash floods often occur when rain falls on the built environment where impervious surfaces, gutters, and storm sewers hasten the flow of run-off. Flowing waters can become raging torrents of water that course through streambeds and streets, sweeping away everything in their path.

Previous Occurrences

Table B.18 provides a summary of flood events recorded in Bolivar County from 2000 to 2019, and Table B.19 shows the events sorted by location within the County. While inadequate storm management capabilities likely contributed to flash flooding in all areas, it is noted where local creeks, rivers and their tributaries are located nearby and may be potential sources of overflow for flooding

Table B.18: Flood Events 2000 to 2019 | Source: NCEI

Location	Date	Event Type	Death	injury	Property Damage	Crop Damager
Boyle	5/12/2019	Flash Flood	-	-	80,000	-
Cleveland	5/09/2019	Flash Flood	-	-	10,000	-
Cleveland	8/20/2018	Flash Flood	-	-	25,000	-
Cleveland	2/22/2018	Flash Flood	-	-	50,000	-
Cleveland Muni ARPT	6/16/2017	Flash Flood	-	-	3,000	-
Shaw	3/11/2016	Flash Flood	-	-	20,000	-
Gunnison	3/12/2016	Flood	-	-	75,000	-
Cleveland	3/10/2016	Flash Flood	-	-	60,000	-
Cleveland	12/25/2015	Flash Flood	-	-	5,000	-
Cleveland	8/11/2014	Flash Flood	-	-	10,000	-
Cleveland	1/13/2013	Flash Flood	-	-	10,000	-
Cleveland	6/12/2012	Flash Flood	-	-	20,000	-
Cleveland Muni Arpt	9/25/2011	Flash Flood	-	-	10,000	-
Cleveland	9/25/2011	Heavy Rain	-	-	10,000	-
Cleveland Muni Arpt	9/4/2011	Flash Flood	-	-	4,000	-
Lamont	5/4/2011	Flood	-	-	1,000,000	100,000
Shelby	8/7/2010	Flash Flood	-	-	5,000	-
Renova	10/13/2009	Flash Flood	-	-	125,000	200,000
Cleveland	10/13/2009	Flash Flood	-	-	50,000	400,000
Cleveland	7/29/2009	Flash Flood	-	-	15,000	-
Shaw	7/29/2009	Flash Flood	-	-	15,000	-
Bolivar Co.	5/6/2009	Flash Flood	-	-	12,000	-
Cleveland	2/27/2009	Flash Flood	-	-	50,000	-
Duncan	7/5/2008	Flash Flood	-	-	0	5,000
Deeson	5/2/2008	Flash Flood	-	-	0	500,000
Central Portion	5/10/2006	Flash Flood	-	-	100,000	-
Bolivar (Zone)	1/22/2006	Flash Flood	-	-	300,000	-
Cleveland	9/25/2005	Flash Flood	-	-	30,000	-
Cleveland	4/11/2005	Flash Flood	-	-	10,000	-
Cleveland	6/2/2004	Flash Flood	-	-	-	-
Cleveland	11/18/2003	Flash Flood	-	-	20,000	-
Cleveland	6/17/2003	Flash Flood	-	-	10,000	-
Cleveland	6/11/2003	Flash Flood	-	-	10,000	-
Shelby	6/11/2003	Flash Flood	-	-	5,000	-
Rosedale	12/23/2002	Flash Flood	-	-	5,000	-
Countywide	12/19/2002	Flash Flood	-	-	20,000	-
Cleveland	10/10/2002	Flash Flood	-	-	1,500	-
Countywide	1/24/2002	Flash Flood	-	-	1,000	-
Countywide	12/13/2001	Flash Flood	-	-	-	-
Countywide	12/12/2001	Flash Flood	-	-	1,000	-
Countywide	11/29/2001	Flash Flood	-	-	-	-
Countywide	11/29/2001	Flash Flood	-	-	600,000	-

Location	Date	Event Type	Death	injury	Property Damage	Crop Damager
Countywide	10/11/2001	Flash Flood	-	-	10,000	-
Cleveland	8/10/2001	Flash Flood	-	-	40,000	-
Totals			-	-	**$2,817,000**	$1,205,000

Table B.19: Bolivar County Flood Events 20001 to 2019 – Sorted by Location |
Source: FEMA Preliminary FIS (11/14/2018)- Bolivar County

Jurisdiction	# of Events	Major Water Bodies
Town of Alligator	-	-
Town of Beniot	-	-
Town of Beulah	-	-
Town of Boyle	1	Jones Bayou
City Cleveland	23	Pecan Bayou West Main Canal
Town of Duncan	1	-
Town of Gunnison	1	-
Town of Merigold	-	Jones Bayou
Town of Mound Bayou	-	Mound Bayou
Town of Pace	-	
Town of Renova	1	West Main Canal
City of Rosedale	1	Goff Bayou Holmes Lake Lane Bayou
City of Shaw	2	Pecan Bayou
City of Shelby	2	Mound Bayou Tributary 6
Town of Winstonville	-	-
Unincorporated Bolivar County	12	Bear Pan Canal Big Sunflower River Goffs Bayou Holmes Lake Jones Bayou Lead Bayou, Lane Bayou Mound Bayou Mound Bayou Tributary 6 Pecan Bayou West Main Canal

Information from the same table can be further sorted to assess vulnerability for the jurisdictions and unincorporated areas of the Bolivar County. All unincorporated communities to part of the County, will be counted toward incidents not within an identified municipality.

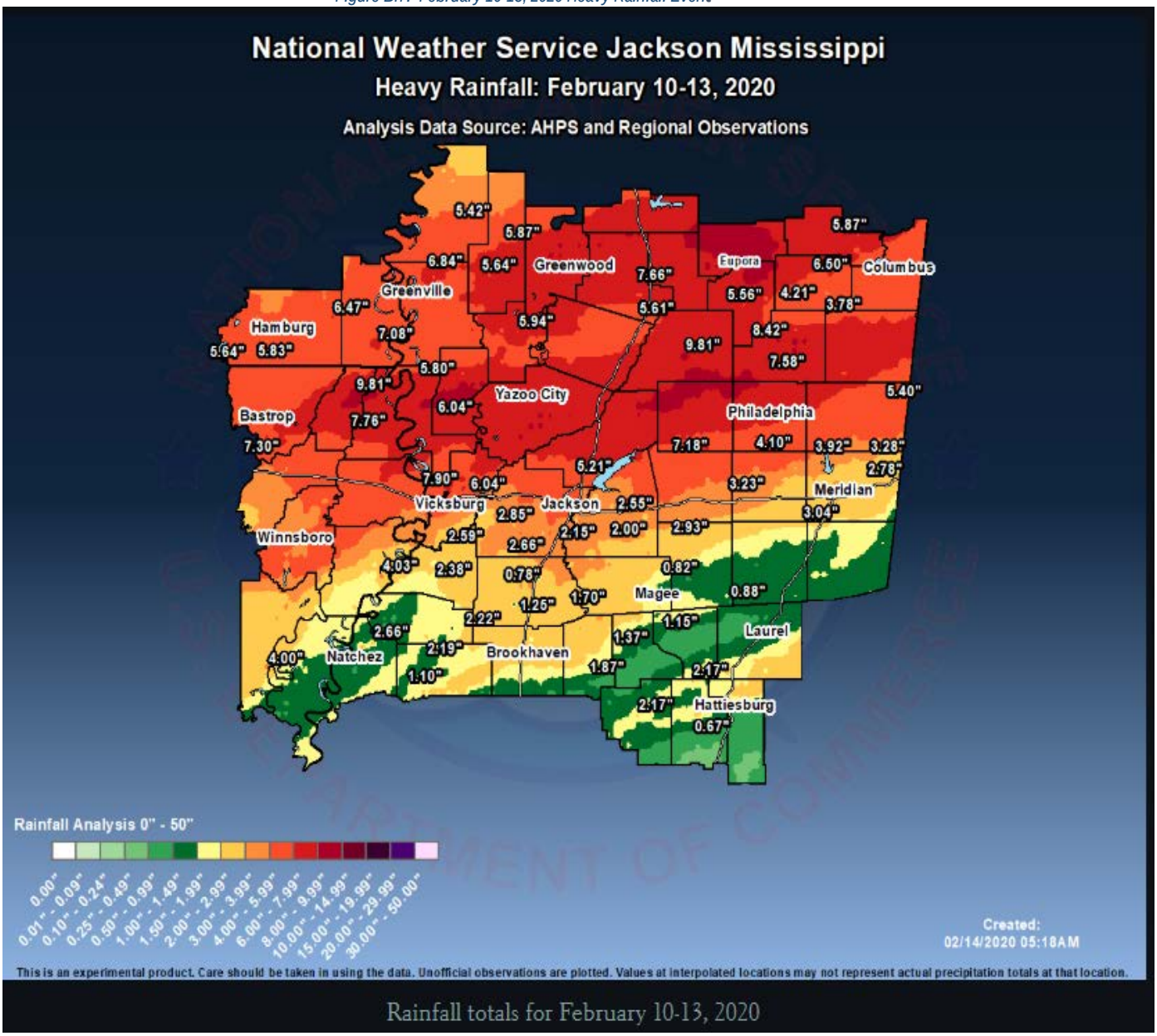
While there is a section devoted to flood vulnerability further in this annex, vulnerability will also be addressed here, in proximity to the previous information.

Table E.20: Geographic Vulnerability to Flood by Jurisdiction | Source: NCEI

Jurisdiction	# of Events	Vulnerability Level	Major Water Bodies
Town of Alligator	-	Low	Location of minor canals throughout the town
Town of Beniot	-	Low	Location of minor canals throughout the town
Town of Beulah	-	Low	Location of minor canals throughout the town
Town of Boyle	1	Low	Presence of major rivers and tributaries covering most of the county
City Cleveland	23	High	Presence of major rivers and tributaries covering most of the county
Town of Duncan	1	Low	Location of minor canals throughout the town
Town of Gunnison	1	Low	Location of minor canals throughout the town
Town of Merigold	-	Low	Location of minor canals throughout the town
Town of Mound Bayou	-	Low	Location of minor canals throughout the town
Town of Pace	-	Low	-
Town of Renova	1	Low	Location of minor canals throughout the town
City of Rosedale	1	Low	Location of minor canals throughout the city
City of Shaw	2	Low	Location of minor canals throughout the city
City of Shelby	2	Low	Location of minor canals throughout the city
Town of Winstonville	-	Low	Location of minor canals throughout the town
Unincorporated Bolivar County	12	High	Presence of major rivers and tributaries covering most of the county
Overall vulnerability of Bolivar County		High	Number events, that do not affect structures, input from the Office of Emergency Management

In addition to the events documented as occurring through 2019, MEMA District 3 experienced significant rainfall in early 2020 that had not yet been fully documented by NCEI at the time of plan development. The visual included on the next page as Figure B.7 shows during the period of February 10-13, 2020, communities countywide received between three to 14 inches of rain, and rain continued to fall – at times heavily – through the rest of the month. The Bolivar County Emergency Management Director said rainfall affected roadways and caused his department to recognize the need for road improvements in certain areas to mitigate against future flooding.

Figure B.7: February 10-13, 2020 Heavy Rainfall Event



National Flood Insurance Program (NFIP)

Bolivar County and all of its municipalities participate in the National Flood Insurance Program (NFIP).

Based on losses outlined in the 2013 SHMP, the following HAZUS Flood Results were listed for Bolivar County. Comparable data from the 2018 SHMP was not available to researchers working on the 2020 RHMP Update.

Table B.25 – Bolivar County HAZUS Flood Results | Source: HAZUS (2018 State of Mississippi SHMP

Structural Damage	Contents Damage	Inventory Loss	Total Building Loss	Income loss	Total Building and Income Loss	Bldg. Loss Ratio
$7,431,000	$9,034,000	$207,000	$16,672,000	$163,000	$16,835,000	1.9%

Residential at Risk	Other at Risk	Total Bldgs. Risk	No. of Bldgs. Substantially Damaged	No. of house-holds	No. of people needing shelter	Countywide Building Exposure
69	1	70	25	297	606	$1,511,484,000

The next two tables were also taken from the 2018 SHMP and, respectively, show the number of RL/SRL properties for Bolivar County and the eight other counties included in MEMA District 3 and the number of NFIP participating communities for each county and number of properties mitigated.

Table B.21: MEMA District 3 Repetitive Loss and Sever Repetitive Loss Properties – Over time and by County | Source: 2018 Mississippi SHMP

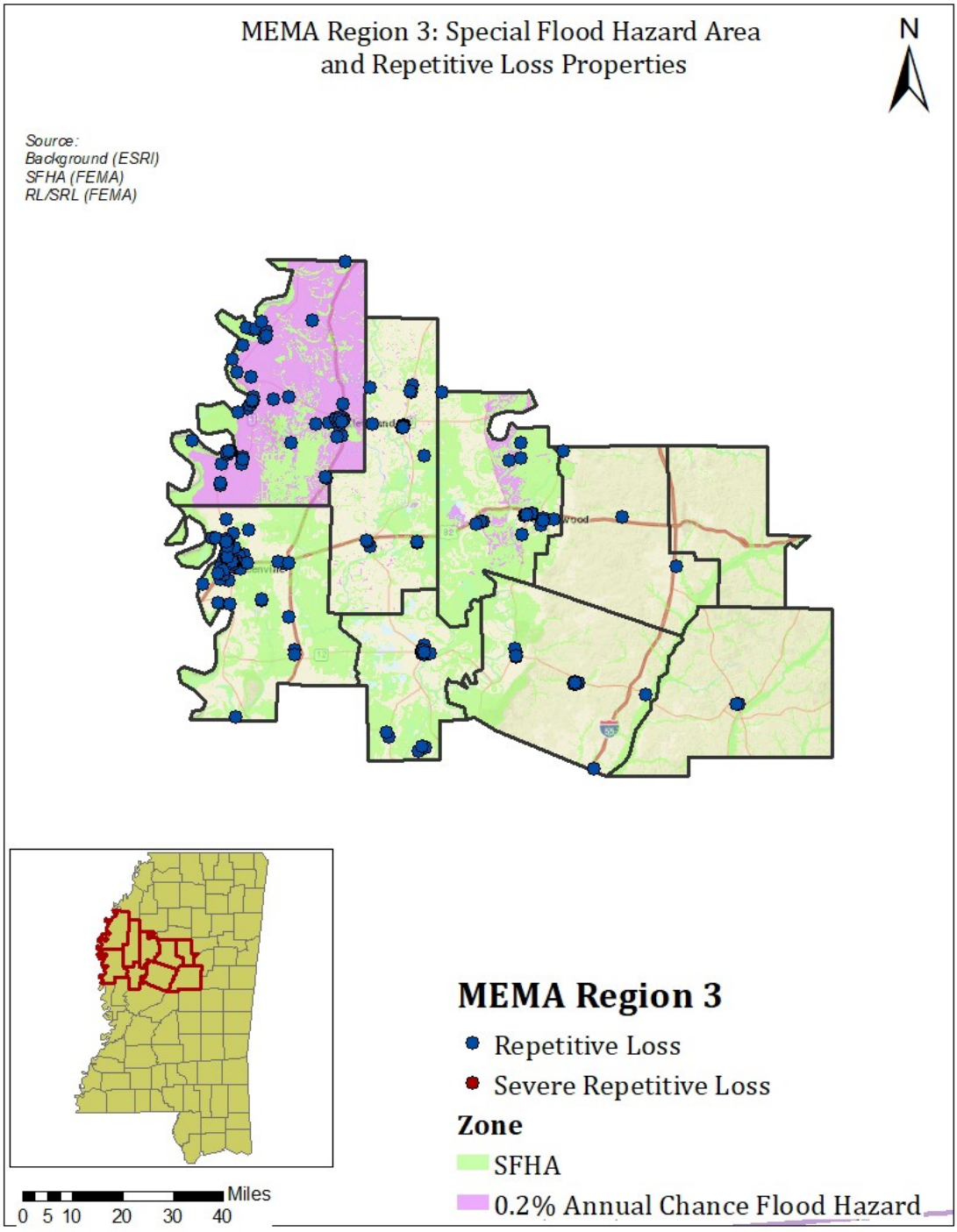
County	Repetitive Loss				Severe Repetitive Loss			
	No. of Properties 2009	No. of Properties 2011	No. of Properties 2016	No. of Flood Claims	No. of Properties 2009	No. of Properties 2011	No. of Properties 2016	No. of Flood Claims
Attala	0	0	1	2	0	0	0	0
Bolivar	155	108	210	631	2	48	2	228
Carroll	4	4	4	8	0	0	0	0
Holmes	11	12	12	27	0	0	0	0
Humphreys	40	31	46	161	2	10	1	61
Leflore	29	27	27	71	0	2	0	8
Montgomery	0	0	0	0	0	0	0	0
Sunflower	19	16	20	72	1	4	0	21
Washington	152	115	191	631	14	48	8	250
Totals	410	313	511	1,603	19	112	11	568

Table B.22: District 3 Participating Communities and Number of Mitigated Properties by County | Source: 2018 Mississippi SHMP

County	No. of NFIP Communities	No. of Mitigated Properties
Attala	5	0
Bolivar	16	20
Carroll	4	0
Holmes	8	0
Humphreys	5	1
Leflore	6	1
Montgomery	4	0
Sunflower	8	4
Washington	6	26
Totals	61	52

The Capabilities Assessment of this Annex identifies NFIP participation and also the fact that a Flood insurance Study was conducted when FEMA developed local Flood Insurance Rate Maps (FIRMs). As of 2016, there was 156 repetitive loss properties in the county. The map below, also from the 2018 SHMP, shows the location of Special Flood Hazard Areas (SFHAs) and RL structures for each county in District 3.

Figure B.8: MEMA District 3 Special Flood Hazard Area (SHFA) and Repetitive Loss Structures I Source: 2018 Mississippi SHMP



Repetitive Flood and Severe Repetitive Loss

Based on best available data, as shown in Table B.24, there are a total of 156 properties listed on the state's repetitive loss property database, of which three have been mitigated. The remaining properties probably have not been mitigated due to the fact providing replacement housing and relocation assistance for the low-income residents in this area is an issue. Additional information regarding these properties is provided in the mitigation strategy chapter of this plan.

Residents of Bolivar County participating in the National Flood Insurance Program (NFIP) have received over $5,662,205 in flood loss payments. Details regarding the NFIP program by community are provided in the capability's assessment section of this annex.

Table B.24: Repetitive Flood and Severe Repetitive Loss Properties I Source: MEMA RL Listing 02-28-2011

Jurisdiction	Repetitive Flood							
	Community ID	No. of properties	No. Mitigated	No. Insured	Total Losses	Total Bldg. Payments	Total Contents	Total Paid
Bolivar County	280011	96	2	9	237	1,700,054.42	384,534.64	2,084,589.06
Benoit	280013	3	-	-	10	50,566.60	6,708.35	57,274.95
Beulah	280014	3	-	1	9	65,676.32	22,037.77	87,714.09
Cleveland	280016	5	1	1	14	181,067.64	36,966.21	218,033.85
Shaw	280023	1	-	-	2	13,695.26	-	13,695.26
Total Repetitive Flood		**108**	**3**	**11**	**272**	**$2,011,060.24**	**$450,246.97**	**$2,461,307.21**
Jurisdiction	**Severe Repetitive Loss**							
	Community ID	**No. of properties**	**No. Mitigated**	**No. Insured**	**Total Losses**	**Total Bldg. Payments**	**Total Contents**	**Total Paid**
Bolivar County	280011	36	-	-	172	2,008,223.34	412,947.16	2,421,170.50
Benoit	280013	3	-	-	16	354,260.84	51,498.27	405,759.11
Beulah	280014	5	-	-	25	167,698.33	65,826.03	233,524.36
Cleveland	280016	1	-	-	3	35,201.70	8,868.03	44,069.73
Rosedale	280022	3	-	-	12	81,776.88	14,597.50	96,374.38
Total Severe Repetitive Loss		**48**	**-**	**-**	**228**	**$2,647,161.09**	**$553,736.99**	**$3,200,898.08**
Total		**156**	**3**	**11**	**500**	**$4,658,221.33**	**$1,003,984.96**	**$5,662,205.29**

Probability of Future Occurrence

Flooding events continue to be a threat in Bolivar County and the probability of future occurrences will remain as highly likely given the history of flood events; the presence of an overtaxed drainage system; and location in the region of the Big Sunflower River and its many tributaries. NCEI data shows that one or more portions of the County reported flooding in 10 of the 19 years of data being studied. This suggests that there is a 100% chance of flooding in any given year. As such, it is highly likely that the community will see flooding roughly once every 18 to 24 months.

Assessing Vulnerability

All major rivers in Bolivar County are contained by significant levee systems designed to withstand a 500-year plus 5-foot flood event and are managed by the US Army Corps of Engineers. However, minor river systems in Bolivar County are not protected by levee systems. These include the Bogue Phalia, Sunflower River, and Jones Bayou. These systems drain much of Bolivar and Coahoma County and will flood, as they did in 1960, 1979 and 1991, when prolonged excessive rainfall occurred, clogging transportation routes and sewers and inundating homes and foundations in every jurisdiction within the county.

Of primary concern is the potential for flooding due to prolonged excessive rainfall - something which happens on a fairly frequent basis. Overbank flooding of minor river systems will occur here every 7-10 years and affect areas within Flood Zone A. These areas follow tributary and intermittent streams primarily feed the Bogue Phalia. Other Flood Zone A areas are primarily associated with meander scars. These areas suffer from particularly poor drainage, and once full, take extended periods of time to dry out.

The topology of Bolivar County also makes it prone to significant ponding of water in low-lying and poorly draining areas when rainfall amounts exceed 2 inches per hour. These areas are generally associated with roadway intersections, areas adjacent to drainage ditches and canals, catchment basins, and yards. The latter is of concern because repeated rapid rainfall events occur during short periods of time (~24 hours) ponding will expand and often affect homes and significant sections of roadway. Such events happen 2-3 times a year during “normal” years and are generally deemed “nuisance flooding”, though repetitive loss does occur

Impact on Transportation Systems: Bolivar County includes several state-owned bridges located on US Route 61, Mississippi Highways 1, 8 and 32 and serve as vital transportation and evacuation routes for the county and surrounding areas. In addition to bridges, roadways are subject to inundation and overtopping by periods of heavy rain, which appear likely to occur more frequently given climate change observations. Storm events generally projected to occur as 100-year flood events are occurring more frequently. The potential loss could include up to the full replacement value of the bridge structure if flooding results in bridge collapse. In severe cases, roadways could also be undermined, causing complete or partial washout of roadbed and collapse of the road surface. Bridges and roadways with a history of flood impact could benefit from mitigation projects. and should be thoroughly inspected following a flood event.

Impact on Lifeline Utility Systems: Lifeline utility systems such as electric power, gas, utility and water distribution and telephone service are generally not significantly affected by flood events, although flooded lift stations could result in storm water infiltration into treatment

facilities. A facility's power source could be interrupted during a flood and result in expensive repairs unless the supply is elevated.

Severe Storms (Lightning, Hail and Severe Wind)

Location and Extent

Severe storms include non-spatial elements and, therefore, can be described as equally affecting all areas of Bolivar County. All municipalities and unincorporated areas are susceptible to lightning, hail and severe wind events. Of a particular concern are persons who reside in a mobile/manufactured home, and the elderly and disabled. It is strongly recommended that all manufactured housing be fastened to the ground. The National Association of Certified Home Inspectors (NACHI) describes a housing tie downs as a system of "heavy-duty straps and anchors designed to stabilize manufactured homes (also known as mobile homes) during high winds." The organization points out that failure to properly install and maintain tie-downs results in reduced capacity to resist sliding and overturning.

Previous Occurrences

The next four tables and subsequent two figures show numerous severe storm events have occurred countywide.

Table B.26 – All Severe Storm Events 2000 to 2019 I Source: NCEI

Total – All Severe Weather Events					
Hazard Event	No of Events	Property Damage	Crop Damage	Deaths	Injuries
Lightning	1	35,000	-	-	-
Hail	115	727,000	705,000 -	-	-
Severe Wind	136	5,489,000	15,000	-	-
Totals	252	$6,251,000	$720,000	-	-

Table B.27 – Lightning Events 2000 to 2019 I Source: NCEI

Location	Date	Event	Death	Injury	Property Damage	Crop Damage
Renova	5/2/2008	Lighting	-	-	35,000	-

Between the years 2000 and 2019, one lighting event is listed as having to occur in the Town of Renova.

Between 2000 and 2019, 28 hail events were recorded by the National Weather Service as affecting Bolivar County. Captured in the table below, the data shows that all incorporated and unincorporated areas of the county were affected, and the recorded hail magnitude ranged from .75" to 1.750" and total recorded property damage was $727,000 and crop damage was $705,000.

Table B.28 – Hail Events 2000 to 2019 | Source: NCEI

Location	Date	Event	Magnitude	Death	Injury	Property Damage	Crop Damage
Alligator	7/19/2018	Hail	1.25 in.	-	-	15,000	-
Shelby	6/03/2018	Hail	1.00 in.	-	-	1,000	5,000
Deeson	3/19/2018	Hail	1.00 in.	-	-	-	-
Lobdell	3/10/2018	Hail	1.75 in.	-	-	15,000	-
Shelby	11/3/2017	Hail	1.00 in.	-	-	2,000	-
Cleveland	7/1/2017	Hail	1.25 in.	-	-	3,000	-
Alligator	1/9/2016	Hail	1.00 in.	-	-	-	-
Hannah	10/9/2015	Hail	1.00 in.	-	-	-	-
Gunnison	4/3/2015	Hail	0.88 in.	-	-	-	-
Alligator	3/31/2015	Hail	1.00 in.	-	-	-	-
Dahomey	3/31/2015	Hail	2.75 in.	-	-	15,000	-
Alligator-**Booga Fld**	4/27/2014	Hail	1.00 in.	-	-	-	-
Shelby	3/27/2014	Hail	1.50 in.	-	-	1,000	-
Duncan	10/17/2012	Hail	1.00 in.	-	-	-	-
Duncan	1/22/2012	Hail	1.75 in.	-	-	10,000	-
Shaw	9/27/2011	Hail	0.75 in.	-	-	-	-
Shaw	9/25/2011	Hail	1.00 in.	-	-	-	-
Francis	9/25/2011	Hail	1.00 in.	-	-	-	-
Gunnison	5/25/2011	Hail	1.75 in.	-	-	30,000	-
Mound Bayou	4/27/2011	Hail	1.00 in.	-	-	50,000	-
Eldridge	4/26/2011	Hail	1.00 in.	-	-	-	-
Gunnison	4/26/2011	Hail	1.00 in.	-	-	-	-
Rochdale Watta Arpt	4/20/2011	Hail	1.75 in.	-	-	-	-
Cleveland	3/26/2011	Hail	0.75 in.	-	-	-	-
Cleveland	3/26/2011	Hail	1.00 in.	-	-	-	-
Benoit	3/26/2011	Hail	0.88 in.	-	-	-	-
Perthshire	10/24/2010	Hail	1.00 in.	-	-	-	-
O Reilly	10/24/2010	Hail	1.25 in.	-	-	-	-
Shaw	10/24/2010	Hail	1.00 in.	-	-	-	-
Shaw	10/24/2010	Hail	1.00 in.	-	-	-	-
Shaw	10/24/2010	Hail	1.75 in.	-	-	2,000	-
Lees Flat	10/24/2010	Hail	1.25 in.	-	-	-	-
Renova	5/17/2010	Hail	0.75 in.	-	-	-	-
Renova	5/17/2010	Hail	0.75 in.	-	-	-	-
Gunnison	4/24/2010	Hail	1.00 in.	-	-	-	-
Rosedale	4/24/2010	Hail	1.75 in.	-	-	1,000	-
Waxhaw	4/24/2010	Hail	1.00 in.	-	-	-	-
Shaw	1/24/2010	Hail	0.88 in.	-	-	-	-
Bolivar Co.	5/27/2009	Hail	0.88 in.	-	-	-	-
Bolivar Co.	5/9/2009	Hail	0.75 in.	-	-	-	-

Location	Date	Event	Magnitude	Death	Injury	Property Damage	Crop Damage
Mound City	4/2/2009	Hail	1.00 in.	-	-	-	-
Cleveland	2/27/2009	Hail	0.88 in.	-	-	-	-
Stringtown	2/27/2009	Hail	1.00 in.	-	-	-	-
Victor	2/27/2009	Hail	0.88 in.	-	-	-	-
Eutaw	2/27/2009	Hail	0.75 in.	-	-	-	-
Duncan	12/9/2008	Hail	0.75 in.	-	-	-	-
Perthshire Rvrsde Ar	8/3/2008	Hail	1.25 in.	-	-	-	-
Turners Flat	8/3/2008	Hail	0.88 in.	-	-	-	-
Turners Flat	8/2/2008	Hail	0.75 in.	-	-	-	-
Bolivar	8/2/2008	Hail	0.75 in.	-	-	-	-
Benoit Vly Fld	8/2/2008	Hail	0.88 in.	-	-	-	-
Alligator	6/25/2008	Hail	0.75 in.	-	-	-	-
Benoit	5/24/2008	Hail	0.75 in.	-	-	-	-
Eutaw	5/2/2008	Hail	0.75 in.	-	-	-	-
Lamont	5/2/2008	Hail	0.75 in.	-	-	-	-
Shelby	5/2/2008	Hail	0.75 in.	-	-	-	-
Waxhaw	5/2/2008	Hail	1.00 in.	-	-	-	-
Francis	5/2/2008	Hail	1.00 in.	-	-	-	-
Alligator Booga Fld	5/2/2008	Hail	0.75 in.	-	-	-	-
Shelby	5/2/2008	Hail	1.00 in.	-	-	-	-
Mound Bayou	3/31/2008	Hail	0.88 in.	-	-	-	-
Rosedale	3/31/2008	Hail	0.88 in.	-	-	-	-
Gunnison	2/5/2008	Hail	0.75 in.	-	-	-	-
Eutaw	2/5/2008	Hail	1.75 in.	-	-	100,000	-
Merigold	12/28/2007	Hail	1.00 in.	-	-	-	-
Lamont	11/14/2007	Hail	0.75 in.	-	-	-	-
Pace	11/14/2007	Hail	1.00 in.	-	-	-	-
Beulah	11/14/2007	Hail	1.75 in.	-	-	25,000	-
Rosedale	6/19/2007	Hail	0.75 in.	-	-	-	-
Shaw	5/15/2007	Hail	0.88 in.	-	-	-	-
Benoit Vly Fld	5/15/2007	Hail	0.75 in.	-	-	-	-
Benoit	5/9/2007	Hail	0.88 in.	-	-	-	-
Shaw	2/24/2007	Hail	0.88 in.	-	-	-	-
Hushpuckena	10/31/2006	Hail	0.75 in.	-	-	-	-
Cleveland	6/21/2006	Hail	1.00 in.	-	-	-	-
Pace	5/10/2006	Hail	0.75 in.	-	-	-	-
Gunnison	5/10/2006	Hail	0.75 in.	-	-	-	-
Alligator	5/10/2006	Hail	0.75 in.	-	-	-	-
Cleveland	5/10/2006	Hail	0.75 in.	-	-	-	-
Rosedale	5/9/2006	Hail	1.00 in.	-	-	20,000	200,00-
Shaw	4/7/2006	Hail	0.88 in.	-	-	-	-

Location	Date	Event	Magnitude	Death	Injury	Property Damage	Crop Damage
Lamont	4/7/2006	Hail	1.75 in.	-	-	50,000	-
Cleveland	4/7/2006	Hail	1.00 in.	-	-	-	-
Benoit	4/7/2006	Hail	1.00 in.	-	-	-	-
Shaw	4/7/2006	Hail	1.75 in.	-	-	300,000	500,00-
Duncan	3/31/2006	Hail	1.00 in.	-	-	-	-
Gunnison	12/4/2005	Hail	0.88 in.	-	-	-	-
Benoit	12/4/2005	Hail	1.00 in.	-	-	-	-
Benoit	11/15/2005	Hail	1.00 in.	-	-	-	-
Shaw	4/29/2005	Hail	1.00 in.	-	-	-	-
Duncan	4/6/2005	Hail	0.75 in.	-	-	-	-
Rosedale	4/6/2005	Hail	0.75 in.	-	-	-	-
Cleveland	3/26/2005	Hail	0.88 in.	-	-	-	-
Cleveland	3/13/2005	Hail	0.75 in.	-	-	-	-
Beulah	4/29/2004	Hail	0.88 in.	-	-	-	-
Skene	6/11/2003	Hail	0.75 in.	-	-	1,000	-
Pace	5/16/2003	Hail	0.75 in.	-	-	1,000	-
Duncan	5/7/2003	Hail	0.88 in.	-	-	1,000	-
Merigold	5/5/2003	Hail	0.88 in.	-	-	1,000	-
Winstonville	5/5/2003	Hail	1.75 in.	-	-	20,000	-
Duncan	5/5/2003	Hail	1.00 in.	-	-	1,000	-
Cleveland	5/5/2003	Hail	1.00 in.	-	-	1,000	-
Benoit	5/5/2003	Hail	1.00 in.	-	-	1,000	-
Cleveland	5/5/2003	Hail	0.75 in.	-	-	1,000	-
Cleveland	5/5/2003	Hail	0.75 in.	-	-	1,000	-
Benoit	5/5/2003	Hail	0.75 in.	-	-	1,000	-
Beulah	3/13/2003	Hail	1.00 in.	-	-	2,000	-
Shelby	5/2/2002	Hail	0.88 in.	-	-	-	-
Rosedale	5/2/2002	Hail	1.00 in.	-	-	-	-
Scott	4/29/2002	Hail	0.75 in.	-	-	-	-
Pace	11/26/2001	Hail	0.75 in.	-	-	-	-
Cleveland	5/27/2001	Hail	0.75 in.	-	-	-	-
Cleveland	5/27/2001	Hail	1.00 in.	-	-	25,000	-
Cleveland	2/24/2001	Hail	1.75 in.	-	-	30,000	-
Mound Bayou	2/17/2000	Hail	0.75 in.	-	-	-	-
Totals				**-**	**-**	**$727,000**	**$705,000**

Historical data for severe wind events shows that they occur frequently in all incorporated and unincorporated sections of the county. While agricultural damage was reported in one instance, events primarily create general property damage totaling over $5,489,000 in property damage and $15,000 in crop damage.

Table B.29 – Wind Events 2000 to 2019 | Source: NCEI

Location	Event Type	Mag	Death	Injury	Property Damage	Crop Damage
Cleveland Muni Arpt	T-Storm Wind	74 kts EG	-	-	400,000	-
Beulah	T-Storm Wind	78 kts EG	-	-	25,000	-
Rosedale	T-Storm Wind	72 kts EG	-	-	500,000	-
Benoit	T-Storm Wind	56 kts	-	-	15,000	-
Scott	T-Storm Wind	83 kts EG	-	-	150,000	-
Alligator	T-Storm Wind	52 kts EG	-	-	-	-
ROSEDALE	T-Storm Wind	55 kts EG	-	-	25,000	-
ROSEDALE WATTA ARPT	T-Storm Wind	63 kts EG	-	-	70,000	-
GUNNISON	T-Storm Wind	50 kts EG	-	-	2,000	-
DUNCAN	T-Storm Wind	60 kts EG	-	-	50,000	-
PERTHSHIRE	T-Storm Wind	50 kts EG	-	-	4,000	-
SHAW	T-Storm Wind	50 kts EG	-	-	5,000	-
ROSEDALE	T-Storm Wind	50 kts EG	-	-	20,000	-
MOUND	T-Storm Wind	50 kts EG	-	-	5,000	-
DAHOMEY	T-Storm Wind	50 kts EG	-	-	5,000	-
BOYLE	T-Storm Wind	54 kts EG	-	-	20,000	-
SHAW	T-Storm Wind	55 kts EG	-	-	60,000	-
BEULAH	T-Storm Wind	55 kts EG	-	-	25,000	-
SHELBY	T-Storm Wind	50 kts EG	-	-	10,000	-
CLEVELAND	T-Storm Wind	55 kts EG	-	-	75,000	-
WINSTONVILLE	T-Storm Wind	50 kts EG	-	-	8,000	-
BOYLE	T-Storm Wind	50 kts EG	-	-	12,000	-
CLEVELAND	T-Storm Wind	54 kts EG	-	-	4,000	-
ROSEDALE	T-Storm Wind	50 kts EG	-	-	5,000	-
VICTOR	T-Storm Wind	55 kts EG	-	-	10,000	-
CLEVELAND MUNI ARPT	T-Storm Wind	53 kts EG	-	-	10,000	-
CLEVELAND MUNI ARPT	T-Storm Wind	51 kts EG	-	-	-	-
CLEVELAND	T-Storm Wind	59 kts EG	-	-	3,000	-
WRIGHT	T-Storm Wind	50 kts EG	-	-	5,000	-
HANNAH	T-Storm Wind	56 kts EG	-	-	20,000	-
ROSEDALE	T-Storm Wind	50 kts EG	-	-	5,000	-
BOYLE	T-Storm Wind	55 kts EG	-	-	65,000	-
SHAW	T-Storm Wind	53 kts EG	-	-	5,000	-
PACE	T-Storm Wind	50 kts EG	-	-	25,000	-
PERTHSHIRE RVRSDEAR	T-Storm Wind	50 kts EG	-	-	1,000	-
SCOTT	T-Storm Wind	50 kts EG	-	-	1,000	-
BEULAH	T-Storm Wind	52 kts EG	-	-	2,000	-
SKENE	T-Storm Wind	52 kts EG	-	-	10,000	-
CLEVELAND	T-Storm Wind	52 kts EG	-	-	3,000	-

ALLIGATOR	T-Storm Wind	52 kts EG	-	-	10,000	-
MOUND BAYOU	T-Storm Wind	50 kts EG	-	-	-	-
GUNNISON	T-Storm Wind	52 kts EG	-	-	2,200	-
Rochdale Watta Arpt	T-Storm Wind	55 kts. EG	-	-	25,000	-
Shelby	T-Storm Wind	50 kts. EG	-	-	25,000	-
Shelby	T-Storm Wind	50 kts. EG	-	-	10,000	-
Cleveland	T-Storm Wind	43 kts. EG	-	-	1,000	-
Cleveland	T-Storm Wind	50 kts. EG	-	-	15,000	-
Duncan	T-Storm Wind	50 kts. EG	-	-	4,000	-
Bolivar (Zone)	Strong Wind	39 kts. EG	-	-	20,000	-
Bolivar (Zone)	Strong Wind	39 kts. EG	-	-	5,000	-
Boyle	T-Storm Wind	50 kts. EG	-	-	10,000	-
Merigold	T-Storm Wind	60 kts. EG	-	-	60,000	-
Scott	T-Storm Wind	50 kts. EG	-	-	10,000	-
Boyle	T-Storm Wind	50 kts. EG	-	-	15,000	-
Benoit	T-Storm Wind	43 kts. EG	-	-	500	-
Bolivar (Zone)	Strong Wind	40 kts. EG	-	-	30,000	-
Wright	T-Storm Wind	50 kts. EG	-	-	3,000	-
Duncan	T-Storm Wind	60 kts. EG	-	-	25,000	-
Cleveland	T-Storm Wind	61 kts. EG	-	-	10,000	-
Gunnison	T-Storm Wind	50 kts. EG	-	-	50,000	-
Cleveland	T-Storm Wind	50 kts. EG	-	-	2,000	-
Wright	T-Storm Wind	50 kts. EG	-	-	40,000	-
Rosedale	T-Storm Wind	55 kts. EG	-	-	12,000	-
Cleveland	T-Storm Wind	63 kts. EG	-	-	30,000	-
Cleveland	T-Storm Wind	60 kts. EG	-	-	40,000	-
Shaw	T-Storm Wind	52 kts. EG	-	-	15,000	-
Boyle	T-Storm Wind	50 kts. EG	-	-	-	-
Rosedale	T-Storm Wind	55 kts. EG	-	-	12,000	-
Alligator	T-Storm Wind	52 kts. EG	-	-	-	-
Cleveland	T-Storm Wind	60 kts. EG	-	-	30,000	-
Merigold	T-Storm Wind	50 kts. EG	-	-	-	-
Boyle	T-Storm Wind	62 kts. EG	-	-	14,000	-
Lake Vista	T-Storm Wind	65 kts. EG	-	-	100,000	-
Wright	T-Storm Wind	50 kts. EG	-	-	-	-
Mound Bayou	T-Storm Wind	50 kts. EG	-	-	-	-
Shaw	T-Storm Wind	55 kts. EG	-	1	75,000	-
Duncan	T-Storm Wind	50 kts. EG	-	-	-	-
Bolivar (Zone)	Strong Wind	46 kts. EG	-	-	20,000	-
Cleveland	T-Storm Wind	50 kts. EG	-	-	1,500	-
Bolivar (Zone)	Strong Wind	43 kts. EG	-	-	40,000	-
Beulah	T-Storm Wind	50 kts. EG	-	-	-	-
Beulah	T-Storm Wind	50 kts. EG	-	-	8,000	-

Rosedale	T-Storm Wind	50 kts. EG	-	-	8,000	-
Wright	T-Storm Wind	58 kts. EG	-	-	15,000	-
Renova	T-Storm Wind	60 kts. EG	-	-	150,000	-
Perthshire Rvrsde Ar	T-Storm Wind	53 kts. EG	-	-	210,000	-
Gunnison	T-Storm Wind	55 kts. EG	-	-	-	-
Gunnison	T-Storm Wind	60 kts. EG	-	-	20,000	-
Hushpuckena	T-Storm Wind	51 kts. EG	-	-	1,000	-
Bolivar (Zone)	High Wind	60 kts. EG	-	-	800,000	-
Lamont	T-Storm Wind	50 kts. EG	-	-	110,000	-
Cleveland	T-Storm Wind	50 kts. EG	-	-	-	-
Cleveland	T-Storm Wind	53 kts. EG	-	-	10,000	-
Gunnison	T-Storm Wind	50 kts. EG	-	-	-	-
Cleveland	T-Storm Wind	51 kts. MG	-	-	-	-
Gunnison	T-Storm Wind	50 kts. EG	-	-	10,000	-
Countywide	T-Storm Wind	58 kts. EG	-	-	300,000	-
Cleveland	T-Storm Wind	60 kts. EG	-	-	100,000	-
Cleveland	T-Storm Wind	50 kts. EG	-	-	-	-
Cleveland	T-Storm Wind	60 kts. EG	-	-	200,000	-
Shaw	T-Storm Wind	60 kts. EG	-	-	50,000	-
Benoit	T-Storm Wind	70 kts. EG	-	-	600,000	-
Cleveland	T-Storm Wind	56 kts. MG	-	-	-	-
Cleveland	T-Storm Wind	60 kts. EG	-	-	80,000	-
Shaw	T-Storm Wind	68 kts. EG	-	-	200,000	-
Shelby	T-Storm Wind	65 kts. EG	-	-	200,000	15,000
Cleveland	T-Storm Wind	52 kts. EG	-	-	10,000	-
Shelby	T-Storm Wind	55 kts. EG	-	-	20,000	-
Gunnison	T-Storm Wind	55 kts. EG	-	-	10,000	-
Shaw	T-Storm Wind	53 kts. EG	-	-	1,000	-
Shaw	T-Storm Wind	65 kts. EG	-	-	150,000	-
Alligator	T-Storm Wind	53 kts. EG	-	-	1,000	-
Benoit	T-Storm Wind	73 kts. EG	-	1	60,000	-
Benoit	T-Storm Wind	60 kts. EG	-	-	2,000	-
Mound Bayou	T-Storm Wind	51 kts. EG	-	-	-	-
Shaw	T-Storm Wind	53 kts. EG	-	-	2,000	-
Cleveland	T-Storm Wind	55 kts. EG	-	-	5,000	-
Pace	T-Storm Wind	60 kts. EG	-	-	10,000	-
Cleveland	T-Storm Wind	55 kts. ES	-	-	1,000	-
Cleveland	T-Storm Wind	50 kts. ES	-	-	1,000	-
Cleveland	T-Storm Wind	53 kts. ES	-	-	8,000	-
Shelby	T-Storm Wind	50 kts. ES	-	-	5,000	-
Countywide	T-Storm Wind	50 kts. ES	-	-	5,000	-
Shelby	T-Storm Wind	55 kts. ES	-	-	20,000	
Gunnison	T-Storm Wind	53 kts. ES	-	-	-	-

Duncan	T-Storm Wind	55 kts. ES	-	-	-	-
Mound Bayou	T-Storm Wind	60 kts. ES	-	-	-	-
Mound Bayou	T-Storm Wind	50 kts. ES	-	-	-	-
Cleveland	T-Storm Wind	50 kts. ES	-	-	-	-
Cleveland	T-Storm Wind	55 kts. ES	-	-	-	-
Cleveland	T-Storm Wind	55 kts. ES	-	-	-	-
Gunnison	T-Storm Wind	60 kts. EG	-	-	-	-
Benoit	T-Storm Wind	52 kts. E	-	-	-	-
Cleveland	T-Storm Wind	87 kts. E	-	-	-	-
Totals			1	2	$5,489,000	$15,000

Probability of Future

Historical NCEI data suggests a lighting event has a 5.2% change of occurring annually since there has been one event in a 19-year period. There is a 94% chance of a hail event occurring in annually and an 100% chance of a severe wind event will occur annually throughout the county.

Assessing Vulnerability

Severe weather events are non-spatial and may occur anywhere in the county. While they cause total property damages of $6,251,000 and $720,000 in crop damages, and the dollar value for most events is relatively low. As such, the county is ranked as having a high vulnerability to severe weather.

Impact on Life and Property: severe storms (high wind, hail, and lightning) do not have particular impacts in any one geographical section of the County. However, hail and heavy rain would have the greatest impact on the agricultural community. The economic impacts of this hazard cannot be evaluated geographically. Critical County infrastructure is unlikely to be affected by this hazard.

Bolivar County's entire population is considered at a medium risk to severe weather, because there are many events, but the level of per event is lower than other as potentially as deadly as tornadoes or hurricanes. Those living in rural areas and special populations, such as those living in mobile homes, the elderly and disabled, may be most vulnerable.

Maps on the next two pages shows a sampling of historic hail and severe winds events that have crossed the county.

Figure B.9 – Sample of Historic Hail Events- Bolivar County

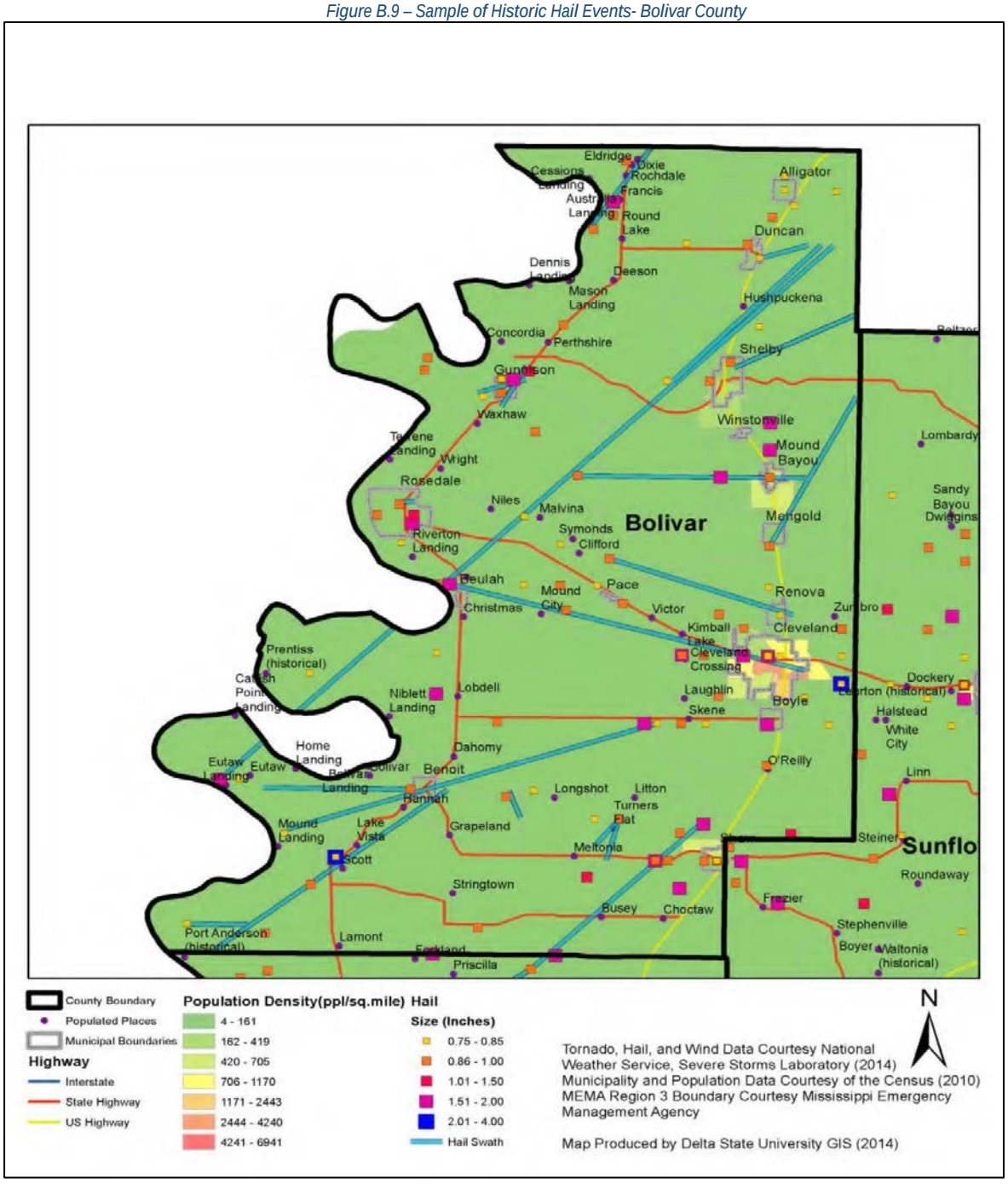
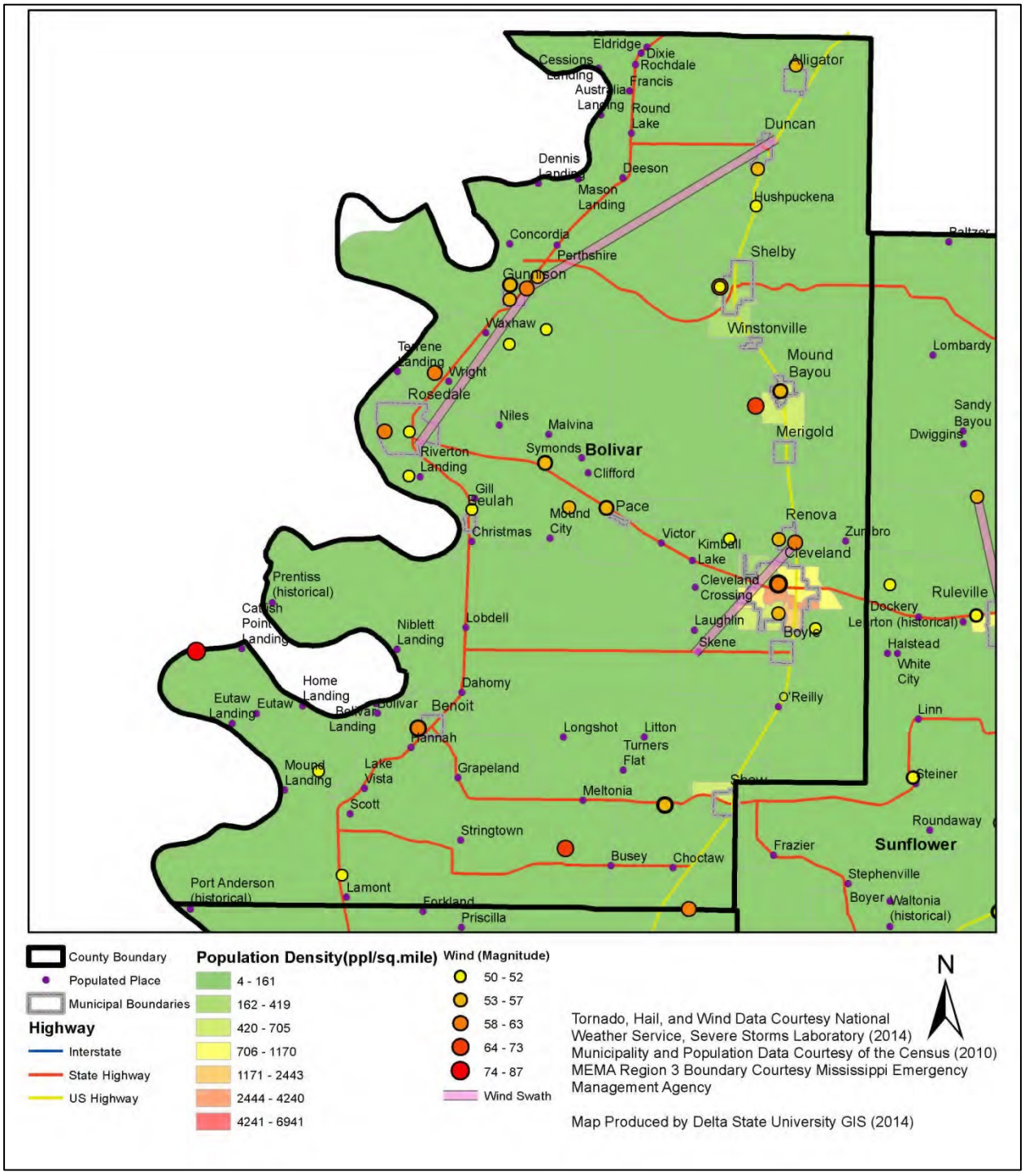


Figure B.10: Sample of Historic Severe Wind Events-Bolivar County | Source: NCEI



Severe Winter Weather

Location and Extent

All of Bolivar County is susceptible to severe winter storm events. As such, they generally are not confined to one geographic area but may, in fact, extend regionally and across multiple states. Severe winter weather can result prolonged power outages and possible energy shortages. They can affect businesses if employees are unable to travel to work, or when the workplace is closed due to loss of power. Dangerous driving conditions occur when ice builds up on roads and bridges. When ice accumulates on power lines and trees, either or both could be downed from the weight of the ice. All Heavy snow has been known to cause roof cave ins. The elderly and disabled residents in Bolivar County who may have limited mobility should be considered very vulnerable. Measures should be taken to ensure that they are safe and warm.

Previous Occurrences

Table B.30 shows that there have been 12 severe winter storm events recorded in Bolivar County between the years 2000 and 2019. These events include hazards such as cold/wind chill, heavy snow, and ice storm.

Table B.30 – Severe Winter Weather Events 2000 to 2019

Date	Type	Death	Injury	Property Damage	Crop Damage
1/16/2018	Heavy Snow	-	-	20,000	-
2/25/2015	Heavy Snow	-	-	-	-
2/23/2015	Winter Weather	-	-	7,000	-
2/20/2015	Winter Weather	-	-	7,000	-
1/15/2013	Ice Storm	-	-	15,000	-
1/13/2013	Ice Storm	-	-	15,000	-
12/7/2011	Winter Weather	-	-	-	-
2/9/2011	Heavy Snow	-	-	450,000	-
1/9/2011	Heavy Snow	-	-	30,000	-
1/7/2010	Winter Weather	-	-	-	-
1/7/2010	Winter Weather	-	-	-	-
1/7/2010	Winter Weather	-	-	-	-
1/7/2010	Winter Weather	-	-	-	-
1/1/2010	Cold/wind Chill	-	-	350,000	-
3/1/2009	Winter Weather	-	-	-	-
3/7/2008	Heavy Snow	-	-	200,000	-
1/25/2008	Ice Storm	-	-	300,000	-
2/18/2006	Ice Storm	-	-	50,000	-
12/22/2004	Ice Storm	-	-	300,000	-
2/26/2003	Ice Storm	-	-	10,000	-
2/25/2003	Ice Storm	-	-	100,000	-
12/31/2000	Heavy Snow	-	-	-	-
12/13/2000	Ice Storm	-	-	3,000	-
1/27/2000	Heavy Snow	-	-	100,000	-
Total		-	-	$1,957,000	-

A National Weather Service description of the sleet event that occurred on March 5, 2015 is typical of how severe winter events unfolded over the past two decades. The following is a shortened summary of the event, and the description shows the extent of multiple cascading effects that occur as a result of multiple weather elements, including rain, a freeze, and warming trends.

> *Sleet accumulated up to one inch at Duck Hill after a heavy snowfall that occurred the previous week. Fortunately, a warming trend helped alleviate a lot of road issues. Temperatures warmed quickly on March 4th into the mid-70s to low-80s, but this was followed by cold and strong high-pressure building stretching from Canada, through the Plains, and further south. Temperatures quickly plummeted to the 40-50-degree range. Moisture lingered behind the cold front and rain changed sleet late the night of March 4th into early morning hours of March 5th. As colder air in the lower parts of the atmosphere continued to filter in, moisture began to transition over to a wintry mix, mainly in the form of sleet, in the northwest Delta. This setup was very favorable for a transition from rain to freezing rain to sleet. Moisture further southeast near the Natchez Trace corridor and Jackson metro began to transition over in the early morning hours of March 5th, with some moderate sleet falling in central Mississippi. Sleet and some snow began to mix into the Delta while the majority of the area saw a significant accumulation of sleet. Some areas in south and east Mississippi also saw some sleet but a little to no accumulation. Precipitation moved out late morning of March 5th. Some areas saw between 1/2 inch to 1-2 inches in the far northern parts of the Delta and northern Mississippi. Because the roads were warm two days previously, bad road conditions were largely limited to areas that received significant heavy sleet accumulation (the Delta and northern Mississippi). Areas in the Jackson Metro region experienced slick roads but warm ground and road temperature from the previous few days alleviated some of the issues.*

January 16, 2018 Heavy Snowstorm-Accumulating snow impacted the ArkLaMiss on January 16, 2018 with accumulations ranging from ½ - 3 inches across much of the area. The synoptic setup was atypical compared to more traditional Deep South snowfalls. During the early morning hours on the 15th (~24 hours prior to the onset of snow), a strong arctic cold front was quickly moving through the Central Plains towards the Deep South with an impressive 1050mb surface high pressure ushering in a brutally cold arctic airmass behind the frontal passage. Further aloft in the atmosphere, a closed cold core upper-level low was located over the Upper Midwest with a positively tilted trough axis extending to the west/southwest through the Northern Plains. A 120 kt jet streak diving into the base of the trough helped the trough dig further south and west over the Texas/Oklahoma panhandles as the closed low transitioned into an open wave. By sunrise on the 16th, the trough axis was oriented from Lake Michigan southwest through the Southern Plains with a strengthening upper-level jet stretched from northern Arkansas through Maine. This orientation allowed flow to become more backed out of the southwest which resulted in sufficient moisture return over the ArkLaMiss. At the same time, the arctic cold front had raced well ahead of the upper level forcing with temperatures plummeting well below freezing. This set the stage for the moist southwest flow aloft to overrun the cold arctic air and produce a frontal band of snow as right entrance region jet dynamics overspread the area.

Snow began falling in the Delta around 4am and slowly spread south and east. A swath of 1-3" of snow occurred along and northwest of a line from Tensas Parish to Grenada where the best moisture and forcing where juxtaposed. The band of snow became more broken as the better forcing pulled away to the northeast with lighter amounts of ½ - 2" along a line from Natchez through the Jackson metro to Columbus. However, the band of snow filled back in and dropped another 1-3" along and southeast of a line from Brookhaven to southern Lauderdale County as a subtle wave/vorticity maximum helped increase forcing over the area. This snowfall occurred after sunset and quickly accumulated on roads causing extremely dangerous driving conditions during the evening and overnight hours with numerous vehicle accidents reported. Another atypical aspect of this snow event was that the snow itself was very dry and powdery as it fell with temperatures well into the 20s. Most Deep South snows are typically heavy and wet with snow-to-liquid ratios of 10:1 or less. However, this even was unique in that the 0.8" of snow measured at the NWS Jackson office resulted in only 0.04" of liquid equivalent thus resulting in a relatively rare snow-to-liquid ratio of 20:1. Bolivar County impacted by in excess of 1.0-2.0 inches of snowfall.

February 9-11, 1994 Ice Storm – ArkLaMiss Delta (source NWS Jackson): The map below represents the approximate area within the NWS Jackson forecast area impacted by the February 1994 ice storm. Areas shaded in light blue experienced at least some icing, mainly during the late-night hours of February 9th into the morning hours of February 10th. Areas shaded in a darker blue experienced a more prolonged period of icing beginning on the evening of February 9th lasting into the morning of February 11th.

Figure B.11: 1994 Ice Storm

This storm began with a sharp cold front with temperatures ranging from 70 degrees at midnight on February 9th to 28 degrees at 8 pm with light to moderate rain showers following the front. Ice began to accumulate causing tree branches to break and eventually entire trees thus causing power outages throughout the Delta. Making matters worse, a new low pressure system developed in the northwestern Gulf of Mexico along the front that had pushed through the area on Wednesday.

This low tracked along the front toward the Mississippi coast on Thursday, spreading a new round of heavy precipitation northward across the state. Moderate freezing rain, which was already enough to cause significant issues Wednesday night and Thursday morning, became heavy freezing rain with thunder around noon on Thursday. This caused a significant escalation of issues as ice accumulated quickly on trees, power and phone lines, and utility poles. It was

now impossible for utility companies to keep up with falling lines, snapping poles, and snapping trees. All they could do was attempt to maintain utilities for hospitals, nursing homes, emergency responders, and other priority customers. The heavy precipitation also caused flooding, which was only made worse by storm drains clogged with tree debris. Several fields across the Delta were flooded as surrounding trees were full of ice.

Temperatures finally warmed to above freezing during the daytime hours of February 11th, but only by a few degrees in the hardest-hit areas. The slow thaw continued into the weekend, as temperatures finally reached the 40s by Saturday.

Across northern Mississippi, approximately 3.7 million acres of commercial forestland was significant damaged, with the value of damaged timber estimated to be $1.3 billion. Damage to trees in urban areas was estimated to be another $27 million. Twenty-five percent of Mississippi's pecan crop was destroyed and impacted for years to come, at an estimated cost of $5.5 million per year. Nearly 750,000 customers were without power at some point across North Mississippi, with some outages lasting up to a month. Over 8,000 utility poles were pulled down by the weight of the ice, and over 4,700 miles of lines were downed. About 490 water systems were impacted, with as many as 741,000 customers without water at some point. System wide, Entergy had 250,000 to 300,000 customers without power in Mississippi, Louisiana, and Arkansas. Commercial flights would not resume until the following Wednesday, February 16th.

By most accounts, this was the worst ice storm to impact the ArkLaMiss Delta since January of 1951.

Probability of Future Occurrence

The probability of severe winter weather events in Bolivar County is highly likely. There was severe winter event in ten of the 19 years studied, which suggest there is a 53% chance of an occurrence in a given year. The region may experience an event several years in a row, but then not experience one for several years.

Assessing Vulnerability

The community assets at risk from a winter storm include the electrical and telephone utility system and tree coverage and canopy. Vehicular accidents from icy conditions could cause injury, property damage, or death. Ice laden tree limbs can fall, causing property damage. Additionally, hard freezes could result in decreased water pressure as frozen and damaged pipes thaw and leak. Winter storms impact the entire community. Among essential services, critical facilities and infrastructure likely to be affected are the public safety on roadways and electric, telephone and water services.

The Mississippi Economic Development Council produced figures in March 2020 showing that in Bolivar County there were 310 workers employed in the in the mining sector; and 330 in the construction sector. There were not any figures provided for the number employed in agriculture, forestry, fishing and hunting. Workers such as these, who spend a great deal of time outdoors, are most likely to be affected by severe winter weather.

Populations at Risk: Vulnerable persons during winter weather periods are the homeless, the elderly, young children, and persons with chronic health problems. Above freezing temperatures

combined with strong wind can result in felt temperatures below freezing and cause hypothermia, illness, and death.

Property Damage: In the past, this hazard has caused roofs to cave in, trees to fall on houses, prolonged power outages, and dangerous driving conditions.

Critical Facilities and Essential Services: Essential services are not likely to be significantly impacted by a winter storm. For the most part, generators have been installed at critical and essential facilities within the county and participating jurisdictions to ensure that continuity of electricity for dispatch and emergency services.

Transportation Systems: Some major transportation services could be temporarily interrupted should icing occur. These include bridges and overpasses on the US Route 61, Mississippi Highways 1, 8 and 32 and other roads countywide

Lifeline Utility Systems: The most likely lifeline utility system that could be affected by a winter storm would be electric power, telephone and water line service. It could be anticipated that interruption of those rural water systems that do not have access to generators, services would last long enough in Bolivar County to cause a major problem.

Tornado

Location and Extent

Mississippi ranks in the top 10 states with the most tornadoes in the nation. All areas of the state, including Bolivar County, are susceptible to impacts from EF0 to EF5 magnitude tornado that can cause millions of dollars in damage.

Tornado is a non-spatial hazard, meaning that all jurisdictions in the county are equally likely to experience an event. Of particular concern are persons who reside in a mobile/manufactured home, and the elderly and disabled. According to the 2010 Census, there are approximately 1335 mobile/manufactured housing units -- structures at high risk to wind events of any type. These units represent13.4% of the housing stock in Bolivar County

Previous Occurrences

A total of 10 tornadoes were recorded in the NCEI database for Bolivar County between 2000 and 2019. They are summarized below in Table B.31. The table is followed by a discussion of events mapped by the Jackson, MS office of the National Weather Service as having taken place in the year 2020.

Table B.31 – Tornado Events | Source: NCE

Location	Date	Event	Magnitude	Death	Injury	Property Damage	Crop Damage
Cleveland MUNI ARPT	3/13/2016	Tornado	EF0	_	_	40,000	_
Hushpucken A	12/23/2015	Tornado	EF1	-	-	20,000	-
Eutaw	12/21/2013	Tornado	EF2	-	-	500,000	-
Stringtown	1/29/2013	Tornado	EF0	-	-	5,000	-

Location	Date	Event	Magnitude	Death	Injury	Property Damage	Crop Damage
Skene	1/29/2013	Tornado	EF1	-	-	175,000	-
Hushpuckena	10/17/2012	Tornado	EF2	-	-	200,000	-
Alligator	1/22/2012	Tornado	EF2	-	1	700,000	-
Kimball Lake	9/25/2011	Tornado	EF1	-	-	2,500,000	-
Benoit	10/9/2009	Tornado	EF0	-	-	45,000	-
Lamont	5/2/2008	Tornado	EF0	-	-	-	-
Benoit Vly Fld	5/2/2008	Tornado	EF1	-	-	20,000	300,000
Niles	2/5/2008	Tornado	EF0	-	-	70,000	-
Lamont	9/24/2005	Tornado	F0	-	-	-	-
Shaw	9/24/2005	Tornado	F0	-	-	30,000	-
Boyle	9/24/2005	Tornado	F1	-	-	400,000	100,000
Cleveland	9/24/2005	Tornado	F2	-	-	800,000	100,000
Pace	9/24/2005	Tornado	F0	-	-	10,000	-
Cleveland	6/2/2003	Tornado	F0	-	-	150,000	-
Stringtown	11/24/2001	Tornado	F4	-	36	6,000,000	-
Shaw	5/28/2001	Tornado	F0	-	-	-	-
Cleveland	5/28/2001	Tornado	F0	-	-	2,000	-
Boyle	5/28/2001	Tornado	F0	-	-	25,000	-
Lamont	2/24/2001	Tornado	F2	-	-	1,500,000	-
Totals			**23**	**-**	**37**	**$13,192,000**	**$500,000**

More recently, a series of tornadoes struck the Southeastern states, including those occurring over the weekend of April 10-12, 2020, referred to as the Easter Weekend Tornado. While the National Weather Service has not completed damage estimates, it appears as though no damage was recorded in Bolivar County, but there was property damage in adjacent District 3 counties of Carroll, Holmes and Montgomery.

The most recent tornado events to impact Bolivar County are discussed below:

March 3, 2016-The tornado began along Bishop Rd where it downed tree limbs at a funeral home and continued across West Sunflower Rd. Several sections of tin were blown off the end of a strip mall at the No Way Jose restaurant and a tree was downed along MS Highway 8. Along Bolling Ave, a fence and a shed were blown down and trees and tree limbs were downed. The tornado lifted as it reached a Delta State University intercollegiate athletic facility, where minor fence damage occurred. The maximum estimated wind speed was 85 mph

March 8-13, 2016 Flooding & Tornadoes-As high pressure over the East Coast refused to move, a storm system approaching the ArkLaMiss from the west, stalled just to the west of the region on Monday March 7th. While warm moist air from the Gulf of Mexico filtered north and encompassed the region, a series of potent upper level disturbances began lifting northeast

across the Lower Mississippi River Valley. This set the stage for multiple rounds of torrential rains that fell almost continuously across the ArkLaMiss from Tuesday, March 8th through Saturday, March 12th. These prolonged torrential rains resulted in widespread flash flooding and river flooding across the region, with numerous area rivers reaching moderate and major flood stages. Floodwaters damaged numerous homes, businesses, and closed many primary and secondary roads across the region, with some secondary roads washed out.

In addition, one weak tornado developed on Thursday, March 10 as a line of storms began to finally push to the east over central Mississippi. This weak EF-0 tornado touched down just west of Raleigh, snapping a few trees and causing minor damage to a metal roof of an outbuilding.

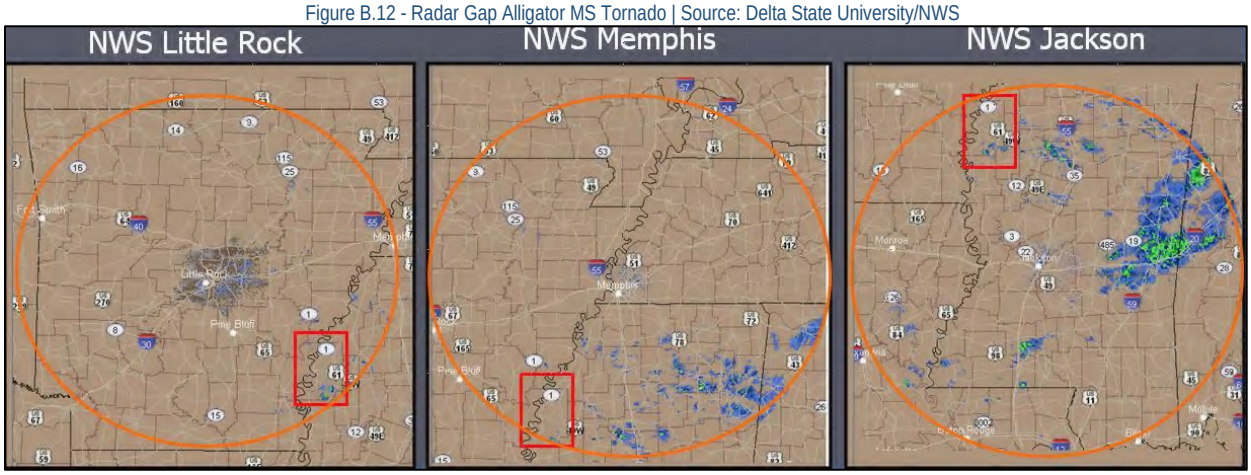
As the storm system finally exited the region late Saturday, another fast moving, compact storm system followed in its wake during the evening of Sunday, March 13th. This system brought another round of heavy rain to the Delta Region, in addition to several reports of hail and damaging straight line winds. Two tornadoes were spawned by this system as well. An EF-1 tornado affected the city of Dermott in Chicot County in Arkansas and continued into Desha County in Arkansas, causing quite a bit of damage to the South Delta Regional Correctional Facility in Dermott and 1 injury. An EF-0 tornado also touched down near Cleveland in Bolivar County in Mississippi.

December 2015 - This tornado touched down about a mile east of US Highway 61 and moved northeast, downing trees and power lines along the path. Damage in Bolivar County was rated EF-1, but the tornado continued into Coahoma County producing more significant damage farther northeast resulting in the EF-3 rating. This tornado began about a mile east of US Highway 61 and moved northeast, downing trees and power lines along the path. The tornado continued into Coahoma County producing more significant damage farther northeast resulting in an overall EF-3 rating.

September 25, 2011 - Kimball Lake (Cleveland): The tornado started out producing a relatively narrow path of tree damage along Township Road in Cleveland. It moved southeast through the Stanton subdivision, heavily damaging four trailer homes and caused minor to moderate damage to several other homes and outbuildings. It continued to move southeast causing tree damage and widened as it moved into the northwest side of the city of Cleveland. As the tornado moved through the north side of Cleveland, it snapped and uprooted numerous trees, blew the signs out of several restaurants and stores, blew the doors out of the automotive area of a department store, and blew out a wall and a large part of a roof of another commercial building. Several homes suffered shingle damage and power lines were downed. The tornado then turned more eastward, continuing to cause tree damage as it moved along and just north of MS State Highway 8 east of Cleveland. Additional power lines were downed and a few more homes suffered minor roof damage due to wind or branches falling on them. As the tornado crossed into Sunflower County it moved more southeast again. It snapped several wooden power poles along and just south of Highway 8 along Mallette-Jones Road, along with destroying a greenhouse type structure and causing some roof damage to a frame home. The tornado continued to cause tree damage in a relatively narrow path as it crossed Walker Road, and then dissipated before reaching Lusk Road. Maximum wind speeds were estimated at 100 mph.

January 22, 2012 – Alligator: The consequences of poor radar coverage left this community with no warning by the National Weather Service (Figure B.12). Three factors contributed to the lack of warning: 1) the storm had a relatively low altitude of tornadic circulation; 2) it was a weak system (EF1); and 3) its distance from dual-pole radar systems. As a result of this event, four mobile homes were destroyed including eight with major damage. A number of other homes had heavy damage along the path, two metal frame buildings were destroyed, and several power poles were snapped. A 200-foot radio tower was blown down and mangled, a grain bin was blown away, and numerous trees and power lines were blown down. Maximum wind speeds were around 120 mph.

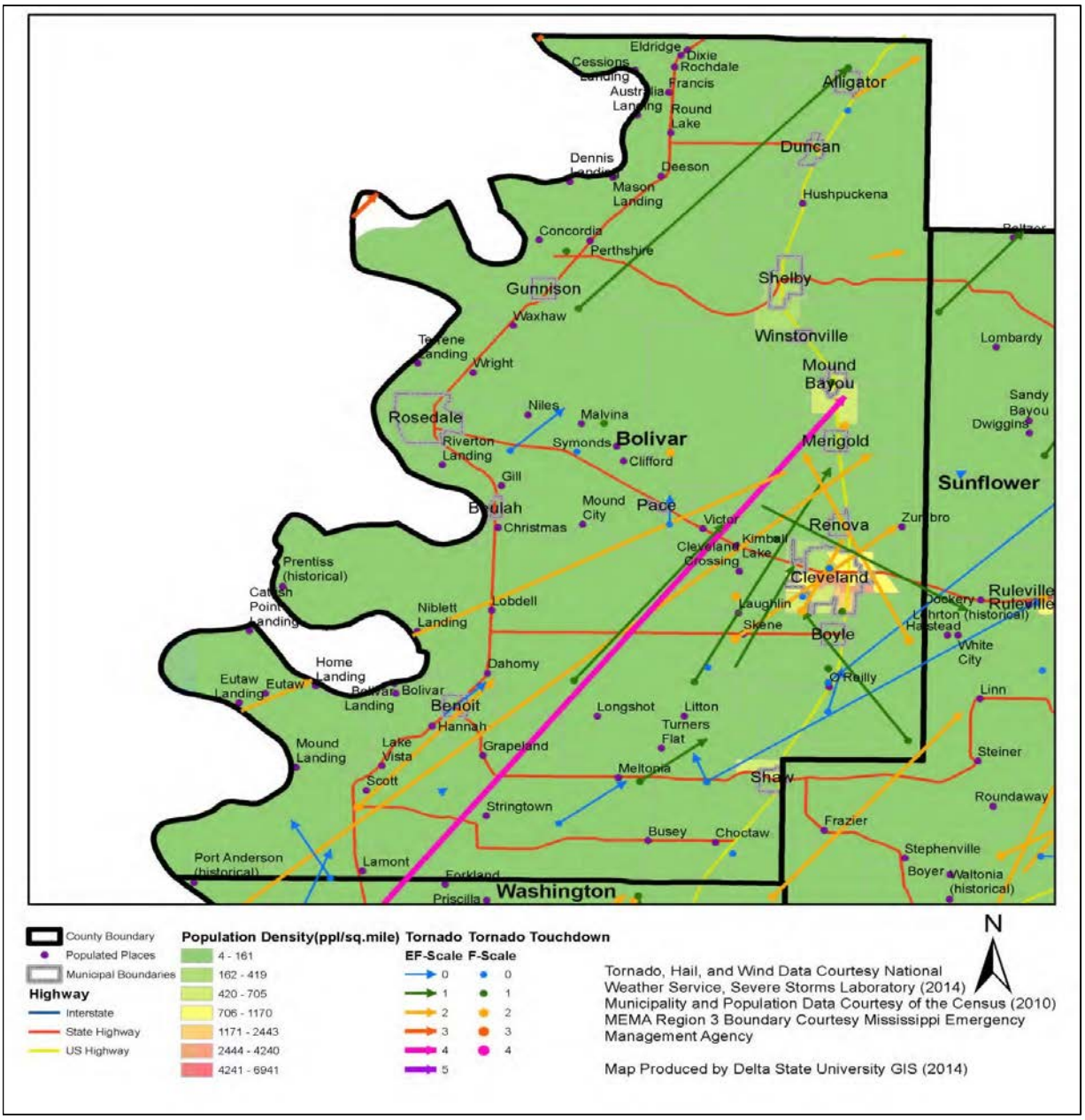
Figure B.12 - Radar Gap Alligator MS Tornado | Source: Delta State University/NWS



Alligator, MS Tornado January 22, 2012

The map on the following page shows the location of surveyed tornado tracks as determined by the National Weather Service Office in Jackson.

Figure E.12: Sample of Historic Tornado Events- Bolivar County | Source: NCDC 1950-2013



Probability of Future Occurrence

NCEI data presented shows that tornado events have occurred in 6 of the 19 years being studied as part of this mitigation planning process. This suggests that there is roughly a 53% chance that Bolivar County will be affected by a tornado in any given year. Equally likely is the possibility that more than one such event will occur within proximity to others – proximity in terms of time and geography.

Assessing Vulnerability

Although technology and warning system capabilities have improved significantly in recent years, tornadoes can still occur with little or no warning, and cause severe destruction, personal injury, and possible loss of life. The list of affected communities included in Table B.31 show that entire county is vulnerable to impacts from tornadoes. Particularly vulnerable are those living in mobile/manufactured housing units, as was discussed below.

Impacts to Life and Property: Perhaps most vulnerable to this hazard are those population segments consisting of (elderly, disabled, and poor) who may not have the ability to seek shelter in a timely manner. Older frame houses and mobile homes are particularly vulnerable to tornadoes. According to the US Census Bureau 2010 and 2018 American Community Survey 5-Year Estimates, there are roughly 1335 mobile homes within the County. This figure represents 13% of the total housing units. If other structures are not built to withstand high winds, roof damage or roof failure may occur. Unless mobile homes are placed on an anchored foundation, the force of tornado winds will likely lift the structure and overturn it. It is unlikely that damaged mobile homes will ever be returned to habitable status.

Impacts to Natural Resources: Tree canopy and decorative vegetation are all subject to tornado damage. The force of a tornado is powerful enough to uproot trees and vegetation and deposit the debris in standing water, which could result in pollution. Wildlife and farm animals are not likely to survive the force of tornado winds and may be carried to distant ground or deposited in a body of water which may result in pollution. Streams can become clogged with windblown debris and downed trees, causing flooding. If debris is not removed from vacant land it could become a threat to health and safety, create a fire hazard, or create a haven for unwanted vermin or pests.

Impacts to Critical Facilities: A tornado may affect any critical facility or critical infrastructure. The County and its municipalities require that all new buildings and infrastructure, such as water tanks and towers, be built to high wind-resistant standards. All public and essential service buildings in the County are still at risk from storms/hurricanes as they reach land and continue to inland away from the coastal landing point. Storms a direct strike indicate that those building are more vulnerable than other building in the County. With the unpredictable nature of tornadoes and the possibility of tornado damage, it is essential to have designated areas that are safer than other areas in all public and essential service buildings.

Tropical Storm / Hurricane

Location and Extent

While Bolivar County is situated over 200 miles from the Mississippi Gulf Coast, the area is vulnerable to the unavoidable effects of tropical moving inland have been known to produce violent winds, torrential rains, tornadoes, and flash flooding. Damage levels can be significant or low, depending on the hurricane path and whether it picks up strength before hitting landfall and moving more inland.

Previous Occurrences

Two recent storms documented by the National Weather Service are listed in Table E.32. They were included in the 2015 District 3 RHMP and records indicate that no subsequent events have affected the region. Hurricane Katrina caused substantial damage to all 82 Mississippi counties.

Table B.32 – Tropical Storm / Hurricane Events | Source NCEI

Event Name	Date	Death		Injury	Property Damage	Crop Damage
Hurricane Rita	9/24/2005	-		-	10,000	200,000
Hurricane Katrina	8/29/2005	-		-	700,000	5,000,000
Total		**-**		**-**	**$710,000**	**$5,200,000**

Probability of Future Occurrence

Based on past events, the probability of tropical storm events is classified as low. Two events occurred in the past 20 years which, if averaged, would yield a 10.5% annual chance of occurrence. While climate change may increase the number and ferocity of hurricane events making landfall, there remains the fact remains that no other events are documented for the period since NCEI began keeping records in the year 1950.

Assessing Vulnerability

Hurricanes affecting the Gulf Coast usually lose strength as they make landfall and move northward, usually without hurricane force winds impacting the area. However, due to the speed, size, and magnitude of the storm, the County could still be affected by damaging winds. The entire population is at risk to tropical storms and hurricanes. Damage during these events may occur as a result from hurricane-spawned tornadoes and flooding from heavy rain.

Table B.33 includes the most recently available data secured from a HAZUS run for tropical storm/hurricane events to evaluate the potential economic losses for Bolivar County.

Table B.33 – Direct Economic Losses for Buildings Annualized Losses | Source: State of Mississippi SHMP

Capital Stock Losses				Income Losses				
Cost Building Damage	Cost Contents Damage	Inventory Loss	Loss Ratio %	Relocation Loss	Capital Related Loss	Wages Loss	Rental Income Loss	Total Loss
$42,000	$7,000	0	0.00	$4,000	0	$1,000	$1,000	$56,000

The greatest threat to life and property in Bolivar County would occur in a Category 5 Hurricane directly striking the coastline of Harrison County, Hancock County, St. Bernard, or Plaquemine Parishes, Louisiana. A strike at these locations could place Bolivar County, being located approximately 200 miles north, directly in the path of the highest winds and heaviest rain bands such a storm would produce.

Impacts to People and Property: The very young, the elderly, and the disabled are particularly vulnerable to harm from tropical storms/hurricanes. Older frame homes and residences and businesses housed in manufactured structures are especially vulnerable to the effects of severe winds, rain, and tornadoes generated by hurricanes. Airborne missiles such as tree limbs and branches, signs and signposts, roofing, metal siding, and other pieces of buildings, including entire roofs can penetrate doors and windows. This penetration into the "envelope" of the building allows the force of the wind to act against interior walls and ceilings of the structure – causing structural failure.

Impact on Critical Facilities: Properties at risk may include hospitals, nursing homes and housing likely to contain occupants who may not be sufficiently mobile to avoid death and injury during a flood or other emergency. Public safety facilities such as fire stations, vehicle and equipment storage facilities and emergency operations centers could also be at risk.

Impacts of Natural Resources: The most significant risk to natural resources in tropical storms and hurricanes in Bolivar County is damage to forests canopy and timberlands. Inland rivers and lakes can become clogged with wind-blown debris and trees, slowing recovery from a hurricane. Obstructions, if not removed can become a cause of flooding. Trees toppled onto the forest floor quickly become a target for infestation from insects that may spread to healthy trees. Water quality may suffer due to unwanted debris and vegetation blown in a hurricane. Potential debris from fallen trees can create fuel for wildfires when the area dries sufficiently to allow for burning through lightning or intervention by mankind. The Mississippi State Forest Commission works continuously to ensure that, through proactive cutting and prescribed burns, fallen trees and debris will not become fuel for a wildfire. In areas where timber is a significant feature of the economy, hurricane winds wreak havoc with growing trees, causing damage that lessens the quality of the timber and increases the likelihood of insect infestation of standing trees.

Impacts on Transportation Systems: Hurricane and/or high winds from tornadoes could result in power poles blown over or broken off onto roadways result in hazardous driving conditions until they can be cleared away. Overhead lines are often still energized until linemen are able to cut power to them. These conditions result in extremely hazardous driving conditions immediately following a hurricane or other windstorm. In heavily populated areas, lack of electricity also results in lack of signal lights at major intersections, creating driving hazards. Rail traffic could be interrupted by damage to railroad lines caused by flooding and damage to bridges and overpasses.

Impact on Lifeline Utility Systems: Overhead electric and telephone lines are damaged by trees and debris blown across them, or power poles and lines are blown over by hurricane force or tornado winds. In some instances, electric power may not be restored for many days or even weeks. In some instances, electric power may not be restored for many days or even weeks.

In the aftermath of Hurricane Katrina, the entire grid of Mississippi Power Company was affected down and, in some areas, land lines for telephones were down for weeks or months. This situation affected electrical cooperatives such as Central Electric Power Association (Carthage, Mississippi), which serves a portion of rural Bolivar County.

The hurricane also damaged cell phone transmission towers and radio and television transmission towers, many of which were out of service due to electric power failure. Lack of electricity also left some water systems and sewage treatment plants unable to operate until generators could be brought in to restore partial power.

Wildfire

Location and Extent

The Bolivar County land area includes approximately 86,465 acres of forestland is equal to 30.9% coverage as a percent of land. County forestland data was derived from the 2019 Forestland Inventory conducted by Mississippi Forestry Commission as shown in the table below.

Table B. 34 – 2019 Forestland Statistics* | Source: *www.mfc.ms.gov*

		Forestland			
County	Total Land Area (Acres)	Acres	Coverage (%)	Pine	Hardwood
Attala	471,597	284,817	60.4	49.1	41.3
Bolivar	279,658	86,465	30.9	0.0	100.0
Carroll	405,982	263,067	64.7	22.5	68.5
Holmes	488,932	197,380	40.3	15.1	84.8
Humphreys	275,892	30,268	10.9	0.0	100.0
Leflore	387,967	57,537	14.8	0.0	100.0
Montgomery	260,948	161,110	61.7	36.1	54.2
Sunflower	452,541	23,174	0.05	0.0	100.0
Washington	487,198	74,984	15.3	0.0	100.0

The Wildfire discussion in the Base Plan mentioned that an analysis of the change in total forestland area from the previous plan shows that the total acreage and percent of coverage has continued on a declining trend in all District 3 counties, with Attala (-23.2%) and Holmes (-22.8%) Counties showing the greatest decline in forested land. The average loss of the other seven District 3 counties was 5.43 percent. Most forested land in the planning area is under private ownership.

Information provided by the Mississippi Forestry Commission indicates that wildfires may occur during any season but, since 2012, the worst fires (determined by the number of acres burned) have occurred in late Summer and early Fall. Data presented in above also shows the potential for county-level differences in the total number of fires and acreage burned from year to year

based on the percentage of forestland in the county.

Past wildfires have threatened and destroyed property. The next table shows the number of residences, commercial buildings and outbuildings, broken down by county, that have been threatened or destroyed since 2015. Bolivar County has not seen any residences or businesses threatened or destroyed.

Table B.36 Bolivar County Residence and Structures Threatened and or Destroyed by Wildfire Since 2015 | Source: Mississippi Forestry Commission

County	Residences Threatened	Residences Destroyed	Commercial Building Threatened	Commercial Building Destroyed	Outbuilding Threatened	Outbuilding Destroyed
Attala	149	3	4	-	75	8
Bolivar	-	-	-	-	-	-
Carroll	113	-	45	-	33	1
Holmes	116	-	3	-	98	2
Humphreys	-	-	-	-	-	-
Leflore	2	-	-	-	6	-
Montgomery	33	-	4	-	43	4
Sunflower	-	-	-	-	-	-
Washington	1	-	-	-	1	-
TOTALS	**414**	**3**	**56**	**-**	**256**	**15**

Fortunately for all Bolivar County stakeholders, there is a strong fire protective services component between the local fire department and the presence of State forest rangers. These forces are strong and likely able to prevent most any fire from growing to catastrophic levels.

Previous Occurrences

A combination of local weather, drought conditions vegetative cover and topographic conditions may affect the development of wildfires. Documenting fire events is not consistent across the planning region with the local fire departments. The NOAA National Centers for Environmental Information (NCEI), Storm Events Database, shows no reported wildfires in the fifty-nine years between January 1, 1960 and December 1, 2019 for each of the District 3 counties. All available wildfire data is on a county level.

Table B.35 captures wildfire data for each District 3 county for the period 2014 to 2019. Bolivar County data is highlighted.

Table B.35 – Wildfire Data 2009 to 2011 | Source: www.mfc.ms.gov

County	2019		2018		2017		2016		2015		2014	
	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned
Attala	28	782	21	392	38	468	59	1,170	52	597	32	187
Bolivar	-	-	-	-	-	-	1	80	-	-	-	-
Carroll	5	18	4	32	13	172	24	387	24	268	16	83
Holmes	13	87	15	522	27	532	39	432	43	441	36	486
Humphreys	-	-	-	-	-	-	-	-	-	-	-	-
Leflore	-	-	-	-	-	-	1	22	6	150	-	-

County	2019		2018		2017		2016		2015		2014	
Montgomery	4	34	-	-	1	7	14	139	12	154	8	135
Sunflower	-	-	-	-	-	-	1	-	-	-	-	-
Washington	1	5	-	-	1	32	-	-	1	8	1	40

Information provided by the Mississippi Forestry Commission indicates that wildfires may occur during any season but, since 2012, the worst fires (determined by the number of acres burned) have occurred in late Summer and early Fall. The data presented in the table above also indicates the differences in total fires and average burned from year to year and county to county.

Probability of Future Occurrences

Table B.37 shows the number of fires and acres burned each year between 2014 and 2019, along with mean and median averaged for each.

Table B.37 Mean and Median Averages for Bolivar County, Number of Fires and Acres Burned | Source: Mississippi Forestry Commission

Total Fires	2019	2018	2017	2016	2015	2014	Total	Mean	Median
Total Fires	-	-	-	1	-	-	1	1	1
Acres Burned	-	-	-	80	-	-	80	80	40

It has been stated that it is difficult to develop probability of wildfire occurrence due to the range of elements that "set the stage" for a wildfire to occur. Looking at historical data for Bolivar County and selecting the lowest figures, it can be stated that in any given year there is a potential for at least 1 fire to develop and burn 80 acres.

Assessing Vulnerability

Wildfires pose a low threat to all areas of Bolivar County, where just around 30.9 % of acreage is forestland. Current mitigation of the fire hazard includes regular thinning of vegetative fuel, but the County Emergency Management Department works closely with County and local fire departments to educate the public about issues such as backyard burning that can lead to wildfire. Figures E.14a through E.14p are screen shots from the web site of the Southern Wildfire Risk website (www.southernwildfirerisk.com) established by the Southern Group of State Foresters. These images show the overall risk of Bolivar County and its jurisdictions located in the Wildfire Urban Interface (WUI).

Figure B.14a –Jurisdictional Wildfire Vulnerability-Bolivar County

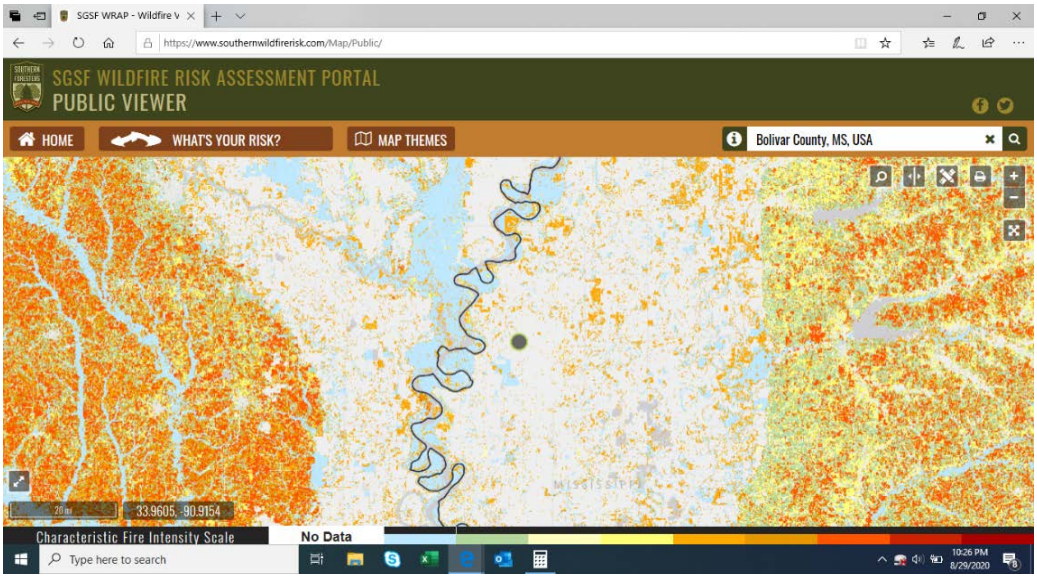


Figure B.14b –Jurisdictional Wildfire Vulnerability-Town of Alligator

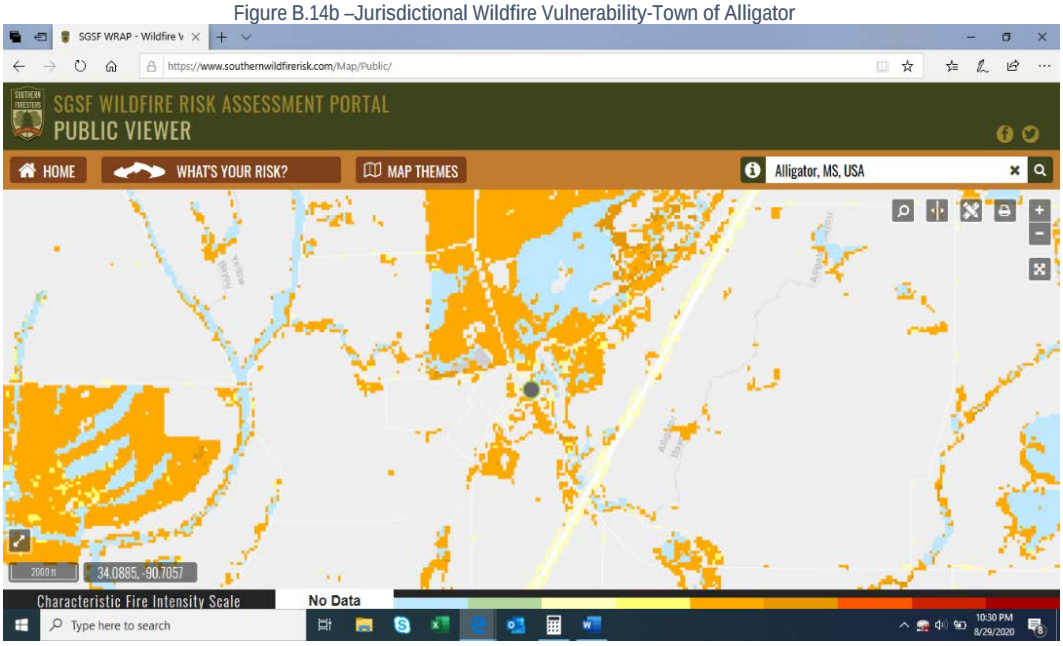


Figure B.14c –Jurisdictional Wildfire Vulnerability-Town of Benoit

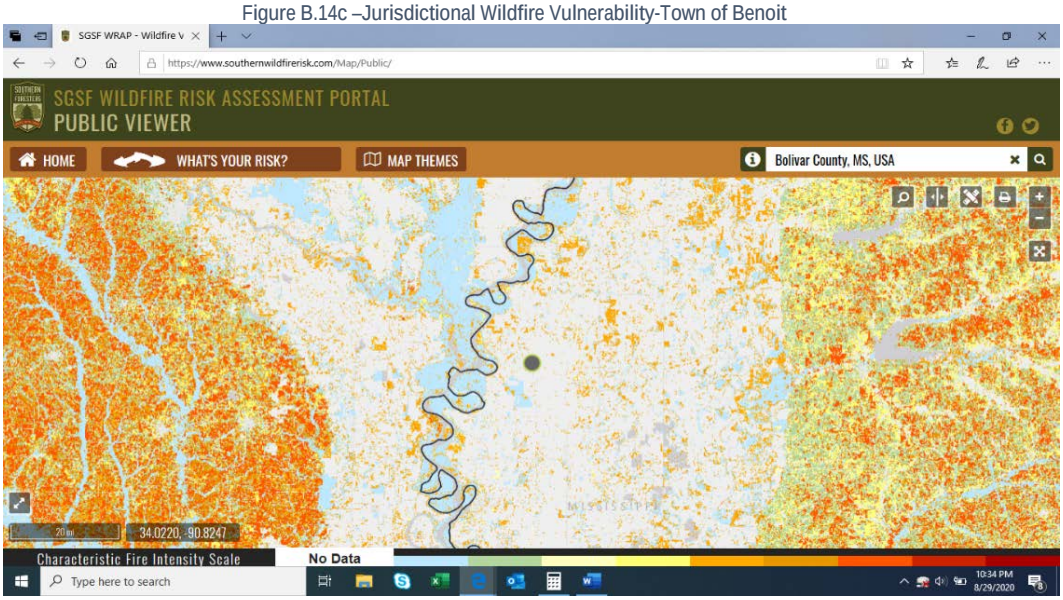


Figure B.14d –Jurisdictional Wildfire Vulnerability-Town of Beulah

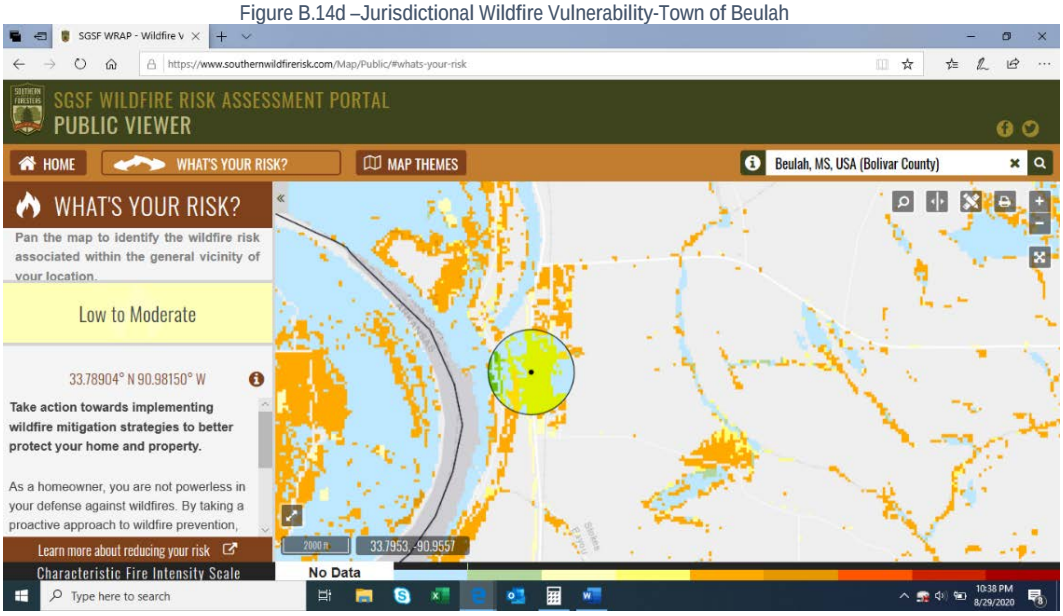


Figure B.14e –Jurisdictional Wildfire Vulnerability-Town of Boyle

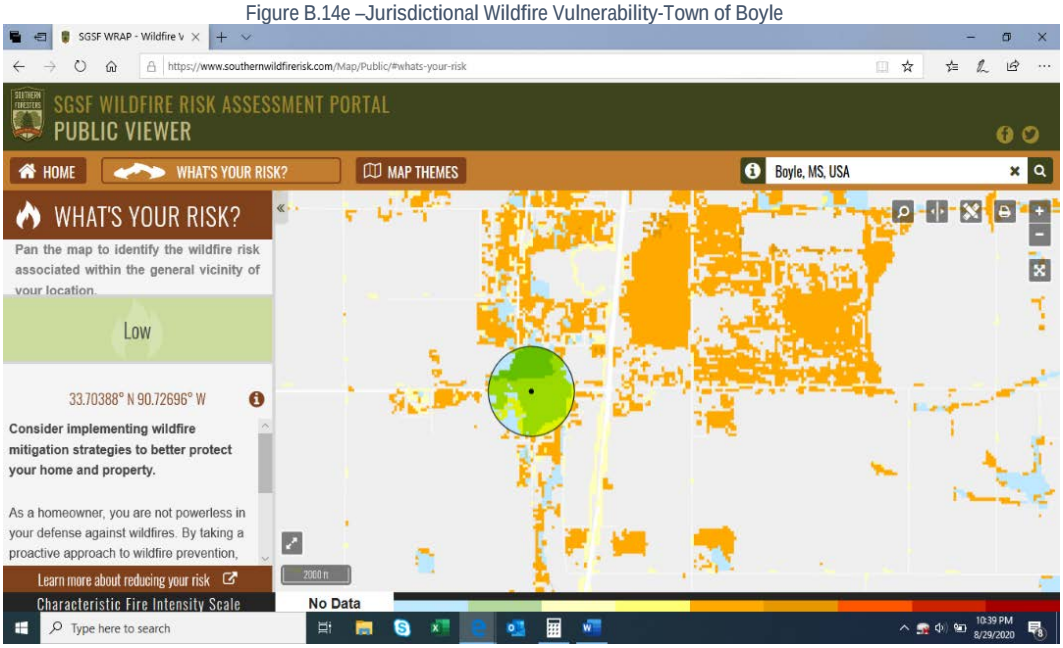


Figure B.14f –Jurisdictional Wildfire Vulnerability- City of Cleveland

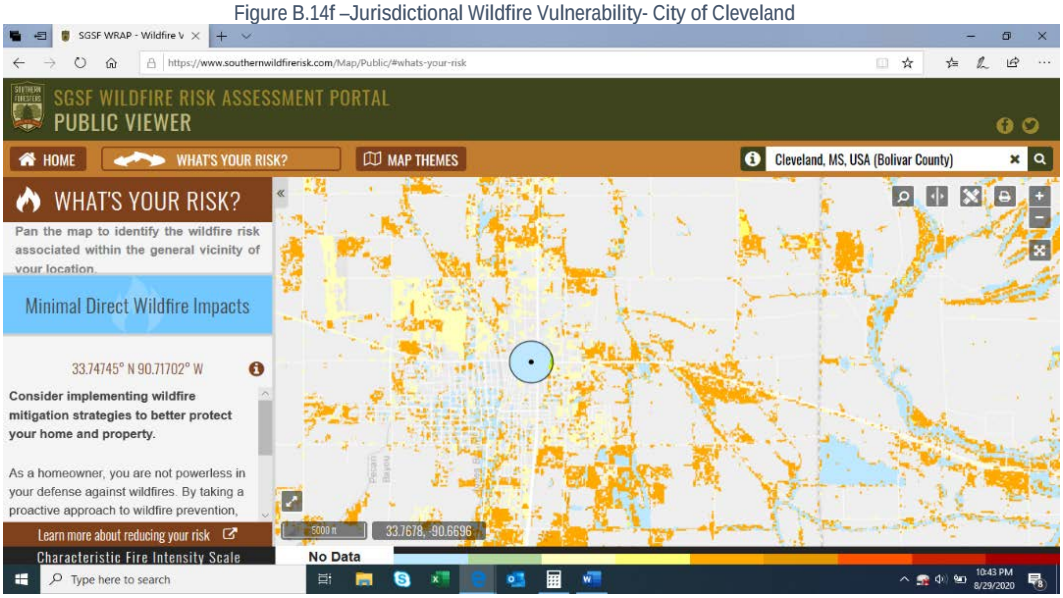


Figure B.14g –Jurisdictional Wildfire Vulnerability- Duncan

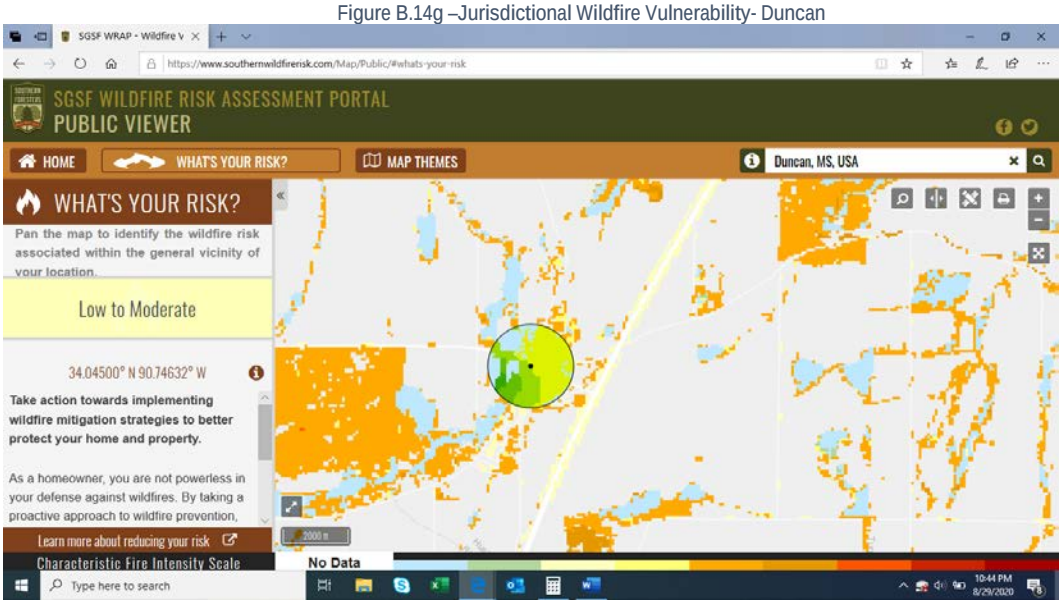


Figure B.14h –Jurisdictional Wildfire Vulnerability- Gunnison

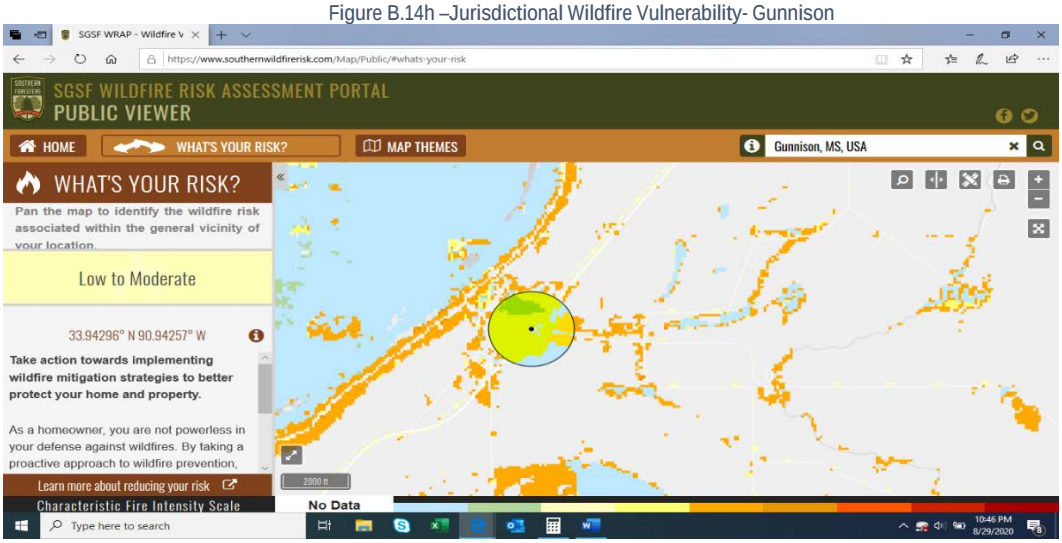


Figure B.14i –Jurisdictional Wildfire Vulnerability- Merigold

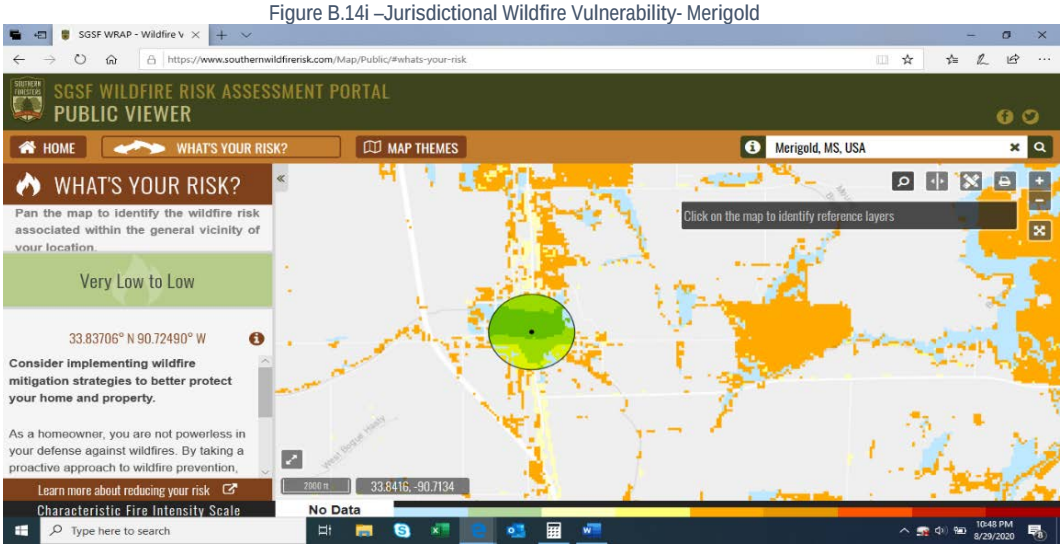


Figure B.14j –Jurisdictional Wildfire Vulnerability- Mound Bayou

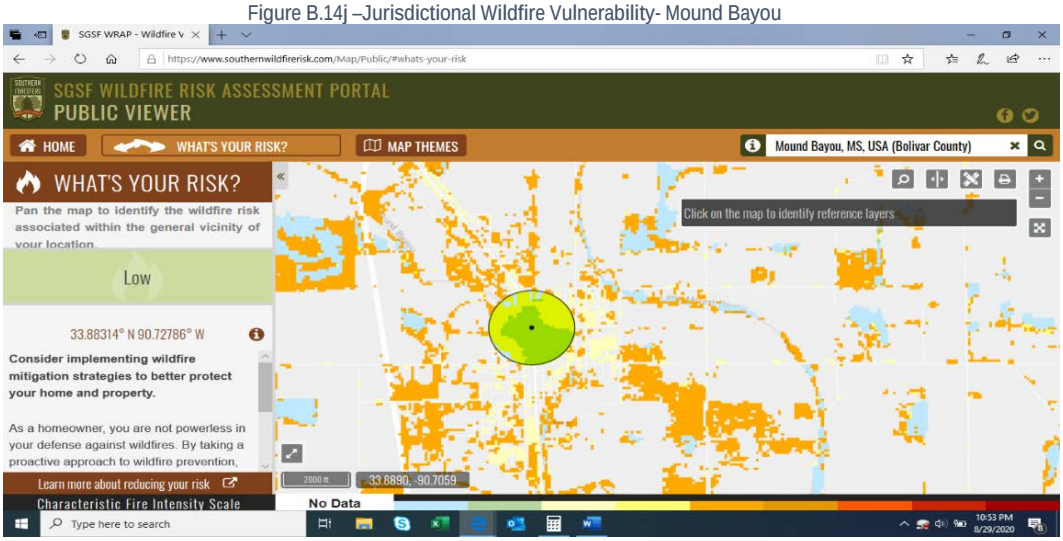


Figure B.14k –Jurisdictional Wildfire Vulnerability-Town of Pace

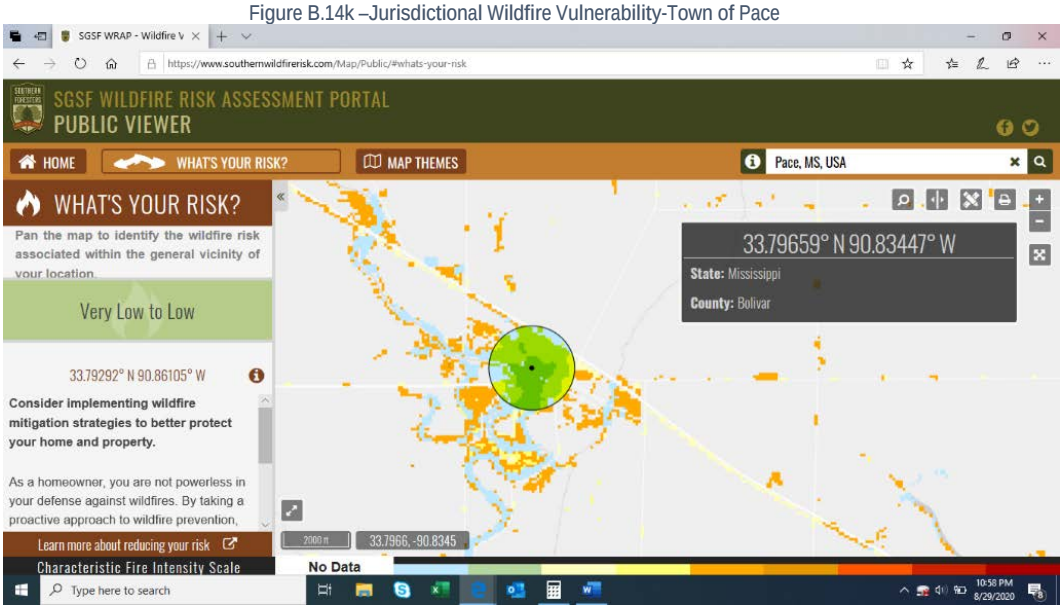


Figure B.14l –Jurisdictional Wildfire Vulnerability-Renova

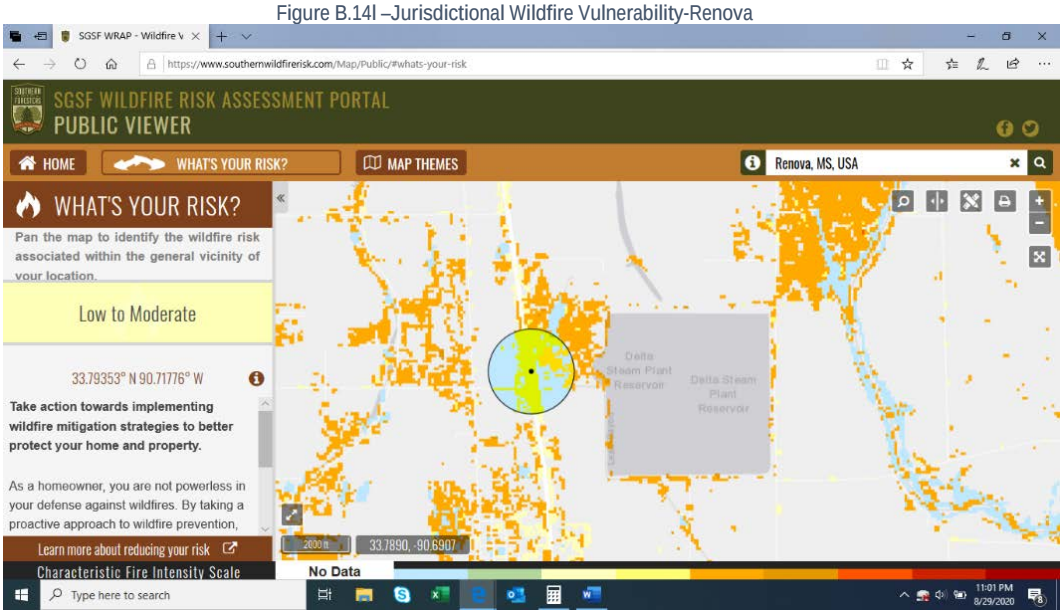


Figure B.14m –Jurisdictional Wildfire Vulnerability-Rosedale

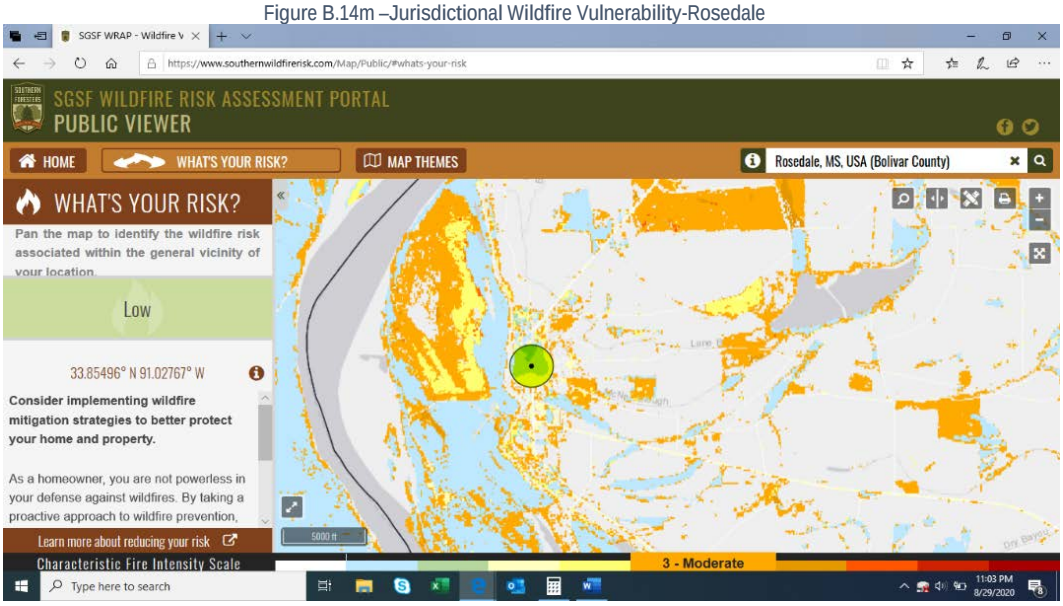


Figure B.14n –Jurisdictional Wildfire Vulnerability-Shaw

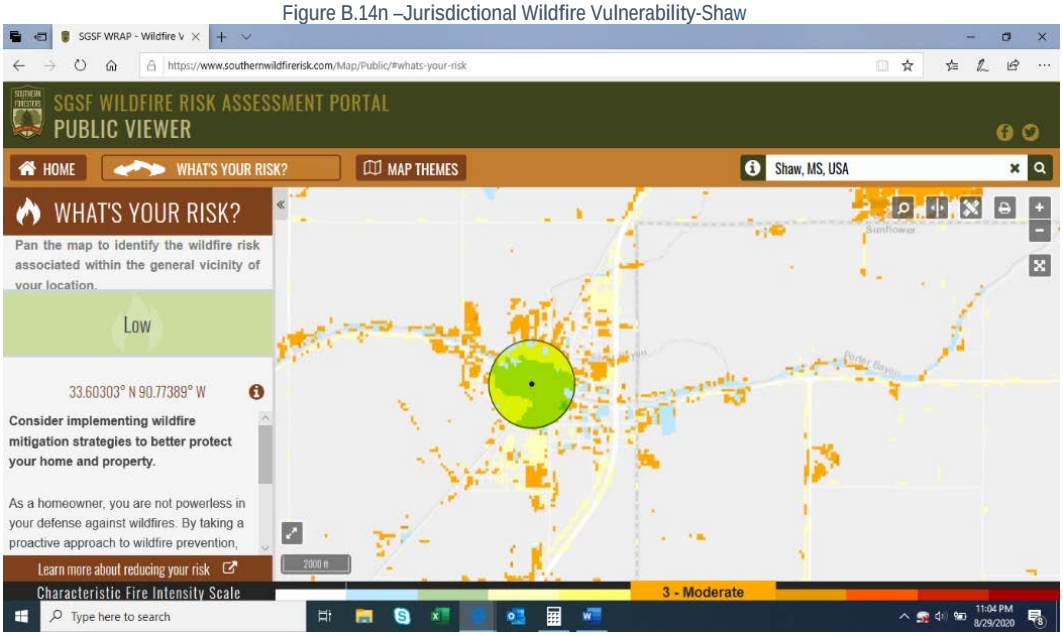


Figure B.14o –Jurisdictional Wildfire Vulnerability-Shelby

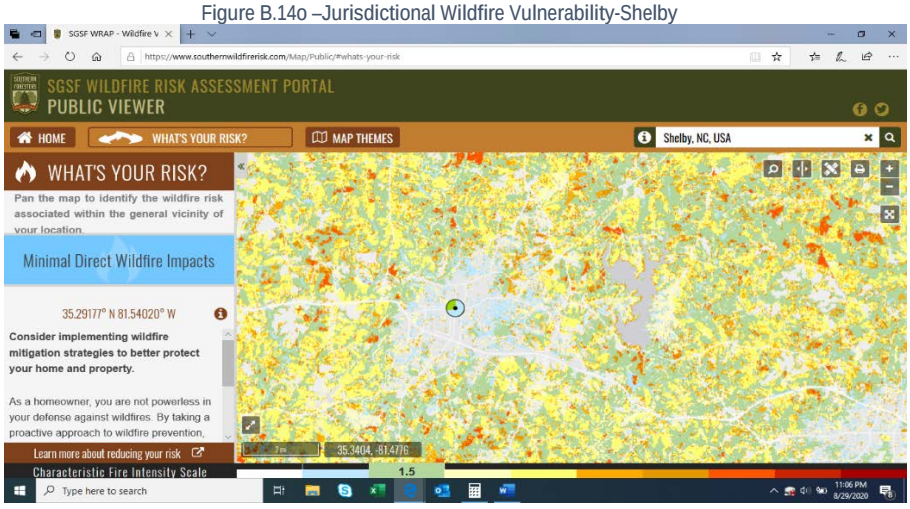


Figure B.14p –Jurisdictional Wildfire Vulnerability-Winstonville

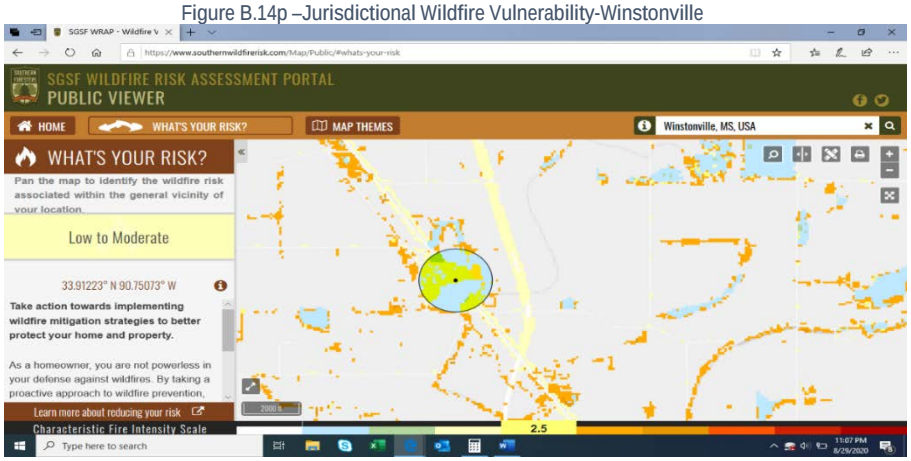


Table B.39: Bolivar County - Geographic Vulnerability to Wildfire by Jurisdiction | Source: SGSF portal

Jurisdiction	Ranking
Unincorporated Bolivar County	Medium
Town of Alligator	No data provided (low)
Town of Benoit	No data provided (low)
Town of Beulah	Low to Moderate
Town of Boyle	Low
City Cleveland	Minimal Direct Wildfire Impact
Town of Duncan	Low to Moderate
Town of Gunnison	Low to Moderate
Town of Merigold	Very Low to Low
Town of Mound Bayou	Low
Town of Pace	Very Low to Low
Town of Renova	Low to Moderate
City of Rosedale	Low
City of Shaw	Low
City of Shelby	Minimal Direct Wildfire Impact
Town of Winstonville	Low to Moderate
Overall Bolivar County Vulnerability to Wildfire Hazard	Low

The hazard was rated as being low overall in the 2015 RHMP. The places most vulnerable to wildfires are forested areas in unincorporated areas of Bolivar County. Current mitigation of fire hazard includes regular thinning of trees and removal of dead limbs and underbrush of the 86,465 acres of forestland

Impacts to Life and Property: Wildfire could impact the community by overextending personnel and financial resources of local emergency response crews and create a need to evacuate residences and businesses. The County's vulnerability to county-wide wildland fire hazard is mitigated somewhat by the presence of fire stations in most parts of the county, as well as the presence of a Sheriff's Office, which serves as an alternate EOC and personnel to augment those resources of fire stations.

Impacts to Critical Facilities: Electrical power could be impacted by wildfire and service could be temporarily interrupted by wildfire. It is doubtful that wildfire would have a lasting impact on water and sewer systems.

Impact on Future Development: The efforts of public and non-profit water associations ensure that there will always be water available for firefighting and structural protection, particularly in rural areas of the County. Several fire stations and districts in the county are not manned on a full-time basis but rely on volunteers, assisted by the Forestry Service, to fight wildfires. This could result in a negative impact on future development especially in the rural areas. Firefighting capacity may need to be enhanced should the community reach a point where future development includes significant numbers of residents or large industrial assets.

Hazardous Material Incidents

Location and Extent

Many hazardous and toxic materials are transported through areas of Bolivar County on 18-wheelers via U.S. Highway 61/278N, and Mississippi State Highways 1, and 8. In addition to roadway access, Bolivar County is also susceptible to river-way transports via the Mississippi River on barges and vessels and impacts from pipelines that cross the Mississippi River into the county's border. The Port of Rosedale is located within the County.

The proximity of these transportation routes to areas of Bolivar County increases the risk to residents in a five-mile radius for hazards involving all modes of transportation accidents and hazardous materials spills. A secondary risk to a transportation accident involving hazardous materials is the hazard of explosions and fires.

Previous Occurrences

Table E.40 provides a summary of toxic release incidents reported in Bolivar County from 2014 through 2019. According to the U.S. Environmental Protection Agency (EPA) Toxic Release Inventory (TRI), the following industries within Bolivar County handle hazardous materials and have had reported releases.

Table E.40- EPA Toxic Release Inventory Summary for Bolivar County 2014-2018 | Source: U.S. Environmental Protection Agency, Toxic Release Inventory Program Database; https://www.epa.gov/toxics-release-inventory-tri-program

	2018		2017		2016		2015		2014	
County	No. Facilities	No. Reports	No. Facilities	No. Reports	No. Facilities	No. Reports	No. Facilities	No. Reports	No. Facilities	No. Reports
Bolivar	4	15	4	13	4	12	4	12	4	13

Probability of Future Occurrence

It is likely that an event of this type will occur in Bolivar County at some point in the future given the fact that a major interstate highway and other major state and local roadways pass through the county. Specific areas where such incidents may occur are discussed under Addressing Vulnerability.

Assessing Vulnerability

Location, magnitude, type of release, wind velocity and direction, and weather conditions vary with each incident, thus making an assessment of vulnerability difficult at best. The possible impact of a hazardous materials incident could include evacuation from homes and businesses, possible.

Summary of Risk Assessment

Table B.41, shown at the beginning of discussion of Bolivar County hazards, is presented here to as a summary of all hazards discussed.

Table B.41: Total of Bolivar County Hazard Events and Damages | Source: NCEI

Hazard Type	No of Events	Death	Injury	Property Damage	Crop Damage
Dam/Levee Failure	-	-	-	-	-
Drought	8	-	-	-	$7,251,000
Earthquake	-	-	-	-	-
Exteme Heat	5	2	-	-	-
Expansive Soil	-	-	-	-	-
Flood	44	-	-	$ 2,817,000	1,205,000
Severe Storm	252	-	-	$ 6,257,000	$ 720,000
Severe Winter Weather	24	-	-	$ 1,957,000	-
Tornado	12	-	37	$ 13,192,000	$ 500,000
Tropical Storm / Hurricane	2	-	-	$ 710,000	$5,200,000
Wildfire	-	-	-	-	-
Totals	286	2	37	$ 24,927,000	$ 14,876,000
* Damage estimates not available					

This data shows that, in terms of number and frequency, severe storms are the most regularly occurring, while tornadoes has caused the most damage to both property and crops totaling over $13,192,000 million in property damage and $500,000 thousand in crop damage. Of the $66,516,043 in total damages from 286 events occurring between 2000 and 2019, crop damage represents just over one third the dollar amount of damage as that to personal property.

The Mississippi Department of Revenue 2018 Annual Report showed that there was a 2017 total property assessment value of 2017 equaled $ 330,440,220. A severe hazard event causing damage to 10 percent of property would cause damage in the amount of $ 33,044,022. Assuming that crop damage associated with such an event might run twice this amount, it can be anticipated that crop damage would run approximately has been estimated and roughly one third of property damage, the crop damage associated with such an event would total approximately $ 66,088,044, and overall damage could run as high as $99,132,066. Figures could vary widely depending on event type, location, magnitude, and extent.

B.3 Capability Assessment

This section assesses Bolivar County's capability to implement hazard mitigation activities. More detailed information on the purpose and methodology used to conduct the capability assessment can be found in Section 5 - Capability Assessment.

Planning and Regulatory Capability

The findings of the Planning and Regulatory section of capability assessment is described below in Table B.42. This table provides a jurisdictional overview of the plans and programs in place, followed by summary statistics of the *Local Capability Assessment Surveys*. Each county and municipality were asked to self-assess their capabilities. The planning and regulatory capabilities in Bolivar County and it participating jurisdictions has not changed since the previous plan.

Table B.42 - Relevant Plans, Ordinances and Programs

Jurisdiction	Comprehensive / Master Plan	Capital Improvements Plan	Economic Development Plan	Emergency Operations Plan	Continuity of Operations Plan	Transportation Plan	Stormwater Management Plan	Community Wildfire Protection Plan	Historic Preservation Plan	Building Codes	Fire Department ISO Rating	Site Plan Review Requirements	Land Use Plan	Zoning Ordinance	Subdivisiorn Regulation	Flood Damage Prevention Ordinance	Flood Insurance Studies	National Flood Insurance Program	National Flood Insurance Program
Bolivar County	✓	✓		✓		✓	✓				8		✓	✓		✓	✓	✓	
Alligator				✓							8					✓	✓	✓	
Benoit				✓							8					✓	✓	✓	
Beulah				✓							9					✓	✓	✓	
Boyle	✓	✓	✓	✓		✓	✓			✓	8	✓	✓	✓	✓	✓	✓	✓	
Cleveland	✓			✓		✓	✓		✓	'06	5	✓	✓	✓	✓	✓	✓	✓	8
Duncan				✓						'97	9		✓	✓	✓	✓	✓	✓	
Gunnison				✓							9					✓	✓	✓	
Merigold			✓	✓		✓				✓	8	✓		✓	✓	✓	✓	✓	
Mound Bayou				✓							8					✓	✓	✓	
Pace	✓	✓		✓							9	✓		✓		✓	✓	✓	
Renova				✓							8					✓	✓	✓	
Rosedale	✓	✓		✓	✓	✓				'71	8			✓	✓	✓	✓	✓	
Shaw				✓						✓	8		✓	✓		✓	✓	✓	
Shelby	✓			✓						✓	7	✓	✓	✓		✓	✓	✓	
Winstonville			✓	✓							8	✓	✓	✓	✓	✓	✓	✓	

Emergency Management Capabilities

Hazard Mitigation Plan: A hazard mitigation plan represents a community's blueprint for how they intend to reduce the impact of natural and human-caused hazards on people and the built environment. Elements of a hazard mitigation plan include a risk assessment, capability assessment and mitigation strategy.

- The jurisdictions within Bolivar County participate in the development and implementation of a hazard mitigation plan.

Emergency Operations Plan: An emergency operations plan outlines responsibility and the means by which resources are deployed during and following an emergency or disaster.

- Survey results indicate Bolivar County and all the participating communities have emergency operations plans.

Continuity of Operation Plan: A continuity of operations plan establishes a clear chain of command, line of succession, and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster.

- Survey results indicate the City of Rosedale has a Continuity of Operations Plan.

General Planning Capabilities

The implementation of hazard mitigation activities often involves individuals beyond the emergency management profession. Stakeholders may include local planners, public works officials, economic development specialists and others. Similarly, hazard mitigation planning cuts across multiple disciplines. As a result, the questions asked in the Local Capability Assessment Survey regarding general planning capabilities were designed to measure the degree to which mitigation is integrated into other planning efforts.

Comprehensive Plan: A comprehensive plan establishes the overall vision for a community and helps to guide municipal decision-making.

- Survey results indicate the Cities of Cleveland, Rosedale, Shelby; the Towns of Boyle, Pace; and Bolivar County have comprehensive plans.

Economic Plan: An economic plan serves as a road map for economic development decision making, based on the collection of statistical data, historical perspective, and human potential.

- Survey results indicate the Towns of Boyle, Merigold and Winstonville have an economic plan.

Community Wildfire Protection Plan: The community wildfire protection plan is a strategic plan that identifies wild land fire issues facing the community and outlines prioritized mitigation actions.

- Survey results indicate no jurisdictions have community wildfire protection plans.

Transportation Plan: A transportation plan identifies the means to gauge transportation demands and the options to meet those needs, while considering the social, economic and environmental characteristics of the area. The development of transportation networks can significantly impact the amount, type and location of future growth. As a result, transportation planning can have a dramatic impact on future hazard vulnerability.

- Survey results indicate the Cities of Cleveland, Rosedale; the Town of Boyle, Merigold; and Bolivar County have a transportation plan.

Capital Improvements Plan: A capital improvements plan guides the scheduling of spending on public improvements. A capital improvements plan can serve as an important mechanism to guide future development away from identified hazard areas. Limiting public spending in hazardous areas is one of the most effective long-term mitigation actions available to local governments.

- Survey results indicate the City of Rosedale; the Towns of Boyle and Pace; and Bolivar County have capital improvement plans.

Historic Preservation Plan: A historic preservation plan is intended to preserve historic structures or districts within a community. An often-overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards to include the identification of the most effective way to reduce future damages. This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of harm's way.

- Survey results indicate the City of Cleveland has a historic preservation plan.

Zoning Ordinances: As part of a community's police power, zoning is used to protect the public health, safety and welfare. A zoning ordinance is the mechanism through which zoning is typically implemented. Since zoning regulations enable municipal governments to limit the type and density of development, it can serve as a powerful tool when applied in identified hazard areas.

- Survey results indicate the Cities of Cleveland, Rosedale, Shaw, Shelby; the Towns of Boyle, Duncan, Merigold, Pace, Winstonville; and Bolivar County have zoning ordinances.

Subdivision Ordinances: A subdivision ordinance is intended to regulate the development of housing, commercial, industrial or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development.

- Survey results indicate the Cities of Cleveland, Rosedale; and the Towns of Boyle, Duncan, Merigold, and Winstonville have a subdivision ordinance.

Building Codes, Permitting and Inspections: Building codes regulate construction standards. Decisions regarding the adoption of building codes, the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community.

- Survey results indicate the Cities of Cleveland, Rosedale, Shaw, and Shelby and the Towns of Boyle, Duncan, and Merigold have building codes, permitting and inspections.

Floodplain Management Capability

Flooding represents the greatest natural hazard facing the Nation and the planning area. At the same time, the tools available to reduce the impacts associated with flooding are among the most developed when compared to other hazard-specific mitigation techniques. Information contained in this section has been gathered through surveys and the NFIP Status Book.

Storm Water Management Plan: A storm water management plan is designed to address flooding associated with storm water runoff. The storm water management plan is typically focused on design and construction measures that are intended to reduce the impact of more frequently occurring minor urban flooding.

- Survey results indicate the City of Cleveland, Town of Boyle and Bolivar County have storm water management plans.

Flood Damage Prevention Ordinance/NFIP participation: A local Flood Damage Prevention Ordinance is a tool used by counties and municipalities to regulate the type of construction that occurs in the floodplain. If a community is an NFIP participant, a Flood Ordinance or Court Order is in place.

- Survey results indicate Bolivar County and all the participating communities have flood damage prevention ordinances plans.

The Table B 23, taken from the 2015 D3 RHMP, represents the most recently available data about Bolivar County NFIP participation and claims data.

Table B.23: Bolivar County NFIP Communities | Source: NFIP Policy and Loss Statistics (3-31-14) and community Status Report (4-4-14)

Jurisdiction	NFIP Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date ($)
Bolivar County	07/17/89	386	$79,814,300	744	$17,386,826
Alligator	09/04/85	-	-	-	-
Benoit	09/27/85	5	$1,440,000	34	$438,214
Beulah	06/25/76	-	-	29	$289,201
Boyle	03/01/87	1	$350,000	1	$1,424
Cleveland	07/17/89	149	$438,772,200	73	$864,238
Duncan	08/01/86	-	-	-	-
Gunnison	06/25/76	4	$980,000	1	$172,938
Merigold	09/27/85	3	$660,000	2	-
Mound Bayou	09/27/85	13	$3,636,700	4	$40,691
Pace	09/27/85	1	$350,000	-	-
Renova		6	$1,078,000	-	-
Rosedale	09/27/85	24	$4,547,000	-	-
Shaw	06/03/86	2	$455,000	-	-
Shelby	09/27/85	30	$3,565,900	-	-
Winstonville		2	$250,000	-	-
	Totals	626	$140,505,100	888	$19,193,532

Continued Compliance to NFIP

Given the flood hazards in the planning area, an emphasis will be placed on continued compliance with the NFIP. The following steps will be taken by each participating community in order to meet or exceed the following minimum requirements as set by the NFIP.

- Issuing or denying floodplain development/building permits
- Inspecting all development to ensure compliance with local ordinance
- Maintaining records of floodplain development
- Assisting in the preparation and revision of flood maps/updates
- Assist residents in obtaining information on flood hazards, floodplain map data, flood insurance and proper construction measures.
- Survey results indicate that Bolivar County and its NFIP participating municipalities of have flood damage prevention ordinances plans.

Administrative and Technical Capability

Table B.43 provides a summary of the capability assessment results for Bolivar County with regard to administrative and technical capabilities. The administrative and technical capabilities in Bolivar County and it participating jurisdictions has not changed since the previous plan.

Table B.43 - Relevant Staff/Personnel Resources

Jurisdiction	Planning Commission	Participation in Emergency Management Committee (LEPC etc.)	Maintenance program to reduce risk (i.e. tree trimming, storm drain cleaning etc.)	Mutual Aid Compacts	Building Inspection department	Floodplain Manager	Emergency Manager	Community Planner	Civil Engineer	GIS Coordinator	Warning System/Services (reverse 911/outdoor warning sirens etc.)	Grant Writing Capabilities
Bolivar County	✓	✓	✓	✓	✓	✓	✓		✓		✓	
Alligator		✓	✓	✓		✓	✓		✓		✓	✓
Benoit		✓	✓	✓		✓	✓		✓		✓	✓
Beulah				✓		✓	✓					
Boyle	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓
Cleveland	✓	✓	✓	✓	✓	✓	✓				✓	✓
Duncan			✓	✓		✓	✓		✓			✓
Gunnison		✓		✓		✓	✓					
Merigold		✓	✓	✓	✓	✓	✓		✓		✓	✓
Mound Bayou			✓	✓		✓	✓		✓		✓	✓
Pace			✓	✓		✓	✓					
Renova			✓	✓		✓	✓				✓	
Rosedale	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Shaw		✓	✓	✓	✓	✓	✓		✓		✓	✓
Shelby		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Winstonville		✓		✓	✓	✓	✓					✓

Fiscal Capability

Table B.44 provides a summary of the results of the local capability assessment for Bolivar County with regard to relevant fiscal resources. The fiscal capabilities in Bolivar County and it participating jurisdictions has not changed since the previous plan.

Table B.44 - Relevant Fiscal Resources

Jurisdiction	Capital Improvements Project Funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric services	Impact fees for new development	Stormwater utility fee	Incur debt through general obligation bonds or tax bonds	Incur debt tss private activities	Community Development Block Grant (CDBG)	Other federal funding programs	State funding programs
Bolivar County	✓	✓				✓		✓	✓	✓
Alligator		✓	✓			✓		✓	✓	✓
Benoit		✓	✓			✓		✓	✓	✓
Beulah		✓	✓	✓		✓	✓	✓	✓	✓
Boyle	✓	✓	✓			✓		✓	✓	✓
Cleveland	✓	✓	✓			✓		✓	✓	✓
Duncan		✓	✓			✓		✓		✓
Gunnison		✓	✓			✓		✓	✓	✓
Merigold		✓	✓			✓		✓	✓	✓
Mound Bayou		✓				✓		✓	✓	✓
Pace		✓	✓			✓	✓	✓	✓	✓
Renova		✓				✓		✓	✓	✓
Rosedale	✓	✓	✓	✓		✓	✓	✓	✓	✓
Shaw	✓	✓	✓	✓		✓		✓	✓	✓
Shelby	✓	✓	✓			✓		✓	✓	✓
Winstonville	✓	✓	✓			✓		✓		✓

Education and Outreach Capability

Table B.45 provides the results for the education and outreach capability for Bolivar County.

Table B.45: Relevant Education Programs and Organizations

Jurisdiction	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Ongoing public education or information programs e.g. responsible water use, fire safe ty, household preparedness, environmental education)	Natural disaster or safety -related school programs	StormReady certification	Firewise Community Certification	Public / Private partnership initiatives addressing disaster - related issues
Bolivar County	✓	✓	✓	✓	✓	✓
Alligator		✓	✓			
Benoit		✓	✓			
Beulah						✓
Boyle	✓	✓	✓			✓
Cleveland	✓	✓	✓			
Duncan			✓			
Gunnison						
Merigold	✓	✓	✓			✓
Mound Bayou		✓	✓			
Pace						✓
Renova						
Rosedale	✓	✓	✓			✓
Shaw		✓	✓			
Shelby	✓	✓	✓			
Winstonville						

The lack of coordinated jurisdictional and countywide mitigation education and outreach resources was identified as a need by all jurisdictions. As such, communities and the County Emergency Management Department have agreed to approach the North Central Mississippi Planning and Development District to help develop a communications and information program using the County web site as its platform. A web page dedicated to this effort would include information on all natural and manmade hazards to which the region is prone. Each jurisdiction could include a hyperlink on its own web site that takes the user to information posted on the County site.

Mitigation action worksheet for this project are included at the end of this annex as a show of support for this countywide mitigation strategy. This approach to communications and outreach is reasonable in light of the Incident Command Structure used in the event of an emergency. Should a major hazard incident occur, the office of District 3 would contact the Emergency Management Director of each county who, in turn, provides status reports to jurisdictional

elected officials. Because communities come together to plan for and respond to disasters, they will use this same approach to collectively develop relevant education and outreach programs that educate communities about how to mitigate against regional hazards of concern.

Conclusions on Local Capability

Table B.46 shows the results of the capability assessment using the scoring system that can be found in Section 5 of the base plan. The scoring for Bolivar County was based on information from the local capability survey and reviewing existing plans. According to the assessment, the average local capability score for the county and its communities is 30.19 which fall into a moderate capability rating.

Table B.46 – Capability Results Summary

Jurisdiction	Overall Capability Score	Overall Capability Rating
Bolivar County	48	High
Alligator	31	Moderate
Benoit	31	Moderate
Beulah	26	Moderate
Boyle	52	High
Cleveland	51	Moderate
Duncan	33	Moderate
Gunnison	24	Moderate
Merigold	42	Moderate
Mound Bayou	29	Moderate
Pace	32	Moderate
Renova	24	Moderate
Rosedale	52	High
Shaw	41	Moderate
Shelby	45	Moderate
Winstonville	36	Moderate

B.4 Mitigation Strategy

The participating jurisdictions reviewed the mitigation goals and priorities identified in the County's previous plan. Common elements of the previous mitigation goals were used to develop regional goals designed to achieve the implementation of mitigation actions. These refined goals were adopted by the participating jurisdictions. It was determined that the priorities for each of the participating jurisdictions had not changed, although the regionwide mitigation goals and objectives were streamlined as discussed in the base plan.

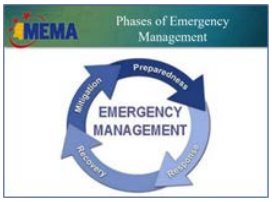
The Mitigation Strategy for Bolivar County includes several changes, including those based on the streamlined list of 2020 Goals and Objectives. The table of action items includes mitigation actions identified in the 2015 plan; the outcome of each; and how the strategy was updated for the 2020 plan; and newly developed mitigation actions, if any. The 2015 plan included two separate tables of mitigation actions: one table to provide a status update on actions mentioned in the previous plan; and a second table outlining the current mitigation strategy. These have been combined into one table in the current plan update.

Previous plans included a large number of mitigation actions considering the size and available resources of some jurisdictions, including those with only a few hundred residents. An example of this is the fact that most County Emergency Management (EM) Directors are the single departmental employee, or they perform their EM duties while functioning in one or more service roles in their community. The same is often true for leadership at the city or town level, where those in leadership "wear many hats."

Several changes were made to streamline the Mitigation Strategy given the following considerations.

- Actions identified as falling into the Preparedness Phase of the Emergency Management Cycle were removed and recommended for consideration under Preparedness Planning. Examples of this include disaster preparedness initiatives (such as providing weather radios to residents) and NIMS training, which represent actions a community normally does to prepare for a hazard event.

- The image at right, developed for a MEMA presentation, clearly delineates that EM agencies operationally function under four phases of emergency management, although sometimes the phases run concurrently. Professional emergency managers and their Emergency Support Functions (ESF), units called up during disaster response, develop specific plans and actions to as appropriate for each event phase.



- Actions identified as being required as part of the FEMA Hazard Mitigation Planning Process were removed because these are fully spelled out under the Plan Maintenance section of this RHMP Update. Examples of this include reviewing the mitigation plan and meeting to discuss needed plan updates after a disaster occurs in the community.

It was recommended that actions that were similar activities be combined into one action. For example, there were previously separate action items for educating the public about natural hazards and for educating the public about manmade (technological, biological, health-related) hazards. A single outreach plan using multiple communications channels can incorporate education about all hazards to all audiences if the outreach plan is fully developed.

- In some instances, extensive description of previous actions was shortened for plan readability.

- Most action items were identified by all jurisdictions. In these cases, a countywide action was recommended developed that would be jointly implemented by all participating jurisdictions.

It is hoped that the streamlined mitigation strategy will be more manageable for the District 3 Counties and its jurisdictions to implement.

Progress Made on Mitigation Strategies and Updated Mitigation Strategy

Bolivar County jurisdictions have been proactive in implementing mitigation strategies identified in their previous plan. Actions included in Table B.47 have been sorted so that deleted actions appear at the end of each jurisdictional listing. They are highlighted, and a reason for deletion is listed in the column labeled "2020 Status." This column includes use of the following designations to show action status:

Designation	Meaning	Description
D	Deleted	Action was deleted from the plan for the reason described under the Column 2020 Status Description
N	New	New action for the 2020 Plan Update
R	Retained	Action previously included in the 2015 plan, with a description of how it will be continued in the 2020 plan
IP	In Progress	Action previously included in the 2015 plan has been initiated, but not yet completed.

In the column labeled *Implementation Timeline*, initiatives listed as "Continuous Action" refers to an ongoing action that has initiated but not completed.

The participating jurisdictions reviewed the mitigation goals and priorities identified in the County's previous plan. Common elements of the previous mitigation goals were used to develop regional goals designed to achieve the implementation of mitigation actions. These refined goals were adopted by the participating jurisdictions. It was determined that the priorities for each of the participating jurisdictions has not changed.

Table B.47: Hazard Mitigation Strategy for Bolivar County and its Jurisdictions

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
Bol-01	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including installation, testing and inspection	Bolivar County	Bolivar County EMA, MEMA	Severe Weather, Tornado	$35,000	R	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	1.1	H	HMA, general budget	2020
Bol-02	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Bolivar County	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.1	M	NWS	2015
Bol-03	Develop weather radio program for vulnerable populations	Outdoor warning sirens, text messaging, television and other forms of communication have been implemented to alert the public; however, areas/population that may not receive notifications due to location and/or lack of communication devices: develop committee to explore benefit/cost, vendors, funding options, etc. to provide weather radios to vulnerable populations.	Bolivar County	MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	Tornado, Severe Storm	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	2 yr.	1.1	H	HMA, CDBG, general budget	2015
Bol-04	Install electric information alert signs over major evacuation routes to alert residents and travelers of threat conditions.	Permanent and portable message boards have been installed throughout the state on key transportation routes. More systems should be installed as funding becomes available within the Bolivar County area.	City of Cleveland	Mayor's office, MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	All-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	2 yr.	1.1	H	HMA, CDBG, general budget	2015

CLE-05	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	City of Cleveland	Mayor's office, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMA, USACE, general budget	2020
Bol-06	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations are necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Bolivar County	Public Works, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation measures.	2020-2025	1.2	M	HMA, CDBG, general budget	2020
Bol-07	Mitigate deficient/obsolete bridges	Bridge throughout MEMA District are not designed to withstand seismic activity and/or are classified as structurally deficient or functionally obsolete by the national bridge inventory. Bridges are vital component to the transportation system in the Delta and will hamper accessibility if impacted by natural disasters or prevented for use due to its inability to function according to its designed standards. Work with local officials in Bolivar and federal and state agencies to develop a priority system for improvements.	Bolivar County	Public Works	Earthquake, Flood	Undetermined	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation measures.	2020-2025	1.2	H	State Aid, MDOT, FHWA	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
Bol-08	Promote/Build storm water detention ponds when appropriate.	Detention ponds could be a solution for addressing flood impacts.	Bolivar County	Public Works	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	L	CDBG, general budget, Developers	2020
Bol-09	Construct flood control measures	The entire Bolivar County area is in need of flood control measures to prevent/reduce future impacts caused by flooding. Conduct study to determine appropriate actions to climate/reduce flooding. Identify funding and implement projects when feasible.	Bolivar County	USACE, Bolivar Co., BOS, MEMA	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.2	H	HMA, CDBG, USACE, general budget	2020
Bol-10	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Bolivar County	Bolivar Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.2	H	HMA, CDBG, general budget	2020
Bol-11	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Bolivar County	Bolivar County EMA, MEMA	Flood	Undetermined	R	Monitor status of properties affected by flooding and research funding and for acquiring or elevating of structures	Continuous Action	1.2	M	HMA, CDBG, general budget	2020
Bol-12	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	Bolivar County	Public Works, Drainage Districts	Flood	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system upgrades	2020-2025	1.2	H	HMA, CDBG, CIAP, general budget	2020
Bol-13	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	Bolivar County	Public Works	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for stormwater conveyance and detention structures	Continuous action	1.2	M	CDBG, CIAP, general budget	2020
Bol-14	Create defensible space around structures and infrastructures.	Defensible zones and buildings, power and gas lines and other infrastructure may be lacking throughout the county.	Bolivar County	Public Works, BOS		Undetermined	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.2	L	general budget	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
Bol-15	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Lighting strikes can create outages to essential county water and sewer services as well as invite unnecessary damage to county facilities. Consider program to establish lightning grounding systems on critical water and sewer system elements and other facilities prone to strikes to ensure that essential county service continue.	Bolivar County	Public Works,	Severe Weather	Undetermined	R	Identify and prioritize critical facilities requiring installation of lightning protection system, starting with water and sewer facilities	2020-2025	1.2	H	General budget	2020
Bol-16	Monitor water supply and establish conservation regulations	Monitoring the water supply and its functions and save water in the long run. The county should consider establishing water conservation ordinances and implement water conservation techniques by regularly checking for leaks to minimize water supply loss.	Bolivar County	Public Works, BOS, Building Department	Drought	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for stormwater conveyance and detention structures	Continuous Action		H	General budget	2015
Bol-17	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease- causing issues.	Bolivar County	BOS	Bolan Infect. Disease	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	1.5	H	General budget	2015
Bol-18	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Keep areas of concern free of unnecessary debris	Bolivar County	Road Department, Public Works,	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove from Mitigation Plan. Routine maintenance is not considered mitigation.	Continuous Action	1.5	H	General budget	2015

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed ; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
Bol-19	Preserve natural wetlands and riparian areas through use of conservation easements.	LAND TRUST assists individuals and communities to preserve and conserve lands that are valuable, when preserved in their natural state. These values may be emotional or ecological. LAND TRUST work with homeowners to purchase the property or secure an easement on the property so that the property remains undeveloped. The LAND TRUST also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of the community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers, streams and bayous which are the floodways of the streams. Implement when opportunity presents themselves and practical.	Bolivar County	Individual landowners	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	M	Private funds	2020
Bol-20	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Bolivar County	Bolivar Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.6	H	General budget	2015
Bol-21	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	Bolivar County	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems,	Multi-hazard	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.2	H	General budget	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
Bol-22	Update the Comprehensive Emergency Management Plan (CEMP)	A CEMP provides for the preparation for and the carrying out all emergency functions to mitigate, prepare for, respond to, recover from emergencies and disasters, and to aid victims suffering from injury or damage, resulting from disasters caused by all hazards, whether natural, technological, or Bolan caused and to provide support for search and rescue operations for person and property in distress.	Bolivar County	EMA, Police and Fire Departments	Multi-hazard	Undetermined	D	Completed-Moved to Preparedness Planning.	2015-2020		H	EMPG, general budget	2015
Bol-23	Develop Community Wildfire Protection Plan (CWPP)	The Healthy Forest Restoration Act provide communities with a tremendous opportunity to influence where and how federal agencies implement fuel reduction projects on federal lands. A CWPP is the most effective way to take advantage of this opportunity. Consider developing a CWPP and contact Mississippi Forest Commission to obtain guidance and potential funding sources.	Bolivar County	Fire Department, County EMA	Wildfire	Undetermined	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.2	H	MFC, general budget	2020
Bol-24	Develop/update Emergency Action Plans (EAP) for high and significant hazard dams	A EAP is required for all HIGH HAZARD and SIGNIFICANT HAZARD dams. Coordinate the development of an EAP for DELTA STREAM ELECTRIC STATION DAM classified as a high hazard dam by MDEQ DAM SAFETY DIVISION.	Bolivar County	Dam Owners, BOS, Co. EMA	Dam Failure	Undetermined	R	Coordinate the development of EAPs for all Dams classified as high hazard dams	2020-2025	1.2	H	HMA, HMEP, MDEQ	2020
Bol-25	Develop/update Stormwater Management Plan	A Stormwater Management Plan outlines what is currently being done to prevent stormwater pollution, and what will be done in the future. Six minimum measures must be incorporated into the plan. Public Education and outreach; Public participation and involvement; Illicit discharge detection and elimination; Construction site runoff control; Post-construction run-off control; Pollution Prevention and good housekeeping	Bolivar County	Public Works	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.2	H	General budget	2020

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Bol-26	Develop/update the Comprehensive Plan to include hazard mitigation strategy/goals	A comprehensive plan establishes the overall vision for a community and help to guide decision making and priorities for addressing growth and changes in land use.	Bolivar County	BOS	Multi-hazards	$50,000-$75,000	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	2020-2025	1.2	M	General budget	2020
Bol-27	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The county has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Bolivar County	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
Bol-28	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Bolivar County	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
Bol-29	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Bolivar County	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning.	Continuous Action		M	General budget	2015
Bol-30	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from an federal, state and local level.	Bolivar County	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning.	Continuous Action		M	General budget	2015
Bol-31	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Bolivar County	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020		H	HMA, general budget	2015

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Bol-32	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The county can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Bolivar County	Bolivar County EMA	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General budget	2015
Bol-33	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	Bolivar County	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings.	Continuous Action		M	HMA, general budget	2015
Bol-34	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	Bolivar County	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	HMA, general budget	2015

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Bol-35	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	Bolivar County participates in the NFIP, but the CRS program. Consider participating in the CRS program and implement.	Bolivar County	BOS, Floodplain Manager, Building Official, Co EMA, MEMA	Multi-hazards	Undetermined	R	Retained and revised for the County to take actions necessary to become a member of the CRS.	Continuous Action	1.2	H	General budget	2020
Bol-36	Become a Firewise community	The Firewise Program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in an effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding. Obtain a wildfire risk assessment from the State Firewise Liaison, form a committee and create an action plan based on the assessment.	Bolivar County	BOS, Fire Department, MFC	Multi-hazards	Undetermined	R	Review requirements to become a Firewise community and take first steps toward becoming certified.	Continuous Action	1.2	H	MFC, general budget	2020
Bol-37	Continue efforts on public information and awareness for natural hazards	The county has several out reaches initiatives to communicate hazard preparedness information to the general public and visitors in the area. Providing timely information and educational information related to preparedness, mitigation, response, and recovery to the public to foster their ability to become self-sufficient.	Bolivar County	Co EMA, applicable department, MEMA, NWS, FEMA	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	M	General budget	2020
Bol-38	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non- natural hazards. Identify areas/groups within the county that are prone to technological, man- made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the county's' web page.	Bolivar County	Co EMA, applicable department, MSDH,	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	H	MSDH, EMPG, HMA, CDBG, general budget	2020

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Bol-39	Promote workshops for emergency preparedness/continuity of operations.	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans establishes a clear chain of command, line of succession, and procedures for backups and alternative emergency facilities in case of extreme emergency or disaster.	Bolivar County	BOS and Bolivar Co.	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	M	Private funds	2020
Bol-40	Encourage the development of training and emergency planning for private companies that handle hazard materials	Hazardous materials, if nothandled correctly, can adversely impact people and property should spills or damaging effects be encountered.	Bolivar County	Bolivar Co. EMA, Police and Fire Officials	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	M	General budget	2020
Bol-41	Develop public/private partnerships that promote community hazard mitigation and assist in reach hazard mitigation goals	Local businesses are important to all jurisdictions as they provide goods and services to support the community. Identifying business that have interest in hazard mitigation due to their own interests or for the interest of the whole community as needed. The county will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives.	Bolivar County	Bolivar Co. applicable departments	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	M	Private funds, general budget	2020
Cleveland													
CLE-01	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including	City of Cleveland	Bolivar County EMA, MEMA	Severe Weather, Tornado	$35,000	R	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	1.1	H	HMA, general budget	2020

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CLE-02	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	City of Cleveland	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.1	M	NWS	2015
CLE-03	Develop weather radio program for vulnerable populations	Outdoor warning sirens, text messaging, television and other forms of communication have been implemented to alert the public; however, areas/population that may not receive notifications due to location and/or lack of communication devices: develop committee to explore benefit/cost, vendors, funding options, etc. to provide	City of Cleveland	MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	Tornado, Severe Storm	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	2 yr.	1.1	H	HMA, CDBG, general budget	2015
CLE-04	Install electric information alert signs over major evacuation routes to alert residents and travelers of threat conditions.	Permanent and portable message boards have been installed throughout the state on key transportation routes. More systems should be installed as funding becomes available within the Bolivar County area.	City of Cleveland	Mayor's office, MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	All-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	2 yr.	1.1	H	HMA, CDBG, general budget	2015
CLE-05	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	City of Cleveland	Mayor's office, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMA, USACE, general budget	2020

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CLE-06	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations are necessary to protect staff and county property. Existing facilities may be glass for windows and doors, frame lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	City of Cleveland	Public Works, Mayor's office	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned	2020-2025	1.2	M	CDBG, Developers	2020
CLE-07	Mitigate deficient/obsolete bridges	Bridge throughout MEMA District are not designed to withstand seismic activity and/or are classified as structurally deficient or functionally obsolete by the national bridge inventory. Bridges are vital component to the transportation system in the Delta and will hamper accessibility if impacted by natural disasters or prevented for use due to its inability to function according to its designed standards. Work with local officials in Bolivar and federal and state agencies to develop a priority system for improvements.	City of Cleveland	Public Works	Earthquake, Flood	Undetermined	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911office into an existing	2020-2025	1.2	H	HMA, general budget	2020

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CLE-08	Promote/Build storm water detention ponds when appropriate.	Detention ponds could be a solution for addressing flood impacts.	City of Cleveland	Public Works	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	L	HMA, CDBG, general budget	2020

CLE-09	Construct flood control measures	The entire Bolivar County area is in need of flood control measures to prevent/reduce future impacts caused by flooding. Conduct study to determine appropriate actions to climate/reduce flooding. Identify funding and implement projects when feasible.	City of Cleveland	Mayor's office, USACE, Bolivar Co., BOS, MEMA	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.2	H	HMA, CDBG, CIAP, general budget	2020
CLE-10	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	City of Cleveland	Mayor's office, Bolivar Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available. This list should include City Hall, Public Works and Community Development.	2020-2025	1.2	H	HMA, CDBG, CIAP, general budget	2020
CLE-11	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	City of Cleveland	Mayor's office, Bolivar County EMA, MEMA	Flood	Undetermined	R	Monitor status of properties affected by flooding and research funding and for acquiring or elevating of structures	Continuous Action	1.2	M	HMA, CDBG, General budget	2020
CLE-12	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events. By-pass pumps provide the City protection to keep storm water and sanitary sewer flowing during Flood Related and wind related hazards. During wind related hazards which lead to power loss, by-pass pump can be used instead of generators to accomplish the same objective. During major flood events, flood waters will infiltrate electric pump motors causing them fail. This has happened several times in the City of Cleveland. Generators provide no assistance during this threat. By-pass pumps are the only option in order to keep storm water and sanitary sewer flowing.	City of Cleveland	Public Works, Drainage Districts	Flood	$8,820,000	R	Develop priority list for Culverts needing upsizing as part of drainage system upgrade. Prioritize list of sites include: Pearl Street Storm Sewer Improvement, North Street Storm Sewer Improvement,, South Bishop Storm Sewer Improvement, Court Street Storm Sewer Improvement, Pecan Bayou Canal Piping Project, Leflore Storm Water Pump Station Improvement), North Christman Storm Sewer Improvement), Lincon Avenue Storm Sewer Improvement), University Storm Water Pump Station Improvement, Bishop Road Storm Sewer Improvement Project), Rosemary/Ronaldman Road Drainage Canal/Piping Project,, Airport Drainage Outlet Improvement Project	2020-2025	1.2	H	HMA, CDBG, General budget	2020

CLE13	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	City of Cleveland	Public Works	Flood	Undetermined	N	Develop a Stormwater Management Plan, which would include a component for stormwater conveyance and detention structures	Continuous action	1.2	M	General budget	2020
CLE-14	Create defensible space around structures and infrastructures.	Defensible zones and buildings, power and gas lines and other infrastructure may be lacking throughout the county.	City of Cleveland	Mayor's office, Public Works		Undetermined	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.2	L	Private funds	2020
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CLE-15	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Lighting strikes can create outages to essential county water and sewer services as well as invite unnecessary damage to county facilities. Consider program to establish lightning grounding systems on critical water and sewer system elements and other facilities prone to strikes to ensure that essential county service continue.	City of Cleveland	Public Works,	Severe Weather	Undetermined	R	Identify and prioritize critical facilities requiring installation of lightning protection system, starting with water and sewer facilities	2020-2025	1.2	H	General budget	2020
CLE-16	Monitor water supply and establish conservation regulations	Monitoring the water supply and its functions and save water in the long run. The county should consider establishing water conservation ordinances and implement water conservation techniques by regularly checking for leaks to minimize water supply loss.	City of Cleveland	Mayor's office, Public Works, Building Department	Drought	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for stormwater conveyance and detention structures	Continuous Action		H	General budget	2015
CLE-17	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease- causing issues.	City of Cleveland	Mayor's office	Bolan Infect. Disease	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	1.5	H	General budget	2015
CLE-18	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Keep areas of concern free of unnecessary debris	City of Cleveland	Road Department, Public Works,	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove from Mitigation Plan. Routine maintenance is not considered mitigation.	Continuous Action	1.5	H	General budget	2015
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CLE-19	Preserve natural wetlands and riparian areas through use of conservation easements.	LAND TRUST assists individuals and communities to preserve and conserve lands that are valuable, when preserved in their natural state. These values may be emotional or ecological. LAND TRUST work with homeowners to purchase the property or secure an easement on the property so that the property remains undeveloped. The LAND TRUST also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of the community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers, streams and bayous which are the floodways of the streams. Implement when opportunity presents themselves and practical.	City of Cleveland	Individual landowners	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	M	General budget	2020
CLE-20	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	City of Cleveland	Mayor's office, Bolivar Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.6	H	General budget	2015
CLE-21	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	City of Cleveland	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.2	H	General budget	2020

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CLE-22	Update the Comprehensive Emergency Management Plan (CEMP)	A CEMP provides for the preparation for and the carrying out all emergency functions to mitigate, prepare for, respond to, recover from emergencies and disasters, and to aid victims suffering from injury or damage, resulting from disasters caused by all hazards, whether natural, technological, or Bolan caused and to provide support for search and rescue operations for person and property in distress.	City of Cleveland	EMA, Police and Fire Departments	Multi-hazard	Undetermined	D	Completed-Moved to Preparedness Planning. Not a mitigation action.- Completed	2015-2020	1.2	H	HMA, general budget	2015
CLE-23	Develop Community Wildfire Protection Plan (CWPP)	The Healthy Forest Restoration Act provide communities with a tremendous opportunity to influence where and how federal agencies implement fuel reduction projects on federal lands. A CWPP is the most effective way to take advantage of this opportunity. Consider developing a CWPP and contact Mississippi Forest Commission to obtain guidance and potential funding sources.	City of Cleveland	Mayor's office, Fire Department, County EMA	Wildfire	Undetermined	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.2	H	General budget	2020
CLE-24	Develop/update Emergency Action Plans (EAP) for high and significant hazard dams	And EAP is required for all HIGH HAZARD and SIGNIFICANT HAZARD dams. Coordinate the development of an EAP for DELTA STREAM ELECTRIC STATION DAM classified as a high hazard dam by MDEQ DAM SAFETY DIVISION.	City of Cleveland	Mayor's office, Dam Owners, BOS, Co. EMA	Dam Failure	Undetermined	R		2020-2025	1.2	H	General budget	2020
CLE-25	Develop/update Stormwater Management Plan	A Stormwater Management Plan outlines what is currently being done to prevent stormwater pollution, and what will be done in the future. Six minimum measures must be incorporated into the plan. Public Education and outreach; Public participation and involvement; Illicit discharge detection and elimination; Construction site runoff control; Post-construction run-off control; Pollution Prevention and good housekeeping	City of Cleveland	Public Works	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.2	H	HMA, general budget	2020

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CLE-26	Develop/update the Comprehensive Plan to include hazard mitigation strategy/goals	A comprehensive plan establishes the overall vision for a community and help to guide decision making and priorities for addressing growth and changes in landuse.	City of Cleveland	Mayor's office	Multi-hazards	$50,000-$75,000	D	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	2015-2020	1.2	M	General budget	2015
CLE-27	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The county has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	City of Cleveland	Mayor's office, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	MFC, general budget	2020
CLE-28	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	City of Cleveland	Mayor's office, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
CLE-29	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	City of Cleveland	Mayor's office, County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action	1.2	M	General budget	2015
CLE-30	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local level.	City of Cleveland	Mayor's office, County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action	1.2	M	MSDH, EMPG, general budget	2015
CLE-31	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	City of Cleveland	Mayor's office, MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020	1.2	H	Private funds	2015

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CLE-32	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The county can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	City of Cleveland	Mayor's office, Bolivar County EMA	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action	1.2	M	General budget	2015
CLE-33	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	City of Cleveland	Mayor's office, Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings.	Continuous Action	1.2	M	Private funds, general budget	2015
CLE-34	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	City of Cleveland	Mayor's office, Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action	1.2	M	HMA, general budget	2015

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
CLE-35	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	Bolivar County participates in the NFIP, but the CRS program. Consider participating in the CRS program and implement.	City of Cleveland	Mayor's, office, Floodplain Manager, Building Official, Co EMA, MEMA	Multi-hazards	Undetermined	R	Retained and revised for the County to take actions necessary to become a member of the CRS.	Continuous Action	1.2	H	General budget	2020
CLE-36	Become a Firewise community	The Firewise Program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in an effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding. Obtain a wildfire risk assessment from the State Firewise Liaison, form a committee and create an action plan based on the assessment.	City of Cleveland	Mayor's office, Fire Department, MFC	Multi-hazards	Undetermined	R	Review requirements to become a Firewise community and take first steps toward becoming certified.	Continuous Action	1.2	H	MFC, general budget	2020
CLE-37	Continue efforts on public information and awareness for natural hazards	The county has several outreach initiatives to communicate hazard preparedness information to the general public and visitors in the area. Providing timely information and educational information related to preparedness, mitigation, response, and recovery to the public to foster their abilityto become self-sufficient	City of Cleveland	Mayor's office, Co EMA, applicable department, MEMA, NWS, FEMA	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources	Continuous Action	1.2	M	General budget	2020
CLE-38	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non- natural hazards. Identify areas/groups within the county that are prone to technological, man- made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the county's' web page.	City of Cleveland	Mayor's office, Co EMA, applicable department, MSDH,	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	H	MSDH, EMGP, general budget	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction (s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted;	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
CLE-39	Promote workshops for emergency preparedness/continuity of operations.	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans establishes a clear chain of command, line of succession, and procedures for backups and alternative emergency facilities in case of extreme	City of Cleveland	Mayor's office, and Bolivar Co.	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications	Continuous Action	1.2	M	Private funds	2020
CLE-40	Encourage the development of training and emergency planning for private companies that handle hazard materials	Hazardous materials, if nothandled correctly, can adversely impact people and property should spills or damaging effects be encountered.	City of Cleveland	Mayor's office, Bolivar Co. EMA, Police and Fire Officials	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across using all communications resources. Stakeholders, including families and	Continuous Action	1.2	M	General budget	2020
CLE-41	Develop public/private partnerships that promote community hazard mitigation and assist in reach hazard mitigation goals	Local businesses are important to all jurisdictions as they provide goods and services to support the community. Identifying business that have interest in hazard mitigation due to their own interests or for the interest of the whole community as needed. The county will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives.	City of Cleveland	Mayor's office, Bolivar Co. applicable departments	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	M	Private funds, general budget	2020
Rosedale													
ROS-01	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Rosendale	NWS, Department of Defense, MEMA District 3 EM	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.1	M	NWS	2015

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
ROS-02	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Rosendale	Mayor's office, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMGP, CDBG, general budget	2020
ROS-03	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Town of Rosendale	Public Works, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation measures.	2020-2025	1.2	M	HMGP, CDBG, general budget	2020
ROS-04	Construct flood control measures	The entire Bolivar County area is in need of flood control measures to prevent/reduce future impacts caused by flooding. Conduct study to determine appropriate actions to climate/reduce flooding. Identify funding and implement projects when feasible.	Town of Rosendale	USACE, Bolivar Co., BOS, MEMA	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.2	H	HMGP, USACE, general budget	2020
ROS-05	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Rosendale	Bolivar Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.2	H	HMGP, general budget	2020
ROS-06	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Town of Rosendale	Bolivar County EMA, MEMA	Flood	Undetermined	R	Monitor status of properties affected by flooding and research funding and for acquiring or elevating of structures	Continuous Action	1.2	M	FMA	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
ROS-07	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	Town of Rosendale	Public Works, Drainage Districts	Flood	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system upgrades	2020-2025	1.2	H	CDBG, CIP, general budget	2020
ROS-08	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	Town of Rosendale	Public Works	Flood	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for stormwater conveyance and detention structures	Continuous action	1.5	M	CDBG, CIP, general budget	2020
ROS-09	Preserve natural wetlands and riparian areas through use of conservation easements.	LAND TRUST assists individuals and communities to preserve and conserve lands that are valuable, when preserved in their natural state. These values may be emotional or ecological. LAND TRUST work with homeowners to purchase the property or secure an easement on the property so that the property remains undeveloped. The LAND TRUST also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of the community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers, streams and bayous which are the floodways of the streams. Implement when opportunity presents themselves and practical.	Town of Rosendale	Individual landowners	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	M	Private funds	2020
ROS-10	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Town of Rosendale	Bolivar Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.6	H	General funds	2020
Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)

ROS-11	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	Town of Rosendale	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.2	H	General budget	2020
ROS-12	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The county has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Town of Rosendale	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
ROS-13	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Town of Rosendale	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
ROS-14	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Town of Rosendale	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2020
ROS-15	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local level.	Town of Rosendale	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2020
Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)

ROS-16	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Town of Rosendale	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020		H	HMA, general budget	2020
ROS-17	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The county can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Town of Rosendale	Bolivar County EMA	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General budget	2020
ROS-18	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	Town of Rosendale	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings.	Continuous Action		M	General budget	2020

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ROS-19	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	Town of Rosendale	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	HMA, general budget	2020
ROS-20	Become a Firewise community	The Firewise Program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in an effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding. Obtain a wildfire risk assessment from the State Firewise Liaison, form a committee and create an action plan based on the assessment.	Town of Rosendale	BOS, Fire Department, MFC	Multi-hazards	Undetermined	R	Review requirements to become a Firewise community and take first steps toward becoming certified.	Continuous Action	1.1	H	MFC, general budget	2020

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ROS-21	Promote workshops for emergency preparedness/continuity of operations.	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans establishes a clear chain of command, line of succession, and procedures for backups and alternative emergency facilities in case of extreme emergency or disaster.	Town of Rosendale	BOS and Bolivar Co.	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	M	General budget	2020
Shaw													
SHA--01	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Shaw	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.1	M	NWS	2020
SHA--02	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Shaw	Mayor's office, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMA, CDBG, general budget	2020

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SHA--03	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Town of Shaw	Public Works, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation measures.	2020-2025	1.2	M	HMA, CDBG, general budget	2020
SHA--04	Construct flood control measures	The entire Bolivar County area is in need of flood control measures to prevent/reduce future impacts caused by flooding. Conduct study to determine appropriate actions to climate/reduce flooding. Identify funding and implement projects when feasible.	Town of Shaw	USACE, Bolivar Co., BOS, MEMA	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.2	H	HMA, USACE, general budget	2020
SHA--05	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Shaw	Bolivar Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.2	H	HMA, general budget	2020
SHA--06	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Town of Shaw	Bolivar County EMA, MEMA	Flood	Undetermined	R	Monitor status of properties affected by flooding and research funding and for acquiring or elevating of structures	Continuous Action	1.2	M	HMA	2020
SHA--07	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	Town of Shaw	Public Works, Drainage Districts	Flood	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system upgrades	2020-2025	1.2	H	HMA, CDBG, CIAP funding	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
SHA--08	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	Town of Shaw	Public Works	Flood	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for stormwater conveyance and detention structures	Continuous action	1.5	M	HMA, CDBG, CIAP, general budget funding	2020
SHA--09	Preserve natural wetlands and riparian areas through use of conservation easements.	LAND TRUST assists individuals and communities to preserve and conserve lands that are valuable, when preserved in their natural state. These values may be emotional or ecological. LAND TRUST work with homeowners to purchase the property or secure an easement on the property so that the property remains undeveloped. The LAND TRUST also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of the community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers, streams and bayous which are the floodways of the streams. Implement when opportunity presents themselves and practical.	Town of Shaw	Individual landowners	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	M	Private funds	2020
SHA--10	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Town of Shaw	Bolivar Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.6	H	General funds	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
SHA--11	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	Town of Shaw	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.2	H	General funds	2020
SHA--12	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The county has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Town of Shaw	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General funds	2020
SHA--13	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Town of Shaw	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General funds	2020
SHA--14	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Town of Shaw	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General funds	2020
SHA--15	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local level.	Town of Shaw	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General funds	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
SHA--16	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Town of Shaw	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This acti+H366:I368on is included in RHMP Plan Maintenance.	2020-2025		H	HMA, general funds	2020
SHA--17	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The county can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Town of Shaw	Bolivar County EMA	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General funds	2020
SHA--18	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	Town of Shaw	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings.	Continuous Action		M	General funds	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
SHA--19	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	Town of Shaw	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General funds	2020
SHA--20	Become a Firewise community	The Firewise Program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in an effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding. Obtain a wildfire risk assessment from the State Firewise Liaison, form a committee and create an action plan based on the assessment.	Town of Shaw	BOS, Fire Department, MFC	Multi-hazards	Undetermined	R	Review requirements to become a Firewise community and take first steps toward becoming certified.	Continuous Action	1.2	H	MFC, General funds	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
SHA--21	Promote workshops for emergency preparedness/continuity of operations.	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans establishes a clear chain of command, line of succession, and procedures for backups and alternative emergency facilities in case of extreme emergency or disaster.	Town of Shaw	BOS and Bolivar Co.	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	M	General funds	2020
Alligator													
ALL-01	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Alligator	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning.	2015-2020	1.1	M	NWS	2015
ALL-2	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Alligator	Mayor's office, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMGP, CDBG, general budget	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
ALL-03	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Town of Alligator	Public Works, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation measures.	2020-2025	1.2	M	HMGP, CDBG, general budget	2020
ALL-04	Construct flood control measures	The entire Bolivar County area is in need of flood control measures to prevent/reduce future impacts caused by flooding. Conduct study to determine appropriate actions to climate/reduce flooding. Identify funding and implement projects when feasible.	Town of Alligator	USACE, Bolivar Co., BOS, MEMA	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.2	H	HMGP, USACE, general budget	2020
ALL-05	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Alligator	Bolivar Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.2	H	HMGP, general budget	2020
ALL-06	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Town of Alligator	Bolivar County EMA, MEMA	Flood	Undetermined	R	Monitor status of properties affected by flooding and research funding and for acquiring or elevating of structures	Continuous Action	1.2	M	FMA	2020
ALL-07	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	Town of Alligator	Public Works, Drainage Districts	Flood	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system upgrades	2020-2025	1.2	H	HMGP, CDBG, CIP funding as part of a developer agreement	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
ALL-08	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	Town of Alligator	Public Works	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous action	1.2	M	HMGP, CDBG, CIP, general budget	2020
ALL-09	Preserve natural wetlands and riparian areas through use of conservation easements.	LAND TRUST assists individuals and communities to preserve and conserve lands that are valuable, when preserved in their natural state. These values may be emotional or ecological. LAND TRUST work with homeowners to purchase the property or secure an easement on the property so that the property remains undeveloped. The LAND TRUST also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of the community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers, streams and bayous which are the floodways of the streams. Implement when opportunity presents themselves and practical.	Town of Alligator	Individual landowners	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	M	Private funds	2020
ALL-10	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Town of Alligator	Mayor's office, Bolivar Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.6	H	General budget	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
ALL-11	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	Town of Alligator	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.2	H	General budget	2020
ALL-12	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The county has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Town of Alligator	Mayor's office, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
ALL-13	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Town of Alligator	Mayor's office, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
ALL-14	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Town of Alligator	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2020
ALL-15	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local level.	Town of Alligator	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed ; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
ALL-16	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Town of Alligator	Mayor's office, MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020-2025		H	General budget	2020
ALL-17	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The county can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Town of Alligator	Mayor's office, Bolivar County EMA	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General budget	2020
ALL-18	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	Town of Alligator	Mayor's office, Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action, included in Plan Maintenance.	Continuous Action		M	General budget	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
ALL-19	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	Town of Alligator	Mayor's office, Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General budget, HMGP	2020
ALL-20	Become a Firewise community	The Firewise Program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in an effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding. Obtain a wildfire risk assessment from the State Firewise Liaison, form a committee and create an action plan	Town of Alligator	Mayor's office, Department, MFC	Multi-hazards	Undetermined	R	Review requirements to become a Firewise community and take first steps toward becoming certified.	Continuous Action	1.1	H	MFC, General budget	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed ; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
ALL-21	Promote workshops for emergency preparedness/continuity of operations.	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans establishes a clear chain of command, line of succession, and procedures for backups and alternative emergency facilities in case of extreme emergency or disaster.	Town of Alligator	Mayor's office, Bolivar Co. EMA	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	M	General budget	2020
Benoit													
BEN--01	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Benoit	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning.	2020-2025	1.1	M	NWS	2020
BEN-02	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Benoit	Mayor's office, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMGP, CDBG, General budget	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
BEN-03	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Town of Benoit	Public Works, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation measures.	2020-2025	1.2	M	General budget, CDBG, HMA	2020
BEN-04	Construct flood control measures	The entire Bolivar County area is in need of flood control measures to prevent/reduce future impacts caused by flooding. Conduct study to determine appropriate actions to climate/reduce flooding. Identify funding and implement projects when feasible.	Town of Benoit	USACE, Bolivar Co., BOS, MEMA	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.2	H	General budget, USACE, HMA	2020
BEN-05	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Benoit	Bolivar Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.2	H	General budget, CDBG, HMA	2020
BEN-06	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Town of Benoit	Bolivar County EMA, MEMA	Flood	Undetermined	R	Monitor status of properties affected by flooding and research funding and for acquiring or elevating of structures	Continuous Action	1.2	M	FMA	2020
BEN-07	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	Town of Benoit	Public Works, Drainage Districts	Flood	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system upgrades	2020-2025	1.2	H	General budget, CDBG, CIP funding or part of a developer	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
BEN-08	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement	Town of Benoit	Public Works	Flood	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for stormwater conveyance and detention structures	Continuous action	1.5	M	General budget, CDBG, CIP funding or part of a developer	2020
BEN-09	Preserve natural wetlands and riparian areas through use of conservation easements.	LAND TRUST assists individuals and communities to preserve and conserve lands that are valuable, when preserved in their natural state. These values may be emotional or ecological. LAND TRUST work with homeowners to purchase the property or secure an easement on the property so that the property remains undeveloped. The LAND TRUST also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of the community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers, streams and bayous which are the floodways of the streams. Implement when opportunity presents themselves and practical.	Town of Benoit	Individual landowners	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	M	Private funds	2020
BEN-10	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Town of Benoit	Bolivar Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.6	H	General funds	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
BEN-11	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	Town of Benoit	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.2	H	General funds	2020
BEN-12	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The county has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Town of Benoit	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General funds	2020
BEN-13	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Town of Benoit	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General funds	2020
BEN-14	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Town of Benoit	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General funds	2020
BEN-15	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local level.	Town of Benoit	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General funds	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
BEN-16	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Town of Benoit	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020-2025		H	General funds	2020
BEN-17	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The county can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Town of Benoit	Bolivar County EMA	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General funds, HMA	2020
BEN-18	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	Town of Benoit	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings.	Continuous Action		M	General funds	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
BEN-19	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	Town of Benoit	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General funds	2020
BEN-20	Become a Firewise community	The Firewise Program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in an effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding. Obtain a wildfire risk assessment from the State Firewise Liaison, form a committee and create an action plan based on the assessment.	Town of Benoit	BOS, Fire Department, MFC	Multi-hazards	Undetermined	R	Review requirements to become a Firewise community and take first steps toward becoming certified.	Continuous Action	1.2	H	General funds, MFC	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed ; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
BEN-21	Promote workshops for emergency preparedness/continuity of operations.	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans establishes a clear chain of command, line of succession, and procedures for backups and alternative emergency facilities in case of extreme emergency or disaster.	Town of Benoit	BOS and Bolivar Co.	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	M	General funds	2020
Beulah													
BEU-01	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Beulah	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.1	M	NWS	2015
BEU-02	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Beulah	Mayor's office, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMGP, CDBG, general budget	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
BEU-03	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Town of Beulah	Public Works, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation measures.	2020-2025	1.2	M	HMGP, CDBG, general budget	2020
BEU-04	Construct flood control measures	The entire Bolivar County area is in need of flood control measures to prevent/reduce future impacts caused by flooding. Conduct study to determine appropriate actions to climate/reduce flooding. Identify funding and implement projects when feasible.	Town of Beulah	USACE, Bolivar Co., BOS, MEMA	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.2	H	HMGP, USACE, general budget	2020
BEU-05	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Beulah	Bolivar Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.2	H	HMGP, CDBG, general budget	2020
BEU-06	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Town of Beulah	Mayor's Office, Bolivar County EMA, MEMA	Flood	Undetermined	R	Monitor status of properties affected by flooding and research funding and for acquiring or elevating of structures	Continuous Action	1.2	M	FMA	2020
BEU-07	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	Town of Beulah	Public Works, Drainage Districts	Flood	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system upgrades	2020-2025	1.2	H	HMGP, CDBG, CIP, general budget	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed ; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
BEU-08	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to conveyance systems water	Town of Beulah	Public Works	Flood	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for stormwater conveyance and detention structures	Continuous action	1.5	M	CDBG, general budget	2015
BEU-09	Preserve natural wetlands and riparian areas through use of conservation easements.	LAND TRUST assists individuals and communities to preserve and conserve lands that are valuable, when preserved in their natural state. These values may be emotional or ecological. LAND TRUST work with homeowners to purchase the property or secure an easement on the property so that the property remains undeveloped. The LAND TRUST also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of the community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers, streams and bayous which are the floodways of the streams. Implement when opportunity presents themselves and practical.	Town of Beulah	Individual landowners	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	M	Private funds	2020
BEU-10	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Town of Beulah	Bolivar Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.6	H	General budget	2015

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
BEU-11	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	Town of Beulah	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.2	H	General budget	2020
BEU-12	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The county has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Town of Beulah	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
BEU-13	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Town of Beulah	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
BEU-14	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Town of Beulah	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2015
BEU-15	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local level.	Town of Beulah	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2015

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
BEU-16	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Town of Beulah	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020		H	HMGP, General budget	2015
BEU-17	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The county can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Town of Beulah	Bolivar County EMA	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General budget	2015
BEU-18	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	Town of Beulah	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings.	Continuous Action		M	General budget	2015

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
BEU-19	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	Town of Beulah	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General budge, HMGP	2015
BEU-20	Become a Firewise community	The Firewise Program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in an effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding. Obtain a wildfire risk assessment from the State Firewise Liaison, form a committee and create an action plan based on the assessment.	Town of Beulah	BOS, Fire Department, MFC	Multi-hazards	Undetermined	R	Review requirements to become a Firewise community and take first steps toward becoming certified.	Continuous Action	1.2	H	MFC, General budget	2015

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
BEU-21	Promote workshops for emergency preparedness/continuity of operations.	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans establishes a clear chain of command, line of succession, and procedures for backups and alternative emergency facilities in case of extreme emergency or disaster.	Town of Beulah	BOS and Bolivar Co.	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	M	General budget	2020
Boyle													
BOY-01	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Boyle	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.1	M	NWS	2015
BOY-02	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Boyle	Mayor's office, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMGP, CDBG, general budget	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
BOY-03	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Town of Boyle	Public Works, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation measures.	2020-2025	1.2	M	HMGP, CDBG, general budget	2020
BOY-04	Construct flood control measures	The entire Bolivar County area is in need of flood control measures to prevent/reduce future impacts caused by flooding. Conduct study to determine appropriate actions to climate/reduce flooding. Identify funding and implement projects when feasible.	Town of Boyle	USACE, Bolivar Co., BOS, MEMA	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.2	H	HMGP, USACE, general budget	2020
BOY-05	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Boyle	Bolivar Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.2	H	HMGP, general budget	2020
BOY-06	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Town of Boyle	Bolivar County EMA, MEMA	Flood	Undetermined	R	Monitor status of properties affected by flooding and research funding and for acquiring or elevating of structures	Continuous Action	1.2	M	FMA	2020
BOY-07	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	Town of Boyle	Public Works, Drainage Districts	Flood	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system upgrades	2020-2025	1.2	H	HMGP, CDBG, CIAP	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed ; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
BOY-08	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	Town of Boyle	Public Works	Flood	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for stormwater conveyance and detention structures	Continuous action	1.5	M	HMGP, CIAP, general budget	2015
BOY-09	Preserve natural wetlands and riparian areas through use of conservation easements.	LAND TRUST assists individuals and communities to preserve and conserve lands that are valuable, when preserved in their natural state. These values may be emotional or ecological. LAND TRUST work with homeowners to purchase the property or secure an easement on the property so that the property remains undeveloped. The LAND TRUST also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of the community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers, streams and bayous which are the floodways of the streams. Implement when opportunity presents themselves and practical.	Town of Boyle	Individual landowners	Flooding	Undetermined	R	Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	M	Private funds	2020
BOY-10	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards to integrate them into future planning and regulatory initiatives.	Town of Boyle	Bolivar Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.6	H	General budget	2015

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
BOY-11	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	Town of Boyle	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.2	H	General budget	2020
BOY-12	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The county has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Town of Boyle	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
BOY-13	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Town of Boyle	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
BOY-14	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Town of Boyle	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2015
BOY-15	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local level.	Town of Boyle	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2015

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
BOY-16	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Town of Boyle	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020		H	HMGP, general budget	2015
BOY-17	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The county can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Town of Boyle	Bolivar County EMA	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General budget	2015
BOY-18	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	Town of Boyle	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings.	Continuous Action		M	General budget	2015

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
BOY-19	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	Town of Boyle	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	HMGP, general budget	2015
BOY-20	Become a Firewise community	The Firewise Program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in an effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding. Obtain a wildfire risk assessment from the State Firewise Liaison, form a committee and create an action plan based on the assessment.	Town of Boyle	BOS, Fire Department, MFC	Multi-hazards	Undetermined	R	Review requirements to become a Firewise community and take first steps toward becoming certified.	Continuous Action	1.2	H	MFC, general budget	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
BOY-21	Promote workshops for emergency preparedness/continuity of operations.	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans establishes a clear chain of command, line of succession, and procedures for backups and alternative emergency facilities in case of extreme emergency or disaster.	Town of Boyle	BOS and Bolivar Co.	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	M	General budget	2015
Duncan													
DUN--01	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Duncan	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.1	M	NWS	2015
DUN-02	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Duncan	Mayor's office, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMA, CDBG, general budget	2015

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
DUN-03	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Town of Duncan	Public Works, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation measures.	2020-2025	1.2	M	HMA, CDBG, general budget	2015
DUN-04	Construct flood control measures	The entire Bolivar County area is in need of flood control measures to prevent/reduce future impacts caused by flooding. Conduct study to determine appropriate actions to climate/reduce flooding. Identify funding and implement projects when feasible.	Town of Duncan	USACE, Bolivar Co., BOS, MEMA	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.2	H	HMA, USACE, general budget	2015
DUN-05	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Duncan	Bolivar Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.2	H	HMA, CDBG, general budget	2015
DUN-06	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Town of Duncan	Bolivar County EMA, MEMA	Flood	Undetermined	R	Monitor status of properties affected by flooding and research funding and for acquiring or elevating of structures	Continuous Action	1.2	M	HMA, CDBG, general budget	2015
DUN-07	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	Town of Duncan	Public Works, Drainage Districts	Flood	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system upgrades	2020-2025	1.2	H	HMA, CDBG, CIAP funding	2015

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
DUN-08	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	Town of Duncan	Public Works	Flood	Undetermined	D	Develop a Stormwater Management Plan, which would include a conveyance and detention structures component for stormwater	Continuous action	1.5	M	HMA, CIAP, general budget	2015
DUN-09	Preserve natural wetlands and riparian areas through use of conservation easements.	LAND TRUST assists individuals and communities to preserve and conserve lands that are valuable, when preserved in their natural state. These values may be emotional or ecological. LAND TRUST work with homeowners to purchase the property or secure an easement on the property so that the property remains undeveloped. The LAND TRUST also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of the community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers, streams and bayous which are the floodways of the streams. Implement when opportunity presents themselves and practical.	Town of Duncan	Individual landowners	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	M	Private funds	2015
DUN-10	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Town of Duncan	Bolivar Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.6	H	General budget	2015

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
DUN-11	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	Town of Duncan	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.2	H	General budget	2015
DUN-12	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The county has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Town of Duncan	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2015
DUN-13	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Town of Duncan	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2015
DUN-14	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Town of Duncan	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2015
DUN-15	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from an federal, state and local level.	Town of Duncan	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2015

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DUN-16	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Town of Duncan	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020		H	General budget	2015
DUN-17	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The county can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Town of Duncan	Bolivar County EMA	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General budget	2015
DUN-18	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	Town of Duncan	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings.	Continuous Action		M	General budget	2015

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DUN-19	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	Town of Duncan	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General budget	2015
DUN-20	Become a Firewise community	The Firewise Program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in an effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding. Obtain a wildfire risk assessment from the State Firewise Liaison, form a committee and create an action plan based on the assessment.	Town of Duncan	BOS, Fire Department, MFC	Multi-hazards	Undetermined	R	Review requirements to become a Firewise community and take first steps toward becoming certified.	Continuous Action	1.2	H	MFC, general budget	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
DUN-21	Promote workshops for emergency preparedness/continuity of operations.	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans establishes a clear chain of command, line of succession, and procedures for backups and alternative emergency facilities in case of extreme emergency or disaster.	Town of Duncan	BOS and Bolivar Co.	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	M	General budget	2020
Gunnison													
GUNN-01	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Gunnison	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.1	M	NWS	2015
GUNN-02	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Gunnison	Mayor's office, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMA, CDBG, general budget	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
GUNN-03	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Town of Gunnison	Public Works, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation measures.	2020-2025	1.2	M	HMA, CDBG, general budget	2020
GUNN-04	Construct flood control measures	The entire Bolivar County area is in need of flood control measures to prevent/reduce future impacts caused by flooding. Conduct study to determine appropriate actions to climate/reduce flooding. Identify funding and implement projects when feasible.	Town of Gunnison	USACE, Bolivar Co., BOS, MEMA	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.2	H	HMA, USACE, general budget	2020
GUNN-05	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Gunnison	Bolivar Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.2	H	HMA, general budget	2020
GUNN-06	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Town of Gunnison	Bolivar County EMA, MEMA	Flood	Undetermined	R	Monitor status of properties affected by flooding and research funding and for acquiring or elevating of structures	Continuous Action	1.2	M	HMA, general budget	2020
GUNN-07	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	Town of Gunnison	Public Works, Drainage Districts	Flood	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system upgrades	2020-2025	1.2	H	HMA, CDBG, CIAP, general budget	2020

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GUNN-08	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	Town of Gunnison	Public Works	Flood	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for stormwater conveyance and detention structures	Continuous action	1.5	M	CDBG, CIAP, general budget	2015
GUNN-09	Preserve natural wetlands and riparian areas through use of conservation easements.	LAND TRUST assists individuals and communities to preserve and conserve lands that are valuable, when preserved in their natural state. These values may be emotional or ecological. LAND TRUST work with homeowners to purchase the property or secure an easement on the property so that the property remains undeveloped. The LAND TRUST also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of the community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers, streams and bayous which are the floodways of the streams. Implement when opportunity presents themselves and practical.	Town of Gunnison	Individual landowners	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	M	Private funds	2020
GUNN-10	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Town of Gunnison	Bolivar Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.6	H	General budget	2015

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GUNN-11	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	Town of Gunnison	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.2	H	General budget	2020
GUNN-12	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The county has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Town of Gunnison	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
GUNN-13	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Town of Gunnison	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
GUNN-14	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Town of Gunnison	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2015
GUNN-15	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local level.	Town of Gunnison	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2015

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GUNN-16	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Town of Gunnison	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020		H	General budget	2015
GUNN-17	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The county can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Town of Gunnison	Bolivar County EMA	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General budget	2015
GUNN-18	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	Town of Gunnison	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings.	Continuous Action		M	General budget	2015

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GUNN-19	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	Town of Gunnison	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General budget	2015
GUNN-20	Become a Firewise community	The Firewise Program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in an effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding. Obtain a wildfire risk assessment from the State Firewise Liaison, form a committee and create an action plan based on the assessment.	Town of Gunnison	BOS, Fire Department, MFC	Multi-hazards	Undetermined	R	Review requirements to become a Firewise community and take first steps toward becoming certified.	Continuous Action	1.2	H	MFC, general budget	2020

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GUNN-21	Promote workshops for emergency preparedness/continuity of operations.	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do indifferent situations. Continuity of operations plans establishes a clear chain of command, line of succession, and procedures for backups and alternative emergency facilities in case of extreme emergency or disaster.	Town of Gunnison	BOS and Bolivar Co.	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	M	General budget	2020
Merigold													
MER-01	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Merigold	NWS, Department of Defense, MEMA District 3 EMA Directors,	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.1	M	NWS	2015
MER-02	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Merigold	Mayor's office, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMA, CDBG, general budget	2020

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MER-03	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Town of Merigold	Public Works, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation measures.	2020-2025	1.2	M	HMA, CDBG, general budget	2020
MER-04	Construct flood control measures	The entire Bolivar County area is in need of flood control measures to prevent/reduce future impacts caused by flooding. Conduct study to determine appropriate actions to climate/reduce flooding. Identify funding and implement projects when feasible.	Town of Merigold	USACE, Bolivar Co., BOS, MEMA	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.2	H	HMA, USACE, general budget	2020
MER-05	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Merigold	Bolivar Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.2	H	HMA, general budget	2020
MER-06	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Town of Merigold	Bolivar County EMA, MEMA	Flood	Undetermined	R	Monitor status of properties affected by flooding and research funding and for acquiring or elevating of structures	Continuous Action	1.2	M	HMA, CDBG, general budget	2020
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MER-09	Preserve natural wetlands and riparian areas through use of conservation easements.	LAND TRUST assists individuals and communities to preserve and conserve lands that are valuable, when preserved in their natural state. These values may be emotional or ecological. LAND TRUST work with homeowners to purchase the property or secure an easement on the property so that the property remains undeveloped. The LAND TRUST also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of the community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers, streams and bayous which are the floodways of the streams. Implement when opportunity presents themselves and practical.	Town of Merigold	Individual landowners	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	M	General budget	2020
MER-10	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Town of Merigold	Bolivar Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.6	H	General budget	2015

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MER-11	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	Town of Merigold	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.2	H	General budget	2020
MER-12	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The county has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Town of Merigold	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	M	General budget	2020
MER-13	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Town of Merigold	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
MER-14	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Town of Merigold	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2015
MER-15	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local level.	Town of Merigold	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2015
MER-16	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Town of Merigold	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020		H	HMA, general budget	2015

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
MER-17	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The county can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Town of Merigold	Bolivar County EMA	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General budget	2015
MER-18	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	Town of Merigold	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings.	Continuous Action		M	General budget	2015
MER-19	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	Town of Merigold	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	HMA, general budget	2015

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MER-20	Become a Firewise community	The Firewise Program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in an effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding. Obtain a wildfire risk assessment from the State Firewise Liaison, form a committee and create an action plan based on the assessment.	Town of Merigold	BOS, Fire Department, MFC	Multi-hazards	Undetermined	R	Review requirements to become a Firewise community and take first steps toward becoming certified.	Continuous Action	1.2	H	MFC, general budget	2020
MER-21	Promote workshops for emergency preparedness/continuity of operations.	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans establishes a clear chain of command, line of succession, and procedures for backups and alternative emergency facilities in case of extreme emergency or disaster.	Town of Merigold	BOS and Bolivar Co.	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	M	General budget	2020
Mound Bayou													
MOU--01	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Mound Bayou	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.1	M	NWS	2015
MOU-02	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Mound Bayou	Mayor's office, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMA, CDBG, general budget	2020
Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)

MOU-03	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Town of Mound Bayou	Mayor's Office, Public Works, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation	2020-2025	1.2	M	HMA, CDBG, general budget	2020
MOU-04	Construct flood control measures	The entire Bolivar County area is in need of flood control measures to prevent/reduce future impacts caused by flooding. Conduct study to determine appropriate actions to climate/reduce flooding. Identify funding and implement projects when feasible.	Town of Mound Bayou	Mayor's Office, USACE, Bolivar Co., BOS, MEMA	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.2	H	HMA, USACE, general budget	2020
MOU-05	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Mound Bayou	Bolivar Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.2	H	HMA, general budget	2020
MOU-06	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Town of Mound Bayou	Mayor's Office, Bolivar County EMA, MEMA	Flood	Undetermined	R	Monitor status of properties affected by flooding and research funding and for acquiring or elevating of structures	Continuous Action	1.2	M	HMA, CDBG, general budget	2020
MOU-07	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	Town of Mound Bayou	Mayor's Office, Public Works, Drainage Districts	Flood	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system upgrades	2020-2025	1.2	H	HMA, CDBG, CIAP, general budget	2020
MOU-08	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	Town of Mound Bayou	Public Works	Flood	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for stormwater conveyance and detention structures	Continuous action	1.5	M	CIAP, CDBG, general budget	2020

MOU-09	Preserve natural wetlands and riparian areas through use of conservation easements.	LAND TRUST assists individuals and communities to preserve and conserve lands that are valuable, when preserved in their natural state. These values may be emotional or ecological. LAND TRUST work with homeowners to purchase the property or secure an easement on the property so that the property remains undeveloped. The LAND TRUST also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of the community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers, streams and bayous which are the floodways of the streams. Implement when opportunity presents themselves and practical.	Town of Mound Bayou	Individual landowners	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	M	Private funds	2020
MOU-10	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Town of Mound Bayou	Mayor's Office, Bolivar Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.6	H	General budget	2015

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MOU-11	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	Town of Mound Bayou	Mayor's Office, County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.2	H	General budget	2020
MOU-12	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The county has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Town of Mound Bayou	Mayor's Office, County EMA, applicable departments	Multi-hazards	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	M	General budget	2020
MOU-13	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Town of Mound Bayou	Mayor's Office, EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
MOU-14	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Town of Mound Bayou	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2015
MOU-15	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local level.	Town of Mound Bayou	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2015

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MOU-16	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Town of Mound Bayou	Mayor's Office, MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020		H	HMA, general budget	2015
MOU-17	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The county can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Town of Mound Bayou	Mayor's Office, Bolivar County EMA	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General budget	2015
MOU-18	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	Town of Mound Bayou	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings.	Continuous Action		M	General budget	2015

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MOU-19	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	Town of Mound Bayou	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General budget	2015
MOU-20	Become a Firewise community	The Firewise Program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in an effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding. Obtain a wildfire risk assessment from the State Firewise Liaison, form a committee and create an action plan based on the assessment.	Town of Mound Bayou	BOS, Fire Department, MFC	Multi-hazards	Undetermined	R	Review requirements to become a Firewise community and take first steps toward becoming certified.	Continuous Action	1.2	H	MFC, general budget	2020

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MOU-21	Promote workshops for emergency preparedness/continuity of operations.	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do indifferent situations. Continuity of operations plans establishes a clear chain of command, line of succession, and procedures for backups and alternative emergency facilities in case of extreme emergency or disaster.	Town of Mound Bayou	BOS and Bolivar Co.	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	M	General budget	2020
Pace													
PAC-01	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Pace	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.1	M	NWS	2015
PAC-02	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Pace	Mayor's office, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMA, CDBG, General budget	2020

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PAC-04	Construct flood control measures	The entire Bolivar County area is in need of flood control measures to prevent/reduce future impacts caused by flooding. Conduct study to determine appropriate actions to climate/reduce flooding. Identify funding and implement projects when feasible.	Town of Pace	USACE, Bolivar Co., BOS, MEMA	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.2	H	HMA, USACE, general budget	2020
PAC-05	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Pace	Bolivar Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.2	H	HMA, general budget	2020
PAC-06	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Town of Pace	Bolivar County EMA, MEMA	Flood	Undetermined	R	Monitor status of properties affected by flooding and research funding and for acquiring or elevating of structures	Continuous Action	1.2	M	HMA, CDBG, general budget	2020
PAC-07	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	Town of Pace	Public Works, Drainage Districts	Flood	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system upgrades	2020-2025	1.2	H	HMA, CDBG, CIAP, general budget	2020

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PAC-09	Preserve natural wetlands and riparian areas through use of conservation easements.	LAND TRUST assists individuals and communities to preserve and conserve lands that are valuable, when preserved in their natural state. These values may be emotional or ecological. LAND TRUST work with homeowners to purchase the property or secure an easement on the property so that the property remains undeveloped. The LAND TRUST also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of the community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers, streams and bayous which are the floodways of the streams. Implement when opportunity presents themselves and practical.	Town of Pace	Individual landowners	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	M	Private funds	2020
PAC-10	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Town of Pace	Bolivar Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.6	H	General budget	2015

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PAC-12	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The county has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Town of Pace	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
PAC-13	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Town of Pace	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
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PAC-17	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The county can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Town of Pace	Bolivar County EMA	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General budget	2015
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PAC--20	Become a Firewise community	The Firewise Program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding. Obtain a wildfire risk assessment from the State Firewise Liaison, form a committee and create an action plan based on the assessment.	Town of Pace	BOS, Fire Department, MFC	Multi-hazards	Undetermined	R	Review requirements to become a Firewise community and take first steps toward becoming certified.	Continuous Action	1.2	H	MFC, general budget	2020

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PAC-21	Promote workshops for emergency preparedness/continuity of operations.	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans establishes a clear chain of command, line of succession, and procedures for backups and alternative emergency facilities in case of extreme emergency or disaster.	Town of Pace	BOS and Bolivar Co.	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	M	General budget	2020
Renova													
REN-01	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Renova	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.1	M	NWS	2015
REN-02	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Renova	Mayor's office, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type		Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2015-2025	1.2	M	HMA, CDBG, general budget	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
REN-03	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Town of Renova	Public Works, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation measures.	2020-2025	1.2	M	HMA, CDBG, general budget	2020
REN-04	Construct flood control measures	The entire Bolivar County area is in need of flood control measures to prevent/reduce future impacts caused by flooding. Conduct study to determine appropriate actions to climate/reduce flooding. Identify funding and implement projects when feasible.	Town of Renova	USACE, Bolivar Co., BOS, MEMA	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.2	H	HMA, USACE, general budget	2020
REN--05	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Renova	Bolivar Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.2	H	HMA, general budget	2020
REN-06	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Town of Renova	Bolivar County EMA, MEMA	Flood	Undetermined	R	Monitor status of properties affected by flooding and research funding and for acquiring or elevating of structures	Continuous Action	1.2	M	HMA, CDBG, general budget	2020
REN-07	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	Town of Renova	Public Works, Drainage Districts	Flood	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system upgrades	2020-2025	1.2	H	HMA, CDBG, CIAP, general budget	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
REN-08	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	Town of Renova	Public Works	Flood	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for stormwater conveyance and detention structures	Continuous action	1.5	M	CDBG, CIAP, general budget	2015
REN-09	Preserve natural wetlands and riparian areas through use of conservation easements.	LAND TRUST assists individuals and communities to preserve and conserve lands that are valuable, when preserved in their natural state. These values may be emotional or ecological. LAND TRUST work with homeowners to purchase the property or secure an easement on the property so that the property remains undeveloped. The LAND TRUST also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of the community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers, streams and bayous which are the floodways of the streams. Implement when opportunity presents themselves and practical.	Town of Renova	Individual landowners	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	M	Private funds	2020
REN-10	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Town of Renova	Bolivar Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.6	H	General budget	2015

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
REN-11	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	Town of Renova	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.2	H	General budget	2020
REN-12	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The county has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Town of Renova	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
REN-13	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Town of Renova	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
REN-14	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Town of Renova	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2015
REN-15	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local level.	Town of Renova	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2015

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REN-16	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Town of Renova	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020		H	HMA, general budget	2015
REN-17	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The county can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Town of Renova	Bolivar County EMA	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General budget	2015
REN-18	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	Town of Renova	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings.	Continuous Action		M	General budget	2015

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
REN-19	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	Town of Renova	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	HMA, general budget	2015
REN-20	Become a Firewise community	The Firewise Program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in an effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding. Obtain a wildfire risk assessment from the State Firewise Liaison, form a committee and create an action plan based on the assessment.	Town of Renova	BOS, Fire Department, MFC	Multi-hazards	Undetermined	R	Review requirements to become a Firewise community and take first steps toward becoming certified.	Continuous Action	1.2	H	MFC, general budget	2020

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REN-21	Promote workshops for emergency preparedness/continuity of operations.	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans establishes a clear chain of command, line of succession, and procedures for backups and alternative emergency facilities in case of extreme emergency or disaster.	Town of Renova	BOS and Bolivar Co.	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	M	General budget	2020
Shelby													
SHE--01	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Shelby	NWS Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.1	M	NWS	2015
SHE--02	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Shelby	Mayor's office, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMA, CDBG, CIAP, general budget	2020

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SHE--03	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Town of Shelby	Public Works, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation	2020-2025	1.2	M	HMA, CDBG, general budget	2020
SHE--04	Construct flood control measures	The entire Bolivar County area is in need of flood control measures to prevent/reduce future impacts caused by flooding. Conduct study to determine appropriate actions to climate/reduce flooding. Identify funding and implement projects when feasible.	Town of Shelby	USACE, Bolivar Co., BOS, MEMA	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.2	H	HMA, USACE, general budget	2020
SHE--05	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Shelby	Bolivar Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.2	H	HMA, general budget	2020
SHE--06	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Town of Shelby	Bolivar County EMA, MEMA	Flood	Undetermined	R	Monitor status of properties affected by flooding and research funding and for acquiring or elevating of structures	Continuous Action	1.2	M	HMA, CDBG, general budget	2020
SHE--07	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	Town of Shelby	Public Works, Drainage Districts	Flood	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system upgrades	2020-2025	1.2	H	HMA, CDBG, CIAP, general budget	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed ; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
SHE--08	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as preventive maintained to water conveyance systems designed for typical events. Continue toimplement	Town of Shelby	Public Works	Flood	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for tormwater conveyance and detention structures	Continuous action	1.5	M	CDBG, CIAP, general budget	2015
SHE--09	Preserve natural wetlands and riparian areas through use of conservation easements.	LAND TRUST assists individuals and communities to preserve and conserve lands that are valuable, when preserved in their natural state. These values may be emotional or ecological. LAND TRUST work with homeowners to purchase the property or secure an easement on the property so that the property remains undeveloped. The LAND TRUST also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of the community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers, streams and bayous which are the floodways of the streams. Implement when opportunity presents themselves and practical.	Town of Shelby	Individual landowners	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	M	Private funds	2020
SHE--10	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Town of Shelby	Bolivar Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.6	H	General budget	2015

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
SHE--11	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	Town of Shelby	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.2	H	General budget	2020
SHE--12	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The county has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Town of Shelby	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
SHE--13	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Town of Shelby	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
SHE--14	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Town of Shelby	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2015
SHE--15	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local level.	Town of Shelby	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2015

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
SHE--16	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Town of Shelby	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This acti+H366:I368on is included in RHMP Plan Maintenance.	2020		H	General budget	2015
SHE--17	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The county can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Town of Shelby	Bolivar County EMA	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General budget	2015
SHE--18	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	Town of Shelby	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC	Continuous Action		M	General budget	2015

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
SHE--19	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	Town of Shelby	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General budget	2015
SHE--20	Become a Firewise community	The Firewise Program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in an effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding. Obtain a wildfire risk assessment from the State Firewise Liaison, form a committee and create an action plan based on the assessment.	Town of Shelby	BOS, Fire Department, MFC	Multi-hazards	Undetermined	R	Review requirements to become a Firewise community and take first steps toward becoming certified.	Continuous Action	1.2	H	MFC, general budget	2020

Project #	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
SHE--21	Promote workshops for emergency preparedness/continuity of operations.	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans establishes a clear chain of command, line of succession, and procedures for backups and alternative emergency facilities in case of extreme emergency or disaster.	Town of Shelby	BOS and Bolivar Co.	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	2020-2025	1.2	M	General budget	2020
Winstonville													
WIN--01	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Winstonville	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.1	M	NWS	2020
WIN--02	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Winstonville	Mayor's office, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMA, CDBG, general budget	2020

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WIN--03	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Town of Winstonville	Public Works, Bolivar Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation	2020-2025	1.2	M	HMA, CDBG, general budget	2020
WIN--04	Construct flood control measures	The entire Bolivar County area is in need of flood control measures to prevent/reduce future impacts caused by flooding. Conduct study to determine appropriate actions to climate/reduce flooding. Identify funding and implement projects when feasible.	Town of Winstonville	USACE, Bolivar Co., BOS, MEMA	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.2	H	HMA, USACE, general budget	2020
WIN--05	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Winstonville	Bolivar Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.2	H	HMA, general budget	2020
WIN--06	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Town of Winstonville	Bolivar County EMA, MEMA	Flood	Undetermined	R	Monitor status of properties affected by flooding and research funding and for acquiring or elevating of structures	Continuous Action	1.2	M	HMA, CDBG, general budget	2020
WIN--07	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	Town of Winstonville	Public Works, Drainage Districts	Flood	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system upgrades	2020-2025	1.2	H	HMA, CDBG, CIAP, general budget	2020

	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
WIN--08	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems preventive maintained to water conveyance systems	Town of Winstonville	Public Works	Flood	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for stormwater conveyance and detention structures	Continuous action	1.5	M	CIAP, CDBG, general budget	2015
WIN--09	Preserve natural wetlands and riparian areas through use of conservation easements.	LAND TRUST assists individuals and communities to preserve and conserve lands that are valuable, when preserved in their natural state. These values may be emotional or ecological. LAND TRUST work with homeowners to purchase the property or secure an easement on the property so that the property remains undeveloped. The LAND TRUST also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of the community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers, streams and bayous which are the floodways of the streams. Implement when opportunity presents themselves and practical.	Town of Winstonville	Individual landowners	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	M	Private funds	2020
WIN--10	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Town of Winstonville	Bolivar Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.6	H	General budget	2015
	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)

WIN--11	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	Town of Winstonville	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.2	H	General budget	2020
WIN--12	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The county has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Town of Winstonville	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
WIN--13	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Town of Winstonville	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	1.2	M	General budget	2020
WIN--14	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Town of Winstonville	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2015
WIN--15	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local level.	Town of Winstonville	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		M	General budget	2015

	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
WIN--16	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Town of Winstonville	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020		H	HMA, general budget	2015
WIN--17	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The county can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Town of Winstonville	Bolivar County EMA	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	General budget	2015
WIN--18	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	Town of Winstonville	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings	Continuous Action		M	General budget	2015

	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
WIN-19	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	Town of Winstonville	Bolivar County EMA, applicable departments	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		M	HMA, general budget	2015
WIN--20	Become a Firewise community	The Firewise Program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in an effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding. Obtain a wildfire risk assessment from the State Firewise Liaison, form a committee and create an action plan based on the assessment.	Town of Winstonville	BOS, Fire Department, MFC	Multi-hazards	Undetermined	R	Review requirements to become a Firewise community and take first steps toward becoming certified.	Continuous Action	1.2	H	MFC, general budget	2020

	Title - Previous Action (2012/2015)	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
WIN--21	Promote workshops for emergency preparedness/continuity of operations.	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans establishes a clear chain of command, line of succession, and procedures for backups and alternative emergency facilities in case of extreme emergency or disaster.	Town of Winstonville	BOS and Bolivar Co.	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.2	M	General budget	2020

Mitigation Action Worksheets

Bolivar County elected to more fully describe two mitigation actions on a Mitigation Action Worksheet. The two worksheets address the following initiatives:

1. Retrofitting of hazard critical infrastructure to provide protection from floods and high wind events.

2. Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others.

It was decided that all jurisdictions within the county will work on these two actions, so a separate action worksheet for each jurisdiction working on both each is included in the Actions Worksheets section. The Action Worksheets for Bolivar County are included first and then jurisdictional worksheets follow.

Bolivar County Mitigation Action Worksheet-2

Disaster communications originates with the Bolivar County Emergency Management Department. As such, it is appropriate to work with EM staff and the North Central Mississippi Planning and Development District to develop an education and outreach campaign that uses County communications as a touchstone for information about all hazards shared at the local level, included unincorporated and hard-to-reach communities.

Mitigation Action Worksheet

Name of Jurisdiction: Name of Haz. Mitigation Plan:	Bolivar County, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan
Risk / Vulnerability	
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.
Potential Actions/Projects (not being Implemented at this time)	
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.
Action or Project Intended for Implementation	
4. Action/Project Number: Name of Action or Project:	Action #: Bolivar County-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget.
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event. COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation	
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies
8. Action/Project Priority (STAPLEE Score):	20 – High
9. Timeline for Completion:	Two years
10. Useful Life:	50 years
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding
12. Local Planning Mechanisms to be Used in Implementation, if any:	Bolivar County Emergency Management Plan

Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Bolivar County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Jurisdictional Action Worksheets Demonstrating Cooperative efforts with Bolivar on Mitigation Action Bolivar

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Bolivar County, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Bolivar County annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Bolivar County-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Bolivar Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Bolivar County Operations Plan, Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Community Need

Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.

Solution:

Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Bolivar County Annex of the MEMA District 3 RHMP.

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Alligator, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Alligator-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Bolivar County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Alligator, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Bolivar County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Alligator-2 Work with the County and Regional Planning and Development Council to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Supporting efforts led by the Bolivar Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommended plan to the Board of Supervisors and local legislative bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of Alligator Operations Plan, Bolivar County Emergency Management Plan,	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Benoit, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Benoit-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Bolivar County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Benoit, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan p	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Bolivar County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Beniot-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Supporting efforts led by the Bolivar Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommended plan to the Board of Supervisors and local legislative bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town Communications Plan, City Emergency Management Plan, Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Beulah, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Beulah-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Bolivar County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Beulah, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Bolivar County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Beulah-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Supporting efforts led by the Bolivar Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommended plan to the Board of Supervisors and local legislative bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town Operations Plan, Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Boyle, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Boyle-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Bolivar County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town Boyle, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Bolivar County annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Boyle-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Bolivar Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town Operations Plan, Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Cleveland, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Cleveland-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Bolivar County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Cleveland, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Bolivar County annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Cleveland-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital	
5. Action or Project Description:	Led by the Bolivar Emergency Management Director and North Central PDD, outreach would: Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	City Operations Plan, Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Duncan, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Duncan-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Bolivar County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Duncan, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Bolivar County annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Duncan-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Bolivar Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town Operations Plan, Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Gunnison, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Gunnison-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Bolivar County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town Gunnison, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Bolivar County annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Gunnison-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Bolivar Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town Operations Plan, Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Merigold, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Merigold-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Bolivar County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Merigold, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Bolivar County annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Merigold-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Bolivar Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town Operations Plan, Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Mound Bayou, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Mound Bayou-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Bolivar County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Mound Bayou, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Bolivar County annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Mound Bayou-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Bolivar Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	City Operations Plan, Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Pace, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Pace-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Bolivar County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Pace, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Bolivar County annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Pace-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Bolivar Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town Operations Plan, Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Renova, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Renova-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Bolivar County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Renova, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Bolivar County annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Renova-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Bolivar Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town Operations Plan, Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Rosedale, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Rosedale-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Bolivar County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Rosedale, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Bolivar County annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Rosedale-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Bolivar Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	City Operations Plan, Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Shaw, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Shaw-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies.	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Bolivar County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Shaw, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Bolivar County annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Shaw-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Bolivar Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	City Operations Plan, Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Shelby, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Shelby-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Bolivar County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Shelby, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Bolivar County annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Shelby-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Bolivar Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	City Operations Plan, Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Winstonville, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Winstonville-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Bolivar County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Winstonville, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Bolivar County annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Winstonville-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Bolivar Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
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Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town Operations Plan, Bolivar County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

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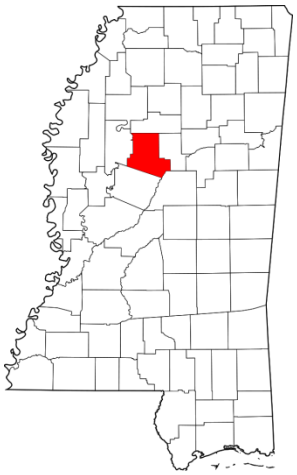
CARROLL COUNTY

C.1 Community Profile



Geography

Located in north-central Mississippi, Carroll County is adjacent to Grenada County to the north, Montgomery County to the east, Attala County to the southeast, Holmes to the Southwest and Leflore County to the west. Carroll County is 95 miles north of Jackson, Mississippi and 115 miles south of Memphis, Tennessee. It includes the following communities (Figure C.1, next page).

Towns	Unincorporated	
Carrollton	Avalon	McCarley
North Carrollton	Black Hawk	Teoc
Vaiden	Coila	Valley Hill

The total area of the county is 634.54 square miles, which includes 6.8 square miles of water. The majority of the land in the county falls within the North Central Hill Region on the north eastern side of the county. The soils are mostly acidic, and the topography is characterized by both ridges and valleys. The Loess Hills Region on the eastern side has both acidic and non-acidic soils and the topography is characterized by narrow ridges and step-sided ravines. The Delta Region covers a sliver of land on the western-most side of the county with a general topography of flat plain and the soil is characterized as mildly acidic to mildly alkaline.

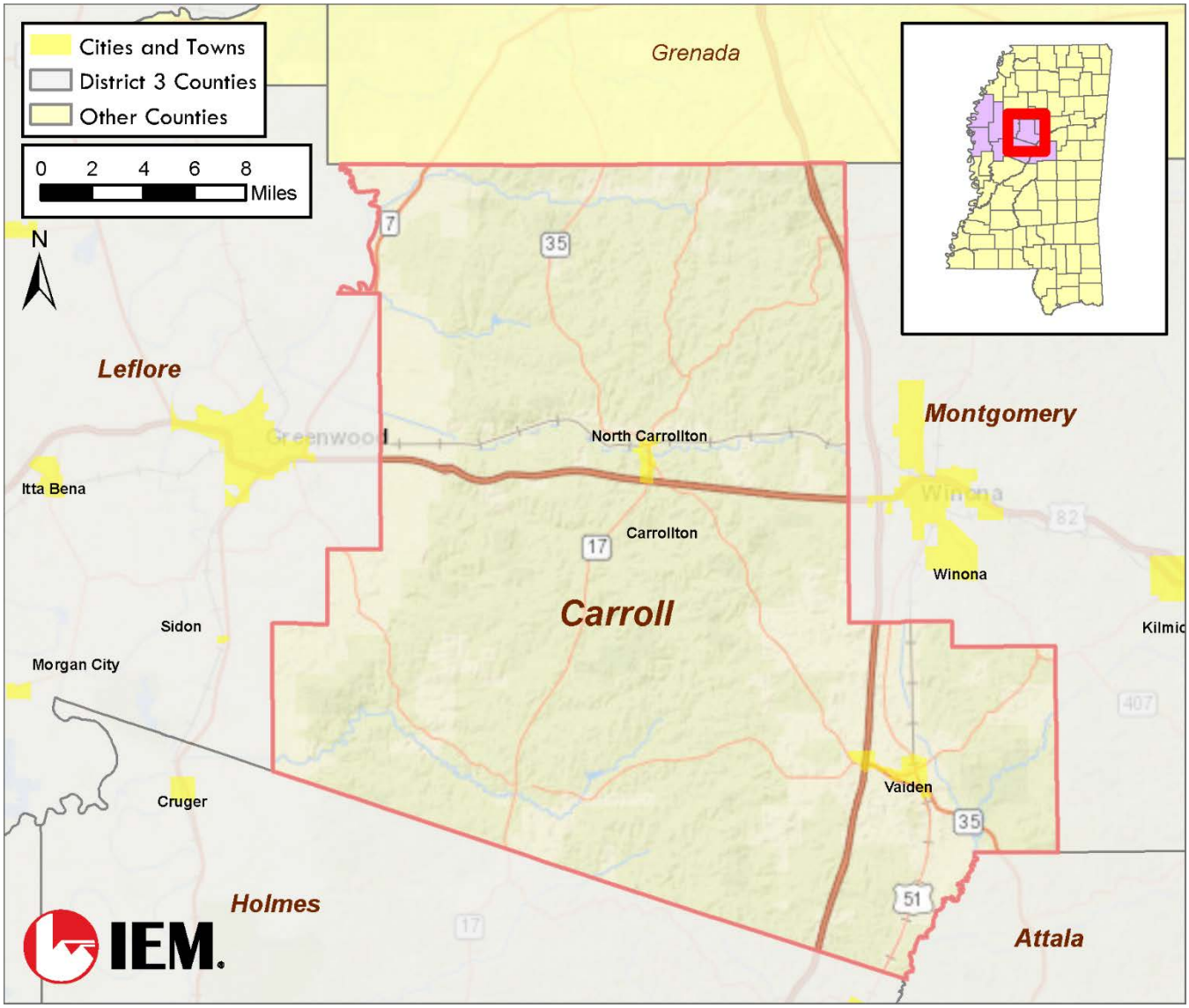
The terrain varies from the low areas in the western section to steep with narrow ridge tops and narrow valleys in the towns of Carrollton and North Carrollton. Most flooding problems result from periods of intense or prolonged rain. Low-lying areas along Big Sand Creek and Beasley Creek are prone to flooding.

Carrollton is one of two county seats and is located along MS State Route 17 and has a land area of about .08 square miles. Carrollton borders North Carrollton and the two communities are often considered by non-residents as one entity.

North Carrollton has a land area of about 0.3 square miles and sits at an altitude of 350 feet. The terrain is described as steep with narrow ridge tops and narrow valleys. Big Sand Creek, which flows westerly along the southern corporate border of North Carrollton, drains the southern portion of the community. Commercial and residential development exists in the flood plain. Low-lying areas along Big Sand Creek and Beasley Creek are subject to periodic flooding caused by overflow of these streams, usually during heavy or prolonged seasonal rains.

Vaiden, the other county seat, is located on U.S. Highway 51. Town Hall is located two miles from Interstate 55. With an approximate land area of 2.0 square miles, Vaiden's elevation is about 350 feet according to the National Geodetic Vertical Datum of 1929. The terrain is steep with narrow ridge tops and narrow valleys leading out to plains around the Big Black River.

Figure C.1 – Carroll County Orientation Map



Population and Demographics

Table C.1 shows there was a decline in population between the 2000 and 2010 Census reports, and between 2000 and the 20014-2018 U.S. Census American Community Survey results. The largest decline in population occurred in the Town of Carrollton.

Table C.1 - Jurisdiction Population and Demographics | Source: U.S. Census

Jurisdiction	Population				Demographics					
	2000 Census	2018 Census	Net Change	Percent Change	White	Black	Hispanic	Asian	Native American	2 + Races
Carroll County	10,769	10,597	-172	-.01%	89.6%	.4%	12.7%	.6%	.9%	2.3%
Carrollton	408	190	-218	-53%	90.5%	8.9%	0	0	.5%	0
North Carrollton	499	473	-26	-05%	59.2%	36.2%	4.9%	0	0	.6%
Vaiden	840	734	-106	-13%	33.2%	66.9%	.5%	.3%	.7%	1.8%

Special Populations (elderly, disabled, and low income): Poverty and other social factors were also considered in assessing the vulnerability of Carroll County and its municipalities. Unincorporated Carroll County includes areas of extreme poverty. These are neighborhoods in which residents would likely require significant community assistance in the wake of a disaster and could be considered worthwhile places in which to implement hazard mitigation activities. By making these areas more resilient, Carroll County can reduce the vulnerability of individuals, while also reducing the future need for public services. Table C-2 shows the breakdown of special populations.

Table C.2 – Special Populations | Source: US Census Bureau 2010

Jurisdiction	Below Poverty	Elderly (65 and older)	Disabled
Carroll County	25.4%	18%	14.3%
Carrollton	12%	23%	13.1%
North Carrollton	41%	19%	8.8%
Vaiden	35.3%	20%	7.1%

Other social factors, such as the number of single mother households living below the poverty level, may indicate where special childcare needs may be identified. Persons with disabilities and the elderly may not be able to evacuate or seek other preventive measures before or during a disaster. These individuals may be among the most vulnerable to severe storms, tornadoes and severe winter storms/freezes.

The Centers for Disease Control and Prevention (CDC) produces a county-based Social Vulnerability Index (SoVi, 2016) discusses social vulnerability overall, as well as vulnerability according to "themes," such as socioeconomic status. Figure C.2a Figure C.2b show the SOVI breakdown using these factors to measure vulnerability in Carroll County.

Figure C.2a - Carroll County Social Vulnerability Index | Source: CDC

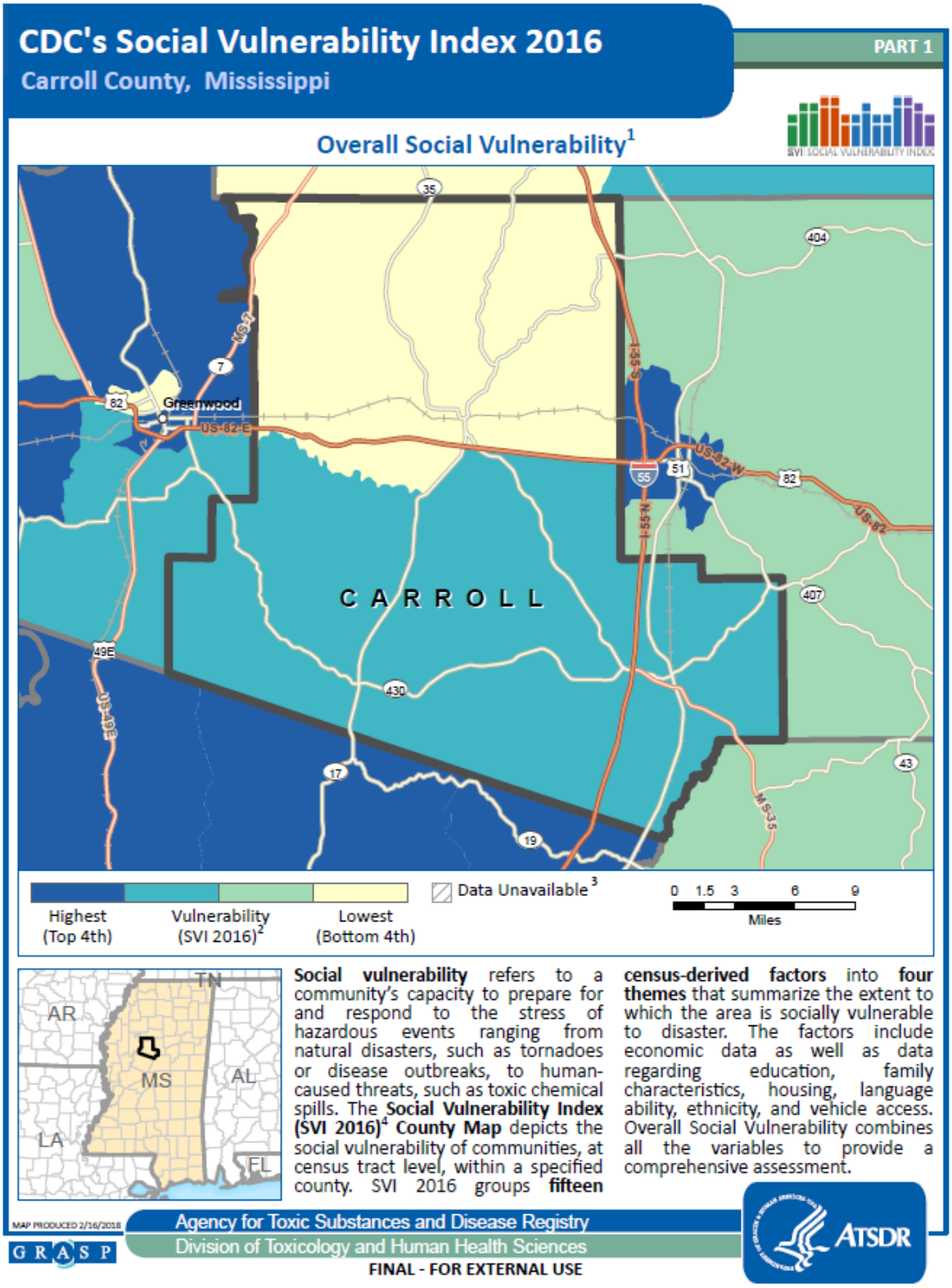
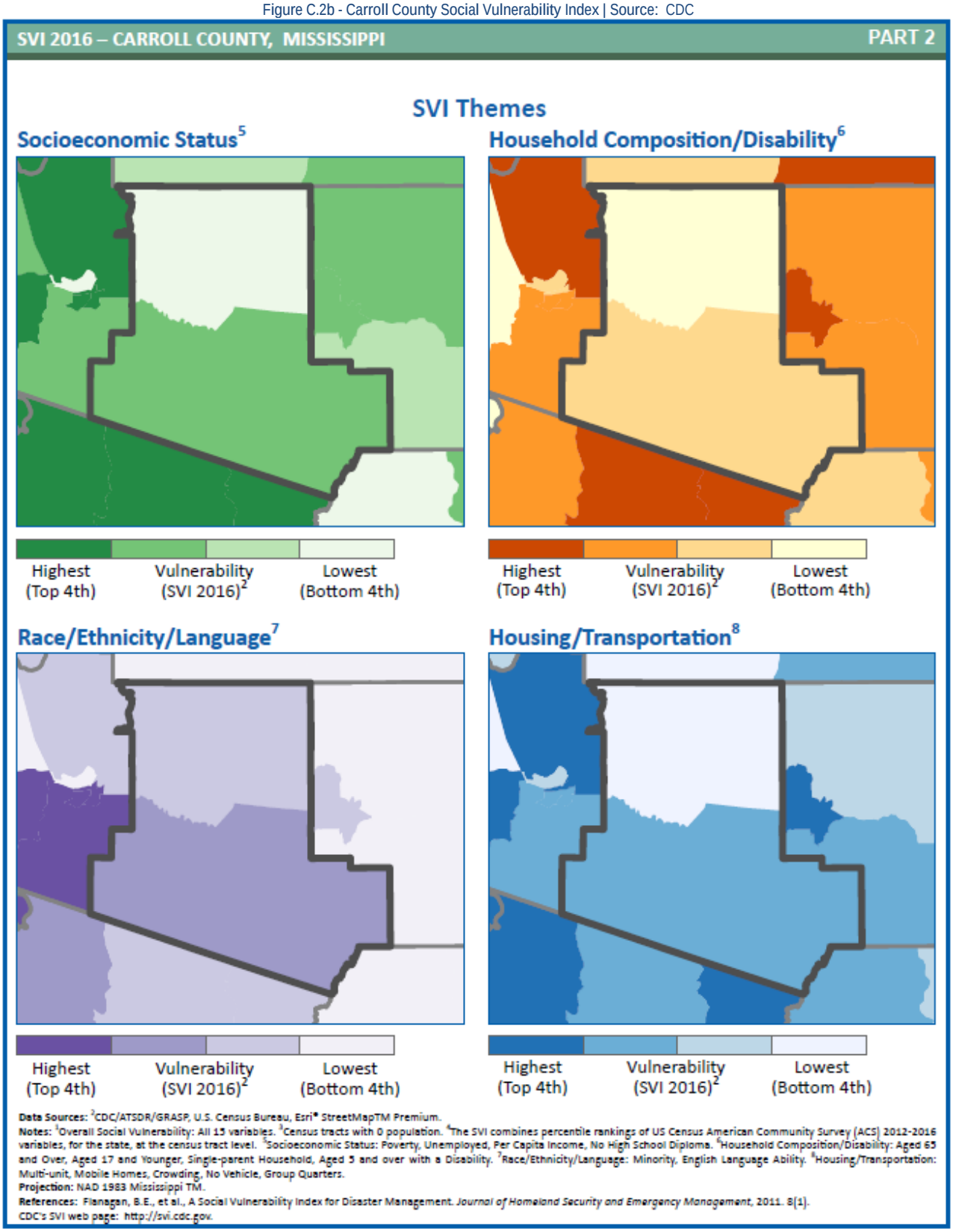


Figure C.2b - Carroll County Social Vulnerability Index | Source: CDC



Housing, Growth Trends, and Land Use

Housing: Housing data shown in Table C.3 was obtained from the US Census Bureau 2018 American Community Survey 5-Year Estimates. The data shows 71 percent of housing units are occupied; 28.6 percent of units are mobile home/manufactured housing; and the majority of the homes were constructed prior to 2000, when building codes were less stringent.

Table C.3 – Housing Statistics | Source: US Census Bureau 2018 American Community Survey 5-Year Estimates

Housing Statistics	Estimate	Percent
HOUSING OCCUPANCY		
Total housing units	5,154	100%
Occupied housing units	3,658	71.0%
Vacant housing units	1,496	29.0%
UNITS IN STRUCTURE		
1-unit, detached	3,522	68.3%
1-unit, attached	0	0.0%
2 units	1	0.0%
3 or 4 units	35	0.7%
5 to 9 units	120	2.3%
10 to 19 units	0	0.0%
20 or more units	3	0.1%
Mobile home	1,473	28.6%
Boat, RV, van, etc.	0	0.0%
YEAR STRUCTURE BUILT		
Built 2014 or later	47	0.9%
Built 2010 to 2013	217	4.2%
Built 2000 to 2009	818	15.9%
Built 1990 to 1999	1,012	19.6%
Built 1980 to 1989	1,204	23.4%
Built 1970 to 1979	553	10.7%
Built 1960 to 1969	773	15.0%
Built 1950 to 1959	206	4.0%
Built 1940 to 1949	140	2.7%
Built 1939 or earlier	184	3.6%
HOUSING TENURE		
Occupied housing units	3,658	100%
Owner-occupied	2,955	80.8%
Renter-occupied	703	19.2%
HOUSE HEATING FUEL		
Occupied housing units	3,658	100%
Utility gas	472	12.9%
Bottled, tank, or LP gas	1,603	43.8%
Electricity	1,418	38.8%
Fuel oil, kerosene, etc.	4	0.1%
Wood	139	3.8%

Growth Trends: There have been no significant changes in development since the previous RHMP was developed. New construction and redevelopment have been minimal, and there are no known changes in conditions that may affect the risks or vulnerabilities for participating jurisdictions. Most of the land in Carroll County is in rural areas and primarily used for agricultural and timber industry use.

Land Use: Carroll County does not have a comprehensive land use plan or building code regulations, but the Regional Hazard Mitigation Plan (RHMP) will be made available to officials in a position to factor mitigation planning initiatives into other planning decisions. A copy of the updated RHMP will be maintained in both county courthouses and in the municipal buildings of Carrollton, North Carrollton and Vaiden.

Employment and Industry

The local economy is predominantly agricultural. Cotton, corn, soybeans and hay are the primary crops grown, with cotton being the main source of farm income. There is one major industry located nearby. Metal fabricator Anel Corporation is located on Highway 51, about 3.6 miles south of the City of Winona (Montgomery County). There are about 105 other non-farm employers in Carroll County.

The Mississippi Department of Employment Securities (MDES) helps individuals obtain employment. Through their network of WIN Job Centers, MDES matches qualified, prospective employees with employers. Table C.4 and Table C.5 provide a summary of employment statistics for Carroll County.

Table C.4 - Mississippi Department of Employment Security Annual Labor Force Report
Source: Mississippi Economic Development Council

County	Average Civilian Labor Force (2020)	Average No. Unemployed (2020)	Average No. Employed (2020)	Average Annual Wage (2020)	Per Capita Income (2020)	Percent Below Poverty (2020)
Carroll	3,220	220	3,200	$29,847	$37,615	14.0%
Mississippi				$38,099	$37,834	21.5%

Table C.5 - Mississippi Department of Employment Security Annual Labor Force Report
Source: Mississippi Economic Development Council

*Establishment-Based Amounts 2020 Carroll County			
Manufacturing	990		
Non-Manufacturing (total):	170		
Agriculture, Forestry, Fishing & Hunting	10	Professional & Business Service	0
Mining	0	Management of Companies & Entertainment	10
Utilities	10	Administrative Support & Waste Management	10
Construction	170	Educational Services	30
Wholesale Trade	30	Health Care & Social Assistance	120
Retail Trade	110	Arts, Entertainment & Recreation	0
Transportation & Warehousing	30	Accommodation & Food Service	20
Information	0	Other Service (except public administration)	0
Finance & Insurance	30	Government	380
Real Estate, Rental & Leasing	0	Education	150
*Note: *Establishment based amounts are estimates and do not include self-employed individuals, religious entities or nonprofit institutions. Amounts include a pro-rata share of unclassified employment.*			

Critical Assets and Infrastructure

This section discusses the assets and facilities considered to be critical to the planning area. These facilities were identified using the most recently available data and in consultation with the County Emergency Management Director. Shelters and outdoor warning sirens are also considered to be essential and their locations are provided as a figure in the Mitigation Strategy section of this Annex.

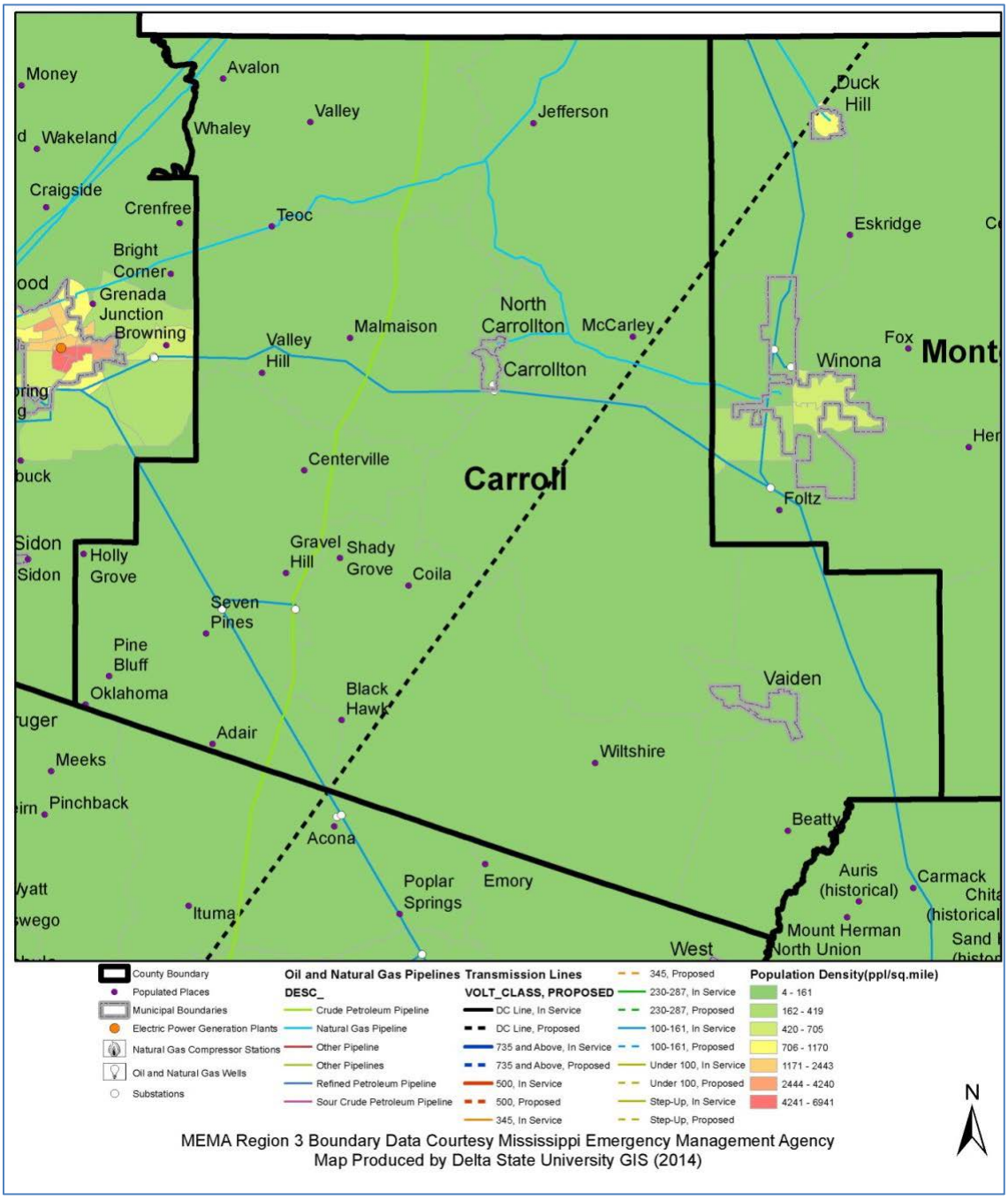
Transportation: Table C.6 shows that Carroll County includes major highway thoroughfares, rail lines, and airport access.

Table C.6 – Carroll County Transportation Routes

Roadway	Rail	Airport
Interstate 55 U.S. Route 51 U.S. Route 82 Mississippi Highway 17 Mississippi Highway 35	Class I Major - Canadian National / Illinois Central (CN/ICRR) Class III Local - Columbus Greenville (CGAY) Closed	Greenwood-Leflore Airport (located in Carroll County)

Energy Assets: Oil, natural gas pipelines, and electric transmission lines traverse the county. Figure C.3 shows the location of these systems. The County Emergency Management Department confirmed that the map of assets, while produced in 2015, remains essentially accurate.

Figure C.3 – Carroll County Energy Assets



Critical Assets and Facilities: Table C.7 lists Carroll County critical assets. The 2020 Hazard Mitigation Strategy includes an action to send this list to the State Remote Sensing Council to include the assets in the statewide Critical Infrastructure Key Resource (CIKR) asset database.

Table C.7 – Carroll County Summary of Critical Assets and Facilities

Facilities		Use
Carrollton Family Clinic Mediquick Clinic	Vaiden Community Living Center Shady Glenn Assisted Living	Health Care Facility
Big Sand WS Structures /Y-32-03 through &-32-32		Public Utility
Fire Stations: Mt. Pisgah, Valley Hill, Gravel Hill, Black Hawk, Hickory Grove, Beat 4-Hwy 430 North Carrollton Fire Station	Carroll County Sheriff's Office Vaiden Fire MS Bureau of Narcotics	Public Safety
Carrollton Town Hall Carroll County Courthouse Vaiden City Hall	North Carrollton City Hall Carroll / Montgomery County Correctional Facility	Government Facility
George JZ Consolidated Marshall School	Carroll Academy Vaiden Head Start	Educational Facility

As a complement to information included in Table A.7, researchers consulted the Mississippi Public Service Commission (PSC) county-specific web pages to identify the PSC's list of county-based utilities. Utility companies listed on the PSC web site are shown in Table 8. This list includes some, but not all, of the assets shown in Table 7. As such, so it was decided that the information in both Table 7 and Table 8 would be included in this annex for the sake of thorough documentation.

Table C.8 - County Utilities Listings | Source: Mississippi Public Service Commission

Gas Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
GC-123-0081-00	Atmos Energy Corporation	Mr. Mathew B. Davidson Vice President	790 Liberty Road Flowood, MS 39232-9321	601.420.5020	601.420.5020

Electric Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
EA-103-0048-00	Delta Electric Power A	Mr. David O'Bryan General Manager.	P.O. Box 9399 Greenwood, MS 38930		662.453.6352
EC-123-0082-00	Entergy Mississippi Inc.	Mr. Martin McGee Customer Service Support	P.O. Box 1640 Jackson, MS 39215-1640		601.969.2336

Sewer Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
SM-003-2176-00	City of Winona	Ms. June Williams City Clerk	P. O. Box 29 Winona, MS 38967		662.283.1232
SC-003-0652-00	Environmental Utilities Inc.	Mr. J. H. Stanton President	N/A		601.856.4778

Water Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
WA-100-0496-00	Acona Water Assn. Inc.	Mr. Edwin Tolbert President	P. O. Box 37 Lexington, MS 39095		662.834.3121
WA-003-0311-00	Black Hawk Water Assn.	Ms. Mary Daves	Rt. 1, Box 299A Coila, MS 38923		662.834.2002
WA-100-0518-00	Centerville Water Assn.	Ms. Tammy Sutton Clerk	P.O. Box 319 West, MS 39192	662.967.0100	662.967.0100
WM-003-0717-00	City of Carrollton	Ms. Linda McGregor City Clerk	P. O. Box 181 Carrollton, MS 38917		662.237.4600
WM-003-0688-00	City of North Carrollton	Ms. Glynnis Taylor City Clerk	P. O. Box 305 North Carrollton, MS 38947	662.237.9268	662.237.9268
WD-003-0669-00	East Leflore Co. Water & Sewer District	Mr. Shane Correro	P. O. Box 8166 Greenwood, MS 38930	662.897.1721	662.453.8860
WA-003-0590-00	Fifty-one Fifty-five Water Assoc. Inc.	Mr. Maxie Ellis Pres.	71 Highway 51 Winona, MS 38967		662.283.4127
WD-003-0093-00	Grenada County Water & Sewer District	Mr. Jimmy Dell Beck President	P.O. Box 776 Grenada, MS 38901		662.226.5925
WA-100-0272-00	Lebanon Water Assn. Inc.	Dr. Walter Roberts President	P.O. Box 610 Lexington, MS 39095	662.834.2646	662.834.2646
WA-003-0258-00	McCarley Water Assn. Inc.	Mr. Vickers President	P. O. Box 666 McCarley, MS 38943	662.453.2922	662.458.4052
WA-003-0600-00	Pelucia Rural Water Assn. Inc.	Mr. Charles Mims Manager	682 CR 23 Greenwood, MS 38930		662.455.2660
WA-003-0494-00	Poor House Water Assn.	Ms. Wilma Thompson	P.O. Box 700 Grenada, MS 389901		662.226.8636
WA-003-0295-00	Poplar Creek Water Assn. Inc.	Mr. Harvey Overstreet	2711 Highway 407 Kilmichael, MS 39747-9612		662.262.7142
WA-003-0594-00	Possumneck-Carmack Water Assn. Inc.	Mr. Ronnie Armstrong	7195 Attala Road 3122 Vaiden, MS 39176	662.289.4389	662.289.5688
WA-003-0400-00	South Winona Water Assn. Inc.	Ms. Jo Ann Dees Secretary	723 Enterprise Dr. Winona, MS 38967	662.283.2158	662.283.2158
WM-003-0605-00	Town of Kilmichael	Ms. Pauline Hall City Clerk	P. O. Box 296 Kilmichael, MS 39747		662.262.4242
WM-003-1854-00	Town of Vaiden, MS	Mr. Melvin Hawthorne Mayor	P.O. Box 76 Vaiden, MS 39176		662.464.5266

Telecommunications Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
TC-123-0001-00	AT&T	Mr. C. D. Smith Regulatory	600 W. Park Avenue Greenwood, MS 38930	601.592.6510	601.917.8787

Historical / Cultural Resources

Historical and cultural resources are important to Carroll County and its jurisdictions because there are many irreplaceable structures of note. Some are listed on the National Register of Historic Places, which is managed by the U.S. National Park Services. Such resources are integral to each community's identity and serve as invaluable assets for the local tourist industry. As such, they also contribute to the economic well-being of the communities.

The following are just a few of the many historic sites in Carroll County.

- Cotesworth - Home of Senator J.Z. George
- John Hurt Museum
- Carrollton Historic District
- Vaiden Old High School
- Historic Cemeteries (Countywide)
- The Senators' House (North Carrollton)
- The Tabernacle (North Carrollton)
- People's Bank and Trust (North Carrollton)

Vaiden Cemetery is one of the oldest cemeteries in Mississippi.
Photo credit: Carrolton County Development Association.

C.2 Hazard Identification and Risk Assessment

This section discusses hazards to which Carroll County is prone, and includes the location and extent, historical events, and probability of future occurrence. Some of the vulnerability assessments included in this Annex are ones for which only county-based data is available. Section 4 of the Base Plan (Hazard Identification and Risk Assessment) includes hazard descriptions for hazards applicable to all jurisdictions covered by the 2020 RHMP Update. Health-related hazards, such as Pandemic Influenza and West Nile virus, are of concern to the County, but there is no county-level data to add to the discussion of this hazard that is not already included in the Base Plan. Section 4 also includes the most recently available information about Coronavirus Disease of 2019 (COVID-19) at the time this plan was written.

Hazard Ranking

Using ranking methodology outlined in Section 4, each county evaluated the number of events and damage claims from impacts over the past 19 years (2000-2019) to determine hazard risk rankings. Probability of future occurrence is based on reported data; local knowledge of previous events; and extent of concern expressed by local leaders. Definitions for the classifications are provided below:

- Highly Likely – more than 8 occurrences over last 10 years
- Likely – 5 - 7 occurrences over last 10 years
- Low – 1 - 4 occurrences over last 10 years
- Susceptible – conditions are favorable or there are historic events (greater than 50 years) or local knowledge of unreported events.

Table C.9 provides a summary of the hazard events for Carroll County, Table C.10 includes the results of their risk ranking exercise, and Table C.11 shows the ranking for each jurisdiction within the planning area.

Table C.9 – Carroll County Summary of Hazard Events 2000 – 2019 | Source: *NCDC, MDEQ, USGS*

Hazard Type	No of Events	Property	Crop Damage	Total Damage	Death	Injury
Dam/Levee Failure	-	-	-	-	-	-
Drought	12	$60,000.00	$3,821,000.00	$3,881,000	-	-
Earthquake	-	-	-	-	-	-
Excessive Heat / Heat	5	-	-	-	-	-
Expansive Soil	0	-	-	-	-	-
Flood	25	$1,026,000.00	$150,000.00	$1,176,000	-	-
Severe Storm	186	$6,997,600.00	$726,500.00	$7,724,100	1	-
Severe Winter Weather	6	$330,000.00	-	$330,000	-	-
Tornado	9	$915,000.00	$720,000.00	$1,635,000	-	-
Tropical Storm / Hurricane	3	$1,010,000.00	$15,050,000.00	$16,060,000	-	-
Wildfire	-	-	-	-	-	-
Totals	246	$10,338,600.00	$20,467,500.00	$30,806,100.00	1	0

Table C.10 – Carroll County Risk Ranking Results

Hazard Type	Area Impacted	Health/Safety	Property Damage	Environmental Damage	Economic Disruption	Total	Future Occurrence	Risk	Risk Level
Dam/Levee Failure	4	0	4	4	4	16	3	48	Medium
Drought	3	0	0	3	3	9	3	27	Medium
Earthquake	4	0	4	4	4	16	2	32	Low
Expansive Soils	0	0	0	0	0	0	2	0	Low
Extreme Heat	1	0	0	1	1	3	3	9	Low
Flood	2	0	2	1	1	6	3	18	Medium
Severe Storm (thunderstorm, lightning, hail and high wind)	2	0	1	1	1	5	5	25	Medium
Severe Winter Weather	2	0	1	1	1	5	3	15	Low
Tornado	3	4	3	3	2	15	2	50	High
Tropical Storm / Hurricane	2	0	2	1	2	7	2	14	Low
Wildfire	2	0	1	1	2	6	1	6	Low

Table C.11 – Carroll County Risk Ranking Results by Jurisdiction

Hazard Type	Unincorporated Carroll County	Town of Carrollton	Town of North Carrollton	Town of Vaiden
Dam/Levee Failure	*High*	*Medium*	*Medium*	*Medium*
Drought	*Medium*	*Medium*	*Medium*	*Medium*
Earthquake	*Low*	*Low*	*Low*	*Low*
Excessive Heat/Heat	*Low*	*Low*	*Low*	*Low*
Expansive Soils	*Low*	*Low*	*Low*	*Low*
Flood	*Medium*	*High*	*High*	*Medium*
Severe Storm	*Medium*	*Medium*	*Medium*	*Medium*
Severe Winter Weather	*Low*	*Low*	*Low*	*Low*
Tornado	*High*	*High*	*High*	*High*
Tropical Storm/Hurricane	*Low*	*Low*	*Low*	*Low*
Wildfire	*Low*	*Low*	*Low*	*Low*

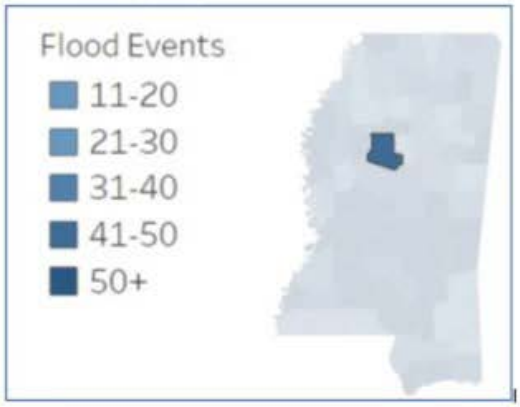
Mitigation planning researchers are fortunate to have access to the Data Visualization Tool included on the FEMA website. This site provides county-level data flood events and hazards included in federal emergency and disaster declarations, as well as for flood events recorded by FEMA. The information on the next page is updated through June 2020 and shows the disaster name, event type, number of events, and occurrence date. The data includes information from the time FEMA first recording disaster events in the format currently used. While this time frame is longer than that included in this RHMP Update, the following page provides a one-page snapshot of Carroll County disasters that have been documented by FEMA.

FEMA Declarations: Carroll County Statistics: 1953 - 2020 *Source:* FEMA Data Visualization Web Site

Not Included in data sourced 3/31/2020

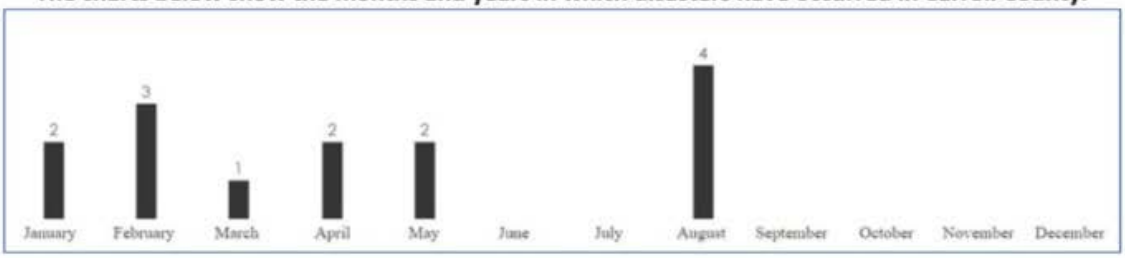
- Mississippi COVID EM-3474 (Declared 3/13/2020)

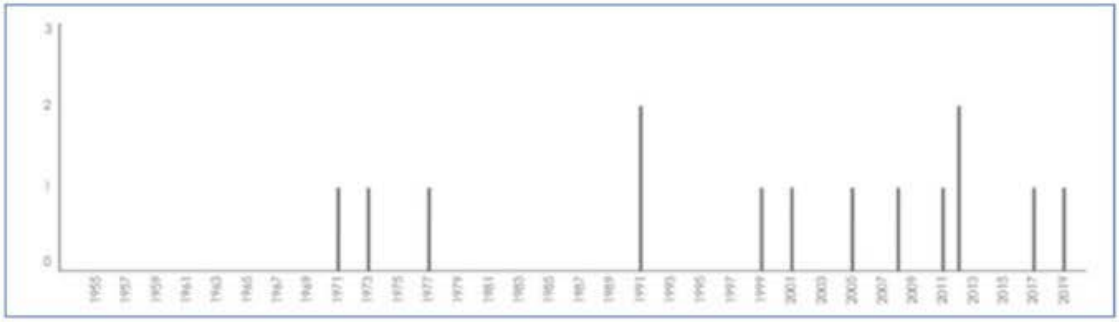
44 Flood Events



14 Declared Events

The charts below show the months and years in which disasters have occurred in Carroll County.





FEMA Declarations for Carroll County (14)

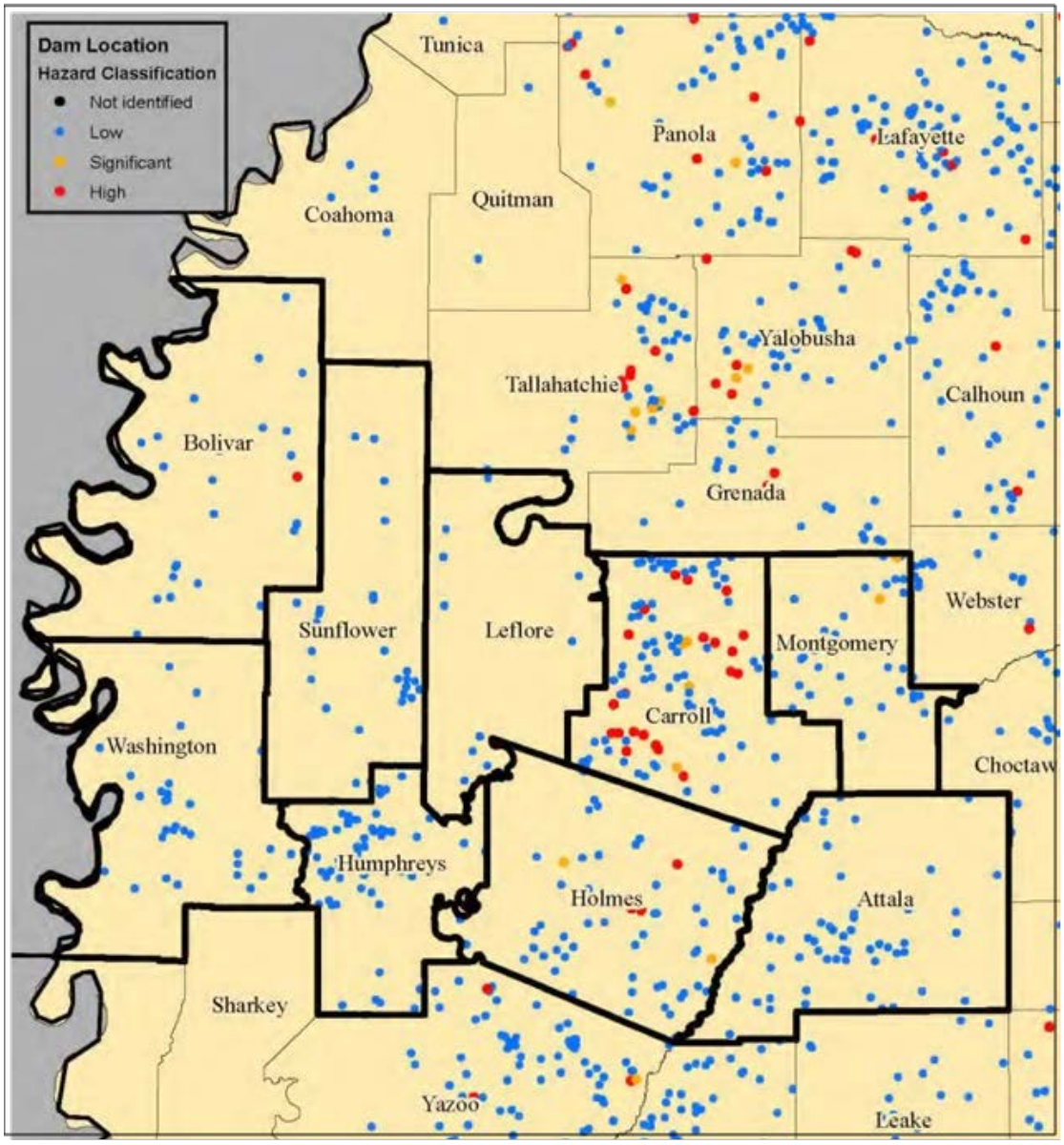
Year	Declaration Name	Disaster Number	Year	Declaration Name	Disaster Number
1971	Storms & Tornadoes	302	2005	Hurricane Katrina	1604
1973	Heavy Rains, Tornadoes & Flooding	368	2008	Hurricane Gustav	3291
1977	Drought & Freezing	3032	2011	Severe Storms, Straight-line Winds, Flooding	1972
1991	Severe Storms, Tornadoes & Flooding	888	2012	Hurricane Isaac	4081
1991	Severe Storms, Tornadoes & Flooding	906	2012	Tropical Storm Isaac	3348
1999	Severe Winter Storms, Ice, Freezing Rain	1265	2017	Severe Storms, Straight-line Winds, Flooding	4314
2001	Severe Storms & Tornadoes	1360	2019	Severe Storms, Straight-line Winds, Tornadoes, and Flooding	4429

Dam/Levee Failure

Location and Extent

Figure C.4 depicts dams mapped based on 2015 data secured from the Mississippi Department of Environmental Quality (MDEQ) and included in Mississippi's previous District 3 RHMP. Data presented about the number of dams in each county comes from a July 2020 MDEQ report provided to the RHMP research team.

Figure C.4 - Dams Mapped by the State of Mississippi | Source: MDEQ, Delta State University



Carroll County includes more flood control dams than are found in most other Mississippi counties. The MDEQ Dam Safety Division reports many Carroll County dams impound thousands of acres of water. Retention dams were built during the 1960's to help control runoff in the upper and lower Yazoo basin, and to help retard erosion of the bluffs. Over the years, about 50 new homes worth approximately $3 million dollars have been built downstream of the dams and would lie in the path of

floodwaters should a dam failure occur. As many as 100 people could be killed in the case of multiple dam failures. An increase in the beaver population has resulted in many weakened dams. Little funding is available for dam repairs; should funding become available, it would take years to complete needed repairs. Twenty-seven Carroll County structures are classified as significant or high hazard dams.

Carroll County is also within the U.S. Army Corps of Engineers (USACE) Yazoo Basin Headwater Project, which uses four reservoirs (north of Carroll County) to control approximately 60 percent of hill drainage. Dam/Levee failure can be a physical break of the levee or control structure, or it can be the result of overflow from the impoundment area. The next table shows the Carroll County figures included in the 2018 SHMP as part of the dam inventory by county for Mississippi District 3. All nine District 3 counties are included in the table to show how many more dams are located in Carroll County when compared to the number of dams in nearby counties. The numbers are broken down to include low, high, and significant hazard dams.

Table C.12: Mississippi District 3 Dam Inventory by County – Carroll County | Source: 2018 Mississippi State Hazard Mitigation Plan

County	Significant	High	Low	Total
Mississippi District 3				
Atalla	1	2	44	47
Bolivar	-	-	14	14
Carroll	4	23	86	113
Holmes	1	5	39	45
Humphreys	-	-	4	4
Leflore	-	-	-	-
Montgomery	-	2	22	24
Sunflower	-	-	12	12
Washington	-	-	3	3

The MDEQ Dam Safety Division has in recent years reviewed dam hazard class ratings statewide and, in the process, reclassified over 3,389 dams. The next table shows Carroll County dams for which classification has been changed from low hazard to high hazard ranking.

Table C.13 - 2018 Dam Hazard Class Changes to from Low Hazard to High Hazard Classification | Source: 2018 SHMP

State ID	County	Dam Name	2013 Plan Hazard	2018 Plan Hazard
MS01050	Carroll	Abiaca Watershed Structure Y-34-13 Dam	L	H
MS01606	Carroll	Pelucia Watershed Structure Y-33a-14 Dam	L	H
MS01616	Carroll	Abotlapoota Ws Str Y-34-15 Dam	L	H
MS01623	Carroll	Abiaca Watershed Structure Y-34-29 Dam	L	H

Table C.14 lists dams whose classification was changed from high hazard to a low hazard. This is followed by a list of significant and high hazard dams, then a list of low hazard dams. Figure C.4, which follows the tables, shows the location of levees managed by the Vicksburg District of the U.S. Army Corp of Engineers.

Table C.14 - 2018 Dam Hazard Class Changes from High to Low Hazard Classification | Source: 2018 SHMP

State ID	County	Dam Name	2013 Plan Hazard	2018 Plan Hazard
MS01049	Carroll	Abiaca Watershed Structure Y-34-12 Dam	H	L
MS01067	Carroll	Big Sand Watershed Structure Y-32-19 Dam	H	L

Table C.15 – Significant and High Hazard Dams | Source: MDEQ, Dam Safety Division

Dam Name	State ID	Latitude	Longitude	EAP Date
Significant Hazard Dams				
Abiaca Watershed Structure Y-34-08 Dam	MS06906	33.328691211	-89.9608183329	
Abiaca Watershed Structure Y-34-28 Dam	MS06909	33.333134572	-90.0068388084	Y
Big Sand Watershed Structure Y-32-03 Dam	MS06910	33.533214737	-89.9416063681	14-Jul-11
Big Sand Watershed Structure Y-32-04 Dam	MS06911	33.5303233638	-89.9491533969	14-Jul-11
High Hazard Dams				
Abiaca Watershed Structure Y-34-03 Dam	MS02907	33.383590421	-90.0884343774	05-Aug-14
Abiaca Watershed Structure Y-34-04 Dam	MS00020	33.38359296	-90.0754700676	23-Apr-19
Abiaca Watershed Structure Y-34-05 Dam	MS03685	33.385948656	-90.0462619349	23-Apr-19
Abiaca Watershed Structure Y-34-06 Dam	MS00018	33.381621708	-90.0268875968	23-Apr-19
Abiaca Watershed Structure Y-34-07 Dam	MS00022	33.358332096	-89.9976145108	23-Apr-19
Abiaca Watershed Structure Y-34-09 Dam	MS00019	33.314119523	-89.9498414717	17-Oct-12
Abiaca Watershed Structure Y-34-10 Dam	MS03309	33.354548529	-90.0595687665	23-Apr-19
Abiaca Watershed Structure Y-34-25 Dam	MS02741	33.364819646	-90.0025707761	23-Apr-19
Abiaca Watershed Structure Y-34-29 Dam	MS00015	33.328683207	-90.0016888515	
Abotlapoota Creek WS Structure Y-34-11 Dam	MS00025	33.448225701	-90.0626382563	
Abotlapoota Watershed Structure Y-34-13 Dam	MS02742	33.493333333	-90.0663888888889	
Big Sand Watershed Structure Y-32-02 Dam	MS03448	33.531540457	-89.8872973228	05-Aug-13
Big Sand Watershed Structure Y-32-07 Dam	MS00029	33.517600234	-90.006784227	
Big Sand Watershed Structure Y-32-09A Dam	MS00034	33.482131009	-89.84216375	23-Apr-19
Big Sand Watershed Structure Y-32-09B Dam	MS00014	33.484817753	-89.8570754542	23-Apr-19
Big Sand Watershed Structure Y-32-10 Dam	MS06889	33.543826670	-89.8306795731	05-Aug-13
Big Sand Watershed Structure Y-32-11 Dam	MS06890	33.550552238	-89.8534214181	23-Apr-19
Big Sand Watershed Structure Y-32-12 Dam	MS06891	33.542987881	-89.9110906954	26-Aug-15
Big Sand Watershed Structure Y-32-17 Dam	MS06892	33.586667719	-90.0248043038	30-Sep-14
MS06929 Lake Dam	MS06894	33.31808806	-89.74228154	
Pelucia Watershed Structure Y-33A-14 Dam	MS06895	33.490154045	-90.0186415517	
Potacocawa Watershed Structure Y-31A-04 Dam	MS06903	33.644309791	-89.9655315511	23-Apr-19
Potacocawa Watershed Structure Y-31A-06 Dam	MS06905	33.633552638	-89.9434590476	23-Apr-19
Abiaca Watershed Structure Y-34-03 Dam	MS02907	33.383590421	-90.0884343774	05-Aug-14
Abiaca Watershed Structure Y-34-04 Dam	MS00020	33.38359296	-90.0754700676	23-Apr-19
Abiaca Watershed Structure Y-34-05 Dam	MS03685	33.385948656	-90.0462619349	23-Apr-19
Abiaca Watershed Structure Y-34-06 Dam	MS00018	33.381621708	-90.0268875968	23-Apr-19

Table C.16 – Low Hazard Dams | Source: MDEQ, Dam Safety Division

Dam Name	State ID	Latitude	Longitude
Abiaca Watershed Structure Y-34-01 DAM	MS01038	33.3417188641	-90.1340851965
Abiaca Watershed Structure Y-34-02 DAM	MS01039	33.3367633803	-90.0650944139
Abiaca Watershed Structure Y-34-12 DAM	MS01049	33.4309392233	-90.0847386037
Abiaca Watershed Structure Y-34-21 DAM	MS01617	33.3694549501	-90.121142738
Abiaca Watershed Structure Y-34-23 DAM	MS01621	33.3710864912	-90.0604964295
Abiaca Watershed Structure Y-34-36 DAM	MS01624	33.3138132517	-90.0259222345
Abiaca Watershed Structure Y-34-38 DAM	MS01625	33.318310946	-90.0380932249
Abiaca Watershed Structure Y-34-43 DAM	MS01626	33.354964124	-90.0948957122
Abiaca Watershed Structure Y-34-45 DAM	MS02968	33.337026587	-90.1461248728
Abotlapoota Watershed Structure Y-34-14 DAM	MS01615	33.480348659	-90.070385814
Abotlapoota Watershed Structure Y-34-15 DAM	MS01616	33.4458929717	-90.0652394966
Abotlapoota Watershed Structure Y-34-16 DAM	MS01620	33.4467246573	-90.0712775844
Ballas Dam	MS03418	33.4070415211	-89.7755761959
Big Sand Water Structure Y-32-01 DAM	MS01051	33.5176169709	-89.9631003926
Big Sand Water Structure Y-32-08 DAM	MS01057	33.5027169306	-89.81421471
Big Sand Water Structure Y-32-14 DAM	MS01062	33.5263542522	-90.0221191455
Big Sand Water Structure Y-32-15 DAM	MS01063	33.57405394	-90.0516099277
Big Sand Water Structure Y-32-16 DAM	MS01064	33.571745925	-90.0370273175
Big Sand Water Structure Y-32-18 DAM	MS01066	33.597392038	-90.0313478656
Big Sand Water Structure Y-32-19 DAM	MS01067	33.5457343652	-90.0565384194
Big Sand Water Structure Y-32-22 DAM	MS01068	33.5069471272	-89.7856361366
Big Sand Water Structure Y-32-25 DAM	MS01609	33.5948871308	-90.0447812232
Big Sand Water Structure Y-32-27 DAM	MS01613	33.5718359985	-90.0042887497
Big Sand Water Structure Y-32-29 DAM	MS01069	33.5314728334	-90.0084181802
Big Sand Water Structure Y-32-31 DAM	MS01610	33.5341666666667	-89.9911111111111
Big Sand Water Structure Y-32-32 DAM	MS00278	33.5355555555556	-89.96
Big Sand Water Structure Y-32-33 DAM	MS01614	33.524244185	-89.9049225483
Big Sand Water Structure Y-32-49 DAM	MS01612	33.5257084086	-89.9730485905
Charles Ellis Lake Dam	MS03340	33.3450858191	-89.8759646197
Glen Miller Lake Dam	MS03652	33.3311238503	-90.1370841336
Hunter Cade DAM	MS03567	33.2889729076	-89.9422801552
Kilgore DAM	MS03351	33.2929529126	-89.8875002746
L.S. Ellis Lake Dam	MS03686	33.5433903805	-89.9773839656
Moses Dam	MS03350	33.5955029973	-90.0124361648
MS04958 Lake Dam	MS04958	33.45487	-90.04406
MS04959 Lake Dam	MS04959	33.45725	-90.0452
MS05016 Lake Dam	MS05016	33.51323	-90.02275
MS05017 Lake Dam	MS05017	33.50098	-90.02693
MS05018 Lake Dam	MS05018	33.47648	-89.99162
MS05130 Lake Dam	MS05130	33.62256	-89.96976
MS05135 Lake Dam	MS05135	33.66476	-89.97878
MS05136 Lake Dam	MS05136	33.67428	-89.94597

Dam Name	State ID	Latitude	Longitude
MS05138 Lake Dam	MS05138	33.65116	-89.97196
MS05147 Lake Dam	MS05147	33.65383	-89.82111
MS06923 Lake Dam	MS06923	33.262012	-89.76526686
MS06924 Lake Dam	MS06924	33.26212354	-89.83488315
MS06925 Lake Dam	MS06925	33.28348727	-89.84274466
MS06926 Lake Dam	MS06926	33.29976361	-89.85313379
MS06928 Lake Dam	MS06928	33.29903306	-89.74073675
MS06931 Lake Dam	MS06931	33.37201781	-89.82581148
MS06932 Lake Dam	MS06932	33.37351736	-89.88443784
MS06933 Lake Dam	MS06933	33.38119623	-89.88568218
MS06934 Lake Dam	MS06934	33.3958754	-89.90575418
MS06935 Lake Dam	MS06935	33.42299592	-89.82966084
MS06936 Lake Dam	MS06936	33.4400457	-89.80404024
MS06937 Lake Dam	MS06937	33.43806132	-89.90089147
MS06938 Lake Dam	MS06938	33.46018306	-89.92176977
MS06939 Lake Dam	MS06939	33.39537035	-90.00794543
MS06951 Lake Dam	MS06951	33.59361405	-89.86165633
MS06952 Lake Dam	MS06952	33.58586963	-89.84801056
MS06953 Lake Dam	MS06953	33.55668493	-89.87624494
MS06954 Lake Dam	MS06954	33.54486819	-89.87749783
MS06956 Lake Dam	MS06956	33.50708167	-89.85932171
MS06957 Lake Dam	MS06957	33.47961746	-89.82830008
MS06958 Lake Dam	MS06958	33.46365632	-89.95037317
MS06959 Lake Dam	MS06959	33.54040442	-89.80303168
MS07080 Lake Dam	MS07080	33.34996028	-90.07904664
MS07082 Lake Dam	MS07082	33.32705324	-89.98486847
MS07083 Lake Dam	MS07083	33.31579888	-90.03059833
MS07229 Lake Dam	MS07229	33.39843935	-89.81828622
MS07311 Lake Dam	MS07311	33.4043327	-89.77736451
Pellucia Watershed Structure Y-33A-01 DAM	MS01593	33.4602220727	-89.939767138
Pellucia Watershed Structure Y-33A-02 DAM	MS01594	33.4349670571	-89.8933018109
Pellucia Watershed Structure Y-33A-03 DAM	MS01595	33.4231716077	-89.8900835362
Pellucia Watershed Structure Y-33A-04 DAM	MS01596	33.4168363532	-89.8774816393
Pellucia Watershed Structure Y-33A-05 DAM	MS01597	33.391172304	-89.8747633787
Pellucia Watershed Structure Y-33A-06 DAM	MS01598	33.385608658	-89.8831067347
Pellucia Watershed Structure Y-33A-07 DAM	MS01599	33.3871243818	-89.8969916675
Pellucia Watershed Structure Y-33A-08 DAM	MS01600	33.3864055664	-89.9085044836
Pellucia Watershed Structure Y-33A-09 DAM	MS01601	33.4249450962	-89.9301693624
Pellucia Watershed Structure Y-33A-10 DAM	MS01602	33.4258989381	-89.9383349401
Pellucia Watershed Structure Y-33A-11 DAM	MS01603	33.4323872535	-89.9403778708
Pellucia Watershed Structure Y-33A-12 DAM	MS01604	33.4585142762	-89.9766941295
Pellucia Watershed Structure Y-33A-13 DAM	MS01605	33.4752064941	-89.9629652847

Dam Name	State ID	Latitude	Longitude
Pellucia Watershed Structure Y-33A-20 DAM	MS01628	33.4752777777778	-90.0127777777778
Pellucia Watershed Structure Y-33A-22 DAM	MS01607	33.4715672675	-90.0259113177
Pellucia Watershed Structure Y-33A-23 DAM	MS01627	33.47	-90.0088888888889
Pellucia Watershed Structure Y-33A-25A DAM	MS01608	33.4780124342	-89.947311906
Pellucia Watershed Structure Y-33A-26 DAM	MS01629	33.422528274	-89.9136829138
Pellucia Watershed Structure Y-33A-28 DAM	MS01630	33.4055864843	-89.8978864913
Pellucia Watershed Structure Y-33A-39 DAM	MS01631	33.450344745	-89.9383787893
Potacocawa Watershed Structure Y-31A-01 DAM	MS01070	33.6610951659	-90.027577986
Potacocawa Watershed Structure Y-31A-02 DAM	MS01071	33.6549532124	-90.0074548857
Potacocawa Watershed Structure Y-31A-03 DAM	MS01072	33.6513807725	-89.9828320147
Potacocawa Watershed Structure Y-31A-05 DAM	MS01074	33.6631763145	-89.9700606193
Potacocawa Watershed Structure Y-31A-07 DAM	MS01076	33.651459425	-89.9303721917
Potacocawa Watershed Structure Y-31A-09 DAM	MS01077	33.6606658881	-89.8956715408
Potacocawa Watershed Structure Y-31A-10 DAM	MS01078	33.6469217672	-89.8916250228
Potacocawa Watershed Structure Y-31A-11 DAM	MS01079	33.6250902416	-89.8843157411
Potacocawa Watershed Structure Y-31A-12 DAM	MS01080	33.6157348678	-89.8634321319
Potacocawa Watershed Structure Y-31A-13 DAM	MS01081	33.6379464181	-89.8684462867
Potacocawa Watershed Structure Y-31A-15 DAM	MS01082	33.6595243217	-89.8834539815
Potacocawa Watershed Structure Y-31A-18 DAM	MS01083	33.6722222222222	-90.0222222222222
Potacocawa Watershed Structure Y-31A-19 DAM	MS01084	33.6459895969	-89.9473578889
Potacocawa Watershed Structure Y-31A-20 DAM	MS01085	33.6625077044	-89.9954221339
Potacocawa Watershed Structure Y-31A-26 DAM	MS01588	33.6622222222222	-89.9844444444444
Potacocawa Watershed Structure Y-31A-28 DAM	MS01589	33.6641372403	-90.0388692019
Potacocawa Watershed Structure Y-31A-34 DAM	MS01590	33.6718100951	-89.8637303362
Potococawa Watershed Structure Y-31A-05 DAM	MS01591	33.5983333331	-89.8616666668
Potococawa Watershed Structure Y-31A-17 DAM	MS01592	33.6679614748	-90.0138438335
Smith Dam	MS03327	33.3636392858	-89.8362459237
Stanton Brothers Lake Dam	MS01349	33.3718645329	-90.10256605
Stevens Dam	MS03346	33.2724442785	-89.7698354863
Vaiden Baptist Church Dam	MS03503	33.3466978203	-89.7704850426

Figure C.5 – Mississippi Levee System Managed by USACE

Previous Occurrences

In April 2002, there was a breach at Billups Dam caused by pipe deficiencies.

There was also a breach in September 2018 that caused residents living near the town of Black Hawk to evacuate their homes after heavy rain associated with Tropical Storm Gordon caused Abiaca Creek to overflow, as well as erosion of an earthen dam on Lake Murdock. The storm dropped over 12 inches of rainfall to the area. Widespread flash flooding occurred as water entered homes and significantly destroyed crops. The Mississippi Highway Patrol blocked Highway 16 and other roads because water was expected to rise eight to ten feel along the Creek over a week-long period beginning September 7. Flash flooding was expected downstream from the Lake, although it was anticipated to level off before reaching the Delta, located 15 miles west of the breach.11

Probability of Future Occurrence

It is not possible to develop an accurate statistical probability based on two incidents, but there is cause for concern statewide based on a 2019 report disseminated by Associated Press (AP). AP conducted a two-year nationwide investigation and reported that 35% of Mississippi's high hazard dams are in poor or unsatisfactory condition, and also a dam failure could cause loss of life.[12] Most high hazard dam operators have developed an Emergency Action Plan (EAP), and the County Emergency Management Director communicates regularly with managers of these structures to coordinate preventive measures.

The two documented failures over the 19-year period used for this study indicate there is a 10.5% probability of dam failure in any given year (two incidents divided by total number of years).

Assessing Vulnerability

The most vulnerable areas of unincorporated Carroll County include the central region, roughly 6 miles north or south of Highway 82. About 50 homes are vulnerable to dam failure. In the event of a disaster with the levee system or dams at the flood-control lakes to the north, the western region of Carroll County could experience serious flooding along local streams. In the case of multiple dam breaks, events could generate over $18 million in damage and cause up to 100 deaths. As much as nine (9) feet of water could reach homes near flood control dams.

North Carrollton is vulnerable to dam failure if multiple flood control dams fail and cause water to drain into Big Sand Creek. At least six homes could be destroyed and potentially 20 lives lost if this occurs. In the case of a dam break at Saunders Lake, six homes in North Carrollton could be flooded. North Carrollton could also be affected in the event either Grenada Dam or Enid Dam fails. The USACE Yazoo Basin Headwater Project uses four reservoirs (north of Carroll County) to control approximately 60 percent of downhill drainage.

The maps below, taken from the MDEQ Dam Safety Division mapping website and included as ***Figure C.54a through Figure C.5d*** and, show close up views of the location of dams in all of Carroll County and for each of its jurisdictions. In each screen shot, the name of the community is shown in the Search Box, and a legend is included to show the degree of hazard for each identified dam.

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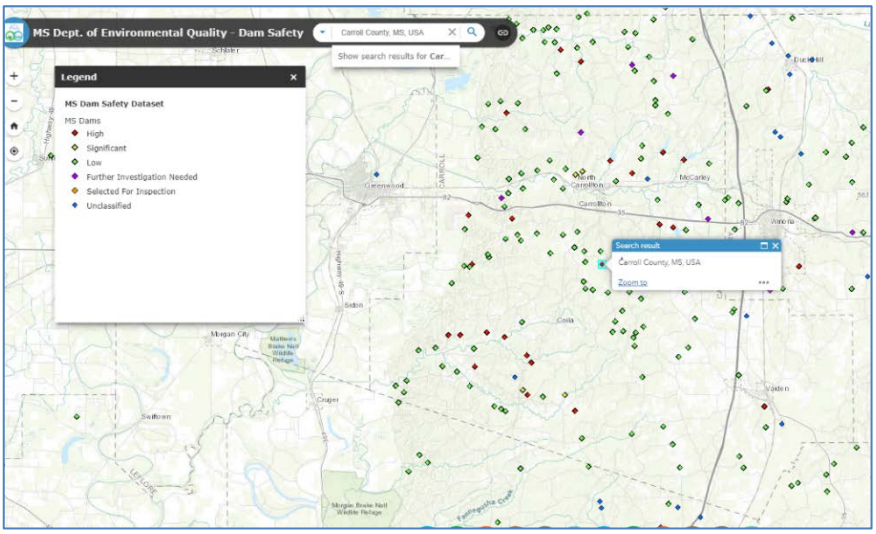
[11] Associated Press, *Dam Breaches sending water from lake in Carroll County*, www.wtva.com, 9/8/2018, accessed 8/25/2020.

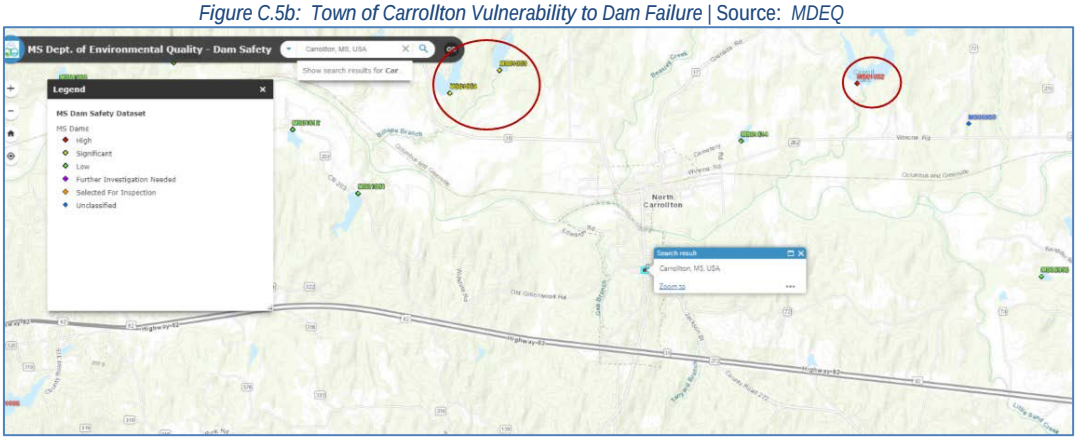
[12] Jeff Army, *Mississippi among worst states for dams rated in bad shape,* Associated Press, www.clarionledger.com, 11/11/2019, accessed 8/25/2020.

Figure C.5a: Carroll County Vulnerability to Dam Failure | **Source:** *MDEQ*



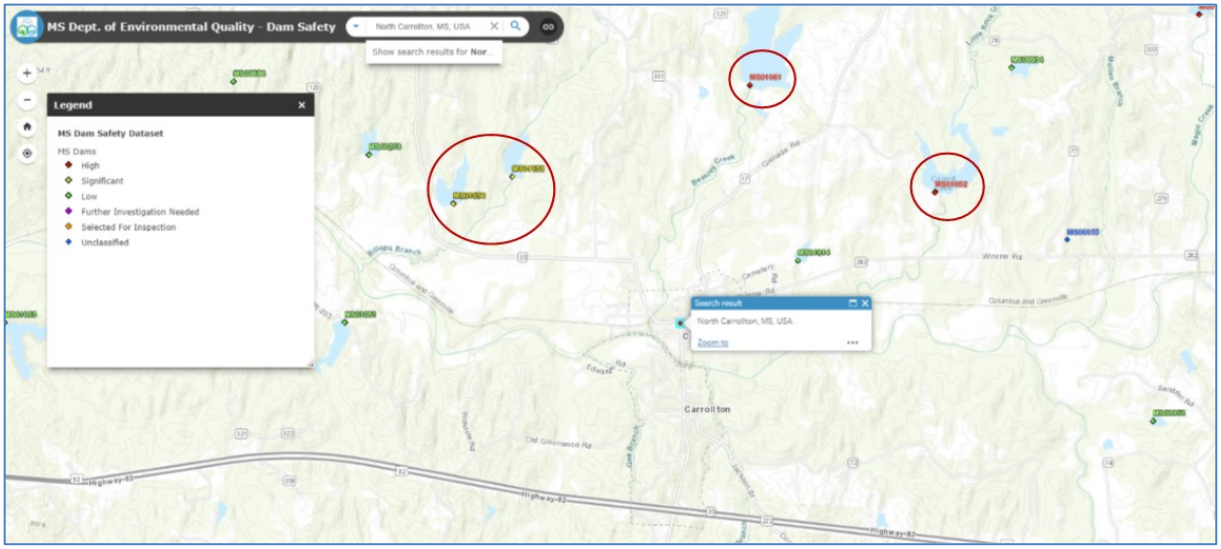
The significant and high hazard dams are shown as being scattered throughout Carroll County, including dams near each municipality as indicated on the maps below.

Figure C.5b: Town of Carrollton Vulnerability to Dam Failure | Source: *MDEQ*



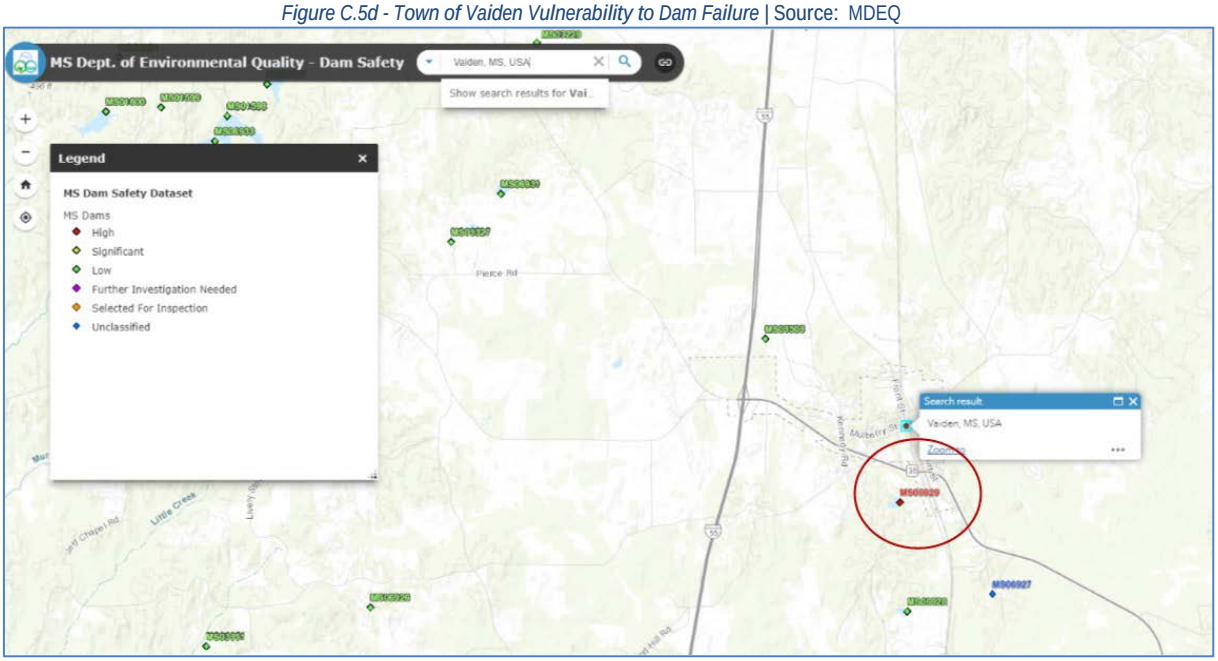
The Towns of Carrollton and North Carrollton are adjacent to each other, divided only by the Yalobusha River. They are both affected by dams lying within fairly close distance.

Figure C.5c: Town of North Carrollton Vulnerability to Dam Failure | Source: MDEQ



The map of North Carrollton shows the proximity of two significant hazard dams and two high hazard dams that could affect this town and the Town of Carrollton.

Figure C.5d - Town of Vaiden Vulnerability to Dam Failure | Source: MDEQ



The high hazard dam labeled MS06929 sits just outside the Vaiden town limits, south of Highway 35 and east of Highway 51, both major thoroughfares.

Overall Vulnerability to Dam Failure

The following table summarizes the vulnerability of each jurisdiction to dam failure.

Table C.16 – Vulnerability of Carroll County Jurisdictions to Dam Failure

Jurisdiction	Ranking
Carroll County	High
Town of Carrollton	Medium
Town of North Carrollton	Medium
Town of Vaiden	Medium
Overall Vulnerability to dam failure	**Medium**

The presence of many significant and high hazard dams countywide increases the vulnerability ranking for unincorporated Carroll County. Fortunately, there are few business and residential structures located there, though inundation would (and has) affected agricultural assets. There is at least one high hazard dam near each municipality, suggesting the communities be assigned a medium ranking. The community ranked the county overall as having a medium level of vulnerability to dam failure.

Drought

Location and Extent

Drought may affect the entire county. As a non-special hazard, it cannot be geographically confined, so all areas of Carroll County could be exposed to drought conditions. Drought damage typically does not extend to property, but the hazard may affect agricultural assets.

Previous Occurrences

The NWS Storm Events Database reported 12 events, shown in Table C.17, as occurring in the years of 2000 through 2019. These are listed in the following table. Lack of data for a given time frame does not mean drought conditions did not exist – they simply went unreported. Data was reported at the county level and not by jurisdiction.

Table C.17: Drought Occurrences 2000 to 2019 | Source: NCEI

Date	Death	Injury	Property Damage	Crop Damage
12/1/2016	-	-	-	2,000,000
10/11/2016	-	-	-	-
8/1/2016	-	-	-	200,000
7/26/2016	-	-	-	600,000
10/1/2015	-	-	30,000	
9/15/2015	-	-	-	500,000
10/1/2010	-	-	-	400,000
7/1/2007	-	-	-	1,000
6/1/2007	-	-	30,000	-
5/1/2007	-	-	-	30,000
4/25/2007	-	-	-	40,000
10/1/2006	-	-	-	50,000
Total	0	0	$60,000	$3,821,000

Probability of Future Occurrence

Historical data shown above suggest drought is likely to occur in the future. It may occur one or more times in a given year, or the community may experience a drought-free period of several years. Future drought may be an inevitable result of climate change nationwide, and there's cause for concern given the county's large agriculture holdings. Because there were drought conditions in five of the 19 years studied, a probability developed by dividing the number of drought years by the total number of years studied results in a 26% probability that a drought will occur in any given year.

Assessing Vulnerability

Drought occurs with advance warning because the those in farm community are able to tell when patterns of water availability begin to change. Drought is also monitored by the National Weather Service and the State of Mississippi State University Extension Service, which has offices in each county. Two tools are available for Extension staff and others who monitor drought: the Keetch-Bynum Drought Index and the Palmer Drought Severity Index, both discussed in Section 4 of the Base Plan as tools for drought monitoring. Drought is not known to cost human lives, but it may affect lifestyle, and the economic effects may be felt countywide. There are no recorded deaths or injuries from drought in the planning area.

All NCEI events are listed as occurring in the Carroll Zone, so it can be deduced the entire county is equally at risk to the hazard. In many communities nationwide, unincorporated areas are where the bulk of agriculture assets are located, and this is also true in Carroll County. However, many farms are located on the border between towns and the unincorporated region, so the towns are equally affected by drought. Due to the high dollar value of agricultural losses and the 25% probability of drought occurring in a given year, drought is ranked as a medium hazard of concern for all of Carroll County.

Table C.18: Ranking of the Drought Hazard by Carroll County Jurisdictions

Jurisdiction	Ranking
Unincorporated Carroll County	Medium
Town of Carrollton	Medium
City of North Carrollton	Medium
Town of Vaiden	Medium
Overall, Carroll County Vulnerability to Drought	Medium

Earthquake

Location and Extent

Carroll County, like most of North Central Mississippi, is located within the Modified Mercalli Zone VI. Should an event occur that has a 5.9 to 6.0 magnitude on the Richter Scale, some or all of the following may occur based on descriptions included in the Scale:

- The event would be felt by all or nearly everyone
- People may be awakened from sleep if the event occurs at night
- Widespread frightened population
- Some dishes and windows would be broken
- Unstable objects would be overturned.
- Pendulum clocks may stop
- Heavy furniture moved
- Instances of fallen plaster
- Slight property damage

Previous Occurrences

No earthquakes have been reported as having taken place in or affected Carroll County.

Probability of Future Occurrence

In 2002, a study by the Center for Earthquake Research and Information (CERI) at the University of Memphis reported that, in any given 50-year interval, there is a seven to ten percent probability of the region experiencing an event similar to that of the devastating 1811-1812 New Madrid Zone earthquakes sequence. It was estimated that there is an estimated 25 to 40 percent probability of a 6.0 magnitude event occurring over a 50-year time period. The community relies on studies such as this for probability estimates because there is no locally available occurrence data.

Assessing Vulnerability

The level of vulnerability is the same for all areas of the county given that there is no substantive geographic variation in distance any place in the county to the city of New Madrid, MO, the potential epicenter of the New Madrid Seismic Zone. The distance between New Madrid and the City of Carrollton, is roughly 217 miles, with the Mississippi town lying almost due south of New Madrid. The entire county is only 20 miles in length at its longest point, so all jurisdictions are assigned the same level of vulnerability.

There have been no recorded deaths, injuries, or property damage from earthquakes in Carroll County. There is little likelihood of any detrimental effect on the County's economy, residents' lifestyle, or physical structures. However, the effects on life and property in the area and on its many dams could be significant if a large earthquake were to occur given the nature of the built environment. In estimates derived from a report by the U.S. Geological Survey (USGS) "New Madrid Earthquake Project," there is the potential for Carroll County and other District 3 sectors to experience a seismic event with a magnitude of between 3 and 4 on the Richter scale.

Research done by the USGS Earthquake Hazard Program suggests buildings constructed using load-bearing masonry walls are vulnerable to damage by earthquakes, while steel and wood-frame buildings have a lower seismic vulnerability. Low-rise reinforced concrete buildings are also in this

lower seismic risk category. Damage expected in such an event within the unincorporated areas of Carroll County could include buildings not secured to a solid foundation being shaken off their supports, and chimneys falling away from houses. Multi-story structures built with un-reinforced masonry buildings could be substantially damaged.

In reviewing earthquake effects on dams, the 2018 SHMP overlaid significant high hazard dams with historic seismic recordings and developed a dam inventory for earthquake prone counties. Dam/levee systems are also vulnerable to earthquake events as shown by the table below.

Table C.19: Dam Inventory in Relation to Earthquake Prone Counties by Dam Type | *Source:* 2018 Mississippi State Hazard Mitigation Plan

MISSISSIPPI DISTRICT 3				
County	Significant	High	Medium	Low
Attala	1	2	44	47
Bolivar	-	-	14	14
Carroll	4	23	86	113
Holmes	1	5	39	45
Humphreys	-	-	4	4
Leflore	-	-	-	-
Montgomery	2	22	24	2
Sunflower	-	-	12	12
Washington	-	-	3	3

The County is being proactive by maintaining open communications with the owners of the significant and high hazard dams and encouraging them to develop or maintain a current EAP that includes earthquake preparedness.

The 2018 SHMP also lists Carroll County as a place where soil composition lends itself to extreme liquefaction at higher earthquake magnitudes that take a toll on all but the best seismically mitigated structures. The liquefaction potential as identified in the 2018 SHMP HAZUS scenario is listed in Table C.20.

Table C.20: Carroll County High Liquefaction Hazard | Source: 2018 State of Mississippi SHMP

Seismic Source	Geographic Area of Concern	Liquefaction Potential
New Madrid Seismic Zone (NMSZ) White River Fault Zone (WRFZ)	Mississippi River Floodplain (MRFP)	Very High Very Low

Excessive Heat / Heat

Location and Extent

Waves of heat may cover all of District 3, or a larger area that includes one or more states. The hazard is not geographically confined. As such, all of Carroll County could be equally affected by excessive heat. Regarding hazard extent, such events typically do not include property damage, but heat can affect the elderly, infants, and disabled persons, and cause death in persons who are overexposed. It may cause crop damage and affect the livelihood of agricultural workers.

Previous Occurrences

As shown in Table C.21, there were five recorded heat events between 2005 and 2019. There were no damages or loss of life/injury documented as a result of these events.

Table C.21: Excessive Heat / Heat Occurrences 2000 to 2019 | Source: NCEI

Date	Event	Death	Injury	Property Damage	Crop Damage
8/1/2010	Excessive Heat	-	-	-	-
8/5/2007	Heat	-	-	-	-
7/15/2006	Heat	-	-	-	-
8/17/2005	Heat	-	-	-	-
7/23/2005	Heat	-	-	-	-
Totals					

The National Weather Service event narrative for the most recent occurrence (8/1/2010) is typical of how extent is described for the other events:

> A four-day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS Jackson, MS forecast area, 19 record highs were set between August 1st and 4th. On August 2nd, the 2nd warmest average temperature was recorded. The low was 78 and the high 105, resulting in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in three fatalities across the forecast area.

The deaths mentioned in this description occurred elsewhere in the region served by the Jackson, MS weather station, so they are a reminder that extreme heat affects the entire county and a wider region. It is not feasible to discuss vulnerability broke down by jurisdiction because NCEI data for this hazard is reported countywide.

Probability of Future Occurrence

While five events are listed in the table of historical events, two appear to be from an extended event that occurred over a two-month period. As such, for the purpose of determining probability, it is somewhat more accurate to say four events took place over a 19-year period. It is worth noting that a heat event has not been recorded for the most recent nine years of available data. The number of recent events over the 19-year period studied suggests there is a 21% percent chance of occurrence in any given year.

Assessing Vulnerability

Heat can affect certain populations but generally causes no property damage. During periods of extreme heat, there is little physical destruction, although roads can buckle, and livestock may perish. Extreme heat conditions can pose problems for those not accustomed to the climate or who are outside for prolonged periods of time. Extreme heat can create a threat even to individuals and communities accustomed to high temperatures. Excessive heat can also cause utility outages due to an increased demand for electricity.

All of the following populations are prone to heat-related conditions: the elderly; young children; those who are immobile; persons who live alone or without air conditioning; people without transportation; and those suffering from a serious illness. Because NWS reports are county-based and events described are often regional occurrences, it is safe to say the entire population countywide is are vulnerable.

Expansive Soil

Location and Extent

Expansive soils are present throughout Mississippi and have been known to cause considerable damage to housing and infrastructure. Less than 50 percent of soils in Carroll County consist of clay having high swelling potential.

Previous Occurrences

There are no recorded incidents of expansive soil in Carroll County.

Probability of Future Occurrence

The probability of expansive soils is classified as low. Because the unexpected does occur, it is not realistic to say there is a zero percent chance of occurrence, although it is not possible to estimate probability without historical data.

Assessing Vulnerability

Expansive soils could cause damage to infrastructure and to both business and residential structures within Carroll County. Community leaders agreed this is a hazard of low-level concern in all jurisdictions but wanted to retain it in the 2020 RHMP update to document a discussion about the hazard took place.

Flood

Location and Extent

All segments of Carroll County are at risk to riverine, flash flooding, and flooding caused by undersized overburdened stormwater management systems. All of the flood events cited from recent NCEI data below are documented as flash floods. Flood data shown below shows the entire county is susceptible to flooding. The extent of some events is listed as countywide.

Flash floods often occur when rain falls on the built environment and impervious surfaces, gutters, and storm sewers hasten the flow of run-off. Flowing waters can become raging torrents of water that course through streambeds and streets, sweeping away everything in their path.

Previous Occurrences

Table C.22 provides a summary of the 23 flood events recorded from 2000 to 2019, and the tables that follow show the events sorted by location within the county. Inadequate stormwater management capability may also contribute to flash flooding in all areas.

Table C.22: Flood Events 2000 to 2019 | Source: NCEI

Location	Date	Hazard Type	Death	injury	Property Damage	Crop Damager
Jefferson	2/22/2019	Flash Flood	-	-	10,000	-
Jefferson	2/22/2019	Flash Flood	-	-	30,000	-
Teoc	2/22/2019	Flash Flood	-	-	10,000	-
North Carrollton	2/20/2019	Flash Flood	-	-	10,000	-
Carrollton	2/19/2019	Flash Flood	-	-	25,000	-
Coila	2/19/2019	Flash Flood	-	-	10,000	-
Coila	9/6/2018	Flash Flood	-	-	20,000	-
Carrollton	8/7/2016	Flash Flood	-	-	5,000	-
Centerville	3/31/2016	Flash Flood	-	-	30,000	-
Coila	3/31/2016	Flash Flood	-	-	30,000	-
Gravel Hill	3/31/2016	Flash Flood	-	-	25,000	-
Valley Hill	3/31/2016	Flash Flood	-	-	20,000	-
Carrollton	12/25/2015	Flash Flood	-	-	5,000	-
Vaiden	4/15/2011	Flash Flood	-	-	25,000	-
Seven Pines	12/31/2010	Flash Flood	-	-	3,000	-
North Carrollton	5/2/2010	Flash Flood	-	-	400,000	-
Beatty	4/30/2010	Flash Flood	-	-	75,000	-
Coila	10/12/2009	Flash Flood	-	-	25,000	150,000
Vaiden	12/9/2008	Flash Flood	-	-	250,000	-
Carrollton	9/14/2007	Flash Flood	-	-	10,000	-
Carrollton	4/6/2005	Flash Flood	-	-	2,000	-
Carrollton	12/7/2004	Flash Flood	-	-	-	-
Countywide	3/31/2002	Flash Flood	-	-	5,000	-
Countywide	1/24/2002	Flash Flood	-	-	1,000	-
Countywide	12/13/2001	Flash Flood	-	-	-	-
Totals					$1,026,000	$150,000

Table C.23: Carroll County Flood Events 20001 to 2019 – Sorted by Location | Source: NCEI

Location	# Events	Major Water Bodies
Beatty	1	Dry Creek, Big Black River
Carrollton	6	Yalobusha River
Centerville	1	Pelucia Creek
Coila	3	Coila Creek
Countywide	3	Yalobusha River, Big Black River
Gravel Hill	1	Coila Creek
Jefferson	2	Yalobusha River, Loden Creek, Purnell Creek, Potacocowa Creek
North Carrollton	2	Yalobusha River, Beasley Creek
Seven Pines	1	Coila Creek
Teoc	1	Yalobusha River
Vaiden	2	Big Black River
Valley Hill	1	Yalobusha River

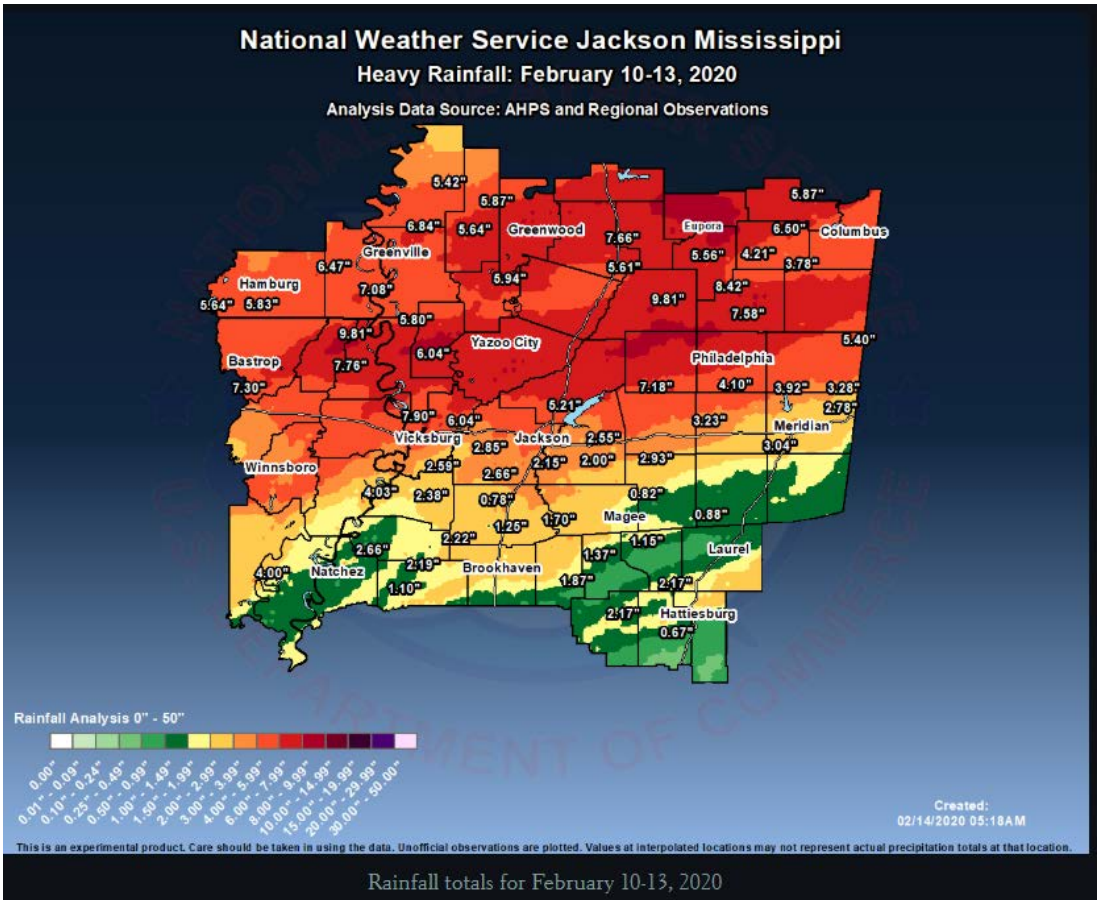
Information from the same table can be further sorted to assess vulnerability for the jurisdictions and unincorporated areas of the Carroll County. All unincorporated communities, or reference to part of the County, will be counted toward incidents not within an identified municipality. While there is a section devoted to flood vulnerability later in this annex, vulnerability will also be addressed here, in proximity to the previous information.

Table C.24: Vulnerability of Carroll County Locations to the Flood Hazard | Source: NCEI

Location	# Events	Vulnerability Level	Critical Points
Countywide	3	Medium	Presence of major rivers and tributaries covering most of the county
Unincorporated Areas: Beatty, Centerville, Coila, Gravel Hill, Jefferson, Seven Pines, Teoc, Valley Hill	9	Medium	Frequency and cost of events, though much of the impacted land does not include structures
Town of Carrollton	1	High	Major river downtown, Stormwater Management Concerns expressed by local officials
City of North Carrollton	4	High	Location of major river downtown
Vaiden	2	Low	River located outside town limits
Overall vulnerability of Carroll County		Medium	Relatively low dollar value of damage Events in unincorporated areas affect few structure

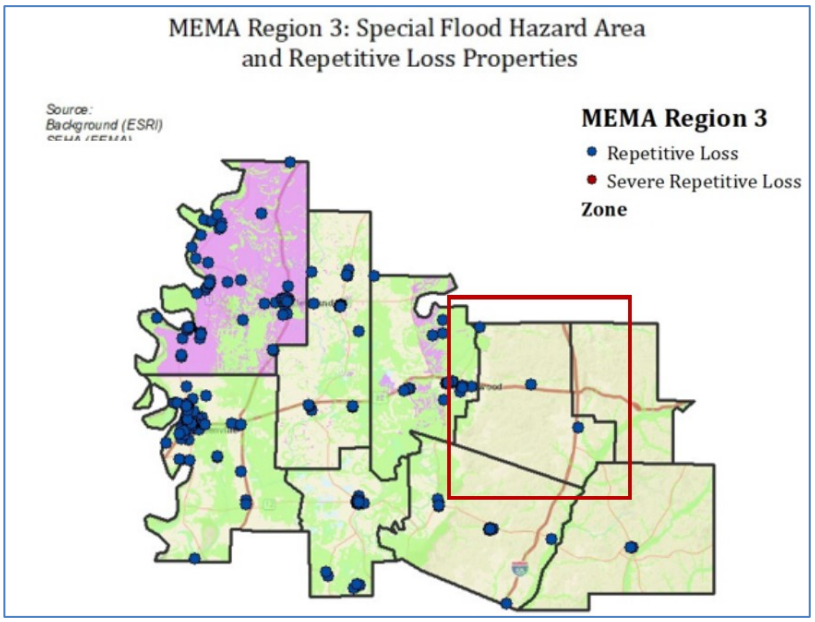
In addition to the events documented as occurring through 2019, District 3 experienced significant rainfall in early 2020 that had not yet been fully documented by NCEI at the time of plan development. The visual identified below as Figure C.5 shows that during the period of February 10-13, 2020, communities district wide received between three to 14 inches of rain, and rain continued to fall – at times heavily – through the rest of the month. The Carroll County Emergency Management Director, who also serves as the Mayor of North Carrollton, and the Mayor of Carrollton, both reported rainfall affecting roadways and causing communities to recognize the need for road improvements in certain areas to mitigate against future flooding.

Figure C.6: Heavy Rainfall Event Recorded for February 10-13, 2020 | Source: National Weather Service



Carroll County and its three municipalities – the Towns of Carrollton, North Carrollton, and Vaiden -- participate in the National Flood Insurance Program. The Capabilities Assessment of this section notes NFIP also notes a Flood insurance Study was conducted in 2017, when FEMA updated the local Flood Insurance Rate Maps (FIRMs). Figure C.7 below shows the location of Carroll County's two repetitive loss properties. The County is identified by the red text box.

Figure C.7: Carroll County Speical Flood Hazard Areas | Source: 2018 SHMP



The next two tables show the most recently available data about NFIP claims data available. Table C.25, taken from the 2015 RHMP, represents the most recently available data about Carroll County NFIP participation and claims data. Table C.26 and Table C. 27 were taken from the 2018 SHMP and the 2015 D3 RHMP respectively. Because each plan showed different data, presenting data from both provides a full picture of insurance losses and their dollar value.

Table C.25- Carroll County NFIP Insurance Losses | Source: NFIP Policy and Loss Statistics as of 3/31/3018, 2018 SHMP

Jurisdiction	NFIP Date	Total Losses	Closed Losses	Open Losses	CWOP Losses	Total Payments to Date ($)
Carroll County	7/3/1978	22	21	0	1	$162,422.68
Carrollton	2/26/2009 E	0	0	0	0	0
North Carrollton	4/3/1978	1	1	o	1	762.10
Vaiden	3/15/1978	2	1	0	1	$35,000.00

Table C.26 - Carroll County NFIP Communities | Source: NFIP Policy and Loss Statistics (3-31-14) and Community Status Report (4-4-14)
2015 Mississippi District 3 Regional Hazard Mitigation Plan

Jurisdiction	NFIP Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date ($)
Carroll County	7/3/1978	14	$3,210,500	20	$157,024
Carrollton	2/26/2009 E	0	0	0	0
North Carrollton	4/3/1978	6	$500,400	1	$762
Vaiden	3/15/1978	3	$137,000	1	$35,000
Totals		23	$3,908,600	22	$192,786

Table C.27 and Table C.28 are from the 2018 SHMP and, respectively, show the number of RL/SRL properties for Carroll County and the eight other counties included in District 3. Also included are the number of NFIP participating communities for each county and number of properties mitigated.

Table C. 27: Historical Record of Mississippi's District 3 Repetitive Loss and Severe Repetitive Loss Properties | Source: 2018 Mississippi SHMP

County	Repetitive				Severe Repetitive Loss			
	No. of Properties 2009	No. of Properties 2011	No. of Properties 2016	No. of Flood Claims	No. of Properties 2009	No. of Properties 2011	No. of Properties 2016	No. of Flood Claims
Attala	0	0	1	2	0	0	0	0
Bolivar	155	108	210	631	2	48	2	228
Carroll	4	4	4	8	0	0	0	0
Holmes	11	12	12	27	0	0	0	0
Humphreys	40	31	46	161	2	10	1	61
Leflore	29	27	27	71	0	2	0	8
Montgomery	0	0	0	0	0	0	0	0
Sunflower	19	16	20	72	1	4	0	21
Washington	152	115	191	631	14	48	8	250
Totals	410	313	511	1,603	19	112	11	568

Table C.28: D3 Participating Communities and Number of Mitigated Properties by County | Source: 2018 Mississippi SHMP

County	No. of NFIP Communities	No. of Mitigated Properties
Attala	5	0
Bolivar	16	20
Carroll	4	0
Holmes	8	0
Humphreys	5	1
Leflore	6	1
Montgomery	4	0
Sunflower	8	4
Washington	6	26
Totals	61	52

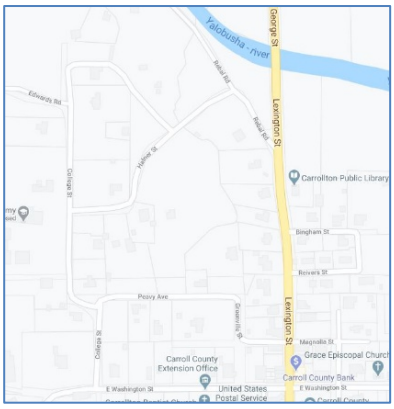
Probability of Future Occurrence

There have been one or more flood events reported to the National Weather Service in 13 of the 19 years included in 2020 RHMP Update research. As such, there 68% chance in any given year a flood will occur. Geographic analysis of the NCEI data shows events are equally likely to occur in the unincorporated areas of the county as well as in the municipalities. There were roughly the same total number of events in unincorporated communities (9) as there were in municipalities, and this does not include the events listed as countywide. This probability takes into consideration the history of flood events; an overtaxed drainage system, and the location of two major rivers, the Big Black River and the Yalobusha River, and their many tributaries.

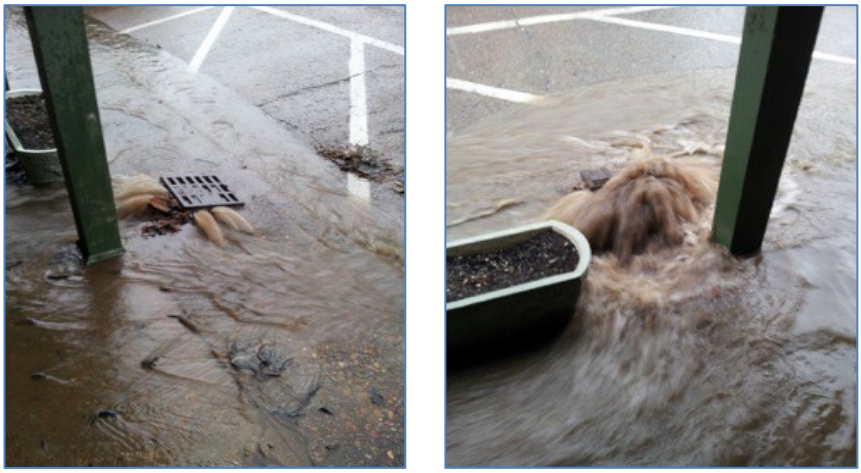
Assessing Vulnerability

Flood stage data is available for the Yalobusha River where it crosses the unincorporated region of Whaley in rural Carroll County. A flood warning issued on April 13, 2020 indicated the river's flood stage is 21.0 feet, and for that flood event the water was anticipated to rise to 22.0 feet. Unincorporated areas of Carroll County include approximately 90 homes located in a SFHA, or the floodplain. The value of the homes is an estimated $5.4 million. The unincorporated areas of Mt. Pisgah, Gravel Hill, and North Carrollton are particularly flood prone. Erosion is secondary hazard, with vulnerable areas in the western section of unincorporated Carroll County. Leadership from the Town of Carrollton pointed out the existence of erosion-prone areas located on Lexington Road north of Highway 85, as shown in the photo at right. (***Photo credit***: City of Carrollton)

During periods of heavy rain, some streets and roads in Carrollton become temporarily flooded due to poor drainage, although no structures are located in the floodplain. Roads and bridges become impassable and damaged, and whole neighborhoods are affected. In particular, flooding on downtown East Washington Street causes excess water to flow from there to an area roughly bounded by East Washington Street, Lexington Avenue, Hafner Street, and College Street. This area is shown as follows on the map below next to a sample photo of road repairs done on road affected by flooding. (***Photo credit below:*** *City of Carrollton*.)



The City of North Carrollton also experiences temporary flooding of streets and roads caused by heavy rainfall affecting an overtaxed drainage system, and inadequate capacity of bridges, culverts and stream segments along Big Sand Creek and Beasley Creek. In these areas, no structures are located in the SFHA, but roughly six homes could be flooded if earthen dam at Saunders Lake were to fail. Such an event could cause upwards of $500,000 in property damage. The Town of North Carrollton provided the images below to demonstrate this situation.



The Town of North Carrollton is frequently impacted by flash flood events due to improper sizing of drainage systems to support storm water runoff. Photo credit: Town of North Carrollton

The Town of Vaiden is also susceptible to flooding as a result of an overtaxed drainage system that exceeds capacity during heavy rainfall. Estimated property damage could exceed $250,000 with some roads and bridges becoming impassable. Two streams in Vaiden are tributaries of Hays Creek, which is a tributary of the Big Black River. The floodplain of the Big Black River includes the lower reach of Hays Creek near the eastern corporate limits of Vaiden. Factors that contribute to flooding problems are bridges, culverts, and streams with inadequate capacity, and streams that collect debris and silt. There are no structures located in the floodplain.

Based on HAZUS data obtained through the 2018 State of Mississippi Standard Hazard Mitigation Plan, Carroll County could experience the following losses as shown in Table 2.29. The information was the same as that included in the State's 2013 SHMP.

***Table C.29: Carroll County HAZUS Flood Results | Source**: HAZUS*

Structural Damage	Contents Damage	Inventory Loss	Total Building Loss	Income loss	Total Building and Income Loss	Bldg. Loss Ratio
$4,289,000	$3,033,000	$56,000	$7,378,000	$32,000	$7,410,000	2.8%

Residences at Risk	Other at Risk	Total Bldgs. Risk	No. of Bldgs. Substantially Damaged	No. of households	No. of people needing shelter	Countywide Building Exposure
33	0	33	11	21	4	$368,321,000

Impact on Transportation Systems: Carroll County includes federal, state and locally owned bridges as shown on the listing below from the 2019 National Bridge Inventory (NBI). Below are 2019 figures for structures rated on a scale from Good to Poor, with 38 Carroll County structures falling into the Poor category.

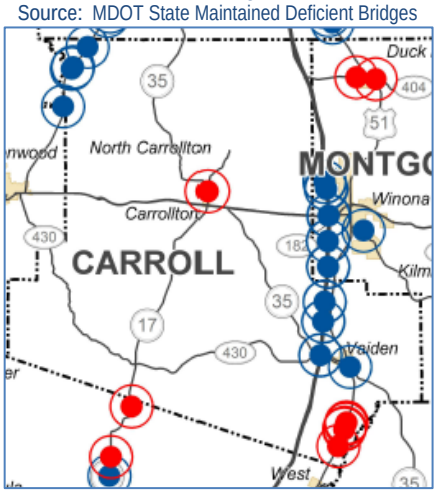
Table 30: Bridges in Carroll County | Source: 2019 National Bridge Inventory

Carroll County	Bridge Counts				Bridge Area (Square Meters)			
	All	Good	Fair	Poor	All	Good	Fair	Poor
Includes Federal Bridges	230	105	87	38	67,312	33,356	25,593	8,363

The importance of bridge functioning was realized in 2018, when 20 bridges were closed for repair over a period of time and several later closed permanently, leading to lengthy detours. In April of that year, fire fighters encountered a closed bridge while responding to a call to cover a fire on County Road 215, but there was a closed bridge on the most direct route to the fire. The County Fire Department reminded the community that closures not only inconvenience residents, but cause delays in incident response on the part of not only the Fire Department but affect the ability of all first responders to help the community, including Sheriff's deputies and MedStat ambulance services[13]

Figure C.8, produced by the Mississippi Department of Transportation (MDOT), shows bridges identified as State-maintained deficient bridges. Red circles indicate the location of posted bridges and blue circles show the location of deficient bridges.

Figure C.8 - State-Maintained Bridges Identified as Deficient | Source: MDOT State Maintained Deficient Bridges



In addition to bridges, roadways are subject to inundation and overtopping by periods of heavy rain, which appear likely to occur more frequently given climate change observations. Storm events generally projected to occur as 100-year flood events are occurring more frequently. The potential loss could include up to the full replacement value of the bridge structure if flooding results in bridge collapse. In severe cases, roadways could also be undermined, causing complete or partial washout of roadbed and collapse of the road surface. Bridges and roadways with a history of flood impact could benefit from mitigation projects and should be thoroughly inspected following a flood event.

Impact on Lifeline Utility Systems: Lifeline utility systems -- such as electric power, gas, utility and water distribution, and telephone service -- are generally not significantly affected by flood events, although flooded lift stations could result in storm water infiltration into treatment facilities. A facility's power source could be interrupted during a flood and result in expensive repairs unless the supply is elevated.

[13] Amanda Sexton Ferguson, *Bridges a Bad Situation in Carroll County*, www.winonatimes.com, April 19, 2018, accessed July 30, 2020.

Severe Weather (Lighting, Hail, and Severe Wind)

Location and Extent

The entire Carroll County planning area is susceptible to lightning, hail and strong wind events. Of particular concern are persons who reside in a mobile/manufactured home, as well as the elderly, and disabled because of their potential lack of mobility to respond to an unexpected hazard situation. It is strongly recommended all manufactured housing be fastened to the ground. The National Association of Certified Home Inspectors (NACHI) describes a housing tie downs as a system of "heavy-duty straps and anchors designed to stabilize manufactured homes (also known as mobile homes) during high winds." The organization points out that failure to properly install and maintain tie-downs results in reduced capacity to resist sliding and overturning. (www.nachi.org)

Previous Occurrences

Severe storm data includes lightning, hail, and severe wind. The following tables show the entire county is susceptible to frequent events. To further demonstrate these historical events, Figure C.9 and Figure C.10 are also provided following the Table C.31, Table C.32, and Table C.33 to visually show the impacts of hail and strong wind events

Table C.31: Carroll County Total Severe Weather Events 2000 to 2019 | Source: NCEI

. Total – All Carroll Severe Weather Events					
Hazard Event	No of Events	Deaths	Injuries	Property Damage	Crop Damage
Lightning	2			40,000	
Hail	47			5,150,000	501,500
Severe Wind	137	1		1,807,600	225,000
Totals	186	1		$ 6,997,600	$ 726,500

Table C.32: Lightning Events 2000 to 2019 | Source: NCEI

Location	Date	Time	Death	Injury	Property Damage	Crop Damage
Carrollton	7/19/2006	18:30	0	0	30,000	0
Malmaison	5/5/2009	22:30	0	0	10,000	0
Totals			0	0	$40,000	0

In addition to the events listed above, one was not recorded by the National Weather Service. In 2014, historic Carrollton Baptist Church was struck by lightning, an event that caused over $40,000 in damages to the organ, sound and media systems, two computers, the copier and chimes.

Incidents of hail occurrences in the following table reveal events occurred in every section of the county and that, in some years, there were multiple incidents. A total of 47 events occurred between 2000 and 2019. While total property damage for this period was $5,150,000 and total crop damage was $501,500, most of this occurred during a single event that occurred on April 7, 2006. This event recorded hail of the largest magnitude shown during this study, when hail reached 2.75 inches in diameter. The list shows all incorporated and unincorporated areas of the county were affected by the hazard. The recorded hail magnitudes listed below range from 0.88" to 2.75".

Table C.33 – Hail Events 2000 to 2019 | Source: NCEI

Location	Date	Magnitude (inches)	Death	injury	Property Damage	Crop Damage
Beatty	5/26/2018	1.00 in	0	0	0	
Carrollton	3/5/2018	1.00 in	0	0	0	
Vaiden	11/29/2016	1.00 in	0	0	0	
Jefferson	4/6/2016	1.00 in	0	0	0	
Jefferson	4/19/2015	1.00 in	0	0	0	
Teoc	4/19/2015	1.00 in	0	0	0	
Carroll	10/13/2014	1.00 in	0	0	0	
Vaiden	10/13/2014	1.75 in	0	0	0	
Jefferson	6/8/2014	1.75 in	0	0	0	
Black Hawk	4/28/2014	1.00 in	0	0	0	
Coila	5/6/2012	1.00 in.	0	0	0	1,500
Vaiden	5/6/2012	1.75 in.	0	0	8,000	0
Vaiden	3/2/2012	1.00 in.	0	0	0	0
Carrollton	3/2/2012	1.00 in.	0	0	0	0
Vaiden	4/20/2011	1.00 in.	0	0	0	0
Malmaison	4/20/2011	1.00 in.	0	0	0	0
Valley Hill	4/20/2011	1.75 in.	0	0	0	0
Avalon	4/20/2011	1.75 in.	0	0	0	0
Avalon	4/20/2011	1.00 in.	0	0	0	0
Black Hawk	12/31/2010	1.75 in.	0	0	0	0
Carrollton	4/23/2010	0.88 in.	0	0	0	0
Avalon	6/13/2009	1.00 in.	0	0	0	0
Carroll Co.	5/16/2009	0.88 in.	0	0	0	0
Carroll Co.	5/5/2009	0.88 in.	0	0	0	0
Carroll Co.	5/5/2009	0.88 in.	0	0	0	0
Carroll Co.	5/2/2009	2.75 in.	0	0	40,000	0
Sommerville Community	8/2/2008	0.88 in.	0	0	0	0
Carrollton	11/14/2007	0.88 in.	0	0	0	0
Vaiden	6/21/2006	1.00 in.	0	0	0	0
Carrollton	4/7/2006	0.75 in.	0	0	0	0
Carrollton	4/7/2006	2.75 in.	0	0	5,000,000	500,000
Teoc	4/7/2006	1.50 in.	0	0	100,000	0
Teoc	12/4/2005	0.75 in.	0	0	0	0
Vaiden	11/15/2005	0.75 in.	0	0	0	0
Holly Grove	6/8/2005	0.88 in.	0	0	0	0
North Carrollton	4/11/2005	1.00 in.	0	0	0	0
Black Hawk	4/11/2005	0.88 in.	0	0	0	0
Seven Pines	4/11/2005	0.88 in.	0	0	0	0
North Carrollton	3/13/2005	0.88 in.	0	0	0	0
Vaiden	10/19/2004	0.75 in.	0	0	0	0

Location	Date	Magnitude (inches)	Death	injury	Property Damage	Crop Damage
Vaiden	6/11/2003	0.75 in.	0	0	1,000	0
Carrollton	7/8/2002	0.75 in.	0	0	0	0
Black Hawk	4/29/2002	1.00 in.	0	0	1,000	0
Carrollton	3/30/2002	0.75 in.	0	0	0	0
Carrollton	10/24/2001	0.75 in.	0	0	0	0
Carrollton	11/8/2000	0.75 in.	0	0	0	0
Vaiden	3/10/2000	1.00 in.	0	0	0	0
Totals			0	0	$5,150,000	$501,500

Historical data for severe wind events, shown in Table C.34, indicates they occur with great frequency in all incorporated and unincorporated sections of the county. While agricultural damage was reported in one instance, events primarily create general property damage.

Table C.34 – Severe Wind Events 2000 to 2019 | Source: NCDC

Location	Date	Event Type	Magnitude	Death	injury	Property Damage	Crop Damage
Vaiden	6/27/2019	Thunderstorm Wind	50 kts. EG	-	-	14,000	-
Carrollton	6/24/2019	Thunderstorm Wind	55 kts. EG	-	-	20,000	-
Carrollton	6/19/2019	Thunderstorm Wind	55 kts. EG	-	-	10,000	-
Jefferson	6/19/2019	Thunderstorm Wind	50 kts. EG	-	-	5,000	-
Seven Pines	6/19/2019	Thunderstorm Wind	52 kts. EG	-	-	15,000	-
Carrollton	11/1/2018	Thunderstorm Wind	50 kts. EG	-	-	2,000	-
North Carrollton	11/1/2018	Thunderstorm Wind	57 kts. EG	-	-	60,000	-
Valley Hill	11/1/2018	Thunderstorm Wind	50 kts. EG	-	-	25,000	-
Teoc	7/21/2018	Thunderstorm Wind	55 kts. EG	-	-	55,000	-
Black Hawk	5/30/2018	Thunderstorm Wind	52 kts. EG	-	-	10,000	-
Carrollton	4/3/2018	Thunderstorm Wind	55 kts. EG	-	-	50,000	-
Coila	6/16/2017	Thunderstorm Wind	50 kts. EG	-	-	5,000	-
Coila	6/16/2017	Thunderstorm Wind	50 kts. EG	-	-	15,000	-
Vaiden	6/16/2017	Thunderstorm Wind	50 kts. EG	-	-	7,000	-
Vaiden	4/30/2017	Thunderstorm Wind	65 kts. EG	-	-	3,000	-
Valley Hill	4/30/2017	Thunderstorm Wind	62 kts. EG	-	-	20,000	-
Wiltshire	4/30/2017	Thunderstorm Wind	54 kts. EG	-	-	1,000	-
Avalon	4/26/2017	Thunderstorm Wind	52 kts. EG	-	-	10,000	-
Black Hawk	4/26/2017	Thunderstorm Wind	52 kts. EG	-	-	5,000	-
	3/30/2017	Thunderstorm Wind	48 kts. EG	-	-	8,000	-
Vaiden	11/28/2016	Strong Wind	50 kts. EG	-	-	8,000	-
Sommerville	8/5/2016	Thunderstorm Wind	43 kts. EG	-	-	4,000	-
Carrollton	7/9/2016	Thunderstorm Wind	45 kts. EG	-	-	3,000	-
Black Hawk	6/17/2016	Thunderstorm Wind	50 kts. EG	-	-	2,000	-
Jefferson	6/17/2016	Thunderstorm Wind	50 kts. EG	-	-	2,000	-
Valley Hill	5/12/2016	Thunderstorm Wind	50 kts. EG	-	-	8,000	-
Beatty	4/11/2016	Thunderstorm Wind	50 kts. EG	-	-	10,000	-
Carrollton	2/23/2016	Thunderstorm Wind	50 kts. EG	-	-	2,000	-
Carrollton	7/15/2015	Thunderstorm Wind	50 kts. EG	-	-	5,000	-
Jefferson	4/19/2015	Thunderstorm Wind	50 kts. EG	-	-	5,000	-
Black Hawk	4/10/2015	Thunderstorm Wind	50 kts. EG	-	-	500	-
Black Hawk	12/5/2014	Thunderstorm Wind	50 kts. EG	-	-	2,000	-

Location	Date	Event Type	Magnitude	Death	injury	Property Damage	Crop Damage
Sommerville	10/13/2014	Thunderstorm Wind	50 kts. EG	-	-	-	-
Jefferson	2/20/2014	Thunderstorm Wind	50 kts. EG	-	-	1,000	-
Teoc	2/20/2014	Thunderstorm Wind	50 kts. EG	-	-	1,000	-
Valley Hill	12/21/2013	Thunderstorm Wind	50 kts. EG	-	-	3,000	-
	6/28/2013	Thunderstorm Wind	43 kts. EG	-	-	500	-
Coila	5/21/2013	Strong Wind	52 kts. EG	-	-	3,000	-
Jefferson	5/21/2013	Thunderstorm Wind	50 kts. EG	-	-	3,000	-
Carrollton	3/31/2013	Thunderstorm Wind	50 kts. EG	-	-	15,000	-
	1/29/2013	Thunderstorm Wind	43 kts. EG	-	-	1,000	-
Malmaison	12/20/2012	Strong Wind	50 kts. EG	-	-	25,000	-
Carrollton	12/10/2012	Thunderstorm Wind	55 kts. EG	-	-	20,000	-
	9/30/2012	Thunderstorm Wind	43 kts. EG	-	-	3,000	-
Avalon	8/13/2012	Strong Wind	50 kts. EG	-	-	1,000	-
Sommerville	8/13/2012	Thunderstorm Wind	50 kts. EG	-	-	10,000	-
Valley Hill	6/11/2012	Thunderstorm Wind	48 kts. EG	-	-	100	-
Vaiden	6/4/2012	Thunderstorm Wind	43 kts. EG	-	-	7,000	-
Carrollton	5/31/2012	Thunderstorm Wind	50 kts. EG	-	-	20,000	-
Jefferson	5/8/2012	Thunderstorm Wind	50 kts. EG	-	-	2,000	-
Black Hawk	4/2/2012	Thunderstorm Wind	50 kts. EG	-	-	5,000	-
Vaiden	2/29/2012	Thunderstorm Wind	50 kts. EG	-	-	500	-
	2/23/2012	Thunderstorm Wind	43 kts. EG	-	-	20,000	-
Avalon	2/1/2012	Strong Wind	55 kts. EG	1	-	10,000	-
Carrollton	8/11/2011	Thunderstorm Wind	50 kts. EG	-	-	13,000	-
North Carrollton	6/13/2011	Thunderstorm Wind	50 kts. EG	-	-	10,000	-
Vaiden	6/13/2011	Thunderstorm Wind	50 kts. EG	-	-	5,000	-
Avalon	5/25/2011	Thunderstorm Wind	50 kts. EG	-	-	-	-
Black Hawk	5/25/2011	Thunderstorm Wind	50 kts. EG	-	-	-	-
Carrollton	4/27/2011	Thunderstorm Wind	70 kts. EG	-	-	300,000	150,000
Valley Hill	4/27/2011	Thunderstorm Wind	63 kts. EG	-	-	-	-
North Carrollton	4/20/2011	Thunderstorm Wind	65 kts. EG	-	-	40,000	-
Seven Pines	4/20/2011	Thunderstorm Wind	55 kts. EG	-	-	1,000	-
Vaiden	4/20/2011	Thunderstorm Wind	65 kts. EG	-	-	300,000	-
Carrollton	2/24/2011	Thunderstorm Wind	65 kts. EG	-	-	25,000	-
Coila	12/31/2010	Thunderstorm Wind	50 kts. EG	-	-	2,000	-
North Carrollton	12/31/2010	Thunderstorm Wind	50 kts. EG	-	-	2,000	-
Gravel Hill	10/12/2010	Thunderstorm Wind	50 kts. EG	-	-	4,000	-
Teoc	10/12/2010	Thunderstorm Wind	50 kts. EG	-	-	5,000	-
Vaiden	10/12/2010	Thunderstorm Wind	52 kts. EG	-	-	4,000	-
Vaiden	7/25/2010	Thunderstorm Wind	52 kts. EG	-	-	8,000	-
Carrollton	4/3/2010	Thunderstorm Wind	50 kts. EG	-	-	-	-
Carrollton	12/8/2009	Thunderstorm Wind	50 kts. EG	-	-	1,000	-
Vaiden	12/8/2009	Thunderstorm Wind	60 kts. EG	-	-	8,000	-
Carrollton	10/9/2009	Thunderstorm Wind	55 kts. EG	-	-	-	-
Carrollton	10/9/2009	Thunderstorm Wind	60 kts. EG	-	-	-	-
Black Hawk	7/30/2009	Thunderstorm Wind	65 kts. EG	-	-	50,000	-
Sommerville	7/30/2009	Thunderstorm Wind	55 kts. EG	-	-	-	-
Teoc	7/30/2009	Thunderstorm Wind	55 kts. EG	-	-	1,000	-
Vaiden	7/30/2009	Thunderstorm Wind	58 kts. EG	-	-	10,000	-

Location	Date	Event Type	Magnitude	Death	injury	Property Damage	Crop Damage
Carrollton	7/16/2009	Thunderstorm Wind	50 kts. EG	-	-	-	-
Coila	5/12/2009	Thunderstorm Wind	50 kts. EG	-	-	7,000	-
Carrollton	5/6/2009	Thunderstorm Wind	50 kts. EG	-	-	-	-
McCarley	5/6/2009	Thunderstorm Wind	50 kts. EG	-	-	-	-
	4/18/2009	Thunderstorm Wind	40 kts. EG	-	-	2,000	-
Valley Hill	4/2/2009	Strong Wind	60 kts. EG	-	-	5,000	-
Black Hawk	12/27/2008	Thunderstorm Wind	50 kts. EG	-	-	-	-
MALMAISON	12/9/2008	Thunderstorm Wind	50 kts. EG	-	-	-	-
Black Hawk	9/14/2008	Thunderstorm Wind	50 kts. EG	-	-	-	-
Sommerville	8/2/2008	Thunderstorm Wind	55 kts. EG	-	-	-	-
Wiltshire	8/2/2008	Thunderstorm Wind	63 kts. EG	-	-	50,000	60,000
Jefferson	7/27/2008	Thunderstorm Wind	55 kts. EG	-	-	15,000	-
Coila	5/3/2008	Thunderstorm Wind	57 kts. EG	-	-	20,000	-
Coila	4/22/2008	Thunderstorm Wind	55 kts. EG	-	-	-	-
Sommerville	4/22/2008	Thunderstorm Wind	65 kts. EG	-	-	-	-
Carrollton	1/8/2008	Thunderstorm Wind	50 kts. EG	-	-	-	-
Carrollton	11/14/2007	Thunderstorm Wind	50 kts. EG	-	-	-	-
North Carrollton	11/14/2007	Thunderstorm Wind	53 kts. EG	-	-	25,000	-
North Carrollton	10/18/2007	Thunderstorm Wind	53 kts. EG	-	-	-	-
Coila	6/19/2007	Thunderstorm Wind	53 kts. EG	-	-	-	-
Gravel Hill	6/19/2007	Thunderstorm Wind	60 kts. EG	-	-	15,000	-
Vaiden	6/19/2007	Thunderstorm Wind	50 kts. EG	-	-	-	-
Valley Hill	6/19/2007	Thunderstorm Wind	50 kts. EG	-	-	-	-
Jefferson	6/18/2007	Thunderstorm Wind	50 kts. EG	-	-	-	-
Sommerville	6/18/2007	Thunderstorm Wind	50 kts. EG	-	-	-	-
Vaiden	6/18/2007	Thunderstorm Wind	55 kts. EG	-	-	3,000	-
Carrollton	2/24/2007	Thunderstorm Wind	50 kts. EG	-	-	40,000	-
Vaiden	6/21/2006	Thunderstorm Wind	58 kts. EG	-	-	40,000	-
Carrollton	4/7/2006	Thunderstorm Wind	55 kts. EG	-	-	50,000	-
Carrollton	4/7/2006	Thunderstorm Wind	50 kts. EG	-	-	-	-
	3/9/2006	Thunderstorm Wind	45 kts. EG	-	-	1,000	-
Carrollton	3/9/2006	Strong Wind	55 kts. EG	-	-	40,000	-
Black Hawk	1/13/2006	Thunderstorm Wind	50 kts. EG	-	-	-	-
Countywide	8/5/2005	Thunderstorm Wind	50 kts. EG	-	-	-	15,000
Carrollton	4/6/2005	Thunderstorm Wind	50 kts. EG	-	-	-	-
Carrollton	4/6/2005	Thunderstorm Wind	55 kts. EG	-	-	5,000	-
Avalon	12/7/2004	Thunderstorm Wind	55 kts. EG	-	-	1,000	-
Carrollton	12/7/2004	Thunderstorm Wind	52 kts. EG	-	-	-	-
Carrollton	5/31/2004	Thunderstorm Wind	50 kts. EG	-	-	-	-
Carrollton	5/30/2004	Thunderstorm Wind	50 kts. EG	-	-	-	-
Coila	5/30/2004	Thunderstorm Wind	50 kts. EG	-	-	-	-
Teoc	8/21/2003	Thunderstorm Wind	53 kts. EG	-	-	5,000	-
Carrollton	7/13/2003	Thunderstorm Wind	58 kts. EG	-	-	100,000	-
Jefferson	6/11/2003	Thunderstorm Wind	50 kts. EG	-	-	1,000	-
Jefferson	6/11/2003	Thunderstorm Wind	50 kts. EG	-	-	1,000	-
Countywide	6/2/2003	Thunderstorm Wind	55 kts. EG	-	-	15,000	-
Carrollton	7/23/2002	Thunderstorm Wind		-	-	2,000	-
Black Hawk	7/21/2002	Thunderstorm Wind		-	-	1,000	-

Location	Date	Event Type	Magnitude	Death	injury	Property Damage	Crop Damage
Carrollton	7/21/2002	Thunderstorm Wind		-	-	1,000	-
Carrollton	7/8/2002	Thunderstorm Wind		-	-	1,000	-
Teoc	10/24/2001	Thunderstorm Wind		-	-	1,000	-
Vaiden	6/4/2001	Thunderstorm Wind		-	-	1,000	-
Jefferson	5/30/2001	Thunderstorm Wind		-	-	1,000	-
Malmaison	2/24/2001	Thunderstorm Wind	53 kts. EG	-	-	-	-
Vaiden	8/26/2000	Thunderstorm Wind		-	-	2,000	-
Countywide	5/27/2000	Thunderstorm Wind		-	-	5,000	-
Carrollton	2/18/2000	Thunderstorm Wind		-	-	20,000	-
Totals				1		$ 1,807,600	$ 225,000

NCEI data was collected early in the 2020 RHMP update process, when the most current data available was through December 2019. Two additional high wind events later occurred. On January 11, 2020, the Town of North Carrollton experienced thunderstorm wind at a magnitude of 50 kts.EG that caused $10,000 in property damage, and on April 12, 2020, the Town of Carrollton experienced winds of 53 kts.EG that caused $20,000 in property damage.

Probability of Future Occurrence

Historical NCEI data suggests the probability of severe weather events in Carroll County is likely, with 100% probability, since hail and thunderstorm wind events have occurred every year. The County and its jurisdictions ranked the Severe Weather hazard as a medium hazard because, despite one death as a result of 136 events, residents remain relatively safe if they remain indoors, and the overall dollar value of damage is low for the number of events that has occurred.

Assessing Vulnerability

Impact on Life and Property: Severe storms do not affect one geographical section of the County, but hail and heavy rain associated with such events would particularly impact the agricultural community. Critical County infrastructure is unlikely to be affected by this hazard.

Carroll County's entire population is considered at medium risk to severe weather because many events occur, but the level of damage per event is low. Those living in rural areas, special populations, people living in mobile homes, the elderly, and the disabled may all be vulnerable to severe weather events.

Figure C.9 and Figure C.10, on the next two pages, show a sampling of historic hail and severe wind events that have crossed the county.

Figure C.9 – Sample Tracks of Historic Hail Events | Source: NCEI

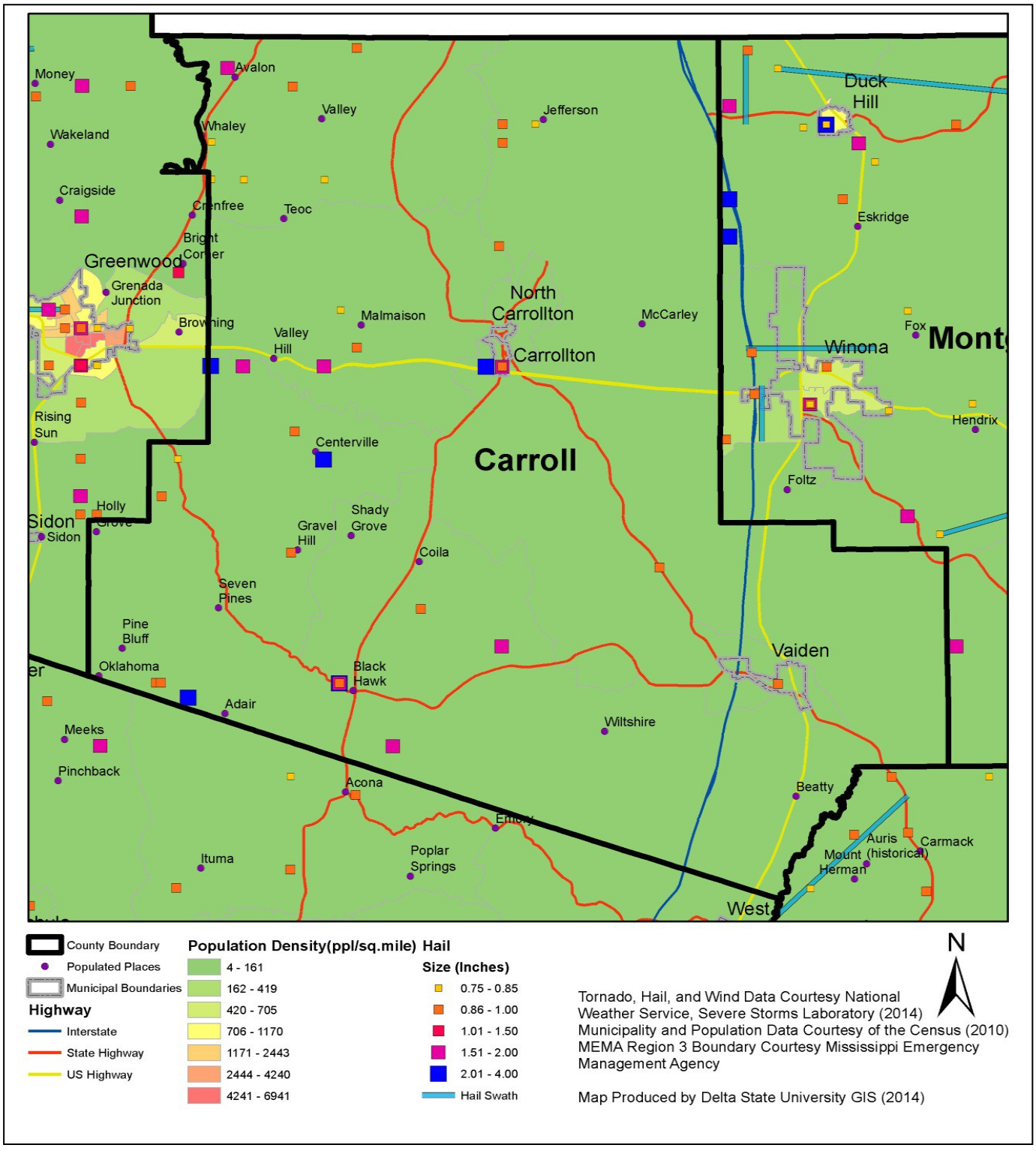
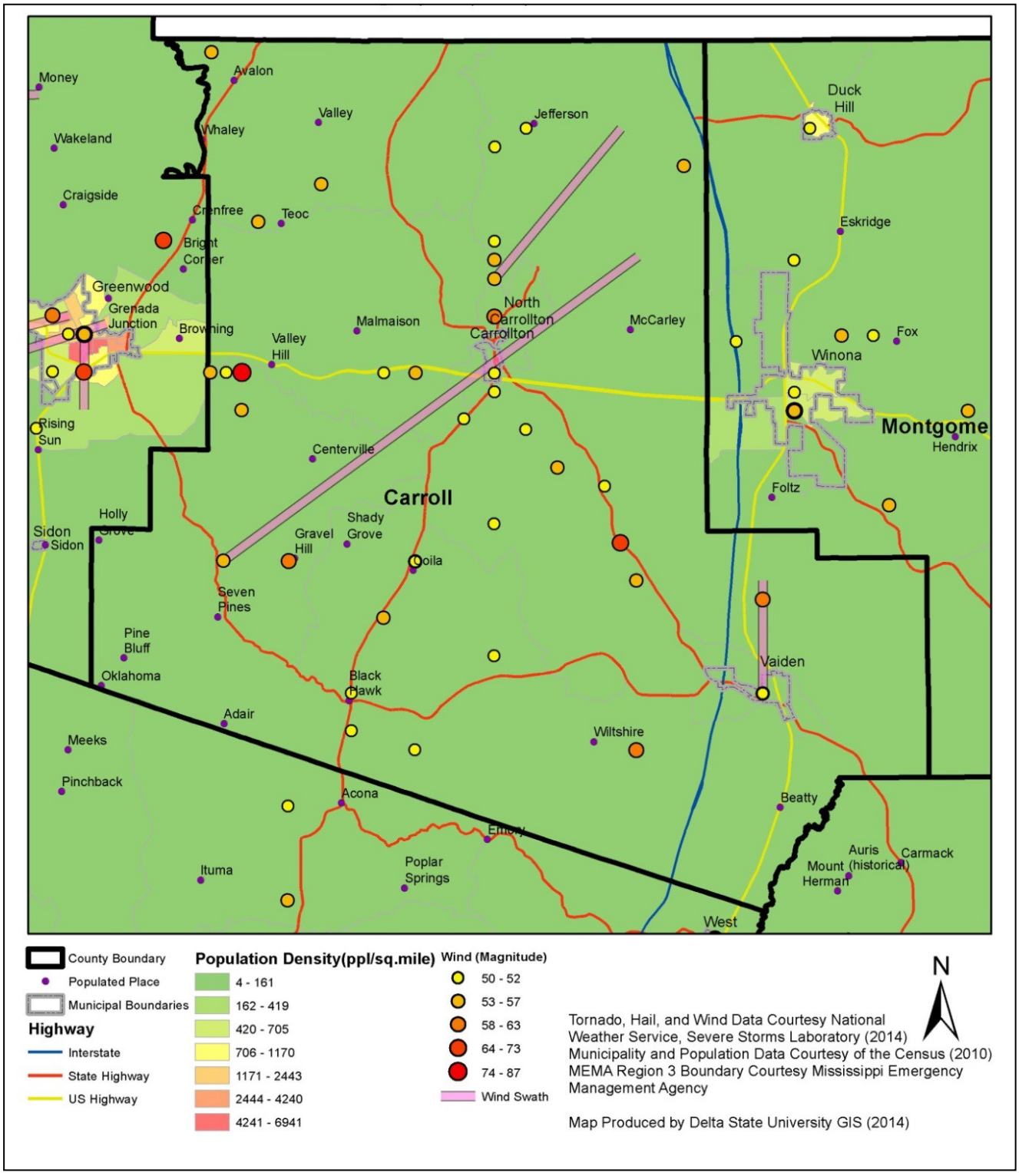


Figure C.10 – Sample Tracks of Historic Severe Wind Events | Source: NCEI



Severe Winter Weather

Location and Extent

Severe winter weather is a non-spacial hazard and jurisdictions of Carroll County are susceptible to the hazard. Impacts may include prolonged power outages and energy shortages. Severe winter weather may affect business operations, causing them to lose income. The same is true for workers, who may be unable to navigate roadways to travel to work or lose pay if their workplace is closed due to loss of power. Ice buildup on roads and bridges creates dangerous driving conditions. When ice accumulates on power lines and trees, either or both could be downed from the weight of the ice. Heavy snow has been known to cause roof cave ins. The elderly and the disabled, who may have limited mobility, are considered vulnerable. Measures should be taken to ensure that they are safe and warm.

Previous Occurrences

The most severe winter storm event to impact the county was recorded in December 1998, when an ice storm, struck the three-state region of Arkansas, Louisiana, and Mississippi just before Christmas. The NWS reported the total estimated cost of damage in the region ranging from southeast Arkansas through central Mississippi was $23 million dollars, with most damage attributable to downed power lines and trees. Many counties were declared federal disaster areas. crippled several counties and communities in Mississippi. Many homes and businesses without power for weeks. Carroll County, along with seven other District 3 counties, was covered under federal declaration DR-1265, which covered the period December 23-26, 1998. Only Holmes County in District 3 was not covered by the declaration. NCEI data shows Carroll County sustained $900,000 in damage during that event.

Table 3.35 shows that for the years 2000-2019 Carroll County experienced five severe winter weather events.

Table C.35 – Severe Winter Weather Events 2000 to 2019 | Source: NCEI

Date	Event Type	Death	Injury	Property Damage	Crop Damage
1/16/2018	Winter Weather	-	-		-
3/5/2015	Sleet	-	-		-
1/7/2010	Winter Storm	-	-		-
1/1/2010	Cold/Wind Chill	-	-	330,000	-
3/1/2009	Winter Weather	-	-		-
Totals				$ 330,000	

Probability of Future Occurrence

Based on past events, the probability of severe winter storms is classified as highly likely, and the hazard could cause property damage from downed trees and roofs cave-ins. Deaths may occur from exposure to cold, and property damage may occur. Since there are recorded events for only four of the 19 years researched for this plan update, there is a 21% probability of a severe winter storm occurring in any given year.

Assessing Vulnerability

The community assets at risk from a winter storm include the electrical and telephone utility system and tree coverage and canopy. Vehicular accidents from icy conditions could cause injury, property damage, or death. Ice laden tree limbs can fall, causing property damage. Additionally, hard freezes could result in decreased water pressure as frozen and damaged pipes thaw and leak. Winter storms impact the entire community. Among essential services, critical facilities and infrastructure likely to be affected are the public safety on roadways and electric, telephone and water services.
The Mississippi Economic Development Council produced figures in March 2020 showing there were ten Carroll County workers employed in the agriculture, forestry, fishing and hunting sector; and 170 workers in the construction sector. Workers such as these, who spend a great deal of time outdoors, are most likely to be affected by severe winter weather.

Populations at Risk: Vulnerable persons during winter weather periods are the homeless, the elderly, young children, and persons with chronic health problems. Above freezing temperatures combined with strong wind can result in perceived temperatures below freezing that may cause hypothermia, illness, and death.

Property Damage: This hazard has caused roofs to cave in, trees to fall on houses, prolonged power outages, and dangerous driving conditions. While most events identified in the research show no property damage from winter hazards, the New Year's Day storm of 2010 caused $300,000 in damage, thus showing these infrequent events can be costly when they do occur.

Critical Facilities and Essential Services: Essential services are not likely to be significantly impacted by a winter storm. For the most part, generators have been installed at critical and essential facilities within the county and participating jurisdictions to ensure continuity of electricity for dispatch and emergency services.

Transportation Systems: Some major transportation services could be temporarily interrupted should icing occur. Those include bridges and overpasses.

Lifeline Utility Systems: The lifeline systems most affected by a winter storm would be area electric power, telephone, and water services. There could be power interruptions to rural water systems that do not have access to generators, although services down time would not last long enough to significantly affect the community.

Tornado

Location and Extent

Mississippi consistently ranks in the top 10 states with the most tornadoes in the nation. Event damages listed below show even an EF1 magnitude tornado can cause millions of dollars in damage. Tornado is a non-spacial hazard, meaning all jurisdictions in the county are equally likely to experience an event.

Of particular concern are persons who reside in a mobile/manufactured home, and the elderly and disabled. The 2018 U.S. American Community Survey (produced by the U.S. Census Bureau) reports there are roughly 1,473 mobile/manufactured housing units in the county, representing 28.6% of overall housing units.

Previous Occurrences

Not shown in Table C.36, but reported by NCEI, is the most severe tornado to affect the county. It occurred 1990. This F3 magnitude tornado caused one fatality and 15 injuries and created $2.5 million in property damage. Nine more recent events are shown in Table C.36.

Table C.36` – Tornado Events 2000 to 2019 | Source: NCEI

Location	Date	Magnitude	Death	Injury	Property Damage	Crop Damage
Beatty	4/30/2017	EF0	-	-	40,000	0
Vaiden	4/30/2017	EF1	-	-	650,000	400,000
Wiltshire	4/30/2017	EF0	-	-	10,000	0
Beatty	4/27/2011	EF2	-	-	5,000	300,000
Beatty	4/27/2011	EF1	-	-	100,000	0
Holly Grove	9/24/2005	F0	-	-	0	20,000
Teoc	4/29/2005	F0	-	-	0	0
Vaiden	12/7/2004	F0	-	-	10,000	0
Malmaison	2/24/2001	F1	-	-	100,000	0
Totals					$ 915,000	$720,000

In addition to the events listed above, NWS includes on its web site a map showing the paths of tornadoes that have taken place thus far in the year 2020. The Carroll County segment of the Google map shown as Figure C.11 indicates no events have been documented.

Figure C.11 - 2020 Tornado Events in Carroll County |
Source: National Weather Service

Probability of Future Occurrence

Based on past events, the probability of tornado events is classified as likely. The list of past events shows they are often clustered, meaning the same event affected more than one community and/or was reported as a separate incident. Looking at the events this way, the nine listed may be pared down to six separate occurrences, resulting in a 32% probability of a tornadic event occurring in any given year.

Assessing Vulnerability

Historical data shows the entire county is vulnerable to impacts from tornadoes. Particularly vulnerable are those living in mobile/manufactured housing units, as was previously discussed. The Carroll County Emergency Management Department recognizes the degree to which its population is vulnerable to tornado and other severe weather events and has included a mitigation action worksheet in this Annex showing its interest in building additional safe rooms. Tornado is ranked as a high hazard for the region because of the population's vulnerability and concern for its safety.

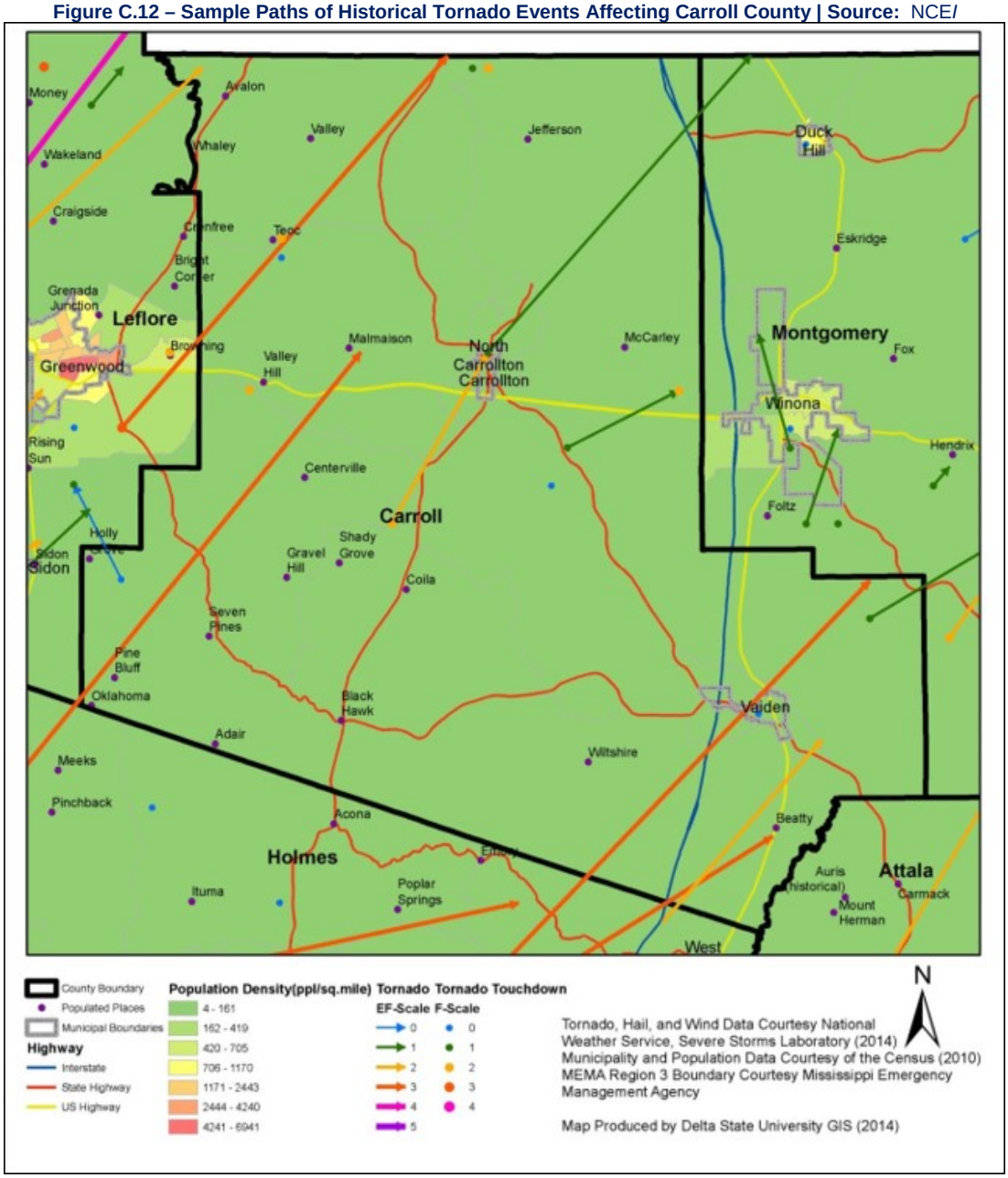
Impacts to Life and Property: Perhaps most vulnerable to this hazard are the elderly, disabled, and economically disadvantaged, who may be unable to reach a safe room in a timely manner. Older frame houses and mobile homes are particularly vulnerable to tornadoes. It was previously mentioned that the 2018 American Community Survey showed that those living in 28.6% of the county's housing units live in mobile homes or manufactured housing. If structures are not built to withstand high winds, roof damage or roof failure may occur. Mobile homes should be anchored to a foundation or the force of tornado winds may lift and overturn the structure. Severely damaged mobile homes may not be later habitable.

Impacts to Natural Resources: Tree canopy and decorative vegetation are all subject to tornado damage. The force of a tornado is powerful enough to uproot trees and vegetation and deposit the debris in standing water, which could result in pollution. Wildlife and farm animals are not likely to survive the force of tornado winds and may be carried to distant ground or deposited in a body of water which may result in pollution. Streams can become clogged with windblown debris and downed trees, causing flooding. If debris is not removed from vacant land it could become a threat to health and safety, create a fire hazard, or create a haven for unwanted vermin or pests.

Impacts to Critical Facilities: A tornado may affect any critical facility or critical infrastructure. The County and its municipalities require that all new buildings and infrastructure, such as water tanks and towers, be built to high wind-resistant standards. All public and essential service buildings in

Carroll County are still at risk from a direct strike from a tornado; however, there is nothing to indicate those buildings are more vulnerable than others in the County. Given the unpredictable nature of tornadoes, it is essential to have designated safe rooms in all public and essential service buildings.

Figure C.12 – Sample Paths of Historical Tornado Events Affecting Carroll County | Source: NCE/



Tropical Storm / Hurricane

Location and Extent

While Carroll County is situated over 200 miles from the Mississippi Gulf Coast, the area is vulnerable to the unavoidable effects of tropical storms/hurricanes as they reach land and continue inland away from the coastal landing point. Storms moving inland have been known to produce violent winds, torrential rains, tornadoes, and flash flooding. Damage levels may be significant or low, depending on the hurricane path and whether it picks up strength before making landfall and turning moving inland.

Previous Occurrences

Three recent storms documented by the National Weather Service are listed in the next table. They were included in the 2015 District 3 RHMP and records indicate no subsequent events have affected the region. Hurricane Katrina caused substantial damage to all 82 Mississippi counties.

Table C.37 – Tropical Storm / Hurricane Events 2000 to 2019 | Source: NCEI

Event Name	Date	Death	Injury	Property Damage	Crop Damage
Hurricane Rita	9/24/2005	-	-	10,000	50,000
Hurricane Katrina	8/29/2005	-	-	1,000,000	15,000,000
Hurricane Lily	10/3/2002	-	-	0	0
Total				$1,010,000	$15,050,000

While the focus of current research is on hazard events occurring between the years 2000 and 2019, a review of NCEI data back to the year 1950 shows no events other than those listed above are on record as affecting Carroll County. The NCEI detailed description of Hurricane Katrina does not provide information about damage estimates or other impacts specific to District 3 counties. It discusses in broad terms how the region north of the Jackson metropolitan area included residential and power line damage primarily from fallen trees. The event severely affected the agricultural and forestry industries, as well as the poultry industry. Row Crops, including cotton, rice, corn, and soybeans, were all severely impacted. It is more likely is that a tornado will strike the Mississippi Gulf Coast and Carroll County could see an influx of evacuees moving north out of harm's way. Some may even choose to relocate to the region.

Probability of Future Occurrence

Based on past events, the probability of tropical storm events is classified as low. Three events occurred in the past 20 years which, if averaged, would yield an estimated 16% probability of occurrence in a given year. While climate change may increase the number and ferocity of hurricane events making landfall, there remains the fact no other events are documented for the period since NCEI began keeping records in the year 1950.

Assessing Vulnerability

Carroll County is located inland of the Mississippi coastline. Hurricanes affecting the Gulf Coast usually lose strength as they make landfall and move northward. However, due to the speed, size, and magnitude of the storm, the County could still be affected by damaging winds, as was the case after Hurricane Katrina. The entire population is at risk to tropical storms and hurricanes and their secondary hazards, including spawned tornadoes and flooding from heavy rain.

Table C.38 includes the most recently available data from a HAZUS run for tropical storm/ hurricane events to evaluate potential economic losses for Carroll County. The HAZUS output is comparable to the damage level shown earlier as resulting from Hurricane Rita. It is likely that little has changed since the last analysis since there has been little regional development.

Table C.38 – Direct Economic Losses for Buildings Annualized Losses | Source: 2013 SHMP

Capital Stock Losses				Income Losses				
Cost Building Damage	Cost Contents Damage	Inventory Loss	Loss Ratio %	Relocation Loss	Capital Related Loss	Wages Loss	Rental Income Loss	Total Loss
$16,000	$5,000	0	.00	$1,000	0	0	0	$22,000

Data from the 2015 RHMP is retained because a different reporting mechanism was used in the 2018 SHMP. Reporting all losses in thousands of dollars, HAZUS calculations included in the 2018 SHMP Global Summary Report of a 100-year Hurricane event identified the State overall as having total Property Damage losses of $9,845,515.73 and Business Interruption Losses of $1,469,644.58, for a total of $11,318,160.30 statewide. However, there is no loss breakdown by county. As such, both sets of information are included to present a more complete picture of potential hurricane losses.

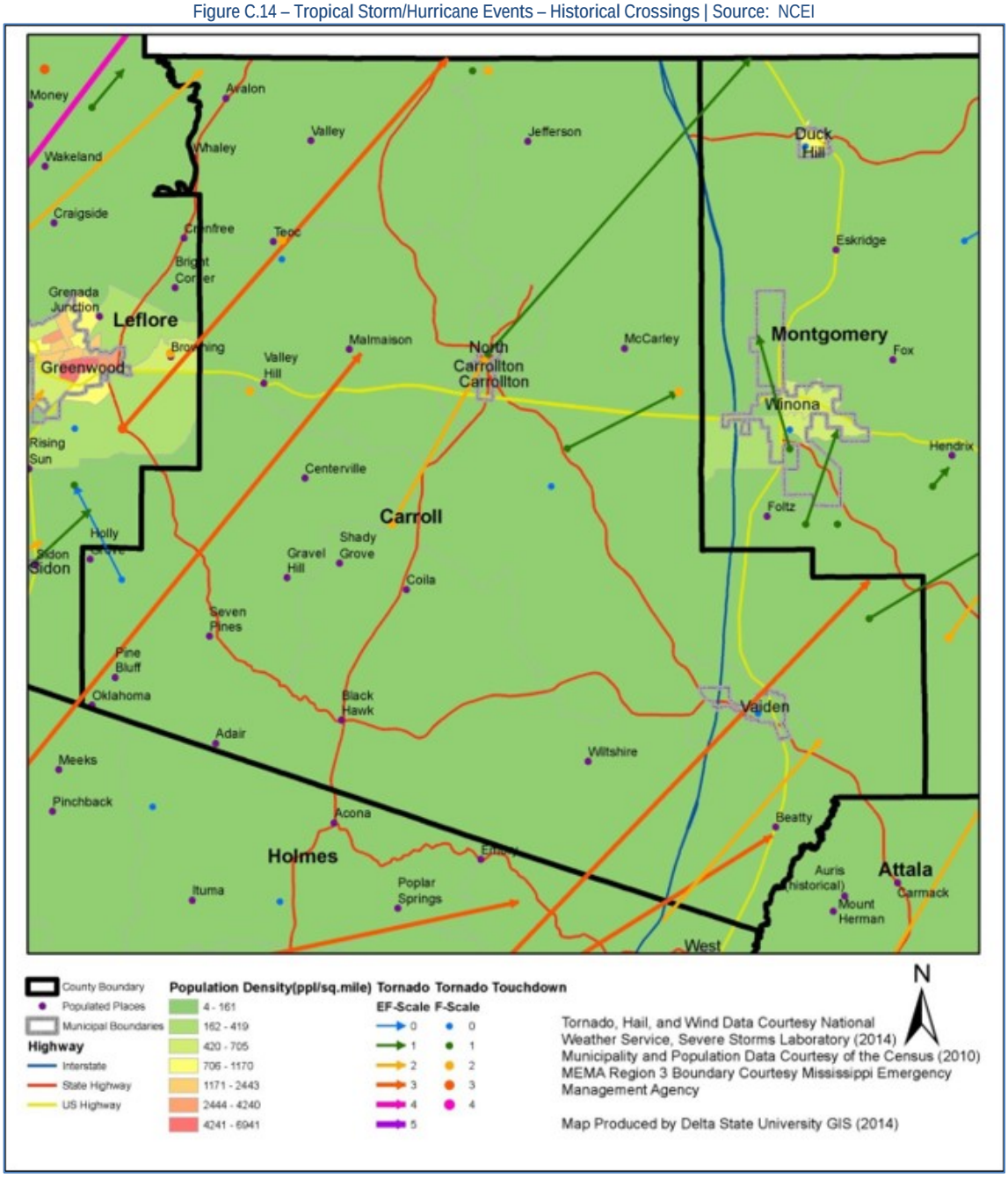
The greatest threat to life and property in Carroll County would occur in a Category 5 Hurricane directly striking the coastline of Mississippi's Harrison County and Hancock County, or in Louisiana's St. Bernard or Plaquemine Parishes. A strike at one of these locations could place Carroll County directly in the path of a storm's high winds and heavy rain bands.

Impacts to Life and Property: Healthy and frail populations are all vulnerable to the effects of a hurricane, where trees may fall on homes, businesses, crops, and people. In addition to concern about those living in mobile homes, those living in substandard housing are susceptible to the hazard if their structures are unable to withstand high winds. In a discussion of the Tornado hazard, it was mentioned that Carroll County would like to build additional safe rooms for residents who may need to evacuate their homes in the event of a deadly hazard event.

Impacts to Natural Resources: Tree canopy and decorative vegetation are all subject to tornado damage. The force of a hurricane winds is powerful enough to uproot trees and vegetation and deposit the debris in standing water, which could result in pollution. Wildlife and farm animals are not likely to survive the force of tornado winds and may be carried to distant ground or deposited in a body of water, which may result in pollution. Streams can become clogged with windblown debris and downed trees, causing flooding. If debris is not removed from vacant land, it could become a threat to health and safety, create a fire hazard, or create a haven for unwanted vermin or pests. Trees and vegetation are important to the ambiance that generates a thriving historic tourism industry.

Impacts to Critical Facilities**:** A hurricane may affect any critical facility or critical infrastructure. The County and its municipalities require all new buildings and infrastructure, such as water tanks and towers, be built to high wind-resistant standards. All public and essential service buildings in Carroll County are still at risk from a direct strike from a tornado; however, there is nothing to indicate those buildings are more vulnerable than any other building in the County. With the unpredictable nature of tornadoes and the possibility of tornado damage, it is essential to have designated safe rooms in all public and essential service buildings.
To further demonstrate how tropical storms have moved inland over a longer period of time (since the 1959s), the figure below shows events that traveled a path across Carroll County even though only three events are documented by NCEI.

Figure C.14 – Tropical Storm/Hurricane Events – Historical Crossings | Source: NCEI



Wildfire

Location and Extent

The Carroll County land area includes approximately 263,067 acres of forested land, which is equal to 64.7% coverage as a percent of total land area. County forestland data a was derived from the 2019 Forestland Inventory conducted by Mississippi Forestry Commission's and is shown in Table C.39, in which Carroll County figures are highlighted.

Table C.39 –2019 Forestland Inventory | Source: www.mfc.ms.gov

County	Total Land Area (Acres)	Forestland			
		Acres	Coverage (%)	Pine	Hardwood
Attala	471,597	284,817	60.4	49.1	41.3
Bolivar	279,658	86,465	30.9	0.0	100.0
Carroll	405,982	263,067	64.7	22.5	68.5
Holmes	488,932	197,380	40.3	15.1	84.8
Humphreys	275,892	30,268	10.9	0.0	100.0
Leflore	387,967	57,537	14.8	0.0	100.0
Montgomery	260,948	161,110	61.7	36.1	54.2
Sunflower	452,541	23,174	0.05	0.0	100.0
Washington	487,198	74,984	15.3	0.0	100.0

The Wildfire discussion in the Base Plan mentioned an analysis of the change in total forestland area from the previous plan shows the total acreage and percent of coverage has continued on a declining trend in all of Mississippi's District 3 counties, with Attala (-23.2%) and Holmes (-22.8%) Counties showing the greatest decline in forested land. The average loss of the other seven District 3 counties, including Carroll County, was 5.43 percent. Most forested land in the planning area is under private ownership.

Previous Occurrences

Local weather, drought conditions, vegetative cover and topographic conditions may assist in the determination of the possible future forecast of wildfires. However, wildfires are difficult to predict due to the variables in how and when they start. Documenting fire events is not consistent across the planning region with the local fire departments. The NOAA National Centers for Environmental Information (NCEI), Storm Events Database, shows no locally reported wildfires in the fifty-nine years between January 1, 1960 and December 1, 2019 for any of the District 3 counties.

Table C.40 captures wildfire data for each D3 county for the period 2014 to 2019. Carroll County data is highlighted.

Table C.40 – Wildfire Data Wildfire Data 2014 to 2019 | Source: Mississippi Forestry Commission (April 20, 2020)

County	2019		2018		2017		2016		2015		2014	
	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned
Attala	28	782	21	392	38	468	59	1,170	52	597	32	187
Bolivar							1	80				
Carroll	**5**	**18**	**4**	**32**	**13**	**172**	**24**	**387**	**24**	**268**	**16**	**83**
Holmes	13	87	15	522	27	532	39	432	43	441	36	486
Humphreys												
Leflore	-	-	-	-	-	-	1	22	6	150	-	-
Montgomery	4	34	-	-	1	7	14	139	12	154	8	135
Sunflower	-	-	-	-	-	-	1	-	-	-	-	-
Washington	1	5	-	-	1	32	-	-	1	8	1	40

Information provided by the Mississippi Forestry Commission indicates wildfires may occur during any season. However, since 2012 the worst fires (determined by the number of acres burned) have occurred in late Summer and early Fall. The data presented in Table C.40 also indicates the differences in total fires and acreage burned from year to year and county to county.

Probability of Future Occurrence

A review of Carroll County data along will help in the discussion of future probability of wildfire events. In addition to showing the number of events and acres burned each year, mean and median averages are given to help

Table C.41 – Mean and Median Averages for Carroll County, Number of Fires and Acres Burned | Source: Mississippi Forestry Commission

Total Fires	2019	2018	2017	2016	2015	2014	Total	Mean	Median
Total Fires	5	4	13	24	24	16	86	14	11
Acres Burned	18	32	172	387	268	83	960	160	125

It is difficult to develop probability of wildfire occurrence due to the range of elements that "set the stage" for an event. Looking at historic figures for Carroll County incidents, it appears in any given year there is a potential for at least 4 fires to develop and burn 18 acres. Looking at the mean and median averages suggests a probability between 11 and 14 events will occur, and these events will burn between 125 and 160 acres.

Assessing Vulnerability

Wildfires pose a threat to all areas of Carroll County, where almost 65% of acreage is forestland. Current mitigation of the fire hazard includes regular thinning of vegetative fuel, but the County Emergency Management Department works closely with County and local fire departments to educate the public about issues such as backyard burning can lead to wildfire. Carroll County data included in Table C.38 (Residences and Structures Threatened and or Destroyed by Wildfire Since 2015) shows many residences, commercial structures, and outbuildings have been threatened by wildfire but only one of these structures was destroyed.

C.42 - Structures Threatened and Destroyed by Wildfire | Source: Mississippi Forestry Commission

County	Residences Threatened	Residences Destroyed	Commercial Building Threatened	Commercial Building Destroyed	Outbuilding Threatened	Outbuilding Destroyed
Carroll	113	0	45	0	33	1

Figure C15.a through Figure C.15d are screen shots from the web site of the Southern Group of State Foresters public portal showing Southern Wildfire Risk (www.southernwildfirerisk.com). Shown are unincorporated Carroll County and areas located in the Wildfire Urban Interface (WUI). Areas shown in yellow are at moderate risk for wildfire, and the segments marked in red, while showing higher vulnerability, are considerably smaller in size.

Table C.15a – Carroll County Jurisdictional Vulnerability to Wildfire | Source: Southern Wildfire Risk Portal

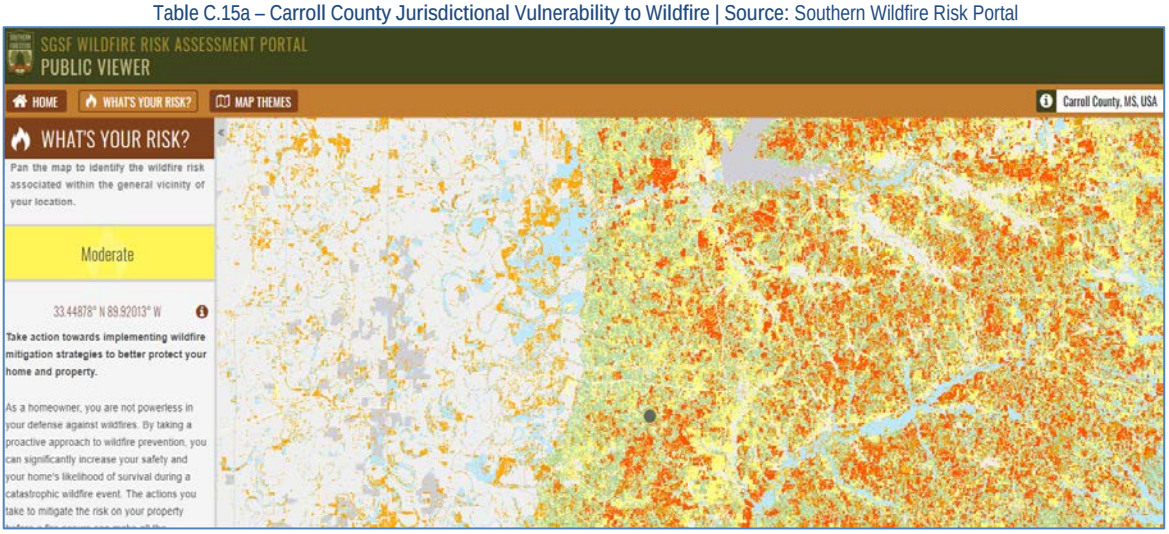


Table C.15b – Town of Carrollton Jurisdictional Vulnerability to Wildfire | Source: Southern Wildfire Risk Portal

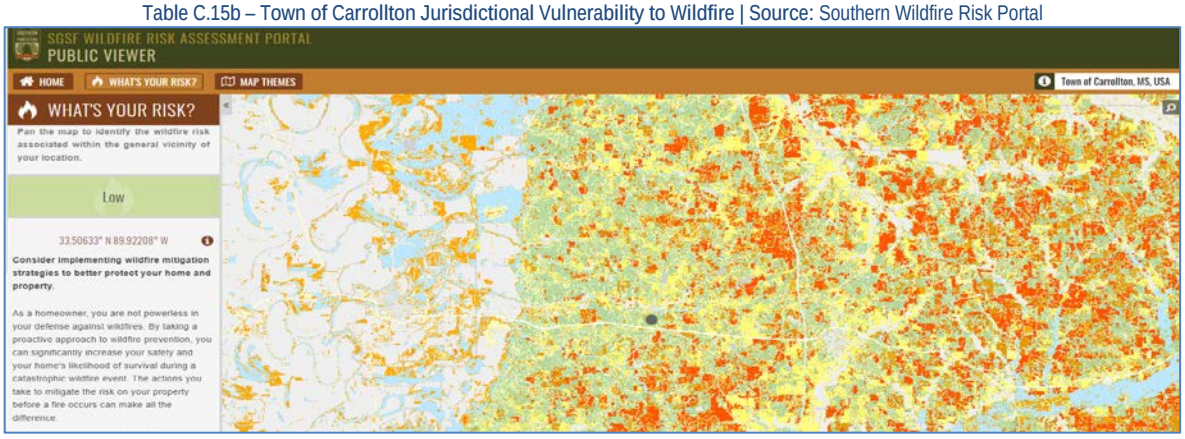


Table C.15c – Town of North Carrollton Jurisdictional Vulnerability to Wildfire | Source: Southern Wildfire Risk Portal

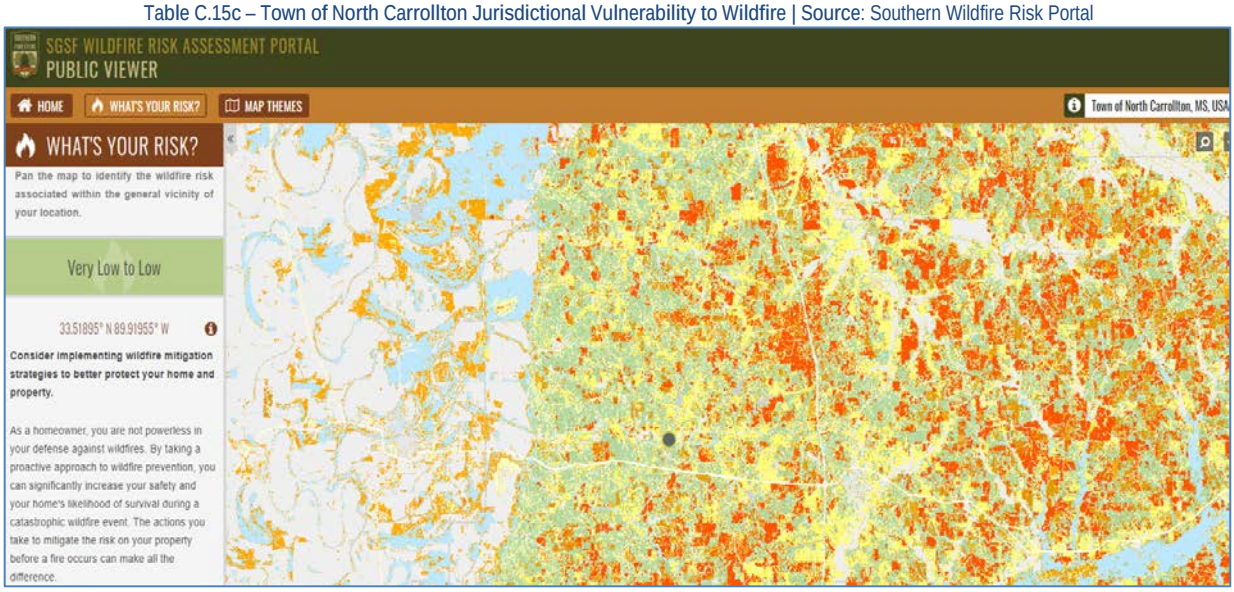
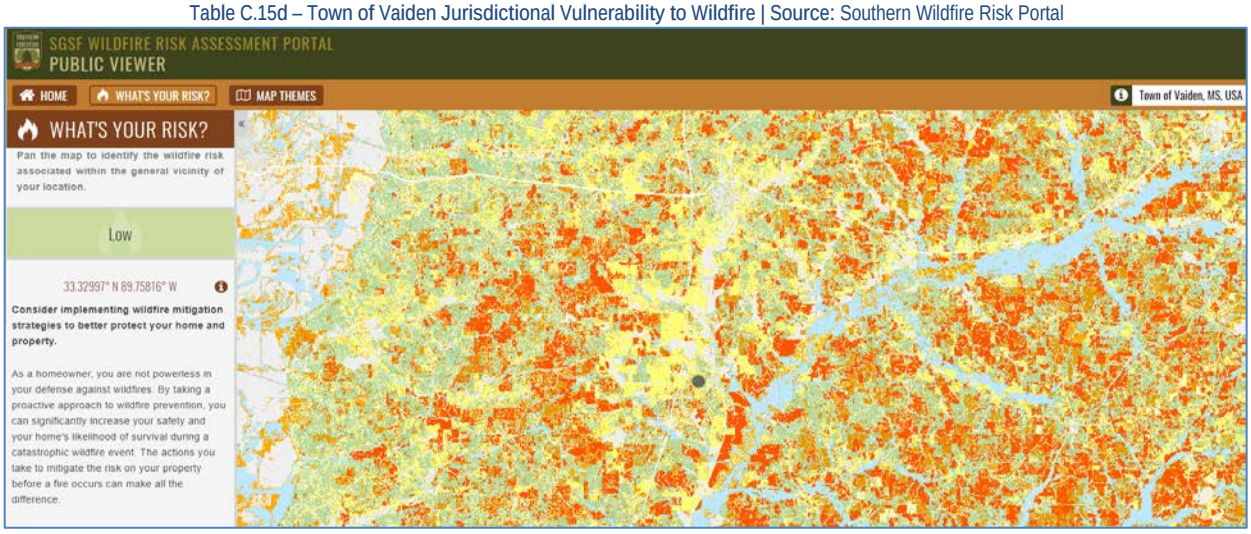


Table C.15d – Town of Vaiden Jurisdictional Vulnerability to Wildfire | Source: Southern Wildfire Risk Portal



Wildfire could impact the community by overextending personnel and financial resources of local emergency response crews and create a need to evacuate residences and businesses. The County's vulnerability to county-wide wildland fire hazard is mitigated somewhat by the presence of fire stations in most parts of the county, as well as the presence of a Sheriff's Office, which serves as an alternate EOC and personnel to augment those resources of fire stations.

Table C.43 below summarizes the risk of Carroll County and each of its jurisdictions to wildfire based on information from the SGSF portal.

C.43 -Rating of the Wildfire Hazard by Carroll County Jurisdictions

Jurisdiction	Ranking
Unincorporated Carroll County	Medium
Town of Carrollton	Low
City of North Carrollton	Low to Very Low
Town of Vaiden	Low
Overall, Carroll County Vulnerability to Wildfire	Low

The places most vulnerable to wildfires are forested areas in unincorporated areas of Carroll County. Current mitigation of fire hazard includes regular thinning of trees and removal of dead limbs and underbrush.

Impacts to Life and Property: Those who live and work in substandard wood structures are vulnerable to wildfire, especially for structures located near the WUI. Healthy and frail populations are all vulnerable to air pollution and smoke inhalation that occur during a fire and may spread for a distance of many miles from the actual event. Fire effects homes, businesses, crops, and people, especially special populations who may not be able to quickly evacuate the region near an incident.

Impacts to Natural Resources*:* Carroll County's extensive forestland acreage is subject to fire damage, as are decorative landscaping, agricultural lands, wildlife, and farm animals. Again, it's important to note the degree to which the area's beauty fosters local historic tourism. Sources of water may become dried up as a result of drought conditions would be at risk to further degradation should a fire cross their path.

Impacts to Critical Facilities: Fortunately, many types of critical facilities are built underground or away from WUI centers. Still, any structure in the path of an uncontrolled fire could be damaged, including fire stations, municipal buildings, wastewater treatment plants, and other essential services buildings. It would be catastrophic if a fire occurred near the gasoline storage unit of a municipal roads department that maintains gas tanks to fuel its road equipment. A structure such as this, if ignited, could potentially cause widespread damage.

Impact on Future Development: The efforts of public and non-profit water associations ensure that there will always be water available for firefighting and structural protection, particularly in rural areas of the County. Fire stations and districts are not manned on a full-time basis but rely on volunteers, with assistance from Forestry Service personnel and the Sheriff's Office, to fight wildfires. Firefighting capacity may need to be enhanced should the community reach a point where future development includes significant numbers of residents or large industrial assets.

Hazardous Material Incidents

Location and Extent

Many hazardous and toxic materials are transported through areas of Carroll County on 18- wheelers via Interstate 55. The area is also served by U.S. Highways 82 and 51, and Mississippi State Highways 17, 35, and 304. The proximity of these transportation routes increases the risk to those living and working within in a five-mile radius of an area where hazardous materials are transported, or where a hazardous materials spill may occur. A secondary risk to a transportation accident involving hazardous materials is potential for the hazard explosions and fires.

Previous Occurrences

The Toxic Release Inventory maintained by the U.S. Environmental Protection Agency (EPA) shows no recorded incidents of hazardous materials incidents in Carroll County in recent years. Its 2018 Report was updated in April 2020.

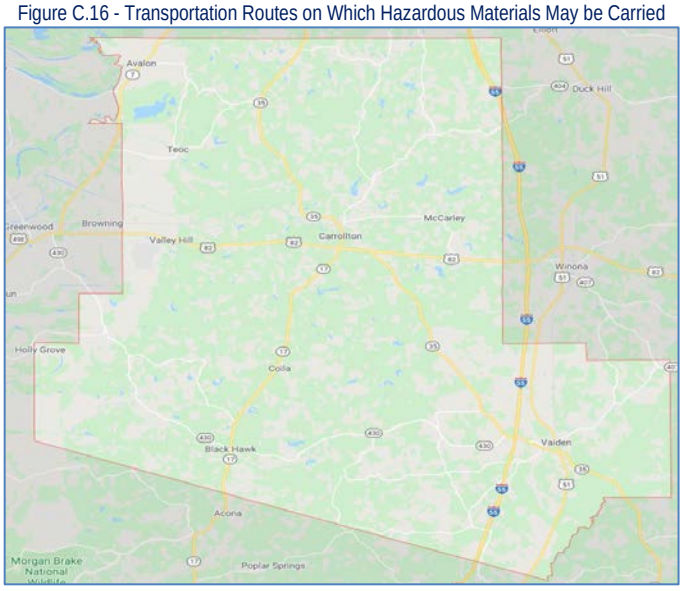
Probability of Future Occurrence

Carroll County is susceptible to an event of this type given a major interstate highway and other major state and local roadways pass through the county. Areas where such incidents may occur are discussed under Addressing Vulnerability. It is not possible to discuss numerical probability without historic data.

Assessing Vulnerability

The Google map shown as Figure C.16 below indicates where the interstate highway and other major roadways cross Carroll County.

Figure C.16 - Transportation Routes on Which Hazardous Materials May be Carried



Carroll County is vulnerable to Hazardous Materials incidents involving transportation accidents along I-55, and Highways 51 and 82. An area of the county known as Beat 4, which includes - Highway 430 and unincorporated Valley Hill, are vulnerable areas, as are the Towns of Carrollton and North Carrollton given their location near Highway 35. The Town of Vaiden, is vulnerable to hazardous materials incidents that may be caused by transportation accidents along I-55, U.S. Highway 51, and Mississippi Highway 35. Highway 35 crosses Big Black River, so an accident at this location could cause long-term environmental damage. The CN Railroad passes through eastern Vaiden and frequently transports hazardous materials. At least three (3) train derailments are on record as having occurred in the Vaiden area.

Impacts to Life and Property: A hazardous materials incident could create a need to evacuate people from their homes and businesses. Chemicals released during such an incident could cause injury or death from exposure. Property sprayed with hazardous elements would need to be rehabilitated before it is considered habitable. Fortunately, outside of the townships, the population is widely dispersed and likely will not be affected by such incidents.

Impacts to Natural Resources: Depending on the incident location and type of natural resources located nearby, Carroll County's forestland and agricultural acreage may be harmed by a hazardous substance that drifts far from the incident center. If hazardous materials spill into water sources, drinking and crop water may be affected.

Impacts to Critical Facilities: If a hazardous materials incident occurs on a major roadway or railway, a hazmat team will be called to clean up after such a spill. First responder and government facilities are often located near major transportation routes, so each location should include hazardous materials incidents in its preparedness plan.

Summary of Risk Assessment

Table C.9, shown at the beginning of discussion of Carroll County hazards, is presented here as Table C.44 with additional information.

Table C.44 - Total of Carroll County Hazard Events and Damages | Source: NCEI

Hazard Type	No of Events	Death	Injury	Property Damage	Crop Damage	Total Damage
Dam/Levee Failure	-	-	-	-	-	$ -
Drought	12	-	-	$ 60,000.00	$ 3,821,000.00	$ 3,881,000
Earthquake	-	-	-	-	-	$ -
Excessive Heat / Heat	5	-	-	-	-	$ -
Expansive Soil	0	-	-	-	-	$ -
Flood	25	-	-	$ 1,026,000.00	$ 150,000.00	$ 1,176,000
Severe Storm	186	1	-	$ 6,997,600.00	$ 726,500.00	$ 7,724,100
Severe Winter Weather	6	-	-	$ 330,000.00	-	$ 330,000
Tornado	9	-	-	$ 915,000.00	$ 720,000.00	$ 1,635,000
Tropical Storm/ Hurricane	3	-	-	$ 1,010,000.00	$ 15,050,000.00	$ 16,060,000
Wildfire *	-	-	-	-	-	$ -
Totals	246	1		$ 10,338,600.00	$ 20,467,500.00	$ 30,806,100.00

* Damage estimates not available

This data shows, in terms of number and frequency, severe storms are the most regularly occurring and the most damaging to Carroll County property and crops. Of the $30,806,100 in total damages from 247 events occurring between 2000 and 2019, crop damage represents roughly twice the dollar amount of damage as that of personal property. The Mississippi Department of Revenue 2018 Annual Report showed there was a 2017 a total Carroll County property assessment value of $85,474,871. A severe hazard event causing damage to 10 percent of property would cause damage in the amount of $8,547,487 in property damage. Assuming crop damage associated with such an event might run twice this amount, it can be anticipated damage would total approximately $17,094,974, and overall damage could run as high as $25,64,461 between property and crop damage. Figures could vary widely depending on event type, location, magnitude, and extent.

C.3 Capability Assessment

This section assesses Carroll County's capability to implement hazard mitigation activities. More detailed information on the purpose and methodology used to conduct the capability assessment can be found in Section 5 of the Base Plan (Capability Assessment).

Planning and Regulatory Capability

The findings of the Planning and Regulatory section of capability assessment are described in the table below, which provides a jurisdictional overview of the plans and programs in place. After this, there is a summary from the *Local Capability Assessment Surveys* each county and municipality were asked to complete.

Table C.45 - Relevant Plans, Ordinances and Programs

Jurisdiction	Comprehensive / Master Plan	Capital Improvements Plan	Economic Development Plan	Emergency Operations Plan	Continuity of Operations Plan	Transportation Plan	Stormwater Management Plan	Community Wildfire Protection Plan	Historic Preservation Plan	Building Codes	Fire Department ISO (Rating)	Site Plan Review Requirements	Land Use Plan	Zoning Ordinance	Subdivision Regulation	Flood Damage Prevention Ordinance	Flood Insurance Studies	National Flood Insurance Program	Community Rating System (Rating)
Carroll County		✓	✓	✓	✓			✓			10							✓	
Carrolton	✓			✓	✓					'12	8		✓	✓				✓	
North Carrollton				✓	✓						8							✓	
Vaiden				✓	✓						8							✓	

Emergency Management Capabilities

Hazard Mitigation Plan: A hazard mitigation plan is a community's blueprint for reducing the impact of natural and human-caused hazards on people and the built environment. Plan elements include a risk assessment, capability assessment and mitigation strategy. Carroll County jurisdictions participated in the development of the 2020 Regional Hazard Mitigation Plan (RHMP) Update and are committed to its implementation.

Emergency Operations **Plan**: An emergency operations plan outlines responsibility and the means by which resources are deployed during and following an emergency or disaster. Survey results indicate Carroll County and the Towns of Carrolton, North Carrolton, and Vaiden all have emergency operations plans.

Continuity of Operation Plan: A continuity of operations plan establishes a clear chain of command, line of succession, and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster. Municipalities also work closely with the Carroll County Emergency Management Department. Survey results indicate Carroll County and its communities have a Continuity of Operations Plan.

General Planning Capabilities

The implementation of hazard mitigation activities often involves individuals beyond the emergency management profession. Stakeholders may include local planners, public works officials, economic development specialists and others. Similarly, hazard mitigation planning cuts across multiple disciplines. As a result, the questions asked in the Local Capability Assessment Survey regarding general planning capabilities were designed to measure the degree to which mitigation is integrated into other planning efforts.

Comprehensive Plan: A comprehensive plan establishes the overall vision for a community and helps to guide municipal decision-making. Survey results indicate the Town of Carrollton has a comprehensive plan and the Carroll County Development Association developed a strategic plan that includes the County and its municipalities.

Economic Plan: An economic plan serves as a road map for economic development decision making, based on the collection of statistical data, historical perspective, and human potential. Survey results indicate Carroll County has an economic development plan.

Community Wildfire Protection Plan: The community wildfire protection plan is a strategic plan that identifies wild land fire issues facing the community and outlines prioritized mitigation actions. Survey results indicate Carroll County has a Community Wildfire Protection Plan (CWPP).

Transportation Plan: A transportation plan identifies the means to gauge transportation demands and the options to meet those needs, while considering the social, economic and environmental characteristics of the area. The development of transportation networks can significantly impact the amount, type and location of future growth. As a result, transportation planning can have a dramatic impact on future hazard vulnerability. Survey results indicate no jurisdictions have a transportation plan.

Capital Improvements Plan: A capital improvements plan guides the scheduling of spending on public improvements. A capital improvements plan can serve as an important mechanism to guide future development away from identified hazard areas. Limiting public spending in hazardous areas is one of the most effective long-term mitigation actions available to local governments. Survey results indicate Carroll County has a capital improvement plan.

Historic Preservation Plan: A historic preservation plan is intended to preserve historic structures or districts within a community. An often-overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards to include the identification of the most effective way to reduce future damages. This may involve retrofitting or relocation techniques accounting for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of harm's way.

Survey results indicate one of the goals of the Carroll County Development Association is to maintain the quality and number of historic assets that contributed to both the community lifestyle, and to a thriving local industry built on historic tourism.

Zoning Ordinances: As part of a community's police power, zoning is used to protect the public health, safety and welfare. A zoning ordinance is the mechanism through which zoning is typically implemented. Since zoning regulations enable municipal governments to limit the type and density of development, it can serve as a powerful tool when applied in identified hazard areas. Survey results indicate the Town Carrollton has a zoning ordinance.

Subdivision Ordinances: A subdivision ordinance is intended to regulate the development of housing, commercial, industrial or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development. Survey results indicate the Town of Carrollton has a subdivision ordinance.

Building Codes, Permitting and Inspections: Building codes regulate construction standards. Decisions regarding the adoption of building codes, the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community. Survey results indicate the Town of Carrollton has building codes, permitting and inspections.

Floodplain Management Capability

Flooding represents the greatest natural hazard facing the nation and one that greatly affects the planning area. At the same time, the tools available to reduce the impacts associated with flooding are among the most developed when compared to other hazard-specific mitigation techniques.

Storm Water Management Plan: A storm water management plan is designed to address flooding associated with storm water runoff. The storm water management plan is typically focused on design and construction measures intended to reduce the impact of more frequently occurring minor urban flooding. Survey results indicate no jurisdictions have Storm Water Management Plans.

Flood Damage Prevention Ordinance/NFIP participation: A local Flood Damage Prevention Ordinance is a tool used by counties and municipalities to regulate the type of construction that occurs in the floodplain. If a community is an NFIP participant, a Flood Ordinance or Court Order is in place. Survey results indicate no jurisdictions have flood damage prevention ordinances plans.

Table C.46 and Table C. 47 summarize information from the NFIP database of participating jurisdictions within Carroll County. This is the most recently available information and it comes from the two most recent SHMPs. The data is presented slightly differently in each plan, so information from both is included here to present a more complete picture of NFIP participation and losses.

Table C.46 - Carroll County NFIP Insurance Losses | Source: NFIP Policy and Loss Statistics as of 3/31/3018, 2018 SHMP

Jurisdiction	NFIP Date	Total Losses	Closed Losses	Open Losses	CWOP Losses	Total Payments to Date ($)
Carroll County	7/3/1978	22	21	0	1	$162,422.68
Carrollton	2/26/2009 E	0	0	0	0	0
North Carrollton	4/3/1978	1	1	o	1	762.10
Vaiden	3/15/1978	2	1	0	1	$35,000.00

Table C.47 - Carroll County NFIP Communities | Source: NFIP Policy and Loss Statistics (3-31-14) and Community Status Report (4-4-14)
2015 Mississippi District 3 Regional Hazard Mitigation Plan

Jurisdicti	NFIP Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date ($)
Carroll County	7/3/1978	14	$3,210,500	20	$157,024
Carrollton	2/26/2009 E	0	0	0	0
North Carrollton	4/3/1978	6	$500,400	1	$762
Vaiden	3/15/1978	3	$137,000	1	$35,000
Totals		23	$3,908,600	22	$192,786

Administrative and Technical Capability

Table C.48 provides a summary of the capability assessment results for Carroll County's administrative and technical capabilities.

Table CA.48 - Administrative and Technical Capability

Jurisdiction	Planning Commission	Participation in Emergency Management Committee (LEPC or other)	Maintenance program to reduce risk (i.e., tree trimming, clearing drainage systems)	Mutual Aid Compacts	Building Inspection Department	Floodplain Manager	Emergency Manager	Community Planner	Civil Engineer	GIS Coordinator	Warning Systems / Services (i.e., reverse 911 / outdoor warning systems)	Grant Writing Capabilities
Carroll County		✓	✓	✓			✓		✓		✓	✓
Carrolton		✓					✓				✓	✓
North Carrollton		✓					✓		✓		✓	✓
Vaiden		✓					✓		✓		✓	✓

Fiscal Capability

Table C.49 provides a summary of the results of the local capability assessment for Carroll County's relevant fiscal resources.

Table C.49 - Relevant Fiscal Resources

Jurisdiction	Capital Improvements Project Funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric services	Impact fees for new development	Stormwater utility fee	Incur debt through general obligation bonds or tax bonds	Incur debt through private activities	Community Development Block Grant (CDBG)	Other federal funding programs	State funding programs
Carroll County	✓	✓				✓		✓	✓	✓
Carrolton	✓	✓	✓			✓		✓	✓	✓
North Carrollton			✓						✓	✓
Vaiden			✓						✓	✓

Education and Outreach Capability

Table C.50 provides the results for the education and outreach capabilities of Carroll County and its jurisdictions.

Table C.50 - Relevant Education Programs and Organizations

Jurisdiction	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Ongoing public education or information programs (e.g. responsible water use, fire safety, household preparedness, environmental education)	Natural disaster or safety-related school programs	StormReady certification	Firewise Community Certification	Public / Private partnership initiatives addressing disaster-related issues
Carroll County	✓		✓			
Carrolton						
North Carrollton						
Vaiden						

The lack of coordinated jurisdictional and countywide mitigation education and outreach resources was identified as a need by all jurisdictions. As such, communities and the County Emergency Management Department have agreed to approach the North Central Mississippi Planning and Development District to help develop a communications and information program using the County web site as its platform. A web page dedicated to this effort would include information on all natural and manmade hazards to which the region is prone. Each jurisdiction could include a hyperlink on its own web site that takes the user to information posted on the County site.

A mitigation action worksheet for this project is included for each jurisdiction as a show of support for this countywide mitigation strategy. The worksheets are included at the end of the Carroll County Annex. This approach to communications and outreach is reasonable in light of the Incident Command Structure used in the event of an emergency. Should a major hazard incident occur, the office of District 3 would contact the Emergency Management Director of each county who, in turn, provides status reports to jurisdictional elected officials. Because communities come together to plan for and respond to disasters, they will use this same approach to collectively develop relevant education and outreach programs that educate communities about how to mitigate against regional hazards of concern.

Conclusions on Local Capabilities

Table C.51 shows the results of the capability assessment using the scoring system included in Section 5 of the Base Plan. The scoring for Carroll County was based on information from the local capability survey and reviewing existing plans. According to the assessment, the average local capability score for the county and its communities is 26.5 which means their capabilities are rated as moderate.

Table C.51 – Capability Results Summary

Jurisdiction	Overall Capability Score	Overall Capability Rating
Carroll County	32	Moderate
Carrolton	32	Moderate
North Carrollton	21	Limited
Vaiden	21	Limited

C.4 Mitigation Strategy

The participating jurisdictions reviewed the mitigation goals and priorities identified in the County's previous plan. Common elements of the previous mitigation goals were used to develop regional goals designed to foster the implementation of mitigation actions. Refined goals were adopted by the participating jurisdictions. It was determined the priorities for each of the participating jurisdictions had not changed, although the regionwide mitigation goals and objectives were streamlined as discussed in the Base Plan.

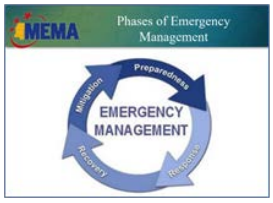
The Mitigation Strategy for Carroll County includes several changes, including those based on the streamlined list of 2020 Regional Goals and Objectives. The table of action items includes mitigation actions identified in the 2015 plan; the outcome of each; how the strategy was updated for the 2020 plan; and newly developed mitigation actions. The 2015 plan included two separate tables of mitigation actions: one table to provide a status update on actions mentioned in the previous plan; and a second table outlining the current mitigation strategy. These have been combined into one table in the current plan update.

Previous plans included a large number of mitigation actions considering the size and available resources of some jurisdictions, including those with only a few hundred residents. An example of this is the fact that most County Emergency Management (EM) directors are the single departmental employee, or they perform their EM duties while functioning in one or more other roles in their community. The same is often true for leadership at the city or town level, where officials may "wear many hats."

Several changes were made to streamline the Mitigation Strategy given the following considerations:

- Actions identified as falling into the Preparedness Phase of the Emergency Management Cycle were removed and recommended for consideration under Preparedness Planning. Examples of this include disaster preparedness initiatives (such as providing weather radios to residents) and NIMS training, which represent actions a community normally does to prepare for a hazard event.

- The image at right, developed for a MEMA presentation, clearly delineates EM agencies operationally function under four phases of emergency management, although sometimes the phases run concurrently. Professional emergency managers and their Emergency Support Functions (ESF), units called up during disaster response, develop specific plans and actions to as appropriate for each event phase.



- Actions identified as being required as part of the FEMA Hazard Mitigation Planning Process were removed because these are fully spelled out under the Plan Maintenance section of the Base Plan. Examples of this include reviewing the mitigation plan and meeting to discuss needed plan updates after a disaster occurs in the community.

- It was recommended actions identifying similar activities be combined into one action. For example, there were previously separate action items for educating the public about natural hazards and about manmade (technological, biological, health-related) hazards. A single outreach plan using multiple communications channels can incorporate education about all hazards to all audiences if the outreach plan is fully developed.

- In some instances, description of previous actions was shortened for plan readability.
- Most action items were identified by all jurisdictions. In these cases, a countywide action was recommended developed that would be jointly implemented by all participating jurisdictions.

It is hoped that the streamlined mitigation strategy a useful tool for the District 3 Counties and its jurisdictions to implement.

Progress Made on Mitigation Strategies and Updated Mitigation Strategy

Carroll County jurisdictions have been proactive in implementing mitigation strategies identified in their previous plan. Actions listed have been sorted so that deleted actions appear at the end of each jurisdictional listing. They are highlighted, and a reason for deletion is listed in the column labeled "2020 Status." This column includes use of the following designations to show action status:

Designation	Meaning	Description
D	Deleted	Action was deleted from the plan for the reason described under the Column 2020 Status Description
N	New	New action for the 2020 Plan Update
R	Retained	Action previously included in the 2015 plan, with a description of how it will be continued in the 2020 plan

In the column labeled *Implementation Timeframe*, initiatives listed as "Continuous Action" refers to an ongoing action that has been initiated but not completed.

The participating jurisdictions reviewed the mitigation goals and priorities identified in the County's previous plan. Common elements of the previous mitigation goals were used to develop regional goals designed to achieve the implementation of mitigation actions. These refined goals were adopted by the participating jurisdictions. It was determined the priorities for each of the participating jurisdictions had not changed.

Table C.52 - Mitigation Action Plan: Carroll County and its Municipalities

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
CC-1	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards.	Carroll County	County EMA	All	Undetermined	R	Conduct a study of public critical structures and infrastructure to determine needs and cost; prioritize projects according to need, and consider options such as shatterproof glass, enhanced frames, roofing, and elevation.	2020-2025	1.1	H	HMGP, CGBG, General budget	2015
CC-2	Mitigate deficient/obsolete bridges	Bridges throughout District 3 are not designed to withstand seismic activity and/or are classified as structurally deficient or functionally obsolete by the national bridge inventory. Work with applicable local, federal and state agencies to develop a priority system for improvements.	Carroll County	County EMA, Public Works	Earthquake, Flooding	Undetermined	R	Study area roadways to identify priority road and bridge improvements; prioritize based on community need	2020-2025	1.1	M	MDOT, FHWA, State Aid	2015
CC-3	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events	Carroll County	County EMA	Flood	Undetermined	R	Develop a Stormwater Management Plan to include components for stormwater convenience and detention structures.	Continuous Action	1.1	L	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
CC-4	Create defensible space around structures and infrastructure	Implement defensible space programs to reduce risk to structures and infrastructure such as replacing flammable vegetation with less flammable species to create defensible zones around buildings, gas lines and other infrastructure.	Carroll County	County EMA	Wildfire		R	Develop Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.1	L	General budget	2015
CC-5	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Lightning strikes can create outages to essential county water and sewer services as well as invite unnecessary damage to county facilities.	Carroll County	County EMA	Severe Storm	Undetermined	R	Identify and prioritize critical facilities requiring installation of lightning protection system, starting with water and sewer facilities	2020-2025	1.1	M	General budget	2015
CC-6	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	Carroll County	BOS, Public Works	Human Infectious Disease (WNV/ other vector-borne illnesses	Undetermined	R	Incorporate community education under overall mitigation public outreach	Continuous Action	1.1	H	General budget	2015
CC-7	Continue efforts on mitigating Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Monitor status of properties affected by flooding and research funding for acquisition of structures. Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Carroll County	County EMA	Flood	Undetermined	R	Monitor status of properties affected by flooding and research funding for acquisition of structures	Continuous Action	1.1	L	Carroll County EMA, BOS, MEMA	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
CC-8	Update drainage systems and culverts	Monitor locations that have been identified as having drainage issues, including new areas identified as growth and land changes occur. Locations include the following county roads: 282, 286, 186, 193, 349, 75, 183, 53, 166, 8, 33, 61, 430	Carroll County	County EMA, BOS, MEMA	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for drainage systems and culverts. Other areas may be identified over time as growth and land changes occur.	2020-2025	1.1	L	General budget	2015
CC-9	Install safe rooms in unserved areas of the community.	Work with the Towns of Carrollton, North Carrollton, and Vaiden to discuss project locations, logistics, funding, and timetable.	Carroll County	County EMA, Mayors	Tornado, Severe Storm	Undetermined	New	Review locations of safe rooms, identify needed facilities, and prioritize funding.	2020-2025	1.2	H	HMGP, Local budget	New 2020
CC-10	Storm proof/retrofit new critical facilities and infrastructure	New public buildings/infrastructure should include advanced mitigation techniques when practical, such as roof and foundation supports, shutters, shatter-proof windows/doors, etc..	Carroll County	BOS, County EMA, MEMA	All	Undetermined	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meet IBC standards to withstand all hazards.	2020-2025	1.2	L	General budget	2015
CC-11	Build/promote stormwater detention ponds when appropriate	Use ponds as a vehicle for stormwater management	Carroll County	Public Works, Engineers	Flood	Study to determine	R	Develop a Stormwater Management Plan, which would include a detention pond component.	Continuous Action	1.2	L	General budget	2015
CC-12	Apply for grants to install generators to support existing or	Generators are essential for providing continual operations in the event of a disaster.	Carroll County	County EMA	All	Undetermined	R	Identify and prioritize facilities needing generators.	2020-2025	1.3	H	HMGP, General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
	new facilities/ infrastructure.												
CC-13	Develop Critical Infrastructure and Key Resources database (CIKR)	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities and infrastructure for the County and its jurisdictions.	Carroll County	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	All	Undetermined	R	Determine status of State CIKR initiative. Action would enhance database of community CIKR assets. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped.	2020-2025	2.1	L	General budget	2015
CC-14	Develop Community Wildfire Protection Plan (CWPP)	The Healthy Forests Restoration Act (HFRA) provided communities with a tremendous opportunity to influence where and how federal agencies implement fuel reduction projects on federal lands. A Community Wildfire Protection Plan (CWPP) is the most effective way to take advantage of this opportunity.	Carroll County	County EMA, Fire Department	Wildfire	Undetermined	R	Communities with Community Wildfire Protection Plans in place will be given priority for funding of hazardous fuels reduction projects carried out under the auspices of the HFRA.	2020-2025	2.1	M	MFC, general budget, State Fire Marshall	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
CC-15	Develop/update Emergency Action Plans (EAPs) for high and significant hazard dams	An Emergency Action Plan (EAP) is a formal document that identifies potential emergency conditions at a dam and specifies preplanned actions to be followed in order to minimize property damage or loss of life in the case of a dam failure. An EAP is required for all High Hazard and Significant Hazard dams. Coordinate the development of an EAP for the following high and significant hazard dams classified by the MDEQ Dam Safety Division.	Carroll County	County EMA, Dam Owners, BOS	Dam Failure	Undetermined	R	Retain and implement for the following dam locations: Y-34-03, Y-34-11, Y-34-12, Y-32-02, Y-32-10, Y-32-17, Y-32.19, Y-31a-12, Y-34-08, Y-33a-01 Review the EAPs for other high and significant hazard dams to determine if updates are necessary due to population and land use changes.	2020-2025	2.1	H	General funds, HMEP, MDEQ	2015
CC-16	Become a Firewise Community	The Firewise program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in the effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding.	Carroll County	County EMA, Fire Department	Wildfire	N/A	R	Review requirements to become a Firewise community and take initial efforts toward becoming certified. Form a committee and create an action plan based on assessment, conduct a Firewise day event, and submit an application to State Firewise liaison.	2020-2025	2.1	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
CC-17	Develop/update Stormwater Management Plan	Include six measures, including: Public Education and Outreach, Public Participation and Involvement, Managing Illicit Discharge Detection and Elimination, Controlling Construction Site Runoff Control, Controlling Post-Construction Runoff, and Pollution Prevention/Good Housekeeping.	Carroll County	County Public Works, Engineers	Flood	Undetermined	R	Develop a countywide stormwater management plan that includes improvements to all structures -- culverts, drainage, stormwater conveyance, detention ponds, and related installations.	Continuous Action	2.1	L	General budget	2015
CC-18	Develop/Update the Comprehensive Plan to include hazard mitigation strategies/goals	The County has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the County and includes any changes in future development areas.	Carroll County	BOS, Applicable Departments	All	N/A	R	Review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	2020-2025	2.2	H	General budget	2015
CC-19	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies.	The County has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards and future development.	Carroll County	BOS, Applicable Departments	All	N/A	R	Review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review. Provide copy of Updated RHMP as guidance.	Continuous Action	2.2	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
CC-20	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analyses, etc.	Carroll County	County EMA, BOS, applicable departments	All	General budget	R	Review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review. Provide copy of Updated RHMP as guidance.	Continuous Action	2.2	H	General budget	2015
CC-21	Improve/maintain participation in the National Flood Insurance Program and the Community Rating System	Carroll County participates in NFIP but not CRS	Carroll County	County EMA, Public Works, Engineers, MEMA	Flood	N/A	R	Consider actions necessary to join CRS.	Continuous Action	2.3	M	General budget	2015
CC-22	Continue efforts on public information and awareness for natural hazards.	The County has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient. Continue to provide information on all hazards that may include but not be limited to educational information, evacuation routes/procedures, workshop/training programs, alert systems and such.	Carroll County	County EMA, North Central MS PDD	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
CC-23	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non- natural hazards. Identify areas/groups within the County that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the County's web page.	Carroll County	County EMA	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015
CC-24	Promote workshops for emergency preparedness and continuity of operation plans	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations.	Carroll County	County EMA	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	H	General budget	2015
CC-25	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their own interests or for the interest of the whole community is needed.	Carroll County	County EMA	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders.	Continuous Action	3.2	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
CC-26	Install / maintain severe weather warning systems	Weather warning system(s) complement the methods of warning already used by the County Emergency Operations Center and the National Weather Service. Identify site locations and develop cost estimates as needed. For installed sirens, provide routine testing and inspection.	Carroll County	Carroll County EMA	Severe Storm, Tornado	$35,000	D	Move to Preparedness Planning initiative	Continuous Action	1.1	H	HMGP, General budget	2015
CC-27	Support the installation of a NEXRAD Doppler Radar site within District 3	Storm systems in the delta region are not always detected due to limitations in range from the Doppler radar sites located in Little Rock, AR; Memphis, TN; and Jackson, MS.	Carroll County	Carroll County EMA	Severe Storm, Tornado	$10-20 million	D	Move to Preparedness Planning initiative	Continuous Action	1.1	H	HMGP, General budget	2015
CC-28	Develop a weather radio program for vulnerable populations	Public Education and Awareness	Carroll County	Carroll County EMA	All	Undetermined	D	Move to Preparedness Planning	Continuous Action	1.1	L	District 3 EMA Directors, MEMA, Private Industries, NWS	2015
CC-29	Implement / maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and roadways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris.	Carroll County	County EMA	Severe Storms, Tornado, Winter Weather	General budget	D	Remove. Routine maintenance is not considered mitigation.	N/A	!.5	M	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
CC-30	Participate in local and statewide studies, workshops and committees that address the all hazards prone within District 3	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the community.	Carroll County	County EMA, Planning Department, Building Official	All	General budget	D	Moved to Preparedness Planning	Continuous Action	1.6	M	General budget	2015
CC-31	Update the Comprehensive Emergency Management Plan (CEMP)	A CEMP provides for the preparation for and the carrying out of all emergency functions to mitigate, prepare for, respond to, and recover from emergencies and disasters, and to aid victims suffering from injury or damage, resulting from disasters caused by all hazards, whether natural, technological, or human caused, and to provide support for search and rescue operations for persons and property in distress.	Carroll County	County EMA	All	Undetermined	D	Moved to Preparedness Planning	Continuous Action	2.1	M	DHS, EMPG	2015
CC-32	Develop a Commodity Study Flow	Based on the high level of hazardous material passing through the region, assemble a committee to determine if a Commodity Flow Study would benefit the County's overall preparedness and response efforts as it relates to hazard material incidents.	Carroll County	Fire Department, EMA	Hazard Material Incidents	Undetermined	D	Move to Preparedness Planning. Appoint a group to conduct Commodity Flow Study as part of County's overall preparedness and response efforts to hazard material incidents.	Continuous Action	1.6	L	$50,000-$75,000	2015

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CC-33	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county/city.	Carroll County	County EMA	All	General budget	D	Move to Preparedness Planning	Continuous Action	2.3	L	General budget	2015
CC-34	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local agency level. Conduct training and verify new employees are integrated into the training programs as necessary	Carroll County	County EMA	All	Staff time	D	Move to Preparedness Planning	Continuous Action	2.3	L	General budget	2015
CC-35	Update the District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44 §206 – communities are required to update their hazard mitigation plan every five years to remain eligible for disaster assistance. Coordinate plan update with the MEMA Mitigation Planning Bureau and the participating jurisdictions in District 3 to schedule plan updates as they become due.	Carroll County	County EMA	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Annually review the plan in anticipation of five-year update	2.4	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
CC-36	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Each disaster presents varying degrees of impacts - no two storms are alike. The city can gain valuable data and insight into impacts as they occur to assess and define appropriate actions in the way of implementing an existing mitigation action or identifying a new need.	Carroll County	County EMA	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Continuous Action	2.4	H	General budget	2015
CC-37	Conduct annual reviews of the District 3 Regional Hazard Mitigation Plan	As defined in the plan maintenance section of this plan, the chairman of the hazard mitigation committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs.	Carroll County	County EMA	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Continuous Action	2.4	H	General budget	2015
CC-38	Pursue training and funding opportunities for mitigation actions	Funding options for actions identified in this plan should be explored and pursued. Coordination with public works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the city from obtaining grants through the HMA.	Carroll County	County EMA	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Ongoing	2.4	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
Town of Carrollton													
Carr-1	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards.	Town of Carrollton	Mayor, County EMA, MEMA	All	Undetermined	R	Conduct a study of public critical structures and infrastructure to determine needs, cost; prioritize projects according to need	2020-2025	1.1	H	HMGP, CDBG, General budget	2015
Carr-2	Mitigate deficient/obsolete bridges	Bridges throughout District 3 are not designed to withstand seismic activity and/or are classified as structurally deficient or functionally obsolete by the national bridge inventory.	Town of Carrollton	Mayor, Public Works, Community Officials/Engineers, County EMA, MEMA	Earthquake, Flooding	Undetermined	R	Study County and Local roadways to identify priority road and bridge improvements; prioritize based on community need	2020-2025	1.1	M	MDOT, FHWA, State Aid	2015
Carr-3	Continue efforts on mitigating Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Monitor status of properties affected by flooding and research funding for acquisition of structures. Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Town of Carrollton	Mayor, County EMA, MEMA	Flood	Undetermined	R	Apply for HMGP funding to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood. Track RFC/SRL properties not yet and mitigation options with the property owners as funding becomes available.	Continuous Action	1.1	L	Carroll County EMA, BOS, MEMA	2015

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Carr-4	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Particular attention should be given to the neighborhoods of Main Street, the area north of Washington Street; and Lexington Drive on the north side of Highway 82, the latter of which has seen extreme erosion.	Town of Carrollton	Mayor, Drainage Districts, Public Works	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for storm water conveyance and detention structures	Continuous Action	1.1	M	General budget	2015
Carr-5	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	Town of Carrollton	Mayor, Public Works	Human Infectious Disease	Undetermined	R	Incorporate into Public Education and Outreach	Continuous Action	1.1	H	General budget	2015
Carr-6	Update drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events. Main and Lexington Streets have been identified with drainage issues. Other areas may be identified over time as growth and land changes occur. These areas should be addressed as funding and opportunities arise.	Town of Carrollton	Mayor, Drainage Districts	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for drainage systems and culverts	Continuous Action	1.1	L	General budget	2015

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Carr-7	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical. Measures may include, but are not limited to roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Carrollton	Mayor, County EMA, MEMA	All	Undetermined	R	Update County and municipal regulations to ensure that new construction of public buildings/ infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	L	General budget	2015
Carr-8	Build/promote stormwater detention ponds when appropriate	Use ponds as a vehicle for stormwater management	Town of Carrollton	Public Works	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a detention pond component	Continuous Action	1.2	L	General budget	2015
Carr-9	Install safe rooms in unserved areas of the community and ensure resiliency of current structures used as safe rooms.	Work with the Carroll County EMA, and the Towns of North Carrollton and Vaiden to discuss project locations, logistics, funding, and timetable.	Carroll County	County EMA, Town Mayors	Tornado, Severe Storm	Undetermined	New	New	2020-2025	1.2	H	HMGP, Local budget	2020
Carr-10	Secure generators for existing and new critical facilities and infrastructure	As funding becomes available, the county will apply for grants to install generators to support existing or new facilities/infrastructure.	Town of Carrollton	Mayor, County EMA, MEMA	All	Undetermined	R	Develop priority list for generator acquisition as funding becomes available	Continuous Action	1.3	H	HMGP, General budget	2015

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Carr-11	Action: Develop Critical Infrastructure and Key Resources database (CIKR)	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.	Town of Carrollton	Mayor, County EMA and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	All	Undetermined	R	Determine status of State CIKR Group. Action will enhance database of CIKR assets within communities	Continuous Action	2.1	M	General budget	2015
Carr-12	Develop/Update the Comprehensive Plan to include hazard mitigation strategies/goals	The Town has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the County and includes any changes in future development areas.	Town of Carrollton	Mayor, Applicable Departments	All	Undetermined	R	Review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	2020-2025	2.1	H	General budget	2015

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Carr-13	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies.	The Town has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the County and includes any changes in future development areas.	Town of Carrollton	Mayor, Applicable Departments	All	N/A	R	Review all planning-related ordinances and initiatives.	Continuous Action	2.2	H	General budget	2015
Carr-14	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analyses, etc.	Town of Carrollton	Mayor, Applicable Departments	All	General budget	R	Review all planning-related ordinances and initiatives. Provide copy of Updated RHMP as guidance.	Continuous Action	2.2	H	General budget	2015
Carr-15	Improve/maintain participation in the National Flood Insurance Program and the Community Rating System	The Town participates in NFIP but not CRS. Research steps to join CRS.	Town of Carrollton	Mayor, County EMA, MEMA Mitigation Bureau	Flood	N/A	R	Consider actions necessary to become a member of the CRS	Continuous Action	2.3	M	General budget	2015

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Carr-16	Continue efforts on public information and awareness for natural hazards.	The Town has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient.	Town of Carrollton	Mayor, County EMA, MEMA, NWS, FEMA, PDD	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015
Carr-17	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non- natural hazards. Identify areas/groups within the County that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the County's web page.	Town of Carrollton	Mayor, County EMA, MSDH, PDD	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015

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Carr-18	Promote workshops for emergency preparedness and continuity of operation plans	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operation plans establishes a clear chain of command, line of succession, and procedures for backup or alternate emergency facilities in case of extreme emergency or disaster.	Town of Carrollton	Mayor, County EMA, PDD	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	H	General budget	2015
Carr-19	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their own interests or for the interest of the whole community is needed.	Town of Carrollton	Mayor, County EMA, PDD	All	N/A	R	Develop public awareness & education campaign about all hazards geared to all stakeholders, families and businesses, using all communications resources.	Continuous Action	3.2	M	General budget	2015
Carr-20	Install/maintain severe weather Warning systems	Weather warning system(s) complement the methods of warning already used by the County Emergency Operations Center and the National Weather Service.	Town of Carrollton	Mayor, County EMA, MEMA	All	$35,000	D	Continue as initiative under Preparedness Planning	Continuous action			Local budget	2015

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Carr-21	Implement / maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and roadways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	Town of Carrollton	Mayor, Road Department, Public Works	Severe Storms, Tornado, Winter Weather	Undetermined	D	Remove from plan, Ongoing maintenance does not qualify as mitigation	Continuous Action		L	General budget	2015
Carr-22	Participate in local and statewide studies, workshops and committees that address the all hazards prone within District 3	New hazards were added to the 2013 plan. Determine how they and cascading impacts may affect the city. Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives	Town of Carrollton	Mayor, County EMA	All	N/A	D	Continuous Action moved to Preparedness Planning initiative as this is not a mitigation action	Continuous Action		M	General budget	2015
Carr-23	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county/city.	Town of Carrollton	Fire and Police Departments	All	General budget	D	Move to Preparedness Planning, not a Mitigation action	Continuous Action		L	General budget	2015

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Carr-24	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local agency level. Conduct training and verify new employees are integrated into the training programs as necessary	Town of Carrollton	Fire and Police Departments	All	Staff time	D	Move to Preparedness Planning, not a Mitigation action	Continuous Action		L	General budget	2015
Carr-25	Update the District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44 §206 – communities are required to update their hazard mitigation plan every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in District 3 to schedule plan updates as they become due.	Town of Carrollton	Mayor, County EMA, MEMA Mitigation Bureau	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Continuous Action		H	General budget	2015
Carr-26	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Each disaster presents varying degrees of impacts - no two storms are alike. The city can gain valuable data and insight into impacts as they occur to assess and define appropriate actions in the way of implementing an existing mitigation action or identifying a new need,	Town of Carrollton	Mayor, County EMA, MEMA Mitigation Bureau	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Continuous Action		H	General budget	2015

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Carr-27	Conduct annual reviews of the District 3 Regional Hazard Mitigation Plan	As defined in the plan maintenance section of this plan, the chairman of the hazard mitigation committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs.	Town of Carrollton	Mayor, County EMA, MEMA Mitigation Bureau	All	N/A	D	Remove as Action Item included in RHMP Plan Maintenance. A developed to facilitate this process.	Continuous Action		H	General budget	2015
Carr-28	Pursue training and funding opportunities for mitigation actions	Funding options for actions identified in this plan should be explored and pursued. Coordination with public works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the city from obtaining grants through the HMA.	Town of Carrollton	Mayor, County EMA, MEMA Mitigation Bureau	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Continuous Action		H	General budget	2015
Town of North Carrollton													
NCarr-1	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property.	Town of North Carrollton	Mayor, County EMA, MEMA	All	Undetermined	R	Conduct a study of public critical structures and infrastructure to determine needs, cost; prioritize projects according to need	Continuous Action	1.1	H	HMGP, CDBG, General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
NCarr-2	Mitigate deficient/obsolete bridges	Bridges throughout District 3 are not designed to withstand seismic activity and/or are classified as structurally deficient or functionally obsolete by the national bridge inventory. Work with applicable local, federal and state agencies to develop a priority system for improvements.	Town of North Carrollton	Mayor, Public Works, Community Officials/Engineers, County EMA, MEMA	Earthquake, Flooding	Undetermined	R	Study County and Local roadways to identify priority road and bridge improvements; prioritize based on community need	Continuous Action	1.1	M	MDOT, FHWA, State Aid	2015
NCarr-3	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events	Town of North Carrollton	Mayor, Drainage Districts, Public Works	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for storm water conveyance and detention structures	Continuous Action	1.1	L	General budget	2015
NCarr-4	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Inform public about outbreaks and preventive measures to avoid disease carriers.	Town of North Carrollton	Mayor's Office, Public Works	Human Infectious Disease	Undetermined	R	Continuous Action	Continuous Action	1.1	H	General budget	2015
NCarr-8	Update drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events. Main and Lexington Streets have been identified with drainage issues.	Town of North Carrollton	Mayor, Drainage Districts	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for drainage systems and culverts	2020-2025	1.1	L	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
NCarr-5	Continue efforts on mitigating Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Monitor status of properties affected by flooding and research funding for acquisition of structures. Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Town of North Carrollton	Mayor, County EMA, MEMA	Flood	Undetermined	R	Apply for HMGP funding to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood. Track RFC/SRL properties not yet and mitigation options with the property owners as funding becomes available.	Continuous Action	1.1	L	Carroll County EMA, BOS, MEMA	2015
NCarr-6	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/ infrastructure should include advanced mitigation techniques when practical. Measures may include, but are not limited to roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of North Carrollton	Mayor, County EMA, MEMA	All	Undetermined	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	L	General budget	2015
NCarr-7	Build/promote stormwater detention ponds when appropriate	Use ponds as a vehicle for stormwater management	Town of North Carrollton	Public Works	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a detention pond component	Continuous Action	1.2	M	General budget	2015
NCarr-9	Install safe rooms in unserved areas of the community.	Work with the Carroll County EMA to discuss project locations, logistics, funding, and timetable.	Carroll County	Mayors, County EMA	Tornado, Severe Storm	Undetermined	New	New	2020-2025	1.2	H	HMGP, Local budget	2020

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
NCarr-10	Secure generators for existing and new critical facilities and infrastructure	As funding becomes available, the county will apply for grants to install generators to support existing or new facilities/infrastructure.	Town of North Carrollton	Mayor, County EMA, MEMA	All	Undetermined	R	Develop priority list for generator acquisition as funding becomes available	Continuous Action	1.3	H	HMGP, General budget	2015
NCarr-11	Develop Critical Infrastructure and Key Resources database (CIKR)	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities and infrastructure for the County and its jurisdictions.	Town of North Carrollton	Mayor, County EMA and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	All	Undetermined	R	Secure update on State CIKR initiative. Action will enhance database of CIKR community assets. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.	2020-2025	2.1	L	General budget	2015
NCarr-12	Develop/Update the Comprehensive Plan to include hazard mitigation strategies/goals	The Town has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the County and includes any changes in future development areas.	Town of North Carrollton	Mayor, Applicable Departments	All	Undetermined	R	Review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	2020-2025	2.1	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
NCarr-13	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies.	There are ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and to address all hazards and consider future development areas.	Town of North Carrollton	Mayor, Applicable Departments	All	N/A	R	Review all planning-related ordinances and initiatives to be included in planning documents.	Continuous Action	2.2	H	General budget	2015
NCarr-14	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analyses, etc.	Town of North Carrollton	Mayor, Applicable Departments	All	General budget	R	Review all planning-related ordinances and initiatives to be included in planning documents. Provide copy of Updated RHMP as guidance.	Continuous Action	2.2	H	General budget	2015
NCarr-15	Improve/maintain participation in the National Flood Insurance Program and the Community Rating System	The Town participates in NFIP but not CRS. Research steps to join CRS.	Town of North Carrollton	Mayor, County EMA, MEMA Mitigation Bureau	Flood	N/A	R	Consider actions necessary to become a member of the CRS	Continuous Action	2.3	M	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
NCarr-16	Continue efforts on public information and awareness for natural hazards.	The Town has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Provide timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient.	Town of North Carrollton	Mayor, County EMA, MEMA, NWS, FEMA	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015
NCarr-17	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non- natural hazards. Identify areas/groups within the County that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the County's web page.	Town of North Carrollton	Mayor, County EMA, MSDH	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
NCarr-18	Promote workshops for emergency preparedness and continuity of operation plans	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Provide applicable support to non-profit agencies, Chamber of Commerce, North Delta Planning and Development District and other organizations that assist families and business owners with the development of disaster plans.	Town of North Carrollton	Mayor, County EMA	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	H	General budget	2015
NCarr-19	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their own interests or for the interest of the whole community is needed.	Town of North Carrollton	Mayor, County EMA	All	N/A	R	Work with PDD to develop public awareness & education campaign about all hazards, for stakeholders, families and businesses, use all communications resources.	Continuous Action	3.2	M	General budget	2015
NCarr-20	Implement / maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and potentially cause loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	Town of North Carrollton	Mayor, Road Department, Public Works	Severe Storms, Tornado, Winter Weather	Undetermined	D	Remove from plan, Ongoing maintenance does not qualify as mitigation	Continuous Action		L	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
NCarr-21	Update the District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44 §206 – communities are required to update their hazard mitigation plan every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in District 3 to schedule plan updates as they become due.	Town of North Carrollton	Mayor, County EMA, MEMA Mitigation Bureau	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Continuous Action		H	General budget	2015
NCarr-22	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Each disaster presents varying degrees of impacts - no two storms are alike. The city can gain valuable data and insight into impacts as they occur to assess and define appropriate actions in the way of implementing an existing mitigation action or identifying a new need.	Town of North Carrollton	Mayor, County EMA, MEMA Mitigation Bureau	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Continuous Action		H	General budget	2015
NCarr-23	Conduct annual reviews of the District 3 Regional Hazard Mitigation Plan	As defined in the plan maintenance section of this plan, the chairman of the hazard mitigation committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs	Town of North Carrollton	Mayor, County EMA, MEMA Mitigation Bureau	All	N/A	D	Remove as Action Item included in RHMP Plan Maintenance. Use worksheet developed to facilitate update process	Continuous Action		H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
NCarr-24	Pursue training and funding opportunities for mitigation actions	Funding options for actions identified in this plan should be explored and pursued. Coordination with public works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the city from obtaining grants through the HMA.	Town of North Carrollton	Mayor, County EMA, MEMA Mitigation Bureau	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Continuous Action		H	General budget	2015
NCarr-25	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis.	Town of North Carrollton	Fire and Police Departments	All	General budget	D	Move to Preparedness Planning, not a Mitigation action	Continuous Action		L	General budget	2015
NCarr-26	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local agency level. Conduct training and verify new employees are integrated into the training programs as necessary.	Town of North Carrollton	Fire and Police Departments	All	Staff time	D	Move to Preparedness Planning, not a Mitigation action	Continuous Action		L	General budget	2015
NCarr-27	Participate in local and statewide studies, workshops and committees that address the all hazards prone within District 3	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the city.	Town of North Carrollton	Mayor, County EMA	All	N/A	D	Continuous Action moved to Preparedness Planning initiative as this is not a mitigation action	Continuous Action		M	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
NCarr-28	Install/maintain severe weather Warning systems	Weather warning system(s) complement the methods of warning already used by the County Emergency Operations Center and the National Weather Service. Identify site locations for additional sirens and develop cost estimates as needed. For installed sirens, provide routine testing and inspection (weekly).	Town of North Carrollton	Mayor, County EMA, MEMA	All	$35,000	D	Continue as initiative under Preparedness Planning	Continuous action			Local budget	2015
Town of Vaiden													
Vaid-1	Mitigate deficient/obsolete bridges	Bridges throughout District 3 are not designed to withstand seismic activity and/or are classified as structurally deficient or functionally obsolete by the national bridge inventory. Work with applicable local, federal and state agencies to develop a priority system for improvements.	Town of Vaiden	Mayor, Public Works, Community Officials/Engineers, County EMA, MEMA	Earthquake, Flooding	Undetermined	R	Study County and Local roadways to identify priority road and bridge improvements; prioritize based on community need	2020-2025	1.1	M	MDOT, FHWA, State Aid	2015
Vaid-2	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards.	Town of Vaiden	Mayor, County EMA, MEMA	All	Undetermined	R	Conduct a study of public critical structures and infrastructure to determine needs, cost; prioritize projects according to need	2020-2025	1.1	H	HMGP, CDBG, General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
Vaid-3	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events	Town of Vaiden	Mayor, Drainage Districts, Public Works	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for storm water conveyance and detention structures	Continuous Action	1.1	L	General budget	2015
Vaid-4	Update drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events. Main and Lexington Streets have been identified with drainage issues.	Town of Vaiden	Mayor's Office, Drainage Districts	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for drainage systems and culverts	2020-2025	1.1	L	General budget	2015
Vaid-5	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	Town of Vaiden	Mayor, Public Works	Human Infectious Disease (WNV/ other vector-borne illnesses	Undetermined	R	Continuous Action	Continuous Action	1.1	H	General budget	2015
Vaid-6	Continue efforts on mitigating Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Monitor status of properties affected by flooding and research funding for acquisition of structures. Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Town of Vaiden	Mayor, Carroll County EMA, MEMA	Flood	Undetermined	R	Apply for HMGP funding to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood. Track RFC/SRL properties not yet and mitigation options with the property owners as funding becomes available.	Continuous Action	1.1	L	Local budget, HMGP, County EMA, BOS, MEMA	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
Vaid-7	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/ infrastructure should include advanced mitigation techniques when practical.	Town of Vaiden	Mayor, County EMA, MEMA	All	Undetermined	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	L	General budget	2015
Vaid-8	Build/promote stormwater detention ponds when appropriate	Use ponds as a vehicle for stormwater management	Town of Vaiden	Public Works	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a detention pond component.	Continuous Action	1.2	L	General budget	2015
Vaid-9	Install safe rooms in unserved areas of the community.	Work with the County EMA and the Towns of Carrollton and North Carrollton to discuss project locations, logistics, funding, and timetable.	Town of Vaiden	County EMA, Town Mayors	Tornado, Severe Storm	Undetermined	New	New	2020-2025	1.2	H	HMGP, Local budget	2020
Vaid-10	Secure generators for existing and new critical facilities and infrastructure	As funding becomes available, the county will apply for grants to install generators to support existing or new facilities/infrastructure.	Town of Vaiden	Mayor, County EMA, MEMA	All	Undetermined	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.3	H	HMGP, General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
Vaid-11	Action: Develop Critical Infrastructure and Key Resources database (CIKR)	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities and infrastructure for the County and its jurisdictions.	Town of Vaiden	Mayor, County EMA and officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	All	Undetermined	R	Secure update on State CIKR initiative. Action will enhance community database of CIKR assets. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.	2020-2025	2.1	L	General budget	2015
Vaid-12	Develop/Update the Comprehensive Plan to include hazard mitigation strategies/goals	The Town has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the County and includes any changes in future development areas.	Town of Vaiden	Mayor, Applicable Departments	All	Undetermined	R	Review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	2020-2025	2.1	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
Vaid-13	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies.	The Town has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the County and includes any changes in future development areas.	Town of Vaiden	Mayor, Applicable Departments	All	N/A	R	Review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review. Provide copy of Updated RHMP as guidance.	Continuous Action	2.2	H	General budget	2015
Vaid-14	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analyses, etc.	Town of Vaiden	Mayor, Applicable Departments	All	General budget	R	Review all planning-related ordinances and initiatives, Provide copy of Updated RHMP as guidance.	Continuous Action	2.2	H	General budget	2015
Vaid-15	Improve/maintain participation in the National Flood Insurance Program and the Community Rating System	The Town participates in NFIP but not CRS. Research steps to join CRS.	Town of Vaiden	Mayor, County EMA, MEMA Mitigation Bureau	Flood	N/A	R	Consider actions necessary to become a member of the CRS	Continuous Action	2.3	M	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
Vaid-16	Continue efforts on public information and awareness for natural hazards.	The Town has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient.	Town of Vaiden	Mayor, County EMA MEMA, NWS, FEMA	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015
Vaid-17	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the County that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the County's web page.	Town of Vaiden	Mayor, County EMA, MSDH	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015
Vaid-18	Promote workshops for emergency preparedness and continuity of operation plans	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations.	Town of Vaiden	Mayor, County EMA	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders.	Continuous Action	3.2	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
Vaid-19	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their own interests or for the interest of the whole community is needed.	Town of Vaiden	Mayor, County EMA	All	N/A	R	Work with the PDD to develop public awareness campaign about all hazards for all stakeholders, including families and businesses, using all communications resources.	Continuous Action	3.2	H	General budget	2015
Vaid-20	Implement / maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and roadways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	Town of Vaiden	Mayor, Road Department, Public Works	Severe Storms, Tornado, Winter Weather	Undetermined	D	Remove from plan, Ongoing maintenance does not qualify as mitigation	Continuous Action		L	General budget	2015
Vaid-21	Update the District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44 §206 – communities are required to update their hazard mitigation plan every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in District 3 to schedule plan updates as they become due.	Town of Vaiden	Mayor, County EMA, MEMA Mitigation Bureau	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Continuous Action	2.4	H	General budget	2015
Vaid-22	Conduct post disaster meetings for declared and/or major events to assess the impacts	Each disaster presents varying degrees of impacts - no two storms are alike. Convene as soon as appropriate	Town of Vaiden	Mayor, County EMA, MEMA Mitigation Bureau	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Continuous Action	2.4	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
	to people and property	after an event to conduct an after-action report and document this in the appendix of the mitigation plan.											
Vaid-23	Conduct annual reviews of the District 3 Regional Hazard Mitigation Plan	As defined in the plan maintenance section of this plan, the chairman of the hazard mitigation committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs.	Town of Vaiden	Mayor, County EMA, MEMA Mitigation Bureau	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Continuous Action	2.4	H	General budget	2015
Vaid-24	Pursue training and funding opportunities for mitigation actions	Funding options for actions identified in this plan should be explored and pursued. Coordination with public works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the city from obtaining grants through the HMA.	Town of Vaiden	Mayor, County EMA, MEMA Mitigation Bureau	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Continuous Action	2.4	H	General budget	2015
Vaid-25	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis.	Town of Vaiden	Fire and Police Departments	All	General budget	D	Move to Preparedness Planning, not a Mitigation action	Continuous Action	2.3	L	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Plan Year
Vaid-26	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local agency level. Conduct training and verify new employees are integrated into the training programs as necessary	Town of Vaiden	Fire and Police Departments	All	Staff time	D	Move to Preparedness Planning, not a Mitigation action	Continuous Action	2.3	L	General budget	2015
Vaid-27	Participate in local and statewide studies, workshops and committees that address the all hazards prone within District 3	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the city. Furthermore, we realize hazards have cascading affects which should also be further explored. Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives	Town of Vaiden	Mayor's Office, County EMA	All	N/A	D	Continuous Action moved to Preparedness Planning initiative as this is not a mitigation action	Continuous Action	1.6	M	General budget	2015
Vaid-28	Install/maintain severe weather Warning systems	Weather warning system(s) complement the methods of warning already used by the County Emergency Operations Center and the National Weather Service. Test equipment regularly	Town of Vaiden	Mayor, County EMA, MEMA	All	$35,000	D	Continue as initiative under Preparedness Planning	Continuous action			Local budget	2015

Mitigation Action Worksheets

Carroll County elected to more fully describe two mitigation actions on a Mitigation Action Worksheet. The two worksheets address the following initiatives:

1. Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms.

2. Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others.

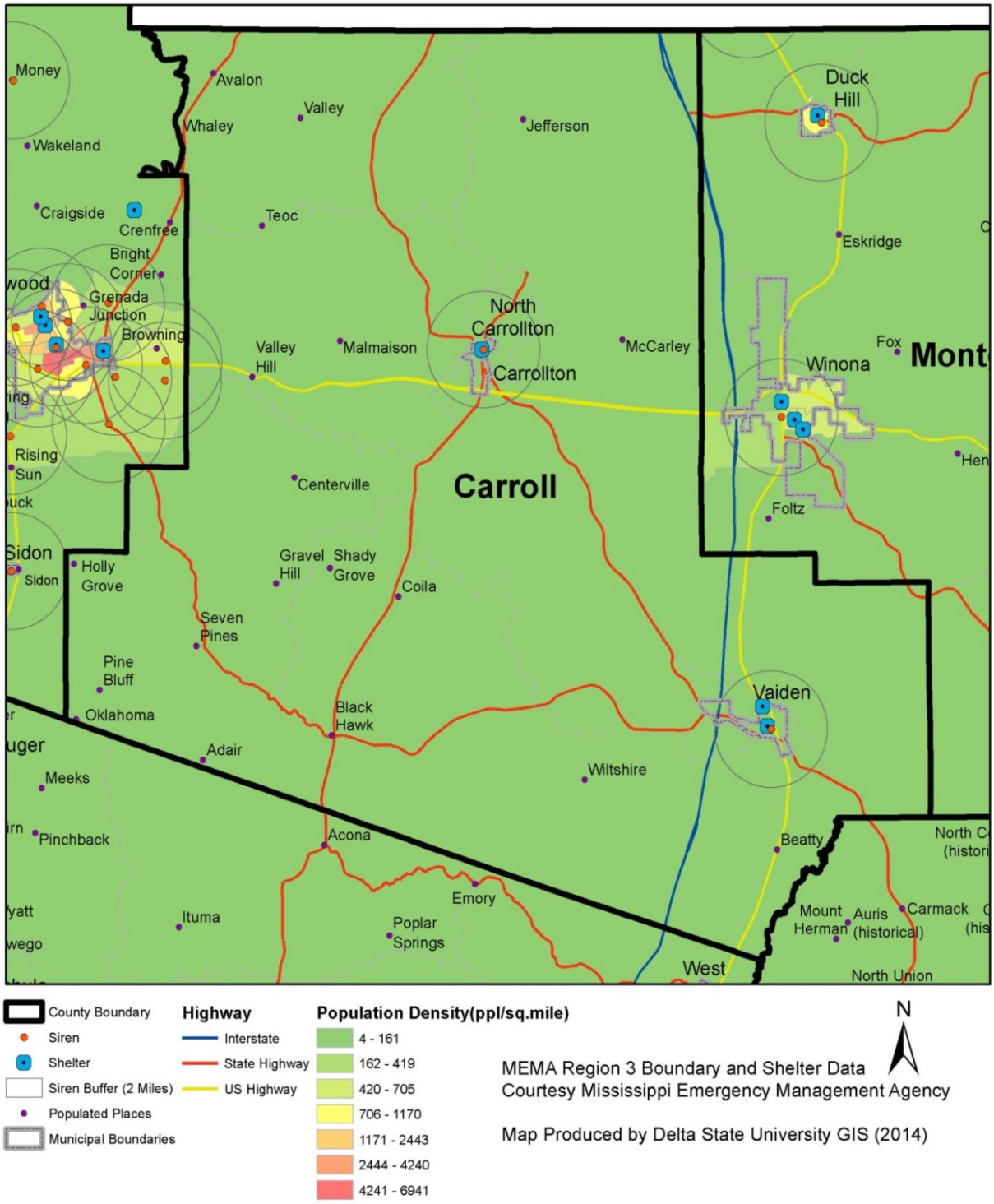
It was decided all jurisdictions within the county will work on these two actions, so a separate action worksheet for each jurisdiction working on both each is included in the Actions Worksheets section. The Action Worksheets for Carroll County are included first, and then jurisdictional worksheets follow.

Carroll County Mitigation Action Worksheet-1

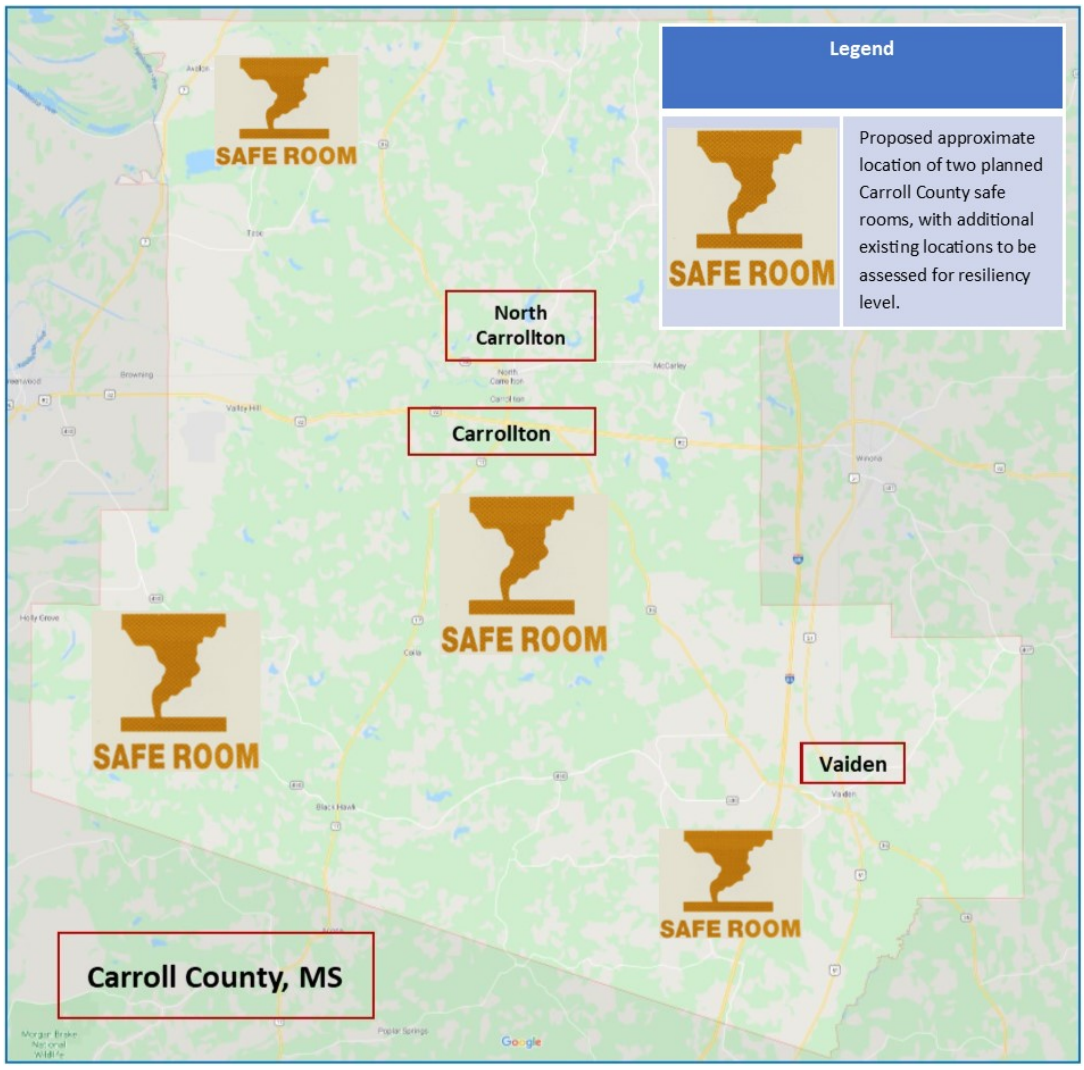
Mitigation Action Worksheet		
Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Carroll County, Mississippi Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Protect vulnerable residents, many of whom are elderly and live in manufactured housing and must seek a safe location during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach a safe location. Hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home. Following maps show project locations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms. Alternative: Incorporate safe room space into current government structures. These spaces are not large or secure enough to serve in this function. Alternative: Situation remains as is, leaving residents exposed to severe weather.	
Action or Project Intended for Implementation		
4. Action/Project Number: **Name of Action or Project:**	**Action #: Carroll-1** Construct safe rooms at several locations so that vulnerable population could reach a structure after a short drive (or walk). Inspect current safe rooms to confirm security and resiliency.	
5. Action or Project Description:	The Emergency Management Director has identified locations where safe rooms would adequately serve the target population. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Confirming site locations. • Acquire property and develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 **Benefits (losses avoided)** **Estimated Cost** **Other Factors Considered (see STAPLEE Worksheet)**	**BENEFIT** Protect vulnerable residents from exposure to tornado, severe storms, & other hazards. Minimize need for residents to drive during dangerous conditions to reach safety.	**COST** Undetermined, depends on safe room size for new structures, and on level of improvements needed for existing safe rooms (if any).
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Mayors, Jurisdictional legislative bodies, BOS	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Carroll County Emergency Management Plan, Local Operations Plans	
Progress Report		
13. Date of Status Report: **Report of Progress:** **Evaluation of Effectiveness:**	06/2020 – Project initially discussed during a conference in which the Carroll County Emergency Management Director participated during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

The map below, taken from the Mississippi District 3 current 2015 RHMP, shows the location of current warning sirens and safe rooms, as well as locations where additional facilities could be built to better serve populations countywide.

Current Carroll County Siren and Safe Room Locations | Source: 2015 Mississippi District 3 RHMP



To augment safety and security provided by existing safe rooms shown on the previous page, the Carroll County Emergency Management Director will discuss with leaders in all areas of the county the process for identifying locations that provide additional places for residents to shelter during severe weather events. Pending funding availability, safe room construction is planned for locations that would eliminate the need for residents to travel a distance either before or during severe weather. These locations allow this living in rural areas to quickly reach safe harbor, while also being located near the population centers of Carrollton, North Carrollton and Vaiden. No specific sites have yet been identified, but this map is presented to show the community's interest in ensuring full coverage countywide. This initiative includes studying the condition of current safe rooms to ensure that they are resilient enough to withstand high winds generated during a tornado or other severe weather conditions.



NOTE:

Maps shown for the Carroll County mitigation action worksheet are not repeated for the jurisdictional action worksheets that follow.

Jurisdictional Action Worksheets
Demonstrating Cooperative efforts with
Carroll County on Mitigation Action Carroll-1

Community Need:

There is a need to protect vulnerable residents, many of whom are elderly and live in manufactured housing and must seek a safe location during severe weather. This population has been known to drive through inclement weather at night when road visibility is limited, in order to reach a safe location. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home.

Solution:

Build safe rooms in locations central to vulnerable populations and confirm resiliency and security of existing safe rooms.

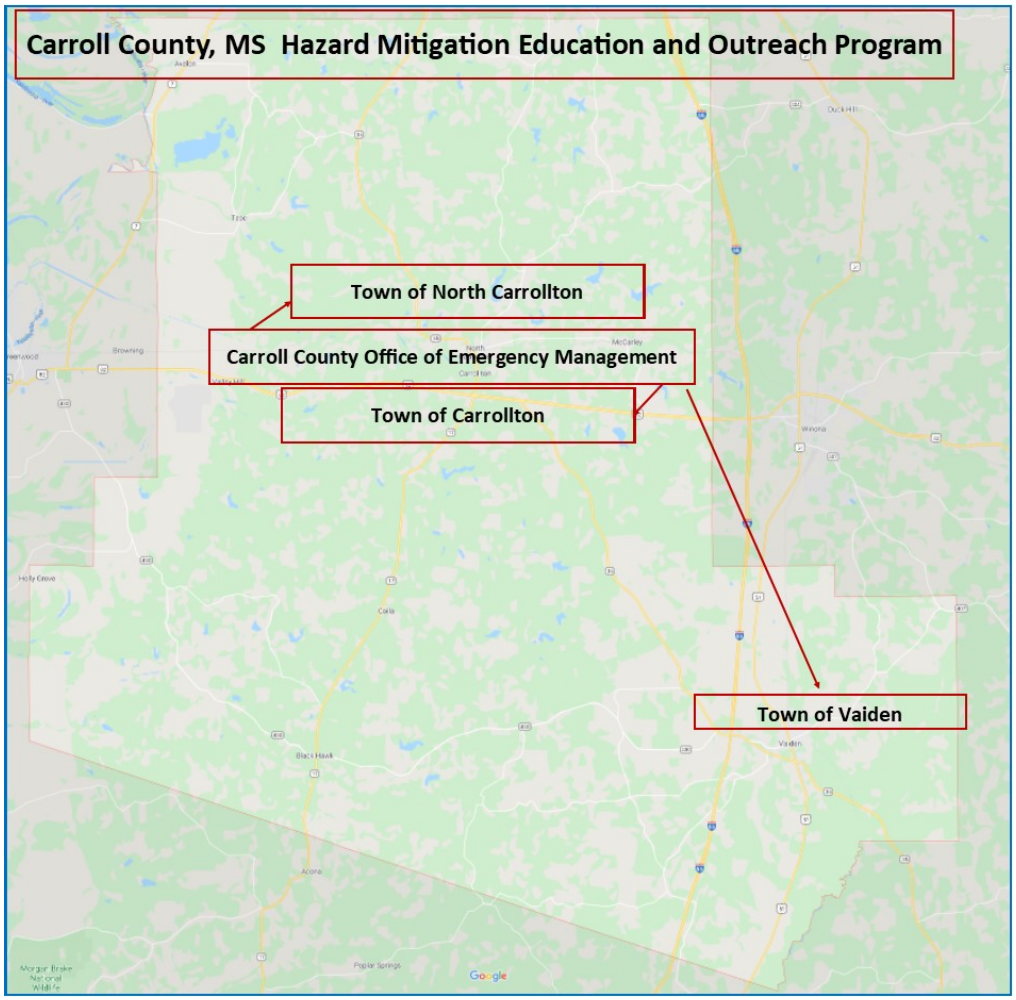
Action Worksheet		
Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Town of Carrolton, Mississippi Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Protect vulnerable residents, many of whom are elderly and live in manufactured housing and must seek a safe location during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach a safe location. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms. Alternative: Incorporate safe room space into current government structures. These spaces are not large or secure enough to serve in this function. Alternative: Situation remains as is, leaving residents exposed to severe weather.	
Action or Project Intended for Implementation		
4. Action/Project Number: **Name of Action or Project:**	**Action #: Carrollton 1** Support construction of safe rooms in locations throughout the county so that vulnerable population could reach a structure within a short drive (or walk). Inspect current safe rooms to confirm security/resiliency.	
5. Action or Project Description:	Work in cooperation with the County Emergency Management Director, who has identified locations where safe rooms would adequately serve the target population. Funding availability may limit construction. Steps to complete the action include: • Confirming site locations. • Acquire property. • Develop a project budget. • Present recommendation to the Board of Aldermen for approval.	
6. Summary of Evaluation1 **Benefits (losses avoided)** **Estimated Cost** **Other Factors Considered (see STAPLEE Worksheet)**	**BENEFIT** Protect vulnerable residents from exposure to tornado, severe storms, & other hazards. Minimize need for residents in inclement weather.	**COST** Undetermined, depends on safe room size for new structures, and on level of improvements needed for existing safe rooms (if any).
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, Police and Fire Departments	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of Ethel Operations Plan, Carroll County Emergency Management Plan	
Progress Report		
13. Date of Status Report: **Report of Progress:** **Evaluation of Effectiveness:**	06/2020 – Project first discussed during a conference in which the Carroll County Emergency Management Director participated during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
1. Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Town of North Carrollton, Mississippi Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Protect vulnerable residents, many of whom are elderly and live in manufactured housing, who seek a safe location during severe weather. People have been known to drive through inclement weather at night during limited road visibility to reach a safe room. Hazards addressed by this project include severe weather and tornadoes, but safe rooms would be used during any during which shelter is needed.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms. Alternative: Incorporate safe room space into current government structures. These spaces are not large or secure enough to serve in this function. Alternative: Situation remains as is, leaving residents exposed to severe weather.	
Action or Project Intended for Implementation		
4. Action/Project Number: **Name of Action or Project:**	**Action #: NCarr-1** Support the effort to construct safe rooms in several locations countywide so that vulnerable population could reach a structure after a short drive (or walk). Inspect current safe rooms to confirm security and resiliency.	
5. Action or Project Description:	Work in cooperation with the County Emergency Management Director Management Director has identified locations where safe rooms would adequately serve the target population. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Confirming site locations. • Acquire property and develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 **Benefits (losses avoided)** **Estimated Cost** **Other Factors Considered (see STAPLEE Worksheet)**	**BENEFIT** Protect vulnerable residents from exposure to tornado, severe storms, & other hazards. Minimize need for residents in inclement weather.	**COST** Undetermined, depends on safe room size for new structures, and on level of improvements needed for existing safe rooms (if any).
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, Police and Fire Departments, County Emergency Management Department	
8. Action/Project Priority (STAPLEE Score):	20 - High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP	
12. Local Planning Mechanisms to be Used in Implementation, if any:	City of N. Carrollton Operations Plan, Carroll County Emergency Management Plan	
Progress Report		
13. Date of Status Report: **Report of Progress:** **Evaluation of Effectiveness:**	06/2020 – Project discussed during a conference in which the Carroll County Emergency Management Director participated during the RHMP planning phase. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
2. Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Town of Vaiden, Mississippi Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Protect vulnerable residents, many of whom are elderly and live in manufactured housing and must seek a safe location during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach a safe location. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms. Alternative: Incorporate safe room space into current government structures. These spaces are not large or secure enough to serve in this function. Alternative: Situation remains as is, leaving residents exposed to severe weather.	
Action or Project Intended for Implementation		
4. Action/Project Number: **Name of Action or Project:**	**Action #: Vaiden-1** Support the effort to construct safe rooms in several locations countywide so that vulnerable populations could reach a structure within a short drive (or walk). Inspect current safe rooms to confirm structural security and resiliency.	
5. Action or Project Description:	Work in cooperation with the County Emergency Management Director Management Director, who has identified locations where safe rooms would adequately serve the target population. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Confirming site locations. • Acquire property and develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval	
6. Summary of Evaluation1 **Benefits (losses avoided)** **Estimated Cost** **Other Factors Considered (see STAPLEE Worksheet)**	**BENEFIT** Protect vulnerable residents from exposure to tornado, severe storms, & other hazards. Minimize need for residents in inclement weather.	**COST** Undetermined, depends on safe room size for new structures, and on level of improvements needed for existing safe rooms (if any).
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, Police and Fire Departments, County Emergency Management Department	
8. Action/Project Priority (STAPLEE Score):	20 - High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town Operations Plan, Carroll County Emergency Management Plan	
Progress Report		
13. Date of Status Report: **Report of Progress:** **Evaluation of Effectiveness:**	06/2020 – Project first discussed during a conference in which the Carroll County Emergency Management Director participated during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Carroll County, Mississippi Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the Planning and Development Council to create a mitigation education and outreach program about natural and manmade hazards targeted to all stakeholders, including residents, businesses, civic groups, churches and others. This project will address several action items outlined in the Carroll County Annex. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education/outreach program, leaving stakeholders vulnerable to hazards.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Carroll--2 Work with the North Central MS Planning and Development Council to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Carroll Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Secure approval from Board of Supervisors and Town/City Legislative Bodies.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Board of Aldermen, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Carroll County Operations Plan, Carroll County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Disaster communications originates with the Carroll County Emergency Management Department. As such, it is appropriate to work with EM staff and the North Central Mississippi Planning and Development District to develop an education and outreach campaign that uses County communications as a touchstone for information about all hazards shared at the local level. Such a plan would include reaching outlying and otherwise hard-to-reach communities, as well as those who may not have access to digital communications.



NOTE: Map shown for the Carroll County mitigation action worksheet is not repeated for the jurisdictional Mitigation Action Worksheets that follow.

Jurisdictional Action Worksheets
Demonstrating Cooperative efforts with
Carroll County on Mitigation Action Carroll 2

Community Need

Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.

Solution:

Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Carroll County Annex of the District 3 RHMP.

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Carrollton, Mississippi Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program on natural and manmade hazards targeted to all stakeholders, including residents, businesses, civic groups, churches and others. This project will address several action items outlined in the Carroll County RHMP Annex. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Carrollton-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Supporting efforts led by the Carroll Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommended plan to the BOS and local legislative bodies for approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of Carrollton Operations Plan, Carroll County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of North Carrollton, Mississippi Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program about natural and manmade hazards targeted to all stakeholders, including residents, businesses, civic groups, churches and others. This project will address several action items outlined in the Carroll County Annex of the District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: North Carrollton-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who lack digital access.	
5. Action or Project Description:	Led by the Carroll Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Recommend plan to the BOS and Board of Aldermen for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 - High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of North Carrollton Operations Plan, Carroll County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
3. Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Vaiden, Mississippi Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program about natural and manmade hazards targeted to all stakeholders, including residents, businesses, civic groups, churches and others. This project will address several action items outlined in the Carroll County Annex of the District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Vaiden-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Supporting efforts led by the Carroll County Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommended plan to the BOS and local legislative bodies for approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 - High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of Vaiden Operations Plan, Carroll County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

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HOLMES COUNTY

D.1 Community Profile

Geography

Located in central Mississippi, Holmes County is adjacent to Carroll and Leflore Counties to the north, Attala County to the east, and Yazoo County to the south and Humphreys County to the west. Holmes County is 65 miles north of Jackson, Mississippi and 160 miles south of Memphis, Tennessee. It includes the following communities:

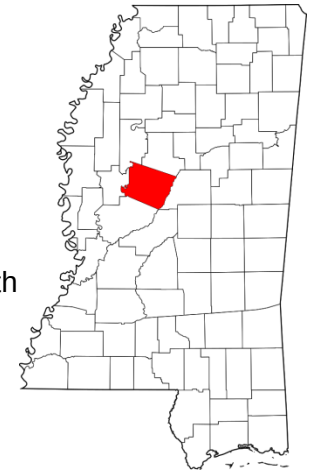


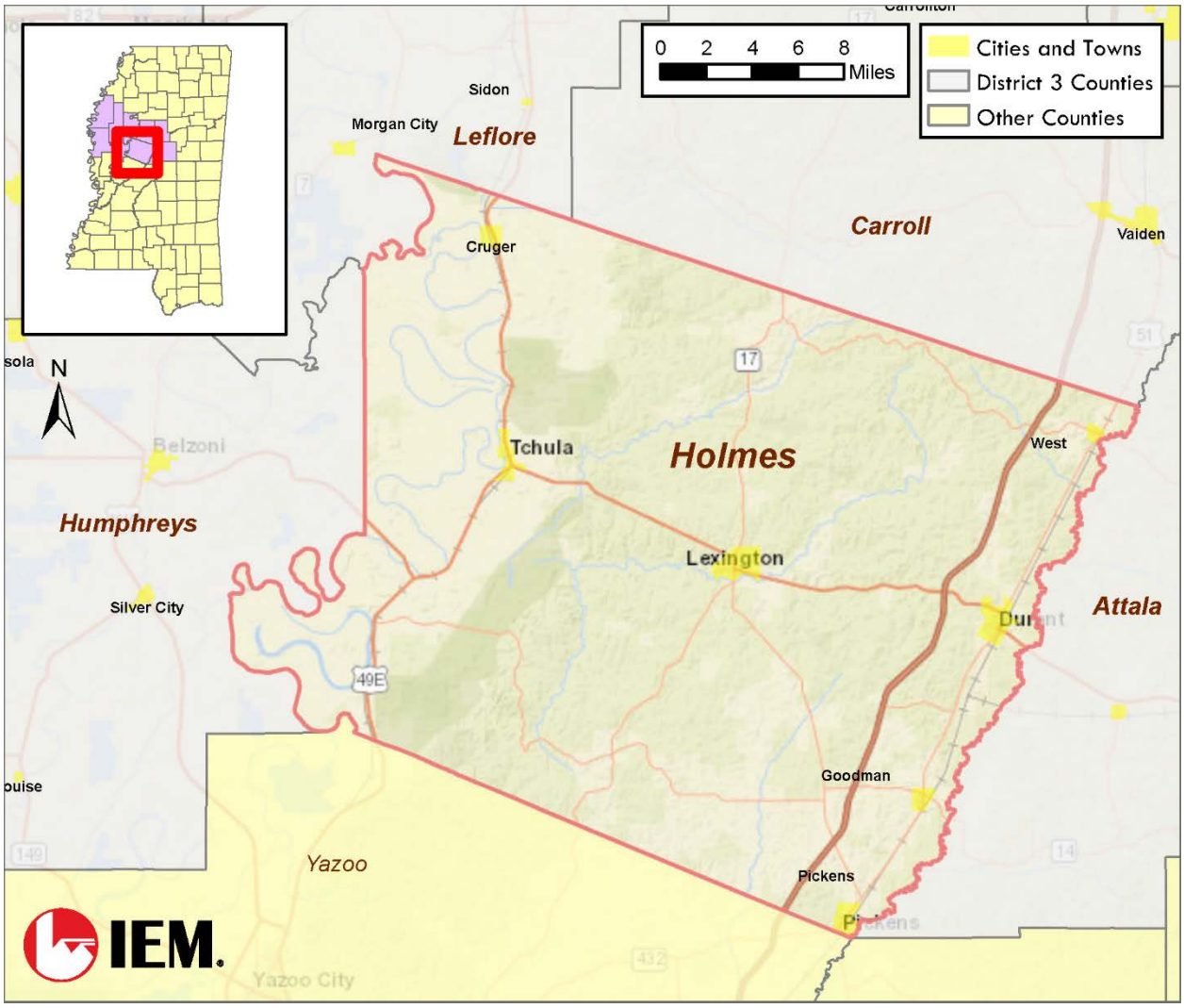
Figure D.1: Jurisdictions and Communities in Holmes County

Cities	Towns	Unincorporated		
Durant	Cruger	Acona	Howard	Richland
Lexington	Goodman	Coxburg	Ituma	Tchula
	Pickens	Ebenezer	Marcella	Thornton
	Tchula	Egypt	Montgomery	Tolarville
	West	Good Hope	Owen	
			Wells	

The total area of the county is 764.18 square miles which includes 8.18 square miles of water. The majority of the land in the county falls within the Loess Hills Region (central portion) and has predominate soil types of both acidic and non-acidic. The topography is characterized by narrow ridges and step-sided ravines. The Delta Region covers the western side of the county with a general topography of flat plain and the soil is characterized as mildly acidic to mildly alkaline. The North Central Hill Region takes up the eastern side of the county where the soils are mostly acidic, and the topography is characterized by both ridges and valleys.

- Lexington is the county seat and is located on MS State Route 12 in the central section of Holmes County and has a land area of about 2.5 square miles.
- Cruger is located in the north east region of Holmes County, north of the Morgan Brake National Wildlife Refuge and south of Leflore County on Hwy 49 and has a land area of about 1.0 square miles.
- Durant is located along U.S. Highway 51 in east central Holmes County and is bordered on the east by the Big Black River and has a land area of about 2.2 square miles.
- Goodman is located on U.S. Highway 51 and has a land area of about 0.8 square miles.
- Pickens is located on U.S. Highway 51 and is bordered on the east by the Big Black River and has a land area of about 1.3 square miles
- Tchula is located on Highways 12 and 49 and has a land area of about 1.4 square miles.
- West is located off U.S. Highway 51 and has a land area of about 0.6 square miles.

Figure D.1 – Holmes County Orientation Map



Population and Demographics

As shown in Table D.1, there has been a decline in population in all but one jurisdiction within Holmes County between the 2010 U.S. Census report and 2018 Census estimates. The Town of Goodman showed a very slight population increase (.009 percent). The largest decline in population occurred in West (-17.8 percent), with Lexington (-16.8 percent) and Durant (-15.7 percent) also showing similar trends. To further demonstrate the changes in population and demographics, Table D.1 shows population trends for each jurisdiction.

Table D.1 - Jurisdiction Population and Demographics, 2010 - 2018

Source: U.S. Census; https://www.worldpopulationreview.com

Jurisdiction	Population				Demographics (%)					
	2010 Census	2018 (Estimate)	Net Change	Percent Change	White	Black	Hispanic	Asian	Native American	2 + Races
Holmes County	19,198	17,622	-806	-.04	16.2%	82.5%	1.1	.2	.2	.8
Cruger	386	341	-45	-11.6	23.8%	76.2%	0	0	0	0
Durant	2,673	2,253	-420	-15.7	13.8%	86.1%	0.7	0	.2	.3
Goodman	1,386	1,399	13	.009%	28.4%	70.4%	0.5	0	0	0
Lexington	1,731	1,440	-291	-16.8	19.9%	80.0%	1.0	0	0	.1
Pickens	1,157	996	-161	-13.9	1.7%	98.3%	.9	0	0	0
Tchula	2,096	1,952	-144	-.07	1.5%	98.3%	1.1	o	0	.2
West	185	33	-35	-17.8	78.3%	20.8%	0	0	0	0

Special Populations (elderly, disabled, and low income): Poverty and other social factors were also considered in assessing the vulnerability of Holmes County and its municipalities. Goodman and Tchula have the highest population living below poverty level; Durant has the highest elderly population; and Cruger the highest percent of population who are disabled. A summary of the percent of population falling into the special population category are listed in **Table D.2**.

Other social factors, such as single mother households living below the poverty level, may indicate areas where special childcare considerations may be necessary. Persons with disabilities and the elderly may not be able to evacuate or seek other preventive measures during a disaster. These individuals may be most vulnerable to severe storms, tornadoes and severe winter storms/freezes

Table D.2 – Special Populations | *Source: US Census Bureau 2010; 2018 Population estimates* - *https://www.worldpopulationreview.com*

Jurisdiction	Below Poverty	Elderly (65 and older)	Disabled (non-institutionalized)
Holmes County	46.5%	15.0%	13.7%
Cruger	37.3%	12.7%	16.2%
Durant	42.5%	13.2%	13.5%
Goodman	59.2%	6.0%	12.5%
Lexington	43.3%	5.6%	13.7%
Pickens	41.0%	12.4%	15.5%
Tchula	57.4%	9.2%	12.8%
West	42.4%	7.0%	12%

Figure D.2a: CDC's Social Vulnerability Index 2016

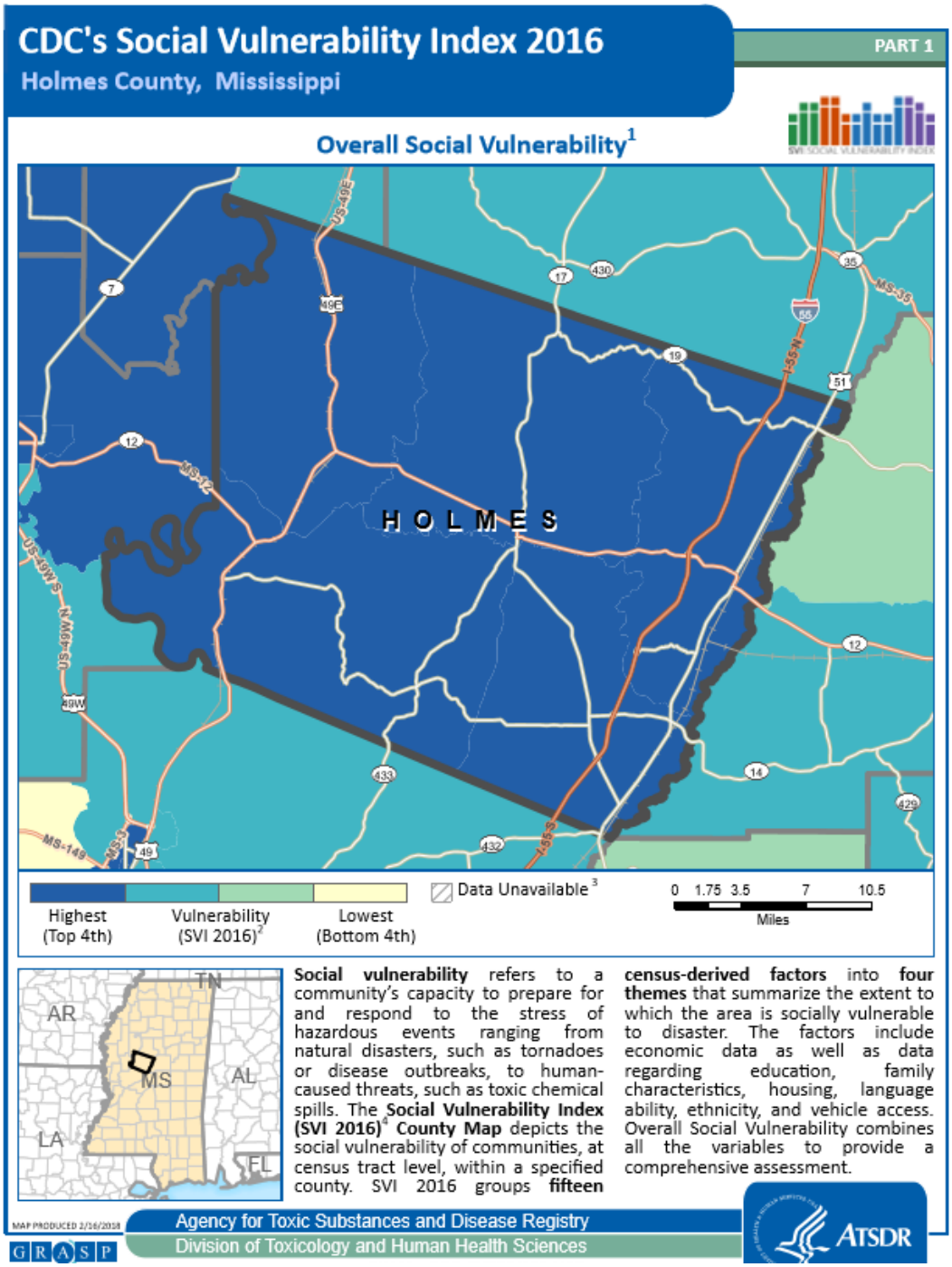
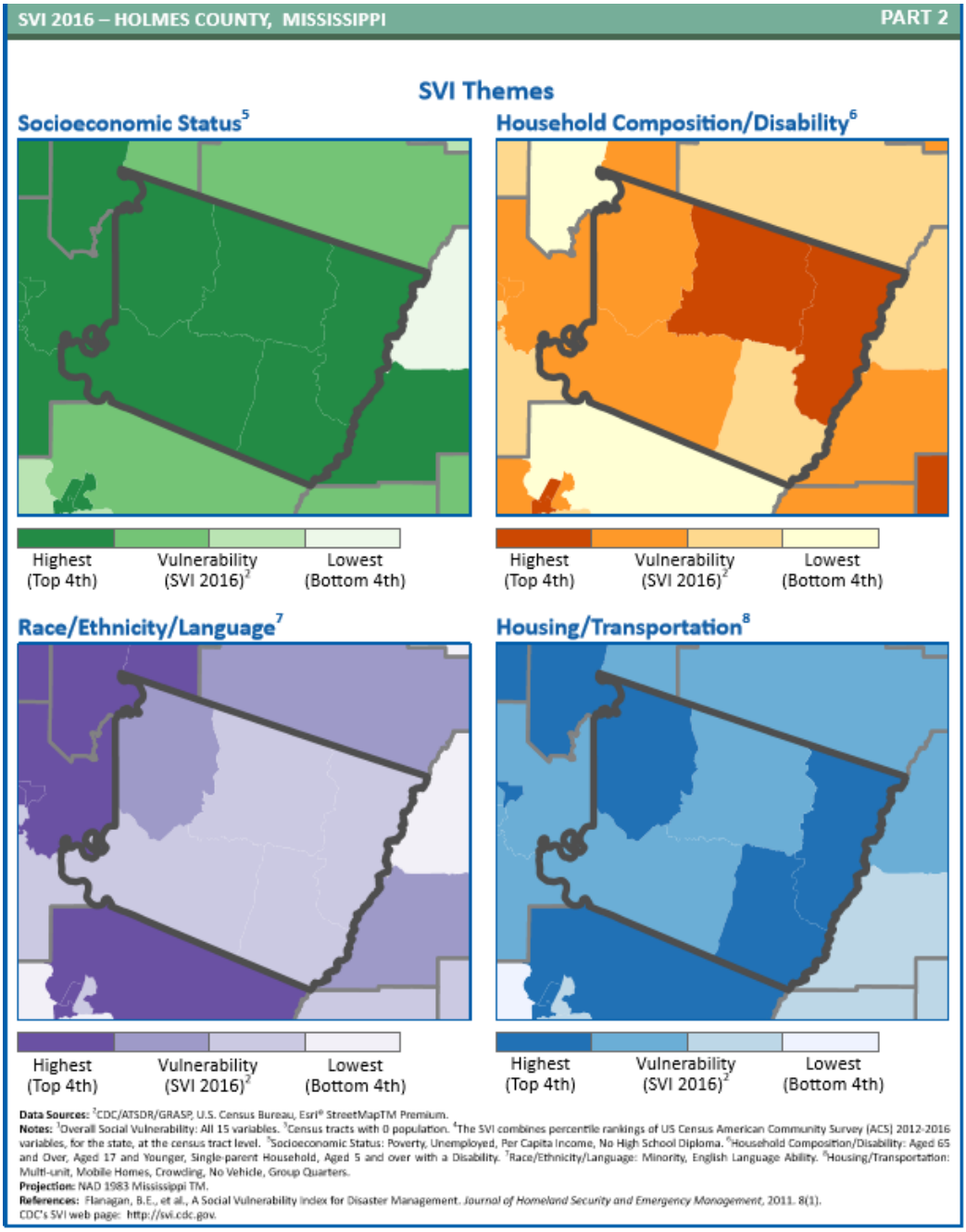


Figure D.2b: CDC's Social Vulnerability Index 2016 Themes



Housing, Growth Trends, and Land Use

Housing: Housing data was obtained from the 2018 population estimates based on the 2010 Census and is presented below in **Table D.3**. In summary, 78.3 percent of housing is occupied, 26 percent of housing is mobile home/manufactured housing, and since 2000 only 11.9 percent of the homes were constructed which can indicate homes built prior to 2000 may not have design standards to protect against high wind events.

Table D.3 – Housing Statistics | Source: US Census Bureau 2010; 2018 Estimates

Housing Statistics	Estimate	Percent
HOUSING OCCUPANCY		
Total housing units	8,433	100%
Occupied housing units	6,604	78.3%
Vacant housing units	1,829	21.7%
UNITS IN STRUCTURE		
1-unit, detached	5,554	65.9%
1-unit, attached	56	0.7%
2 units	34	0.4%
3 or 4 units	167	2.0%
5 to 9 units	369	4.4%
10 to 19 units	22	0.3%
20 or more units	25	0.3%
Mobile home	2,196	26.0%
Boat, RV, van, etc.	10	0.1%
YEAR STRUCTURE BUILT		
Built 2010 or later	9	0.1%
Built 2000 to 2009	762	9.0%
Built 1990 to 1999	1,494	17.7%
Built 1980 to 1989	1,570	18.6%
Built 1970 to 1979	1,733	20.6%
Built 1960 to 1969	1,185	14.1%
Built 1950 to 1959	723	8.6%
Built 1940 to 1949	332	3.9%
Built 1939 or earlier	625	7.4%
HOUSING TENURE		
Occupied housing units	6,604	100%
Owner-occupied	4,723	71.5%
Renter-occupied	1,881	28.5%
HOUSE HEATING FUEL		
Occupied housing units	6,604	100%
Utility gas	2,690	40.7%
Bottled, tank, or LP gas	2,181	33.0%
Electricity	1,473	22.3%
Fuel oil, kerosene, etc.	2	0.0%
Wood	250	3.8%
Other fuel	8	0.1%

Growth Trends: There have been no significant changes in development since the previous plan. New construction and redevelopment have been minimal and there are no known changes in conditions that may affect the risks or vulnerabilities for the participating jurisdictions. The majority of the land in Holmes County is in rural areas and is primarily used for agriculture.

Land Use: None of the jurisdictions in Holmes County currently have comprehensive land use planning or building code regulations, but the Hazard Mitigation Plan will be made available to officials who will be able to use the information in future planning decisions.

Employment and Industry

Although the principal economic base in Holmes County is agriculture; the county also has several major industries, with over 1,300 people employed in that sector. Major employers include the following:

- Bluff Springs Paper Company
- Cheek Companies
- Interstate Industries of Mississippi
- Trinity Industries
- Atwood Fence
- Attala Steel
- Mitchell Metal Products
- Holmes Community College
- Holmes/Humphreys Correctional Facility

The 2020 Annual Labor Force Report, Mississippi Department of Employment Security, indicates that, although the average civilian labor force has declined slightly since the last plan, the average number of unemployed has declined significantly, from 5,450 (2013) to 580 (2020). Growth in job areas has been greatest overall in agriculture, forestry, fishing and hunting; accommodation and food service; and government. Tables D.4 and D.5 provide a summary of employment statistics for Holmes County.

The Mississippi Department of Employment Securities (MDES) assists individuals in obtaining employment. Through their network of WIN Job Centers, MDES matches qualified, prospective employees with employers. Tables D.4 and D.5 summarize county employment statistics.

Table D.4 – Mississippi Department of Employment Security Annual Labor Force Report | *Source:* Mississippi Economic Development Council

Residence Based Amounts – 20120						
County	Average Civilian Labor Force (2020)	Average No. Unemployed (2020)	Average No. Employed (2020)	Average Annual Wage (2012)	Per Capita Income	Percent Below Poverty (2012)
Holmes	5,650	580	5,070	$27,928	$28,045	36.8%
Mississippi				$35,211	$33,657	19.8%

Table D.5 – Mississippi Department of Employment Security Annual Labor Force Report
Source: Mississippi Department of Development Security

*Establishment Based Amounts 2013				
Manufacturing Total				73,80
Non-Manufacturing Total				300
Agriculture, Forestry, Fishing & Hunting	0		Professional & Business Service	60
Mining	0		Management of Companies & Enter	120
Utilities	10		Admin Support & Waste Management	50
Construction	120		Educational Services	80
Wholesale Trade	360		Health Care & Social Assistance	800
Retail Trade	760		Arts, Entertain & Recreation	30
Transportation & Warehousing	860		Accommodation & Food Service	460
Information	20		Other Service (except public admin)	240
Finance & Insurance	200		Government	3,170
Real Estate, Rental & Leasing	40		Education	1290
*Note: *Establishment based amounts are estimates and do not include self-employed individuals, religious entities or non-profit institutions. Amounts include a pro-rata share of unclassified employment.*				

Lifeline Sectors, Critical Assets and Infrastructure

Lifeline sectors provide the framework from which individual critical assets and infrastructure are identified. A lifeline is a sector that provides an indispensable service which enables the continuous operation of critical business and government functions and is critical to human health and safety or economic security. Infrastructure associated with lifelines is a mix of public and private ownership and has many interdependencies. As an example, maintaining the function of a hospital during an event that results in a power failure is dependent on communication infrastructure and access to temporary power to prevent interruption of services. Assessing these sectors helps to identify root causes of impacts and consequences from previous hazard events and prioritizes the highest issue areas and interdependencies in order to create effective mitigation solutions.

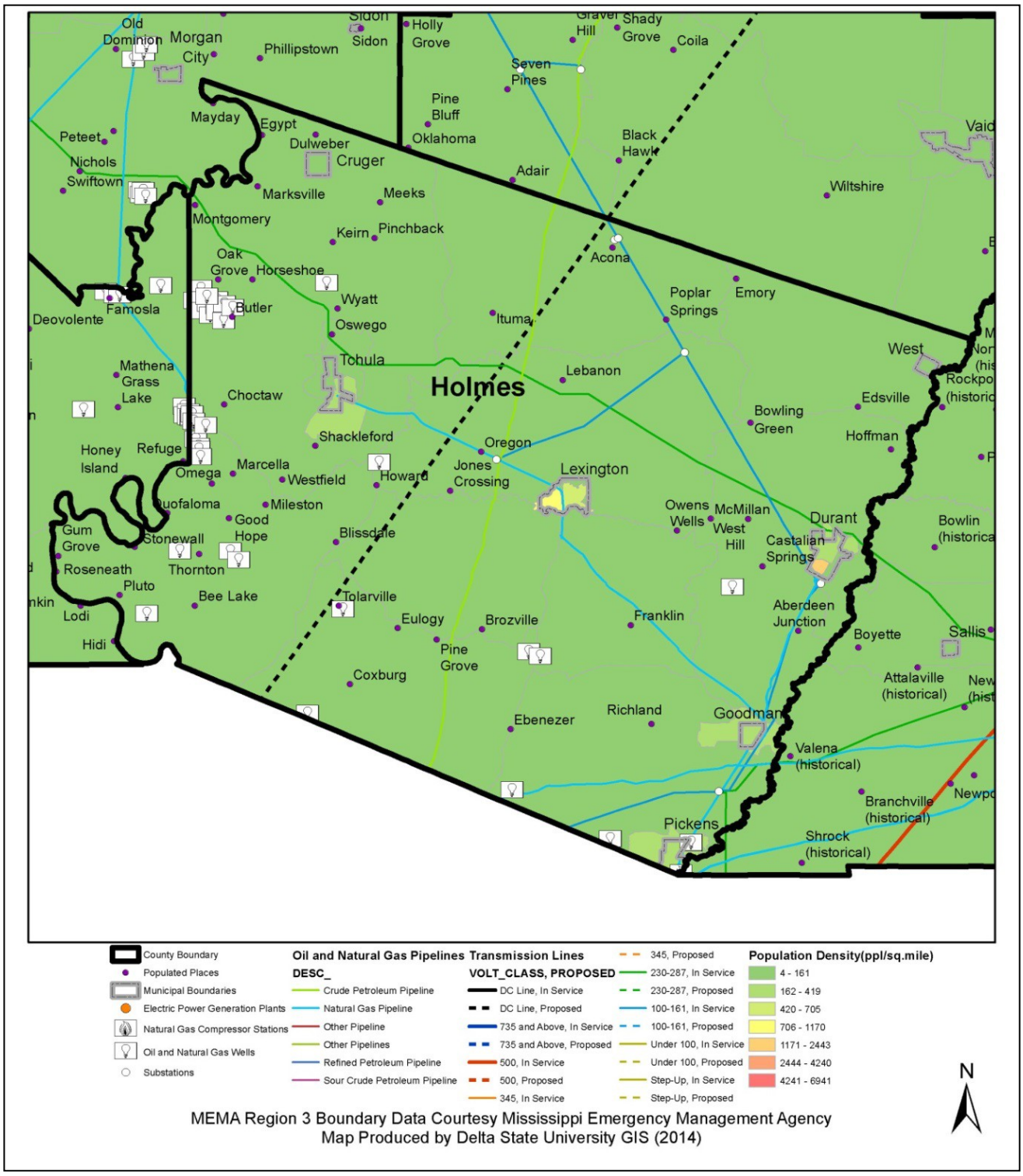
Transportation: As shown in Table D.6, Holmes County has many major thoroughfares, rail lines and airport access.

Table D.6 – Holmes County Transportation Routes

Roadway	Rail	Aviation
Interstate 55 U.S. Route 49 U.S. Route 51 Mississippi Highway 12 Mississippi Highway 14 Mississippi Highway 17 Mississippi Highway 19	Class I Major - Canadian National / Illinois Central (CN/ICRR)	C. A. Moore Airport (Lexington)

Energy Assets: Oil, natural gas pipelines and electric transmission lines transverse through Holmes County. A pipeline extends from south to north through the county approximately three miles west of Lexington. The presence of these pipelines increases the risk for residents in the eastern half of the county to explosions, fires, and release of poisonous gases in the event the pipeline is disturbed. Figure D.3 provides the locations of these systems.

Figure D.3 – Holmes County Energy Assets



Critical Assets and Facilities: Table D.7 provides a list of critical assets identified for Holmes County. The 2020 Hazard Mitigation Strategy includes an action to send the local Critical Infrastructure Key Resource (CIKR) database to the Remote Sensing Council for inclusion in the statewide database.

Table D.7 – Holmes County Summary of Critical Assets and Facilities

Holmes County Facilities		Use
Holmes County Courthouse	Holmes/Humphreys Correctional Facility	Government Facilities
Holmes County Vocational Center Holmes County Learning Center Four-County Academy	Holmes County Community College Central Holmes Academy	Educational Facilities
Holmes County Hospital and Clinics		Health Care Facilities
Holmes County Community College Water System		Public Utility
Cruger Facilities		**Use**
Cruger Post Office	Cruger Town Hall/Police Station	Government Facilities
Cruger Water Storage Facility		Public Utility
Cruger Fire Department		Public Safety
Durant Facilities		**Use**
Durant City Hall/Police Station		Government Facilities/Public Safety
William Sullivan Attendance Center Durant High School	Durant Elementary School	Educational Facilities
Mississippi Neuro Restorative Center	Mallory Clinic	Health Care Facilities
Durant Community Water System Facility		Public Utility
Goodman Facilities		**Use**
Goodman Town Hall/Police Station	Goodman Community Center	Government Facilities/Public Safety
Holmes County Community College		Education Facilities
Holmes County Community College Water System Goodman Community Water System	Goodman Holding Tank and Booster Station Pump	Public Utility
Lexington Facilities		**Use**
Lexington City Hall		Government Facilities
Central Holmes Academy Lexington Elementary School	J.J. McClain High School Saints Academy	Education Facilities
Lexington Water System Facilities		Public Utility

Pickens Facilities		Use
Pickens City Hall		Government Facilities
Velma Jackson High School	Goodman-Pickens Elementary School	Education Facilities
Pickens Medical Clinic		Health Care Facilities
Pickens Community Water System Facility		Public Utility
Pickens Fire Station	Pickens Police Station	Public Safety
Tchula Facilities		**Use**
Tchula City Hall/Police Station	Tchula Post Office	Government Facilities
S.V. Marshall Elementary School		Education Facilities
Tchula Health Center		Health Care Facilities
Tchula Community Water System Facility		Public Utility
West Facilities		**Use**
West City Hall/Police Station		Government Facilities/Public Safety
William Sullivan Attendance Center		Education Facilities
West Community Water System Facility		Public Utility

As a complement to the previous table, researchers consulted the Mississippi Public Service Commission web site to review the list of utilities shown there. The following Holmes County utilities companies are included on the web site. Some of these are the same as the ones listed above, and others are not thus included. It was decided that both tables should be incorporated into this annex for the sake of thorough documentation.

Table D.8: Mississippi Public Service Commission – County Utilities Listings
Source: Mississippi Public Service Commission – Holmes County Utilities

Holmes County Utilities

Gas Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
GC-123-0081-00	Atmos Energy Corporation	Mr. Mathew B. Davidson V-Pres.	790 Liberty Road Flowood, MS 39232-9321	601.420.5020	601.420.5020
GC-120-1937-00	Mississippi River Gas, LLC	Mr. Rene Garza President	P.O. Box 4647 Jackson, MS 39296		601.932.8789

Electric Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
EA-103-0048-00	Delta EPA	Mr. David O'Bryan Gen. Mgr.	P.O. Box 9399 Greenwood, MS 38930		662.453.6352
EC-123-0082-00	Entergy Mississippi Inc.	Mr. Martin McGee Customer Service Support	P.O. Box 1640 Jackson, MS 39215-1640		601.969.2336
EA-100-0049-00	Yazoo Valley EPA	Mr. Ronald White Manager	P.O. Box 8 2255 Gordon Ave. Yazoo City, MS 39194		662.746.4251

Sewer Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
SD-100-1150-01	Holmes Interstate Utility District	Mr. William Douglas Green Pres	Board of Supervisors County Courthouse Lexington, MS 39095		662.967.2457
SD-100-0187-01	Sweethome Water & Sewer District	Ms. Dorothy Gatson Manager	P.O. Box 154 Lexington, MS 39095		662.834.3674

Water Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
WA-100-0496-00	Acona Water Assn. Inc.	Mr. Edwin Tolbert Pres.	P. O. Box 37 Lexington, MS 39095		662.834.3121
WA-100-0186-00	Castalian Community Water Assn.	Mr. Joe Crowder Pres.	13758 Bowling Green Road Durant, MS 39063		662.653.3203

WA-100-0518-00	Centerville Water Assn.	Ms. Tammy Sutton Clerk	P.O. Box 319 West, MS 39192	662.967.0100	662.967.0100
WA-100-0280-00	Ebenezer Water Assn.	Mr. Thomas E. Haffey, Jr. Operator	619 Hwy. 14 Lexington, MS 39095-6162		662.834.3396
WA-100-0691-00	Gage's Springs Water Assn.	Mr. V. Tom Griffin Pres.	P. O. Box 613 Lexington, MS 39095		662.834.1712
WA-100-0270-00	Harland Creek Community Water Assn.	Ms. Melanie Davis	P. O. Box 217 Lexington, MS 39095	662.417.1634	662.834.2560
WD-100-1150-00	Holmes Interstate Utility District	Mr. William Douglas Green Pres.	Board of Supervisors 112 Spring Street Lexington, MS 39095		662.967.2457
WA-100-0272-00	Lebanon Water Assn. Inc.	Dr. Walter Roberts Pres.	P.O. Box 610 Lexington, MS 39095	662.834.2646	662.834.2646
WA-100-0431-00	Midway Community Water Assn. Inc.	David Shipp President	P. O. Box 423 Benton, MS 39039	662.673.8129	662.673.9435
WA-100-0659-00	North Goodman Water Assn. Inc.	Mr. Terry Richards Pres.	Rt. 1 Box 103A Goodman, MS 39079		662.472.2607
WA-103-0779-00	Phillipstown Water Assn. Inc.	Mr. J. D. Patridge Pres.	16934 CR 511 Sidon, MS 38954	662.453.2586	662.453.2586
WA-100-0510-00	South Holmes Water Assn. Inc.	Mr. Doyle Gilmore Manager	P.O. Box 420 Lexington, MS 39095		662.834.0460
WD-100-0187-00	Sweethome Water & Sewer District	Ms. Dorothy Gatson Manager	P.O. Box 154 Lexington, MS 39095		662.834.3674
WM-100-0549-00	Town of Goodman	Ms. Debra Mabry Mayor	P. O. Box 397 Goodman, MS 39079		662.472.2263
WM-100-0843-00	Town of Pickens	Ms. Karen W. Jackson Town Clerk	P.O. Box 297 Pickens, MS 39146		662.468.2171
WA-100-0349-00	West Hill Water Assn.	Mr. Mac Wigley President	P. O. Box 6 Lexington, MS 39095	662.834.3082	662.834.3082
WA-100-2064-00	West Holmes Water Association, Inc.	Ms. Mary Davis	P. O. Box 586 Tchula, MS 39169		662.235.0330

Telecommunications Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
TC-123-0001-00	BellSouth Telecommunications, LLC	Mr. C. D. Smith Regulatory	2310 7th Street Meridian, MS 39301	601.592.6510	601.917.878

D.2 Hazard Identification and Risk Assessment

Section 4 of the Base Plan contains detailed information regarding hazards that are applicable to all jurisdictions within this plan. This annex includes a brief summary of hazards to which Holmes County is prone and includes information related to the location and extent, historical events, and probability of future occurrence that may differ from the information in Section 4. Vulnerability assessments are provided only for those hazards with quantitative data. The health-related hazards of Pandemic Influenza and West Nile were included as low ranked hazards in the 2015 plan, but due to the world-wide coronavirus outbreak occurring at the time of this 2020 plan update, this hazard has been redefined as Human Infectious Disease/Pandemic and elevated as a hazard of concern in Section 4 of the Base Plan, and additional data related to this hazard is included within this Annex.

Hazard Ranking and Probability of Future Occurrences

As discussed in Section 4 of the Base Plan - Hazard Identification and Risk Assessment, each county evaluated the number of events and damage claims from impacts over the past 20 years to determine their hazard risk ranking.

Holmes County determined their probability of future occurrence based on reported data and local knowledge of previous events. Definitions for the classifications are provided below:

- Highly Likely – More than 8 occurrences over last 10 years
- Likely – 5 - 7 occurrences over last 10 years
- Low – 1 - 4 occurrences over last 10 years
- Susceptible – Conditions are favorable or there are historic events (greater than 50 years) or local knowledge of unreported events.

Table D.9 provides a summary of the hazard events for Holmes County followed by the results of their risk ranking exercise (Table D.10).

Table D.9 – Holmes County Summary of Hazard Events 2000 - 2020
Source: NCDC, MDEQ, USGS

Hazard Type	No of Events	Property Damage	Crop Damage	Death	Injury
Dam/Levee Failure	-	-	-	-	-
Drought	13	$120,000	$3,821,000	-	-
Earthquake	-	-	-	-	-
Extreme Heat / Heat	5	-	-	-	-
Expansive Soil	-	-	-	-	-
Flood	24	$3,145,000	$300,000	-	-
Severe Storm	114	$533,000	$48,000	1	1
Severe Winter Weather	9	$1,160,000	-	-	-
Tornado	15	$64,527,000	$6,325,000	1	43
Tropical Storm / Hurricane	2	$1,010,000	$15,100,000	-	-
Wildfire	-	-	-	-	-
	166	$120,549,000	$31,66,000	-	11

Table D.10 – Holmes County Risk Ranking Results

Hazard Type	Area Impacted	Health/Safety	Property Damage	Environmental Damage	Economic Disruption	Total	Future Occurrence	Risk	Risk Level
Dam/Levee Failure	4	0	4	4	4	16	2	32	Low
Drought	3	0	2	2	2	9	3	27	Low
Earthquake	1	0	2	2	1	6	2	12	Low
Expansive Soils	1	0	2	2	1	6	2	12	Low
Extreme Heat	1	0	0	1	1	3	3	9	Low
Flood	4	0	4	4	4	16	4	64	Medium
Severe Storm (thunderstorm, lightning, hail and high wind)	3	3	3	2	1	12	5	60	Medium
Severe Winter Weather	2	0	1	1	2	6	4	24	Low
Tornado	3	3	3	3	2	14	5	70	High
Tropical Storm / Hurricane	4	0	2	2	2	10	2	20	Low
Wildfire	1	0	1	1	2	5	1	5	Low

Table D.12 summarizes the vulnerability of each jurisdiction to each hazard. This information is based on community input, NCEI data, and available resources that discuss each hazard. An example of the latter would be the Mississippi DEQ web site Dam Safety Division, which provides maps illustrating the number and types of dams in each jurisdiction.

Table D.12 – Summary of Hazard Ranking, All Jurisdictions - Holmes County

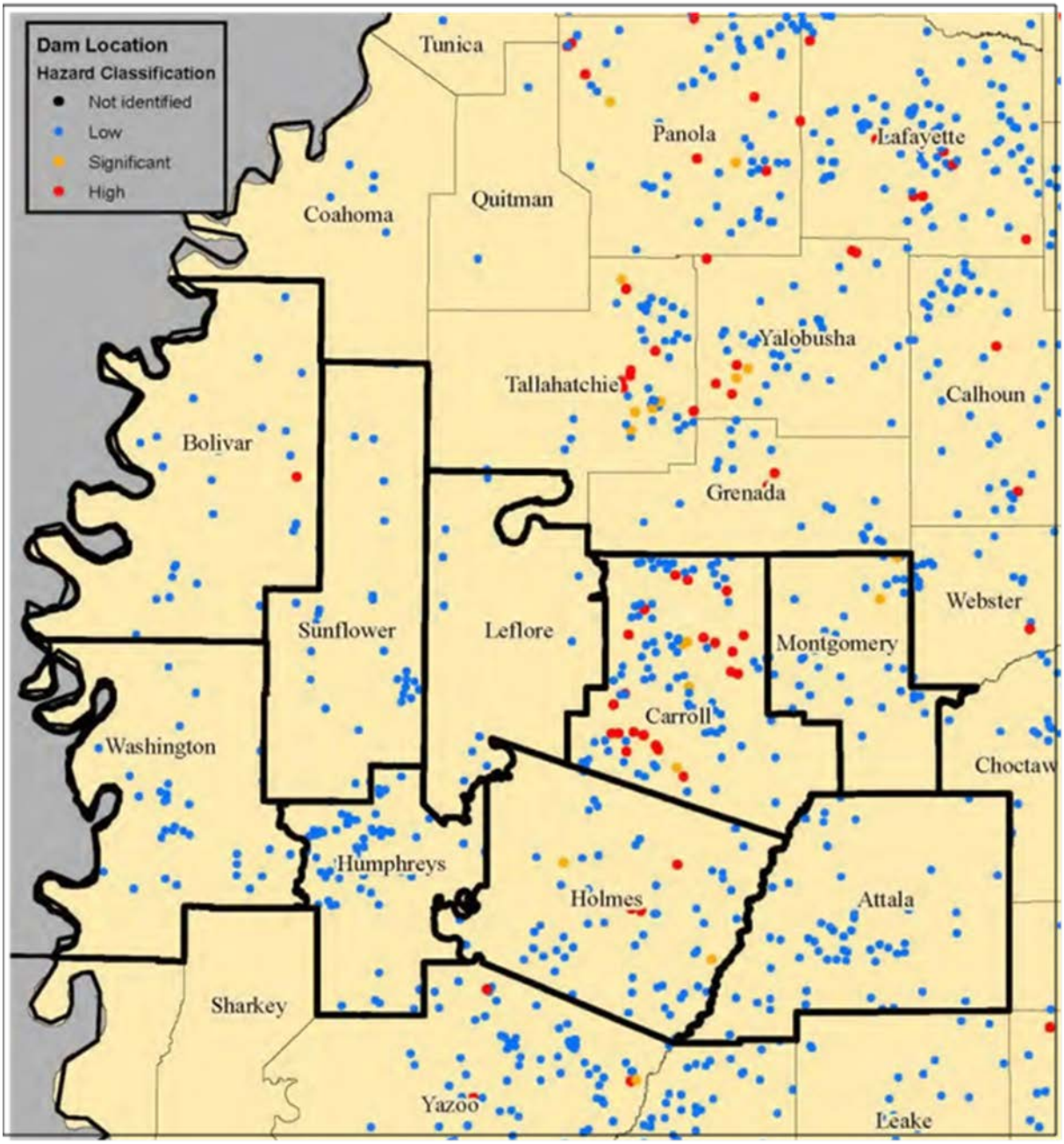
Hazard Type	Holmes County	Town of Cruger	City of Durant	Town of Goodman	City of Pickens	Town of Tchula	Town of West
Dam/Levee Failure	*Medium*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Drought	*Medium*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Earthquake	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Extreme Heat/Heat	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Expansive Soils	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Flood	*Medium*	*Medium*	*High*	*High*	*Low*	*Low*	*Low*
Severe Storm	*Medium*	*Medium*	*Medium*	*Medium*	*Medium*	*Medium*	*Medium*
Severe Winter Weather	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Tornado	*High*	*High*	*High*	*High*	*High*	*High*	*High*
Tropical Storm/Hurricane	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Wildfire	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*

Mitigation planning researchers are fortunate to have access to the Data Visualization Tool included on the FEMA website. This site provides county-level data on the breakdown of flood events and hazards included in federal emergency and disaster declarations, as well as for flood events recorded by FEMA. The information is updated through June 2020 and shows the disaster name, event type, number of events, and occurrence date. The data includes information from the time FEMA first began recording disaster events in the format currently used. While this time frame is longer than that included in this RHMP Update, the following page provides a one-page snapshot of Holmes County disasters that have been documented by FEMA.

Dam/Levee Failure

Figure D.4 shows a list of dams mapped based on 2015 data secured from the Mississippi Department of Environmental Quality (MDEQ) and included in the previous MEMA District 3 RHMP.

Figure D.4: Dams Mapped by the State of Mississippi
Source: MDEQ, Delta State University



Location and Extent

Holmes County is within the U.S. Army Corps of Engineers' Yazoo Basin Headwater Project, which uses four reservoirs (north of Holmes County) to control approximately 60 percent of the hill drainage. Levee-raising and channel improvements have significantly reduced the levee/dam failure hazard to Holmes County by lowering the flow line by up to three feet.

The 2018 SHMP included a MEMA Region 3 Dam Inventory by County, breaking the numbers down for low, high, and significant hazard dams. The numbers of dams for all nine counties in the District are included for the purpose of comparing Holmes County's level of risk to that of surrounding counties. The table shows that there are fewer in Holmes than in Carroll County; about the same as in neighboring Attala County; and more than in Montgomery County.

Table D.13 Region 3 Dam Inventory by County-Holmes

County	Significant	High	Low	Total
MEMA Region 3				
Atalla	1	2	44	47
Bolivar	-	-	14	14
Carroll	4	23	86	113
Holmes	1	5	39	45
Humphreys	-	-	4	4
Leflore	-	-	-	-
Montgomery	-	2	22	24
Sunflower	-	-	12	12
Washington	-	-	3	3

There is a total of 45 Dams located in Holmes County; Three Significant hazard, four High hazard and 38 Low Hazard Dams. Since the previous plan, the total number of Dams located in Holmes County has decreased from 61 to 45. The MDEQ has reclassified two Dams from low to high risk since the 2015 RHMP: the Tackett Watershed Structure 9 Dam, and the Floodwater Retarding Structure Site 35.

Table D.14 provides a listing of all hazard dams in the county. This list does not include dams whose structure has not been categorized.

Table D.14 – All Holmes County Significant, High and Low Hazard Dams | Source: MDEQ Dam Safety Division

Dam Name	State ID	Latitude	Longitude	Owner Type	EAP?
Significant Hazard Dams					
Holmes Jr. College Lake Dam	MS02810	32.9673	-89.9187		
Lake Katherine Dam	MS03446	33.1728	-90.1808		Y
Richard Roberson Lake DamMS0	MS03669	33.9602	_89.9468		
High Hazard Dams					
Black Creek Watershed Number 100 Dam	MS03423	33.0972	-90.0486		Y
FW-90-02 Site Number 38 Dam	MS03599	33.0945	-90.039		
FW-90-02 Site Number 30 Dam	MS03475	33.1700	-89.961		
Floodwater Retarding Structure Site 35		32.937	89.995		

Table D.15 - Low Hazard Dams | Source: MDEQ Dam Safety Division

Dam	State ID	Latitude	Longitude
Black Watershed Structure Y-36-40 Dam	MS00094	33.0517	-90.1800
Black Watershed Structure Y-36-48 Dam	MS00097	33.0333	-90.2383
Black Watershed Structure Y-36-43 Dam	MS00098	33.0350	-90.1617
Bob Gillforth Lake Dam	MS00099	33.0383	-90.0417
Holmes County State Park Number 1 Dam	MS00100	33.0250	-89.9267
Holmes County State Park Number 2 Dam	MS00101	33.0300	-89.9217
Tackett Watershed Structure 11 Dam	MS00102	32.9700	-89.9983
Tackett Watershed Structure 13 Dam	MS00103	32.9733	-89.9883
Goodman Sewage Lagoon Dam	MS00107	32.9633	-89.9033
Tackett Watershed Structure 9 Dam			
Tackett Watershed Structure 6 Dam	MS00109	32.9250	-89.9733
Winstead Reservoir Dam	MS01639	33.0600	-90.2367
Macmorrow Hammett Lake	MS02288	33.0733	-90.1333
Green Lake Dam	MS02745	33.1606	-89.8925
Humphrey Farm Lake Dam	MS03122	32.9858	-90.0458
Mc Bride Pond Dam	MS03154	32.9956	-90.1969
Wilderness West Dam	MS03248	33.2286	-89.8478
McCraw Hawkins Dam	MS03268	33.0139	-90.2564
Robertson Pond Dam	MS03318	33.0197	-90.2197
Jessie Mcright	MS03319	33.0183	-90.1781
Fw-88-01 Site Bfc-47 Dam	MS03356	33.0750	-90.1014
Fw-88-02 Site 52 Dam	MS03411	33.0294	-90.1931
Trash Hunters Lake Dam	MS03534	33.1286	-89.8561
Hoseman Lake Dam	MS03693	32.9289	-90.0544
Ragland Dam	MS03822	33.0556	-90.0253

Dam Name	State ID	Latitude	Longitude	Owner Type
Black Creek WS Str Y-36-56 Dam	MS00074	33.3211	-90.1428	
Black Watershed Structure Y-36-54 Dam	MS00075	33.2750	-90.1217	
Black Watershed Structure Y-36-55 Dam	MS00076	33.2583	-90.1317	
Black Watershed Structure Y-36-53 Dam	MS00077	33.2650	-90.1150	
Edmond Hooker Lake Dam	MS00078	33.2117	-90.0333	
Black Watershed Structure Y-36-21 Dam	MS00079	33.2017	-90.0417	
D C OBriant Lake Dam	MS00080	33.2000	-89.8317	
Black Watershed Structure Y-36-23 Dam	MS00081	33.1850	-90.1133	
Black Watershed Structure Y-36-12 Dam	MS00083	33.1800	-90.1450	
Black Watershed Structure Y-36-11 Dam	MS00084	33.1369	-90.1856	
Black Watershed Structure Y-36-24 Dam	MS00085	33.1217	-90.1500	
Black Watershed Structure Y-36-25 Dam	MS00086	33.1300	-90.1317	
Black Watershed Structure Y-36-28 Dam	MS00087	33.1367	-90.0017	
Black Watershed Structure Y-36-39 Dam	MS00088	33.1100	-90.1183	
Black Watershed Structure Y-36-37 Dam	MS00089	33.0900	-90.0050	
Durant Lagoon Dam	MS00091	33.0817	-89.8450	

Figure D.5 – Mississippi Levee System

Previous Occurrences

There is no record of dam breaches in Holmes County. However, any breach within the county could be catastrophic.

Probability of Future Occurrence

The probability of breaches to dam/levees within and near Holmes County is classified as low. Dam failure is not considered to be among the highest hazards of concern in the county but, since the reclassification, there is increased awareness among officials about monitoring such structures. The probability of future occurrence of dam breach is classified as low. It is not possible to develop a statistical probability when there is no historical data.

Assessing Vulnerability

A high hazard dam is located near Cruger with a capacity of 1,670 foot-acres of water storage. The dam is owned and maintained by the Black Creek Drainage District. This dam is 622 feet long, 38 feet tall and covers 38 acres. If this earthen dam were to fail, it is possible that 1,670 foot-acres of water could inundate homes and agricultural resources in the area, with up to $760,000 in property damages possible. The four other significant and high hazard dams are located within the unincorporated limits of the county.

With the reclassification to two dams from low to high hazard, the County is working more closely with the MDEQ Dam Safety Division and dam owners to ensure that EAPs for both structures are updated. If breached, even a low hazard dam could cause damage to nearby property. The maps below, taken from the MDEQ Dam Safety Division mapping web site, show close up views of the location of dams in all of Holmes County and for each of its jurisdictions. In each screen shot, the name of the community is shown in the Search Box, and a legend is included to show the degree of hazard for each identified dam.

Figure D6a: Holmes County Vulnerability to Dam Failure

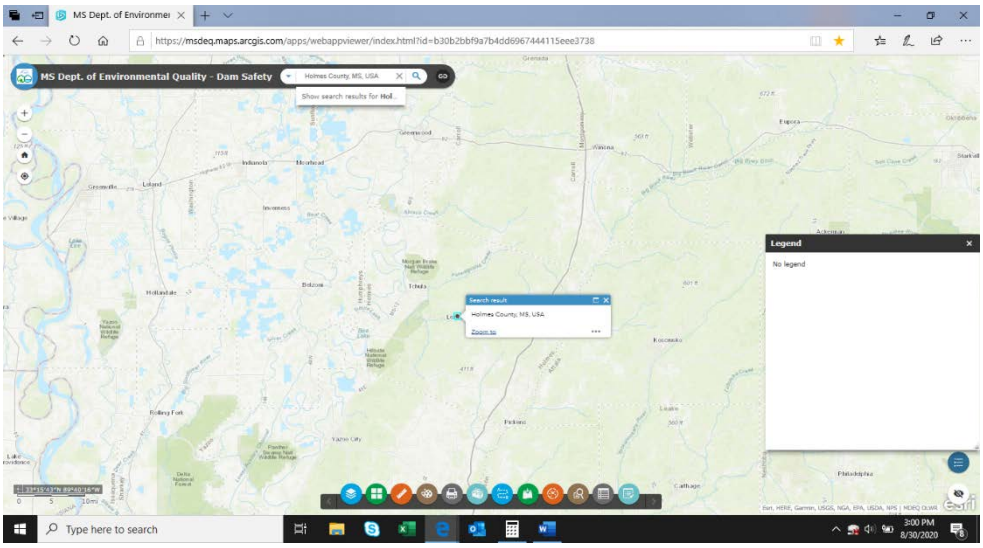


Figure D6a: Holmes County Vulnerability to Dam *Failure*

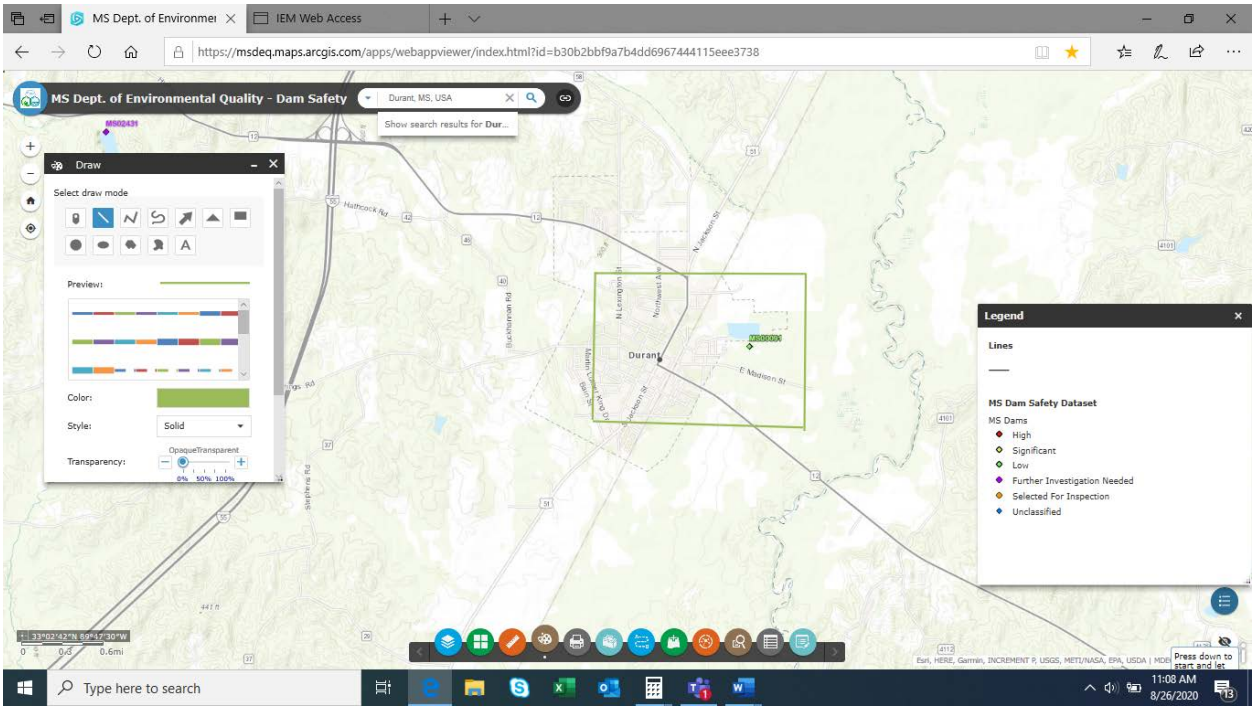


Figure D6c: City of Lexington Vulnerability to Dam Failure

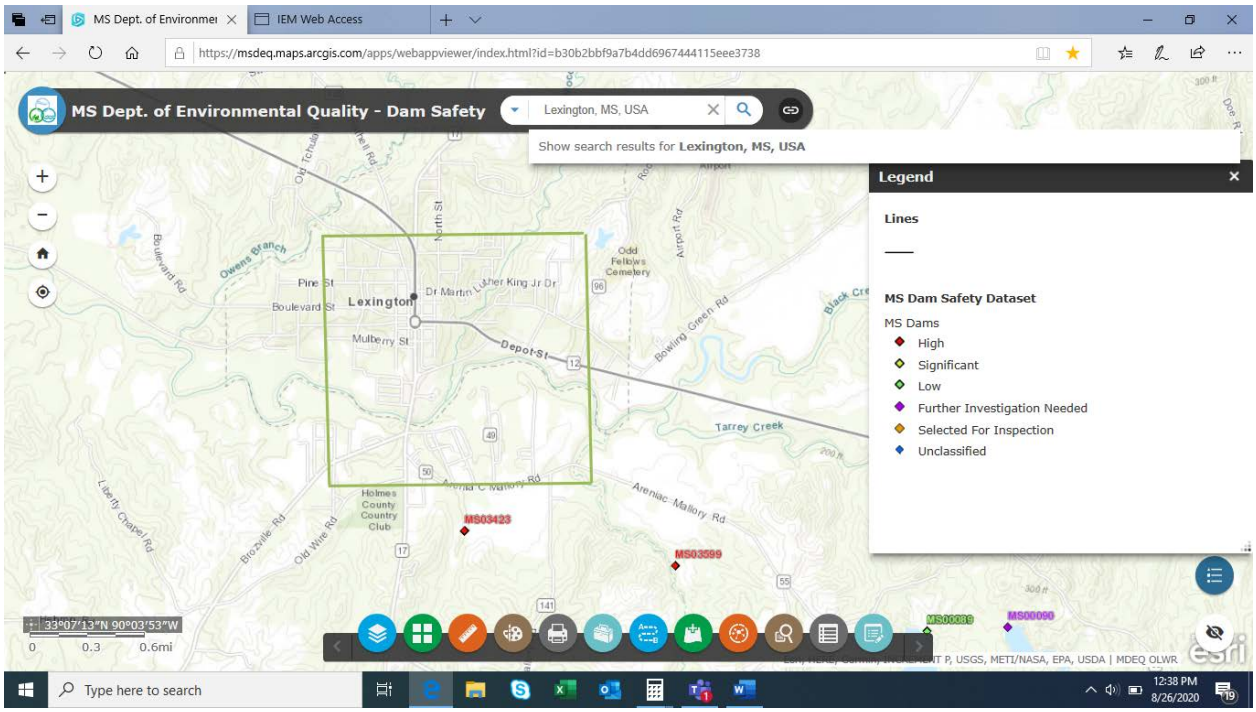


Figure D6d: Town of Cruger Vulnerability to Dam Failure

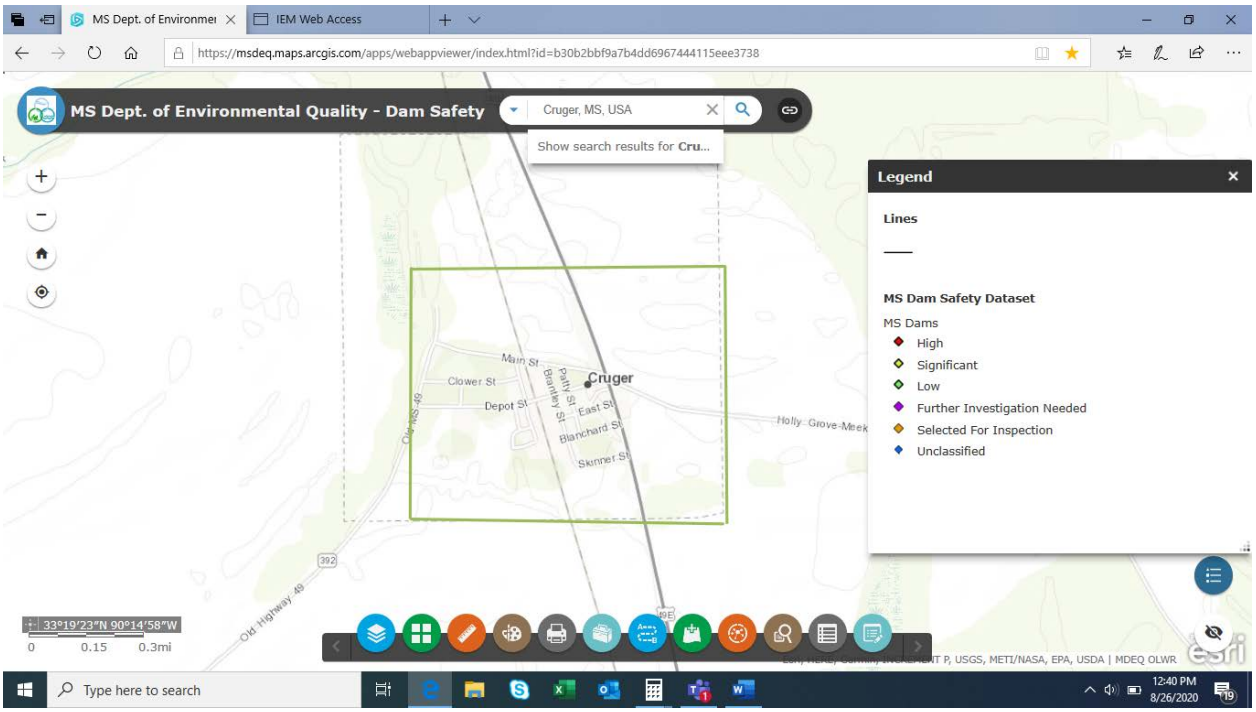


Figure D6e: Town of Goodman Vulnerability to Dam Failure

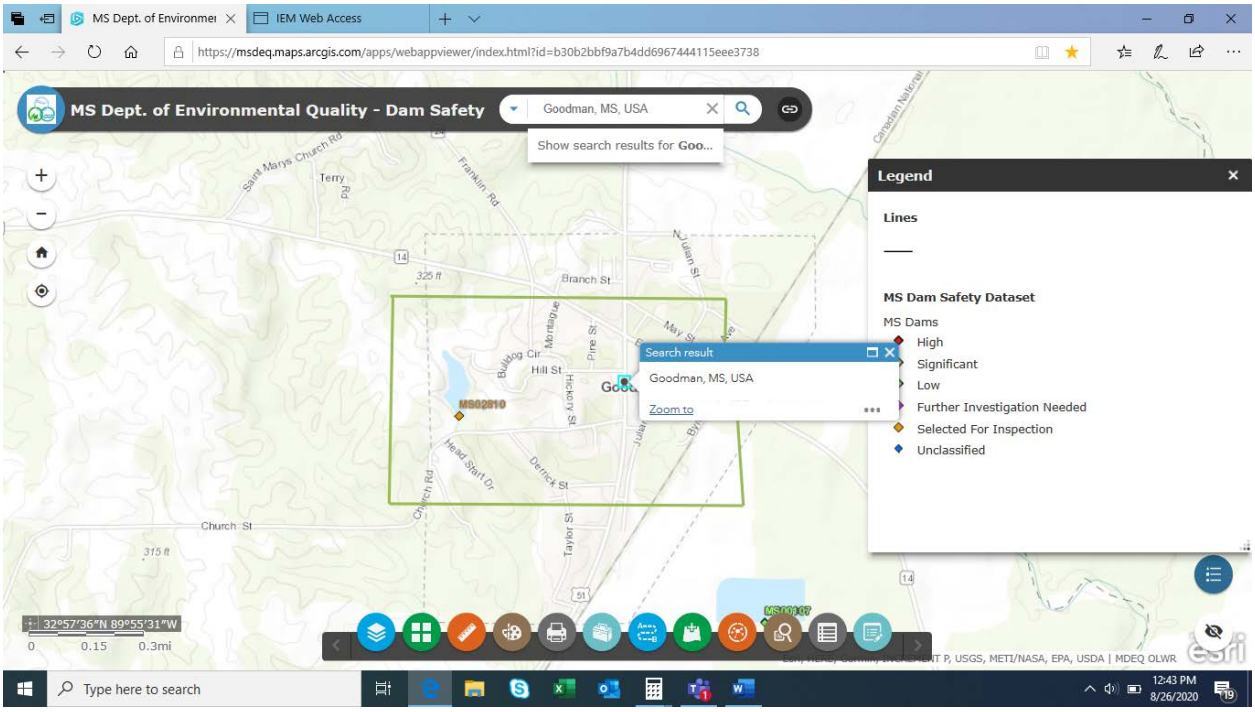


Figure D6f: Town of Pickens Vulnerability to Dam Failure

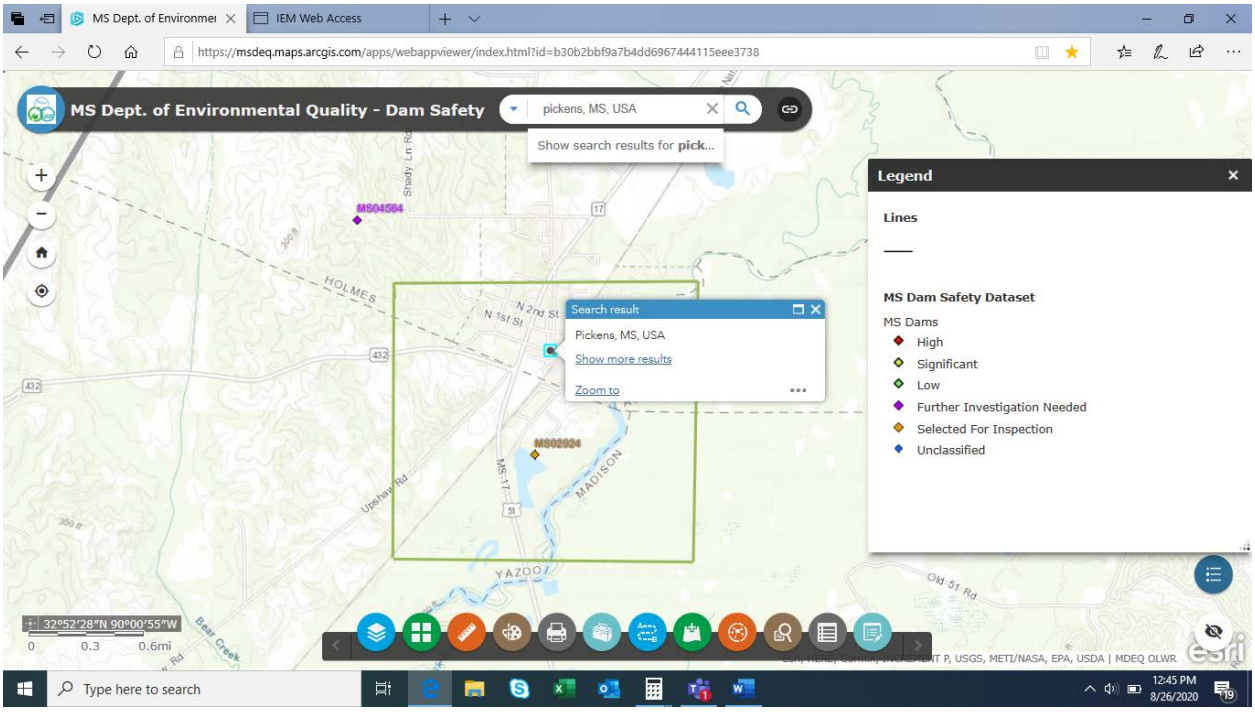


Figure D6g: City of Tchula Vulnerability to Dam Failure

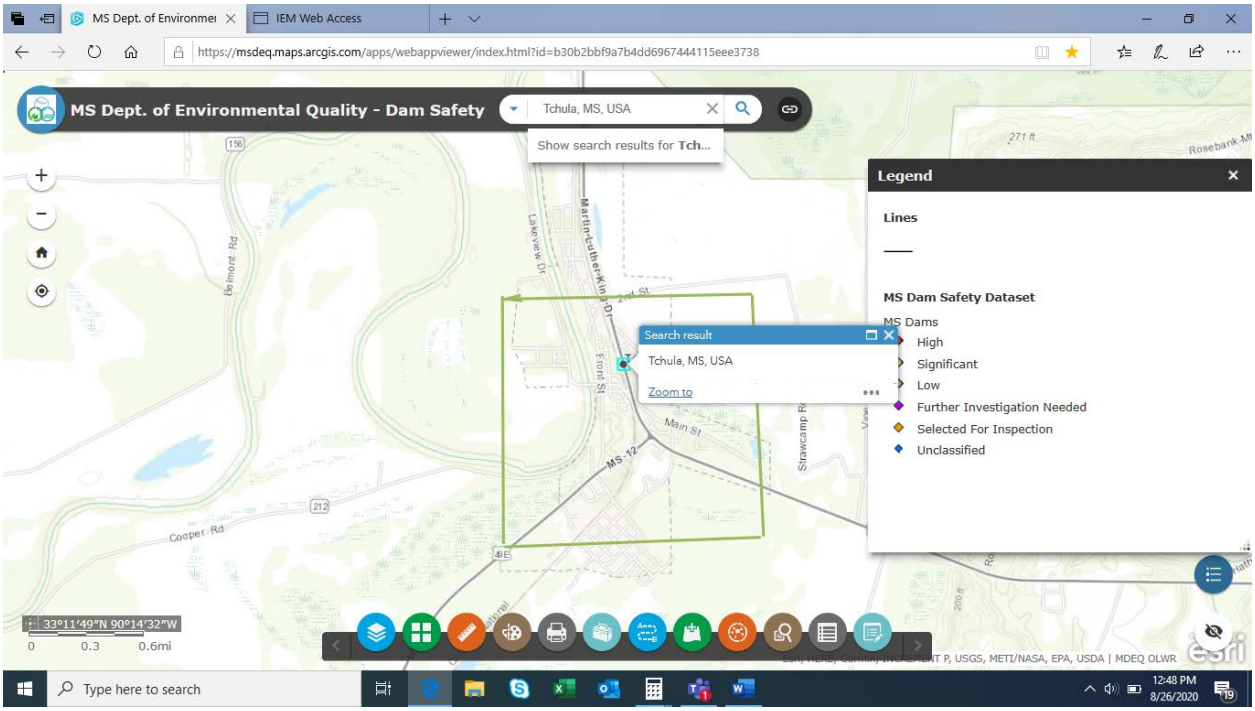
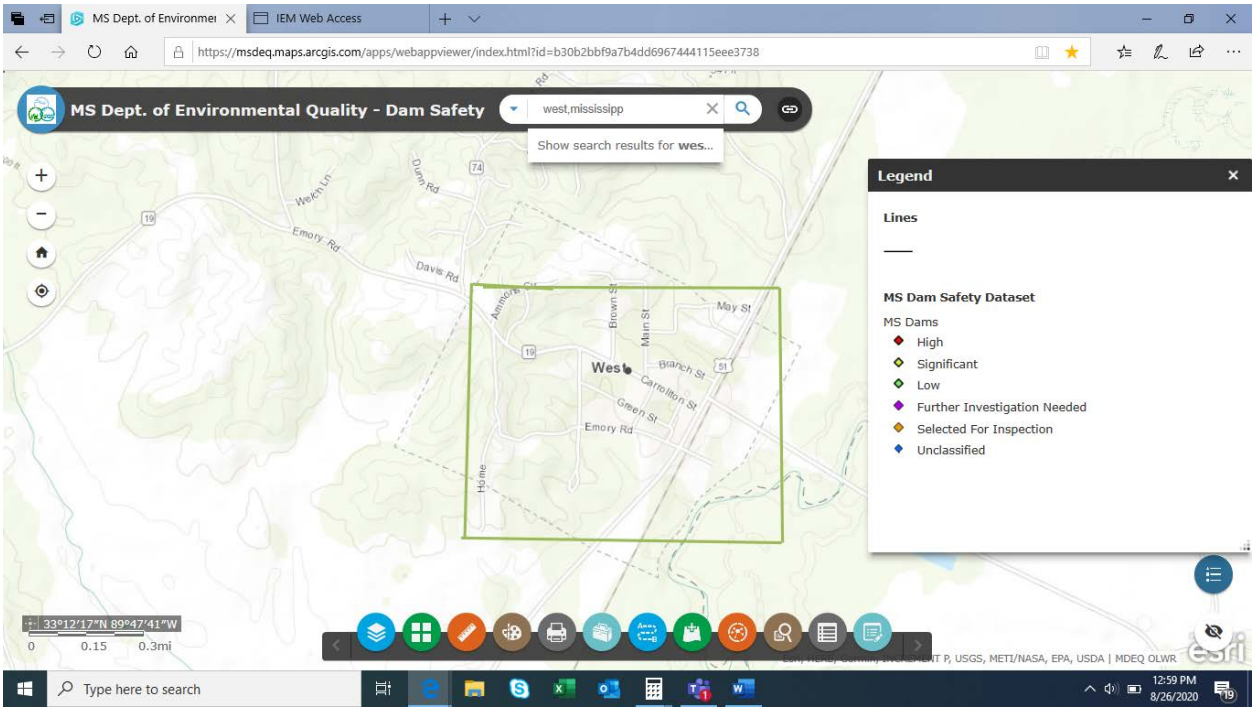


Figure D6h: Town of West Vulnerability to Dam Failure



Overall Vulnerability to Dam Failure

The following table summarizes the vulnerability of each jurisdiction to dam failure.

Table D.16 Geographic Vulnerability to Damn Failure by Jurisdiction

Jurisdiction	Ranking
Unincorporated Holmes County	Medium
Town of Cruger	Low
Town of Durant	Low
Town of Goodman	Low
Town of Lexington	Low
Town of Pickens	Low
Town of Tchula	Low
Town of West	Low

The presence of one significant hazard and two high hazard dams in unincorporated Holmes County suggests that areas near these structures may at some point may be at risk to dam failure so the overall vulnerability rating for that area is medium. However, because most of the region is at low risk to the hazard, it is rated as low risk to Holmes County overall.

Drought

Location and Extent

Drought covers a large area and is not geographically confined. As such, all of Holmes County could be exposed to drought conditions. The extent of damage from drought typically does not pose a threat to property but can impact agricultural assets within the county.

Previous Occurrences

Table D.17 lists thirteen events reported in the years of 2000 through 2019 as shown in the National Weather Service Storm Events Database, referred to in this annex by its acronym NCEI (National Center for Environmental Information. It is important to note that the lack of data during that a given time frame does not mean drought conditions did not exist. NCEI reports drought on a countywide basis and not by jurisdiction.

Table D.17: Drought Occurrences 2000 to 2019 | Source: NCEI

Date	Death	Injury	Property Damage	Crop Damage
12/1/2016	0	0	-	$50,000
11/01/2016	0	0	$50,000	-
10/11/2016	0	0	-	$40,000
8/1/2016	0	0	-	$30,000
7/26/2016	0	0	$30,000	-
10/1/2015	0	0	-	$1,200
9/1/2015	0	0	-	$400,000
10/1/2010	0	0	-	$500,000
7/1/2007	0	0	$40,000	-

6/1/2007	0	0	-	$1,300,000
5/1/2007	0	0	-	$500,000
4/25/2007	0	0	-	-
10/1/2006	0	0	-	$1,000,000
Total	0	0	$120,000	$3,821,200

Probability of Future Occurrence

Historical data listed in Table D.17 suggest that drought is likely with a 26% chance of occurring in any given year. It may occur one or more times in a given year or may experience a drought-free period of several years. Based on limited historical data, we should assume that the probability of a future drought event is inevitable due to the changes in climate throughout the United States and the fact that Holmes County included as a significant agriculture holding.

Assessing Vulnerability

Drought is monitored by the National Weather Service and the State of Mississippi State University Extension Service, which has offices in each county. Two tools are available for Extension staff and others who monitor drought: the Keetch-Bynum Drought Index and the Palmer the Drought Severity Index, which are discussed in Section 4 of the Base Plan as tools for drought monitoring. Drought is not known to cost human lives may not be lost but it affects lifestyles, and the economic effects may be felt countywide. The NCEI database indicates there have been no known deaths or injuries from drought in the planning area.

The agricultural resources of Holmes County are particularly vulnerable to drought events. Drought occurs with a great deal of warning. Human lives may not be lost, but lifestyles could be dramatically altered, and the economic effects felt countywide. Additionally, the catfish and agricultural resources of Holmes County are particularly vulnerable to drought events. The NCEI database indicates there are no known deaths or injuries from droughts in the planning area. There was $120,000 in documented property damage reported in the NCEI database for the period 2002 to 2019. The catfish and agricultural resources of Holmes County are particularly vulnerable to drought. Agricultural losses from multiple events from November 2006 through December 2016 timeframe totaled approximately $3,821,200. The unincorporated areas, which include agricultural assets, are more affected by drought than municipalities, this area ranks the hazard as medium.

Table D.18 Holmes County Jurisdictional Vulnerability to Drought

Jurisdiction	Ranking
Unincorporated Holmes County	Medium
Town of Cruger	Low
Town of Durant	Low
Town of Goodman	Low
Town of Lexington	Low
Town of Pickens	Low
Town of Tchula	Low
Town of West	Low

Earthquake

Location and Extent

Holmes County, like most of North Central Mississippi, is located within the Modified Mercalli Zone VI. Should an event occur that has a 5.9 to 6.0 magnitude on the Richter Scale, some or all of the following may occur based on descriptions included in the Scale:

- The event would be felt by all or nearly everyone
- People may be awakened from sleep if the event occurs at night
- Widespread frightened population
- Some dishes and windows would be broken.
- Unstable objects would be overturned.
- Pendulum clocks may stop.
- Heavy furniture moved
- Instances of fallen plaster
- Slight damage

Previous Occurrences

No earthquakes have been reported as having taken place in or affected Holmes County.

Probability of Future Occurrence

In 2002, a study by the Center for Earthquake Research and Information (CERI) at the University of Memphis reported that, in any given 50-year interval, there is a seven to ten percent probability of the region experiencing an event at the level of the devastating 1811-1812 sequence of earthquakes in the New Madrid Zone. The study also estimated that there is an estimated 25 to 40 percent probability that a 6.0 magnitude event occurring a 50-year time period. The probability of future earthquake occurrence is, therefore, classified as susceptible.

Assessing Vulnerability

The level of vulnerability is the same for all areas of the county given that there is no substantive geographic variation in distance from one end of the county to the city of New Madrid, MO, the epicenter of the New Madrid Seismic Zone. There is not enough of a distance in proximity to New Madrid to say that one community is more vulnerable than the other.

There are recorded deaths, injuries, or property damage from earthquakes in Holmes County. There is little likelihood of any detrimental effect on the County's economy, residents' lifestyle, or physical structures. However, the effects on life and property in the area and low hazard dams could be significant if a large earthquake were to occur given the nature of the built environment. In estimates derived from a report by the U.S. Geological Survey (USGS) "New Madrid Earthquake Project," the relative risk for Holmes County and other sectors of MEMA District 3 for a potential seismic event with a magnitude of between 3 and 4 on the Richter scale.

Research done by the USGS Earthquake Hazard Program suggests that buildings constructed using load-bearing masonry walls are vulnerable to damage by earthquakes, while steel and wood-frame buildings have a lower seismic vulnerability. Low-rise reinforced concrete buildings are also in this lower seismic risk category. Damage expected in such an event within the unincorporated areas of Holmes County could include buildings, not secured to a solid foundation being shaken off their

supports, and chimneys falling away from houses. Multi-story structures built with un-reinforced masonry buildings could be substantially damaged.

In reviewing earthquake effects on dams, the SHMP overlaid significant high hazard dams with historic seismic recordings and developed a dam inventory for earthquake prone counties. Dam/levee systems are also vulnerable to earthquake events as shown by the table below.

Table D.19: Dam Inventory in Relation to Earthquake Prone Counties by Dam Type
Source: 2018 Mississippi State Hazard Mitigation Plan

MEMA DISTRICT 3				
County	Significant	High	Medium	Low
Attala	1	2	44	47
Bolivar	-	-	14	14
Carroll	4	23	86	113
Holmes	1	5	39	45
Humphreys	-	-	4	4
Leflore	-	-	-	-
Montgomery	2	22	24	2
Sunflower	-	-	12	12
Washington	-	-	3	3

The County is being proactive on this score by maintaining open communications with the owners of the significant and high hazard dams and encouraging all five to maintain a current EAP.

Extreme Heat

Location and Extent

Heat waves cover a large area and cannot be confined within geographic boundaries. Therefore, all of Holmes County could be exposed to excessive heat conditions. The extent of damage from heat events typically does not pose a threat to property or crops but heat can affect the elderly, infants, and disabled persons, and cause death in persons who are overexposed. It can cause crop damage and affect the livelihood of those working in the agricultural industry.

Previous Occurrences

Table D.20 shows that there have been five recorded heat events from 2005 to 2010 and none since the 2015 RHMP was written. There were no damages or loss of life/injury documented from these events.

Table D.20: Excessive Heat / Heat Occurrences 2000 to 2020 | Source: NCEI

Date	Event Type	Death	Injury	Property Damage	Crop Damage
8/1/2010	Excessive Heat	0	0	0	0
8/5/2007	Heat	0	0	0	0
7/15/2006	Heat	0	0	0	0
8/17/2005	Heat	0	0	0	0
7/23/2005	Heat	0	0	0	0

The National Weather Service event narrative for the most recent occurrence (8/1/2010) is typical of how extent is described for the other events.

> "A four day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS Jackson, MS forecast area, 19 record highs were set between August 1st and 4th. On August 2nd, the 2nd warmest average temperature was recorded. The low was 78 and the high 105, this resulted in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in 3 fatalities across the forecast area."

The deaths mentioned in this description occurred elsewhere in the region served by the Jackson, MS weather station, so they are a reminder that extreme heat affects the entire county and all populations. It is not feasible to discuss vulnerability broke down by jurisdiction because NCEI data for this hazard is all reported countywide.

Probability of Future Occurrence

While five events are listed in the table of historic events, two of these appear to be from an extended event that occurred over a two-month period. As such, for the purpose of determining probability, it is accurate to say that four events took place over a 19-year period. It is worth noting that a heat event has not been recorded for the most recent nine years of available data. Averaging the events out over the greater period is the most reasonable method for use in determining probability. The average recurrent interval for the 19-year period suggests that there is a 21% percent chance of occurrence for any given year.

Assessing Vulnerability

Heat can affect certain populations but generally causes no property damage. During periods of extreme heat, there is little physical destruction, although roads can buckle, and livestock die. Extreme heat conditions can pose problems for those not accustomed to the climate or who are outside for prolonged periods of time. Extreme heat can create a threat even to individuals and communities that are accustomed to high temperatures. Excessive heat can also cause utility outages due to an increased demand for electricity.

All of the following populations are prone to heat-related conditions: the elderly; young children; those who are immobile; persons who live alone especially without air conditioning; people without transportation; and people suffering from serious illnesses. Because NWS reports are county-based and events described are often regional occurrences, it is safe to say that the entire population of all county locations are vulnerable.

Expansive Soil

Location and Extent

Expansive soils are present throughout Mississippi and have been known to cause considerable damage to housing and infrastructure. Less than 50 percent of soils in Holmes County consist of clay having high swelling potential.

Previous Occurrences

There has been no record of expansive soil issues in Holmes County.

Probability of Future Occurrence

The probability of expansive soils is classified as low.

Assessing Vulnerability

Expansive soils could cause damage to infrastructure and both business and residential structures within Holmes County.

Flood

Location and Extent

Flooding is an issue throughout Holmes County. The impacts vary according to storm system. The entire geographic region of Holmes County is at risk to riverine, flash flooding, and flooding caused by undersized overburdened stormwater management systems. All of the flood events cited from recent NCEI data below are documented as flash floods. Flood data shown below shows that all locations in the county are susceptible to flooding, and the extent of some events is listed as countywide.

Flash floods often occur when rain falls on the built environment where impervious surfaces, gutters, and storm sewers hasten the flow of run-off. Flowing waters can become raging torrents of water that course through streambeds and streets, sweeping away everything in their path.

Previous Occurrences

Table D.21 provides a summary of the 24 flood events recorded from 2000 to 2019, and Table D.22 shows the events sorted by location within the county. While inadequate stormwater management capability likely contributes to flash flooding in all areas, it is noted where local creeks, rivers and their tributaries are located nearby and may be potential sources of overflow.

Table D.21: Flood Events 1997 to 2013 | Source: NCEI

Location	Date	Time	Event Type	Death	injury	Property Damage	Crop Damage
Huma	7/21/2019	9:17	Flash Flood	-	-	1,000	-
Lexington	7/21/2019	9:09	Flash Flood	-	-	25,000	-
Hebron	7/21/2019	9:02	Flash Flood	-	-	30,000	-
Lexington	7/21/2019	8:47	Flash Flood	-	-	1,000	-
Hebron	7/21/2019	7:47	Flash Flood	-	-	120,000	-
Goodman	4/13/2019	18:24	Flash Flood	-	-	30,000	-
Lexington Ca Moor AR	9/6/2018	6:30	Flash Flood	-	-	5,000	-
Tchula	4/16/2015	15:15	Flash Flood	-	-	10,000	-
West	4/15/2011	8:30	Flash Flood	0	0	50,000	100,000

Location	Date	Time	Event Type	Death	injury	Property Damage	Crop Damage
Durant	1/1/2011	0:25	Flash Flood	0	0	1,000	0
Goodman	11/29/2010	21:10	Flash Flood	0	0	9,000	0
Cruger	7/16/2010	15:50	Flash Flood	0	0	5,000	0
Tchula	12/8/2009	22:05	Flash Flood	0	0	5,000	0
Coxburg	10/16/2006	20:00	Flash Flood	0	0	1,000,000	100,000
South Portion	9/25/2005	8:30	Flash Flood	0	0	300,000	100,000
Cruger	4/11/2005	10:00	Flash Flood	0	0	100,000	0
Brozville	3/5/2004	20:30	Flash Flood	0	0	3,000	0
Gwin	6/17/2003	13:00	Flash Flood	0	0	200,000	0
Countywide	12/13/2001	19:05	Flash Flood	0	0	200,000	0
Countywide	4/4/2001	18:00	Flash Flood	0	0	1,000,000	0
Countywide	4/3/2000	13:00	Flash Flood	0	0	50,000	0
Countywide	5/5/1999	19:50	Flash Flood	0	0	20,000	0
Countywide	1/29/1999	14:30	Flash Flood	0	0	50,000	0
Lexington	6/10/1997	0:00	Flash Flood	0	0	10,000,000	0
Totals				0	0	$3,145,00093,0	$300,000

Table D.22: Holmes County Flood Events 20001 to 2019 – Sorted by Location

Source: NCEI

Location	# Events	Major Water Bodies
Durant	1	Big Black River
Goodman	2	Big Black River
Lexington	4	Yazoo River
Tchula	2	Tchula Lake,
West	1	Big Black River, Yazoo River
Countywide	12	Yazoo River, Big Black River, Tchula Lake
Cruger	2	Yazoo River

Information from the same table can be further sorted to assess vulnerability for the jurisdictions and unincorporated areas of the Holmes. All unincorporated communities, or reference to part of the County, will be counted toward incidents not within an identified municipality.

While there is a section devoted to flood vulnerability further in this annex, vulnerability will also be addressed here, in proximity to the previous information.

Table D.23 Geographic Vulnerability to Flood by Jurisdiction

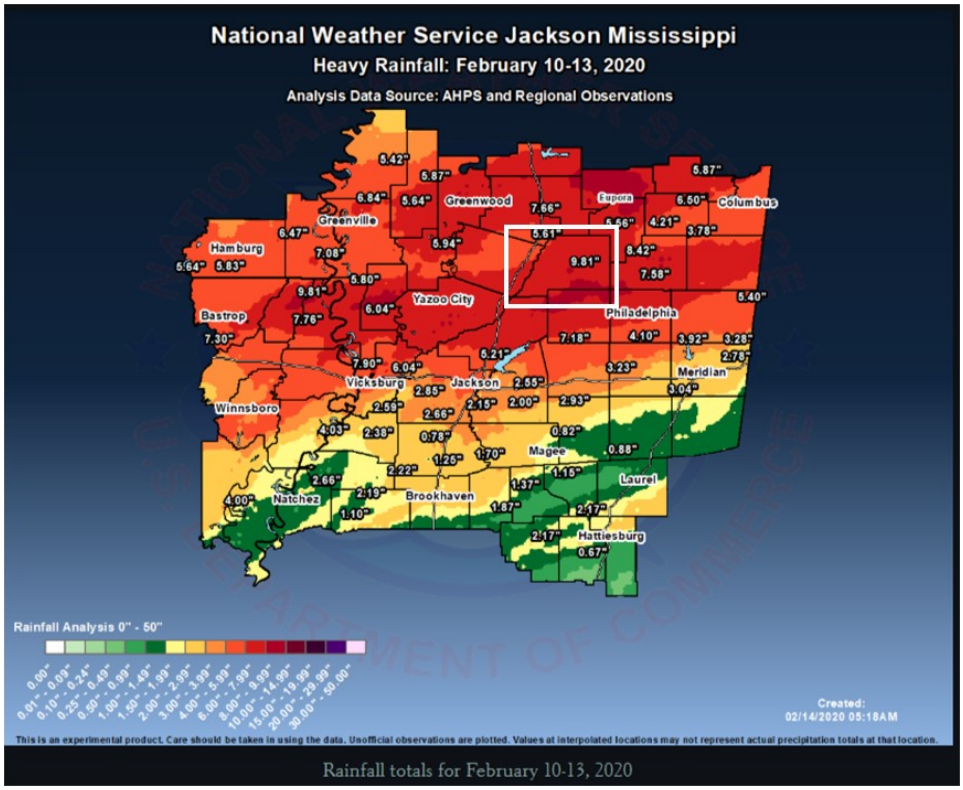
Location	# Events	Vulnerability Level	Critical Points
Cruger	2		Presence of major rivers and tributaries, mostly localized flooding
Durant	1-5	Medium	Presence of major rivers and tributaries, , mostly localized flooding
Goodman	2	Medium	Frequency and cost of events, but much of the impacted land does not include structures

Lexington	4	Low	Location near major river and tributaries
Tchula	2	High	Location near lake and tributaries, mostly localized flooding
West	1	Low	Location of major river running through town
Countywide	12	Medium	Presence of major rivers and tributaries throughout unincorporated portions of the county
Overall vulnerability of Holmes County		Medium	Number events, that do not affect structures, input from the Office of Emergency Management

Residents of Holmes County participating in the National Flood Insurance Program (NFIP) have received over $1,169,154 in flood loss payments. Details regarding the NFIP program by community is provided in the capabilities assessment section of this annex.

In addition to the events documented as occurring through 2019, MEMA District 3 experienced significant rainfall in early 2020 that had not yet been fully documented by NCEI at the time of plan development. The visual included on the next page as Figure D.7 shows that during the period of February 10-13, 2020, communities districtwide received between three to 14 inches of rain, and rain continued to fall – at times heavily – through the rest of the month. The Holmes County Emergency Management Director said that rainfall affected roadways and caused his department to recognize the need for road improvements in certain areas to mitigate against future flooding. The map shows that Holmes County – the portion of the map inside the white text box – received 9.81 inches during the documented period.

Figure D.7 February 10-13, 2020 Heavy Rainfall Event



Holmes County and its six municipalities participate in the National Flood Insurance Program (NFIP).

Based on losses outlined in the 2013 SHMP, the following HAZUS Flood Results were listed for Holmes County Comparable data from the 2018 SHMP was not available to researchers working on the 202 RHMP Update.

Table D.24 – Holmes County HAZUS Flood Result | Source: HAZUS (2013 State of Mississippi Standard Hazard Mitigation Plan)

Structural Damage	Contents Damage	Inventory Loss	Total Building Loss	Income loss	Total Building and Income Loss	Bldg. Loss Ratio
$9,219,000	$10,394,000	$375,000	$19,988,000	$522,000	$20,510,000	5.7%

Residential at Risk	Other at Risk	Total Bldgs. Risk	No. of Bldgs. Substantially Damaged	No. of households	No. of people needing shelter	Countywide Building Exposure
529	0	29	13	14	197	$599,672,000

The next two tables were also taken from the 2018 SHMP and, respectively, show the number of RL/SRL properties for Holmes County and the eight other counties included in MEMA District 3 and the number of NFIP participating communities for each county and number of properties mitigated.

Table D.25: D3 Repetitive Loss and Sever Repetitive Loss Properties – Over time and by County | Source: 2018 Mississippi State Hazard Mitigation Plan

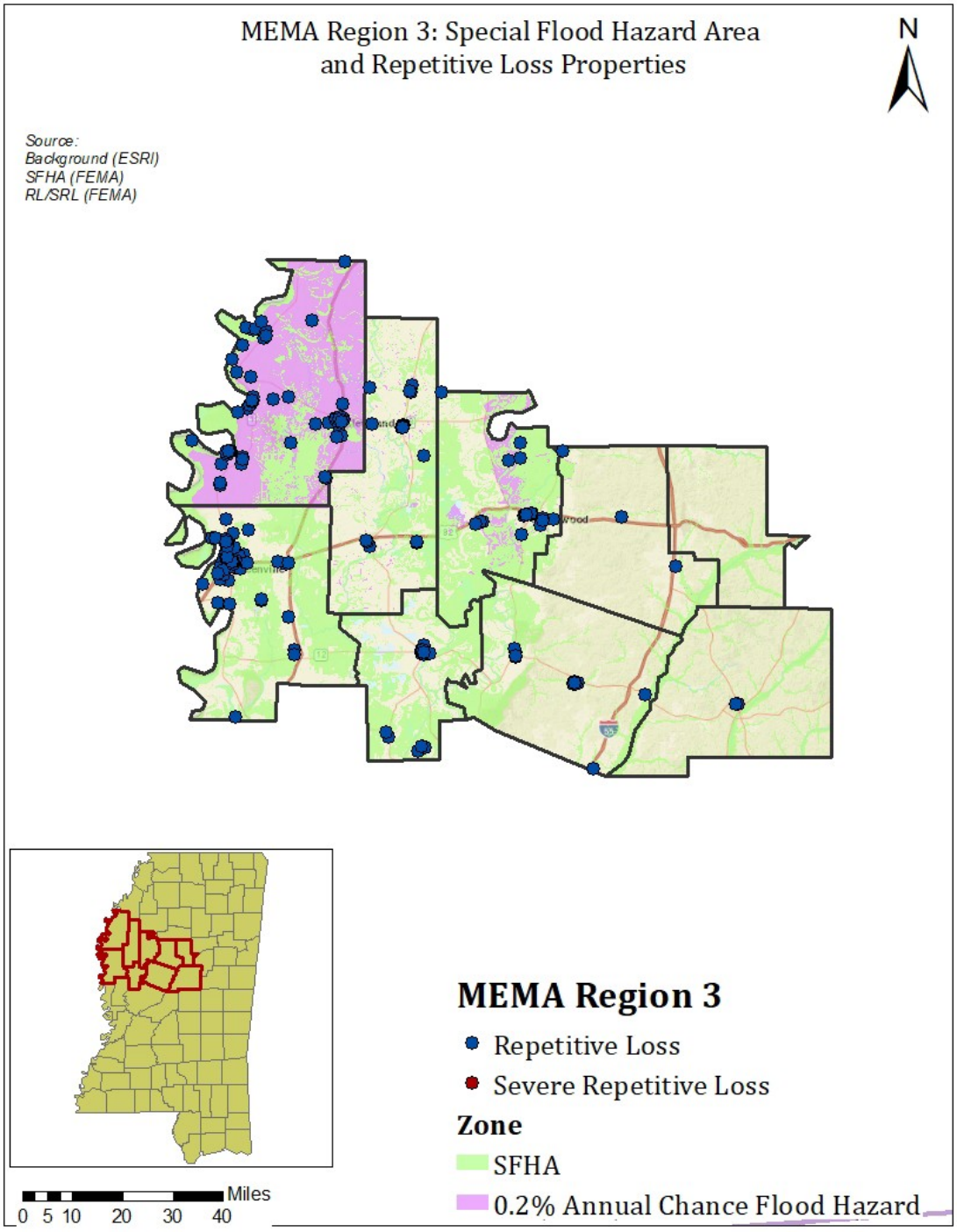
County	Repetitive Loss				Severe Repetitive Loss			
	No. of Properties 2009	No. of Properties 2011	No. of Properties 2016	No. of Flood Claims	No. of Properties 2009	No. of Properties 2011	No. of Properties 2016	No. of Flood Claims
Attala	0	0	1	2	0	0	0	0
Bolivar	155	108	210	631	2	48	2	228
Carroll	4	4	4	8	0	0	0	0
Holmes	11	12	12	27	0	0	0	0
Humphreys	40	31	46	161	2	10	1	61
Leflore	29	27	27	71	0	2	0	8
Montgomery	0	0	0	0	0	0	0	0
Sunflower	19	16	20	72	1	4	0	21
Washington	152	115	191	631	14	48	8	250
Totals	410	313	511	1,603	19	112	11	568

Table 26: D 3 Participating Communities and Number of Mitigated Properties by County | Source: 2018 Mississippi State Hazard Mitigation Plan

County	No. of NFIP Communities	No. of Mitigated Properties
Attala	5	0
Bolivar	16	20
Carroll	4	0
Holmes	8	0
Humphreys	5	1
Leflore	6	1
Montgomery	4	0
Sunflower	8	4
Washington	6	26
Totals	61	52

The Capabilities Assessment of this Annex identifies NFIP participation and also the fact that a Flood insurance Study was conducted when FEMA developed local Flood Insurance Rate Maps (FIRMs). As of 2016, there was one repetitive loss property in the county. The map below, also from the 2018 SHMP, shows the location of Special Flood Hazard Areas (SFHAs) and RL structures for each county in Region 3.

Figure D.8 MEMA District 3 Special Flood Hazard Area (SHFA) and Repetitive Loss Structures | Source: 2018 Mississippi SHMP



Probability of Future Occurrence

The probability of flooding in Holmes County is listed as highly likely given the history of flood events; the presence of an overtaxed drainage system; and location in the region of the Big Black and Yazoo Rivers and their many tributaries. NCEI data shows that one or more portions of the County reported flooding in 12 of the 19 years of data being studied. This suggests that there is a 63% chance of flooding in any given year. As such, it is highly likely that the community will see flooding roughly once every 18 to 24 months.

Assessing Vulnerability

Repetitive and Severe Repetitive Loss Properties

There is a total of 12 repetitive loss flood claim properties in Holmes County. Table D.27 provides a summary of the number of claims reported followed by a detail of the properties (excluding address-specific locations) classified as repetitive loss.

Table D.27– Holmes County Repetitive Flood Loss Properties1978-2011 | *Source: MEMA RL Listing 2-28-2011*

No. of RL Properties	No. of Insured Properties	No. of Mitigated Properties	Flood Claims	Total Property Value ($)	Total Payments ($)	Loss Ratio*
12	4	0	27	655,780	352,489	0.538

The following is a summary of the number of structures, estimated property values, and identified priority areas within each community.

Table D.28: Holmes County Structures, Property Values, and Priority Areas

Community	No. of Structures in Flood Zone	Estimated Property Value	Priority Areas
Holmes County	825	$49,500,000	Pecan Grove, Old Balance Due, Mileston and Thornton
Cruger	0	-	Railroad Street
Durant	15	$640,000	Southeast section of Depot Street, Lee Street, from about one block south of Forrest to Jackson Street.
Goodman	12	$720,000	Parker and Railroad Streets
Lexington	631	$37,860,000	Downtown Lexington: Depot Street; Avenue A; 2nd, 3rd, 4th, and 5th Streets; and Henry Street; Along Highway 12 (from Rogers Street to Hammett Street)
Pickens	202	$12,120,000	All properties along the Big Black River, including the southern extension of Peace Street,
Tchula	403	$16,120,000	North and Lake Streets, North Park Circle, and Cherry Avenue
West	13	$585,000	Properties on the east part of town along the Big Black River

The U.S. Army Corps of Engineers has installed five water retainer structures in Lexington, eliminating many of the repetitive flood losses. However, there remains a risk for flash flooding in areas along Highway 12 and Depot Street that could prevent access to the Holmes County Hospital and clinic, schools and assisted living centers.

Although there are no buildings located in the flood hazard area in Cruger, low areas along Railroad Street near the center of town is frequently covered by water during periods of heavy or prolonged rain. Almost half the homes in town can experience some periodic flooding.

The Town of West is hilly, and usually has no flooding problems even though the Big Black River touches its southeastern boundary. In 2009, the Levee Board installed larger culverts in Pickens to help alleviate flooding.

Erosion is a secondary hazard to flooding, with vulnerable areas in the southern and western areas of unincorporated Holmes County. Possible impacts include roads and bridges becoming impassable and/or damaged, homes could be damaged or destroyed.

Based on HAZUS data obtained through the State of Mississippi Standard Hazard Mitigation Plan, Holmes County could experience the following losses (Table D.29).

Table D.29 – Holmes County HAZUS Flood Results | Source: HAZUS

Structural Damage	Contents Damage	Inventory Loss	Total Building Loss	Income loss	Total Building and Income Loss	Bldg. Loss Ratio
$9,219,000	$10,394,000	$375,000	$19,988,000	$522,000	$20,510,000	5.7%

Residential at Risk	Other at Risk	Total Bldgs. Risk	No. of Bldgs. Substantially Damaged	No. of house-holds	No. of people needing shelter	Countywide Building Exposure
29	0	29	13	145	197	$599,672,000

Severe Storm (Lightning, Hail and Severe Wind)

Location and Extent

Severe storms include non-spatial elements and, therefore, can be described as equally affecting all areas of Holmes County. All municipalities and unincorporated areas are susceptible to lightning, hail, and severe wind events. Of particular concern are persons who reside in a mobile/manufactured home, as well as the elderly, and disabled because of their potential lack of mobility to respond to an unexpected hazard situation. It is strongly recommended that all manufactured housing be fastened to the ground. The National Association of Certified Home Inspectors (NACHI) describes a housing tie downs as a system of "heavy-duty straps and anchors designed to stabilize manufactured homes (also known as mobile homes) during high winds." The organization points out that failure to properly install and maintain tie-downs results in reduced capacity to resist sliding and overturning.

Previous Occurrences

Tables D.30 to D.32, shows that numerous severe storms events have occurred countywide. To further demonstrate these historical events, Figures D.9 and D.10 are also provided following the tables to show the impacts of hail and strong wind events. Below are severe storm event totals.

Table D.30 – Total Severe Storm Events in Holmes County | Source: NCEI

Total – All Holmes County Severe Storm Events					
Hazard Event	No of Events	Property Damage	Crop Damage	Deaths	Injuries
Lightning	-	-	-	-	-
Hail	68	182,000	-	-	-
Severe Wind	121	1,559,000	48,000	-	-
Totals	189	1,741,000	48,000	-	-

There was no documented record of lighting events occurring in Holmes County.

Between the years 2000 and 2019, 68 hail events were recorded by the National Weather Service. Captured in the table below, the data shows that all incorporated and unincorporated areas of the county were affected, and the recorded hail magnitude ranged from .75" to 4.25" and total recorded damage was $182,000.

Table D.31 – Hail Events 2000 to 2019 | Source: NCEI

Location	Date	Event Type	Mag	Death	Injury	Property Damage	Crop Damage
Ebenezer	3/23/2013	Hail	1.00 in.	-	-	0	0
Durant	4/7/2019	Hail	1.50 in.	-	-	15,000	
Lexington	4/7/2019	Hail	1.00 in.	-	-	-	
Lexington	4/7/2019	Hail	2.00 in.	-	-	40,000	
Lexington	4/6/2019	Hail	1.00 in.	-	-	-	
Ebenezer	3/11/2018	Hail	1.00 in.	-	-	-	
Goodman	3/1/2017	Hail	1.25 in.	-	-	10,000	
Choctaw	11/29/2016	Hail	1.75 in.	-	-	4,000	
Cruger	6/17/2016	Hail	1.00 in.	-	-	-	
Lexington	4/11/2016	Hail	1.00 in.	-	-	-	
Ebenezer	3/18/2016	Hail	.75 in.	-	-	-	
West	3/3/2016	Hail	1.0 in.	-	-	-	
Cruger	3/3/2016	Hail	1.00 in.	-	-	-	
Tchula	4/6/2015	Hail	.88 in.	-	-		
Tchula	4/16/2015	Hail	.88 in.	-	-		
Ebenezer	3/30/2015	Hail	1.00 in.	-	-		
Eulogy	4/28/2014	Hail	1.50	-	-	40,000	
Zeiglerville	4/28/2014	Hail	1.75	-	-	15,000	
West	4/24/2014	Hail	4.25	-	-	10,000	
Ebenezer	3/23/2013	Hail	1.00 in.	-	-		
Ezer	3/23/2013	Hail	1.00 in.	-	-		
Ebenezer	3/23/2013	Hail	1.00 in.	-	-	0	0
Ebenezer	3/23/2013	Hail	1.00 in.	-	-	-	-
Durant	8/16/2012	Hail	1.00 in.	-	-	0	0
Oswego	5/30/2012	Hail	1.00 in.	-	-	0	0
Lexington	5/21/2012	Hail	1.00 in.	-	-	0	0
Lexington	5/21/2012	Hail	1.00 in.	-	-	0	0
Hebron	4/5/2012	Hail	1.00 in.	-	-	0	0
Durant	3/2/2012	Hail	1.00 in.	-	-	0	0
Acona	3/2/2012	Hail	1.00 in.	-	-	0	0
Huma	9/11/2011	Hail	1.00 in.	-	-	0	0
West	5/13/2011	Hail	1.00 in.	-	-	0	0
Acona	4/15/2011	Hail	1.00 in.	-	-	0	0
Owens Wells	4/15/2011	Hail	1.00 in.	-	-	0	0
Gwin	12/31/2010	Hail	1.75 in.	-	-	0	0
Tolarsville	5/29/2010	Hail	1.00 in.	-	-	0	0
Oswego	5/20/2010	Hail	1.00 in.	-	-	0	0
Huma	3/11/2010	Hail	1.00 in.	-	-	0	0
Durant	6/13/2009	Hail	0.75 in.	-	-	0	0
Oak Grove	6/13/2009	Hail	0.75 in.	-	-	0	0
Holmes Co.	5/2/2009	Hail	1.00 in.	-	-	0	0
Holmes Co.	5/2/2009	Hail	0.75 in.	-	-	0	0
Holmes Co.	5/2/2009	Hail	1.50 in.	-	-	0	0
Holmes Co.	5/2/2009	Hail	2.00 in.	-	-	3,000	0
Goodman	12/9/2008	Hail	1.00 in.	-	-	0	0
Franklin	12/9/2008	Hail	0.75 in.	-	-	0	0
Huma	8/3/2008	Hail	0.75 in.	-	-	0	0
Bee Lake	7/6/2008	Hail	0.75 in.	-	-	0	0
Thornton	3/14/2008	Hail	1.25 in.	-	-	0	0
Ebenezer	1/10/2008	Hail	1.75 in.	-	-	15,000	0
West	5/10/2007	Hail	0.75 in.	-	-	0	0
Tchula	4/14/2007	Hail	0.75 in.	-	-	0	0

Location	Date	Time	Mag	Death	Injury	Property Damage	Crop Damage
Durant	4/4/2007	Hail	0.75 in.	-	-	0	0
Ebenezer	2/3/2006	Hail	0.75 in.	-	-	0	0
Thornton	4/11/2005	Hail	1.75 in.	-	-	15,000	0
Thornton	4/11/2005	Hail	0.88 in.	-	-	0	0
Zeiglerville	4/6/2005	Hail	0.88 in.	-	-	0	0
Egypt	4/6/2005	Hail	0.75 in.	-	-	0	0
Tchula	3/26/2005	Hail	0.88 in.	-	-	0	0
Omega	10/23/2004	Hail	2.50 in.	-	-	0	0
Bee Lake	5/26/2002	Hail	0.88 in.	-	-	0	0
Thornton	6/2/2001	Hail	1.00 in.	-	-	5,000	0
West	5/27/2001	Hail	0.75 in.	-	-	0	0
Cruger	5/27/2001	Hail	0.88 in.	-	-	0	0
Durant	4/4/2001	Hail	1.00 in.	-	-	10,000	0
Durant	4/4/2001	Hail	0.75 in.	-	-	0	0
Pickens	3/30/2000	Hail	1.00 in.	-	-	0	0
Totals				0	0	$182,000	$0

Table D.32-Severe Wind Events 2010 to 2019 | Source: NCEI

Location	Date	Event Type	Mag	Death	Injury	Property Damage	Crop
Durant	6/24/2019	T-Storm Wind	54 kts. EG	-	-	10,000	
Oswego	6/19/2019	T-Storm Wind	50 kts. EG	-	-	5,000	
Pickens	6/19/2019	T-Storm Wind	50 kts. EG	-	-	10,000	
Aberdeen JCT.	6/19/2019	T-Storm Wind	53 kts. EG	-	-	10,000	
Hoffman	4/6/2019	T-Storm Wind	50 kts. EG	-	-	3,000	
Coxburg	12/31/2-18	T-Storm Wind	50 kts. EG	-	-	3,000	
Lexington	12/27/2018	T-Storm Wind	52 kts. EG	-	-	6,000	
Durant	7/21/2018	T-Storm Wind	50 Kts.EG	-	-	3,000	
Bowling Green	7/21/2018	T-Storm Wind	50 Kts.EG	-	-	5,000	
Crossing	7/21/2018	T-Storm Wind	50 kts. EG	-	-	3,000	
Garden Chapel	7/21/2018	T-Storm Wind	50 kts. EG	-	-	3,000	
Lexington	7/20/2018	T-Storm Wind	50 kts. EG	-	-	3,000	
Tchula	7/20/2018	T-Storm Wind	50 kts.EG	-	-	15,000	
Wyatt	5/30/2018	T-Storm Wind	50 kts. EG	-	-	2,000	
Ebenezer	3/28/2018	T-Storm Wind	74 kts EG.	-	-	50,000	
Crossing	3/28/2018	T-Storm Wind	52 kts. EG	-	-	5,000	
Choctaw	3/28/2018	T-Storm Wind	55 kts. EG	-	-	20,000	
McMillan	3/11/20/18	T-Storm Wind	50 Kts. EG	-	-	10,000	
Egypt	6/16/2017	T-Storm Wind	60 kts.EG	-	-	30,000	
Goodman	4/30/2017	T-Storm Wind	83 kts. EG	-	-	100,000	
Franklin	4/22/2017	T-Storm Wind	50 kts. EG	-	-	3,000	
Gwin	11/29/2016	T-Storm Wind	50 kts. EG	-	-	8,000	
Tchula	11/29/2016	T-Storm Wind	53 kts. EG	-	-	15,000	
Brozville	11/28/2016	T-Storm Wind	54 kts. EG	-	-	12,000	
Lexington	11/28/2016	T-Storm Wind	50 kts. EG	-	-	8,000	
Cruger	6/17/2016	T-Storm Wind	60 kts. EG	-	-	30,000	
Goodman	6/17/2016	T-Storm Wind	50 kts. EG	-	-	3,000	
Goodman	4/11/2016	T-Storm Wind	50 kts. EG	-	-	10,000	
Shady Grove	6/9/2015	T-Storm Wind	50 kts. EG	-	-	15,000	
Tchula	5/24/2015	T-Storm Wind	50 kts. EG	-	-	6,000	
Edville	10/13/2014	T-Storm Wind	50 kts. EG	-	-	-	
Lexington	7/2/2014	T-Storm Wind	50 kts. EG	-	-	1,000	
Tchula	7/2/2014	T-Storm Wind	50 kts. EG	-	-	3,000	
Lexington Monroe APT	6/9/2014	T-Storm Wind	50 kts. EG	-	-	3,000	
Acona	6/9/2014	T-Storm Wind	53 kts. EG	-	-	5,000	
Franklin	4/28/2014	T-Storm Wind	54 kts EG	-	-	1,000	
Westfield	4/28/2014	T-Storm Wind	55 kts. EG	-	-	2,000	
Lexington	4/24/2014	T-Storm Wind	65 kts. EG	-	-	150,000	
Richland	4/14/2014	T-Storm Wind	50 kts. EG	-	-	3,000	
Lexington	12/21/2013	T-Storm Wind	50 kts. EG	-	-	4,000	0
				-	-		
Tchula	12/21/2013	T-Storm Wind	50 kts. EG	-	-	10,000	0
Goodman	6/28/2013	T-Storm Wind	50 kts. EG	-	-	0	0
Lexington Moore Arpt	6/9/2013	T-Storm Wind	52 kts. EG	-	-	0	0
Durant	6/1/2013	T-Storm Wind	55 kts. EG	-	-	15,000	0
Lexington	5/21/2013	T-Storm Wind	50 kts. EG	-	-	2,000	0
Durant	2/10/2013	T-Storm Wind	50 kts. EG	-	-	5,000	0
Acona	1/30/2013	T-Storm Wind	50 kts. EG	-	-	10,000	0
Lexington	12/20/2012	T-Storm Wind	50 kts. EG	-	-	10,000	0
Holmes (Zone)	8/30/2012	Strong Wind	40 kts. EG	1	-	30,000	0

Durant	8/16/2012	T-Storm Wind	50 kts. EG	-	-	20,000	0
Oswego	6/12/2012	T-Storm Wind	50 kts. EG	-	-	3,000	0
Crossing	6/11/2012	T-Storm Wind	56 kts. EG	-	-	15,000	0
Good Hope	7/4/2011	T-Storm Wind	50 kts. EG	-	-	5,000	0
Holmes Co.	6/13/2011	T-Storm Wind	50 kts. EG	-	-	15,000	0
Pickens	4/27/2011	T-Storm Wind	58 kts. EG	-	-	2,000	0
Durant	4/15/2011	T-Storm Wind	60 kts. EG	-	-	3,000	0
Bowling Green	3/14/2011	T-Storm Wind	50 kts. EG	-	-	500	0
Lexington	2/24/2011	T-Storm Wind	60 kts. EG	-	-	10,000	0
Richland	12/31/2010	T-Storm Wind	67 kts. EG	-	-	10,000	0
Lexington	12/31/2010	T-Storm Wind	50 kts. EG	-	-	6,000	0
Huma	12/31/2010	T-Storm Wind	50 kts. EG	-	-	2,000	0
Tchula	12/31/2010	T-Storm Wind	50 kts. EG	-	-	2,000	0
Goodman	12/11/2010	T-Storm Wind	50 kts. EG	-	-	2,000	0
Good Hope	12/11/2010	T-Storm Wind	56 kts. EG	-	-	5,000	0
Lexington Moore Arpt	11/29/2010	T-Storm Wind	50 kts. EG	-	-	0	10,000
Pickens	8/22/2010	T-Storm Wind	50 kts. EG	-	-	0	0
Franklin	8/22/2010	T-Storm Wind	53 kts. EG	-	-	1,000	0
Franklin	8/22/2010	T-Storm Wind	57 kts. EG	-	-	2,000	0
Goodman	8/4/2010	T-Storm Wind	50 kts. EG	-	-	0	0
Huma	12/8/2009	T-Storm Wind	50 kts. EG	-	-	0	0
Tchula	7/30/2009	T-Storm Wind	60 kts. EG	-	-	8,000	0
Bee Lake	7/30/2009	T-Storm Wind	55 kts. EG	-	-	8,000	0
Holmes Co.	5/12/2009	T-Storm Wind	50 kts. EG	-	-	4,500	0
Holmes Co.	5/6/2009	T-Storm Wind	60 kts. EG	-	-	15,000	0
Holmes Co.	5/6/2009	T-Storm Wind	53 kts. EG	-	-	0	0
Holmes Co.	5/2/2009	T-Storm Wind	56 kts. EG	-	-	3,000	3,000
Holmes Co.	5/2/2009	T-Storm Wind	50 kts. EG	-	-	1,000	0
Holmes Co.	5/2/2009	T-Storm Wind	50 kts. EG	-	-	0	0
Holmes Co.	5/2/2009	T-Storm Wind	55 kts. EG	-	-	4,000	0
Holmes Co.	5/2/2009	T-Storm Wind	50 kts. EG	-	-	0	0
Holmes (Zone)	4/18/2009	Strong Wind	43 kts. EG	-	-	2,000	0
Durant	12/9/2008	T-Storm Wind	70 kts. EG	-	-	70,000	0
West	12/9/2008	T-Storm Wind	52 kts. EG	-	-	0	0
Richland	12/9/2008	T-Storm Wind	50 kts. EG	-	-	0	0
Crossing	8/2/2008	T-Storm Wind	52 kts. EG	-	-	0	0
Goodman	7/22/2008	T-Storm Wind	50 kts. EG	-	-	0	0

Location	Date	Time	Event Type	Mag	Death	Injury	Property Damage	Crop Damage
Bee Lake	7/6/2008	13:52	T-Storm Wind	66 kts. EG	-	-	17,000	0
Edsville	7/6/2008	10:40	T-Storm Wind	57 kts. EG	-	-	15,000	0
Tchula	6/24/2008	19:20	T-Storm Wind	55 kts. EG	-	-	12,000	0
Pickens	4/4/2008	11:16	T-Storm Wind	55 kts. EG	-	-	0	0
Pickens	6/19/2007	12:05	T-Storm Wind	55 kts. EG	-	-	2,000	0
Goodman	6/19/2007	11:59	T-Storm Wind	50 kts. EG	-	-	4,000	0
Thornton	6/19/2007	11:53	T-Storm Wind	57 kts. EG	-	-	20,000	0
Tchula	6/19/2007	11:45	T-Storm Wind	55 kts. EG	-	-	2,000	0
Lexington	6/19/2007	11:43	T-Storm Wind	57 kts. EG	-	-	20,000	0
Lexington	6/18/2007	16:10	T-Storm Wind	50 kts. EG	-	-	0	0
Goodman	5/10/2007	15:20	T-Storm Wind	53 kts. EG	-	-	0	0
Holmes (Zone)	2/24/2007	15:30	Strong Wind	42 kts. EG	-	-	2,000	0
West	10/16/2006	19:28	T-Storm Wind	58 kts. EG	-	-	3,000	0
Durant	3/9/2006	14:00	T-Storm Wind	55 kts. EG	-	-	0	0
Lexington	3/9/2006	13:48	T-Storm Wind	58 kts. EG	-	-	10,000	0
Lexington	3/9/2006	13:42	T-Storm Wind	58 kts. EG	-	-	10,000	0
Lexington	8/22/2005	16:00	T-Storm Wind	52 kts. EG	-	-	0	5,000
Pickens	8/21/2005	17:50	T-Storm Wind	50 kts. EG	-	-	0	0
Lexington	8/21/2005	16:05	T-Storm Wind	55 kts. EG	-	-	2,000	30,000
Tchula	7/12/2005	18:25	T-Storm Wind	52 kts. EG	-	-	40,000	0
Coxburg	4/6/2005	4:20	T-Storm Wind	53 kts. EG	-	-	4,000	0
Coxburg	3/26/2005	18:27	T-Storm Wind	63 kts. EG	-	-	15,000	0
Lexington	10/19/2004	9:55	T-Storm Wind	53 kts. EG	-	-	2,000	0
Lexington	5/31/2004	0:35	T-Storm Wind	60 kts. EG	-	-	10,000	0
Lexington	4/29/2004	18:00	T-Storm Wind	55 kts. EG	-	-	1,000	0
Lexington	3/5/2004	19:00	T-Storm Wind	55 kts. EG	-	-	1,000	0
Lexington	3/5/2004	17:53	T-Storm Wind	55 kts. EG	-	-	1,000	0
Ebenezer	3/5/2004	17:51	T-Storm Wind	55 kts. EG	-	-	2,000	0
Tchula	11/18/2003	7:15	T-Storm Wind	55 kts. ES	-	-	5,000	0
Total							1,559,000	48,000

Probability of Future Occurrence

Based on past events, the probability of lightning, hail and strong wind events is classified as highly likely. Based on historical NCEI data, the future probability of hailstorms, severe winds and lightning in Holmes County are 100% likely to occur each year. While a high figure, the total property damage and impact to on life in the County is considered somewhat less than the potential damage from other hazards, such as tornado.

Assessing Vulnerability

Impact on Life and Property: severe storms (high wind, hail, and lightning) do not affect one geographical section of the County, but hail and heavy rain associated with such events would particularly impact the agricultural community. Critical County infrastructure is unlikely to be affected by this hazard.

While Holmes County's entire population is considered at medium risk to severe weather. There are frequent occurrences but the level of damage per event is lower than for an event as potentially deadly as a tornado or hurricane. Those living in rural areas and special populations, such as those living in mobile homes, the elderly and disabled, may be most vulnerable.

Maps on the next two pages show a sampling of historic hail and severe wind events that have crossed the county.

Figure D.9 - Sample of Historic Hail Events in Holmes County | Source: NCEI

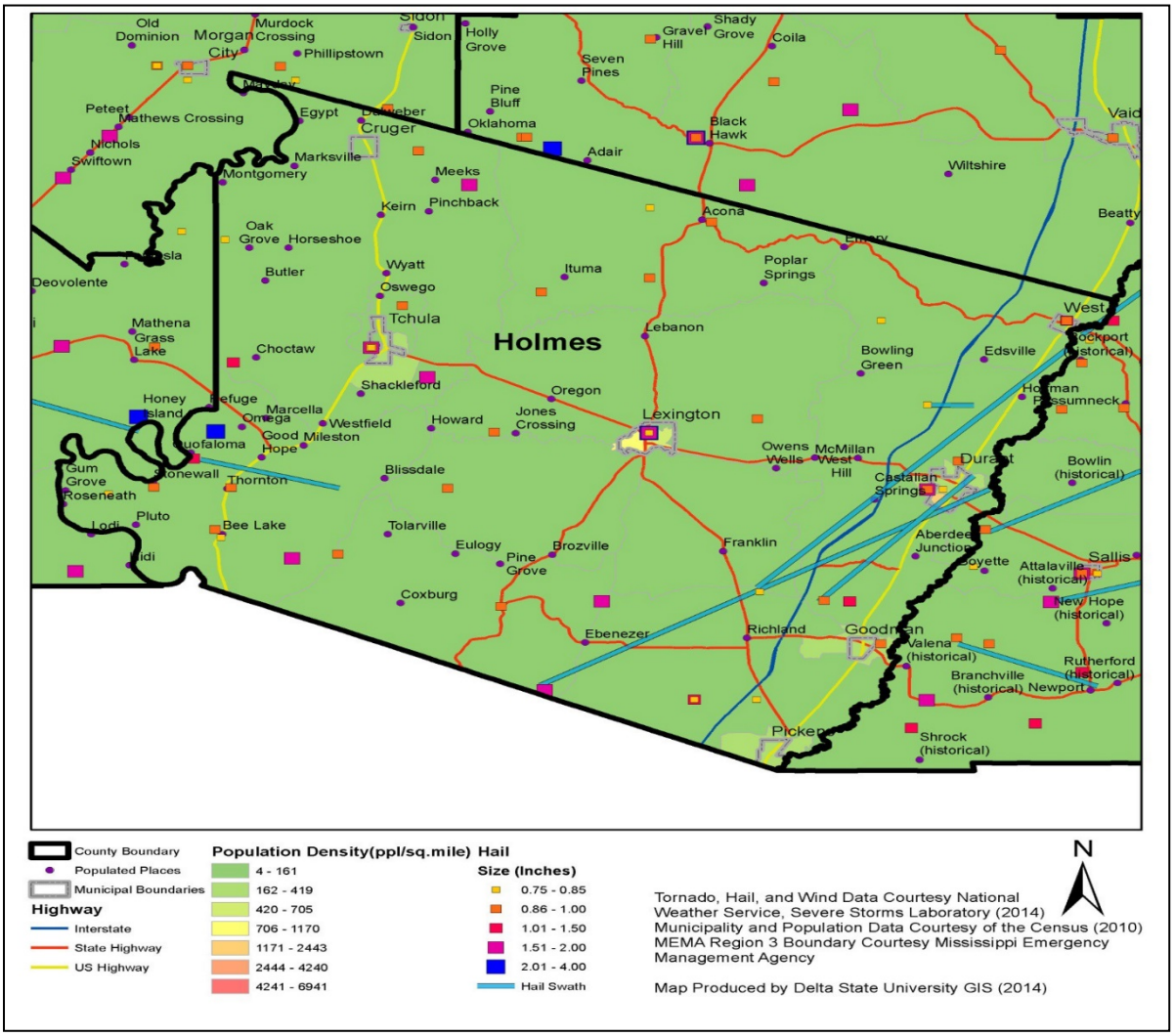
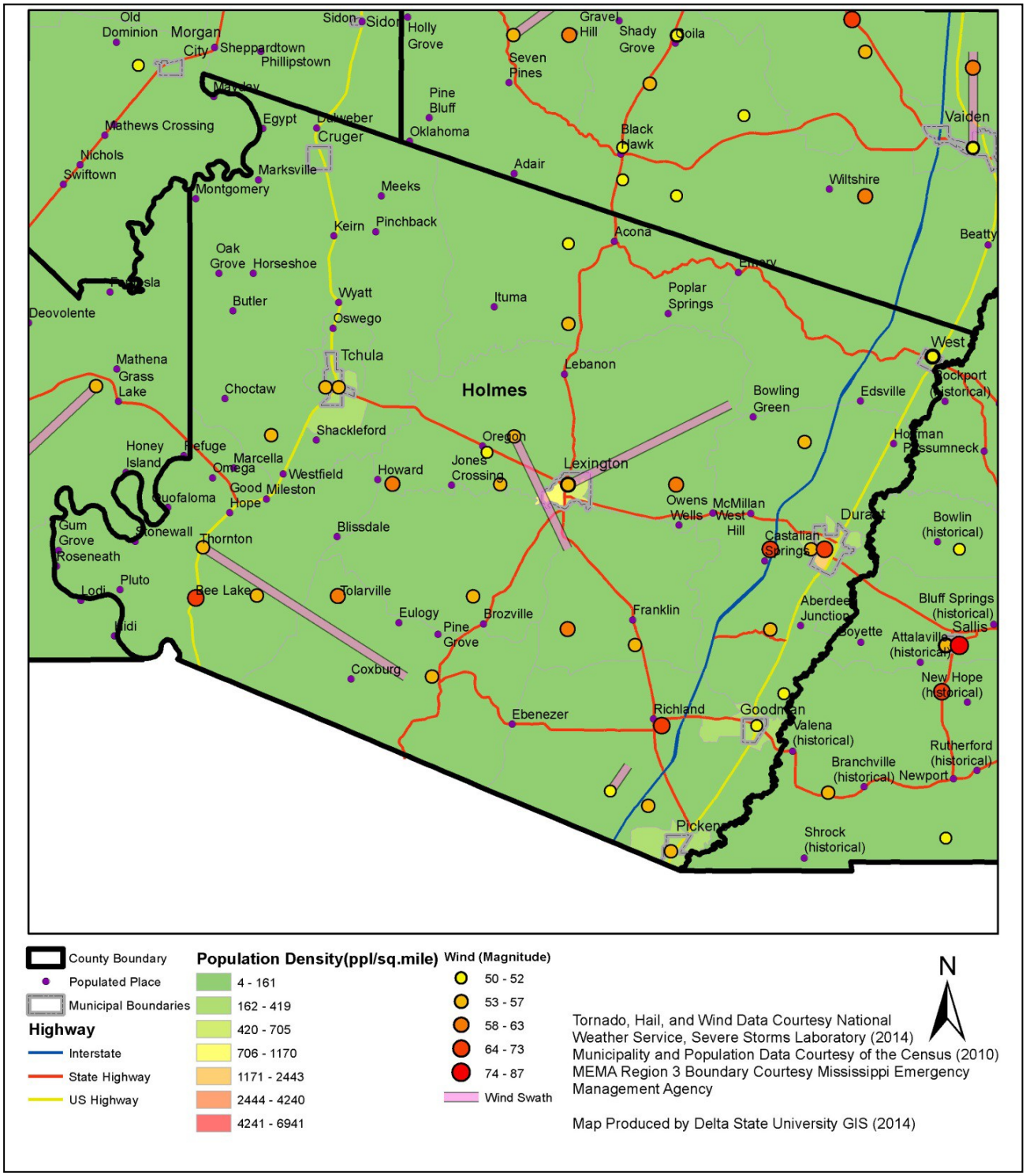


Figure D.10- Sample of Historic Severe Wind Events in Holmes County | Source: NCEI



Severe Winter Weather

Location and Extent

The entire Holmes County planning area is susceptible to severe winter storm events. The extent of impacts can result in prolonged power outages and possible energy shortages. Businesses will be affected, and people will lose wages when they are unable to travel to work, or when their workplace is closed due to loss of power. Dangerous driving conditions will result as ice builds up on roads and bridges. As ice accumulates on power lines and trees, several large trees could be downed. Heavy snow could result in roofs caving in. The elderly and disabled residents in Holmes County who may have limited mobility should be considered very vulnerable.

Previous Occurrences

Table D.33 shows that there have been 12 severe winter storm events recorded in Holmes County between the years 2000 and 2019. These events include hazards such as sleet, cold/wind chill, heavy snow, and ice storm. The entire Holmes County planning area is susceptible to severe winter storm hazards, which occur as non-spatial events.

Table D.33 – Severe Winter Weather Events 2000 to 2019 | Source: NCEI

Date	Type	Death	Injury	Property Damage	Crop Damage
1/17/2018	Cold/wind Chill	1	-	-	-
1/16/2018	Winter Weather	-	-	-	-
1/16/2013	Heavy Snow	-	-	-	-
2/9/2011	Heavy Snow	-	-	400,000	-
2/3/2011	Ice Storm	-	-	300,000	-
1/9/2011	Ice Storm	-	-	10,000	-
2/11/2010	Heavy Snow	-	-	50,000	-
1/1/2010	Cold/wind Chill	-	-	250,000	-
3/7/2008	Heavy Snow	-	-	-	-
1/25/2008	Ice Storm	-	-	100,000	-
2/20/2006	Ice Storm	-	-	50,000	-
1/27/2000	Heavy Snow	-	-	35,000	-
Totals		1	-	$1,445,000	-

Probability of Future Occurrence

The probability of severe winter weather events in Attala County is highly likely. Data indicates that a Severe Winter Events have occurred in ten of the 19 years of research covered under this RHMP process, so there is approximately a 37% chance of occurrence in any given year.

Assessing Vulnerability

Community assets at risk from a winter storm include the electrical and telephone utility system and tree coverage and canopy. Vehicular accidents from icy conditions could cause injury, property damage, or death. Ice laden tree limbs can fall, causing property damage. A hard freeze may also result in decreased water pressure as frozen and damaged pipes thaw and leak. Winter storms impact the entire community. Among essential services, critical facilities and infrastructure likely to be affected are the public safety on roadways and electric, telephone and water services.

The Mississippi Economic Development Council produced figures in March 2020 showing that there were ten Holmes County workers employed in the agriculture, forestry, fishing and hunting sector; ten employed in the mining sector; and 700 in the construction sector. Workers such as these, who spend a great deal of time outdoors, are most likely to be affected by severe winter weather.

Populations at Risk: Vulnerable persons during winter weather periods are the homeless, the elderly, young children, and persons with chronic health problems. Above freezing temperatures combined with strong wind can result in felt temperatures below freezing and cause hypothermia, illness, and death.

Property Damage: In the past, this hazard has caused roofs to cave in, trees to fall on houses, prolonged power outages, and dangerous driving conditions. Figures above show that four storms occurring between the years 2000 and 2019 caused over $100,000 in damage during each event, and these were not the only incidents with associated damage costs. Over $1.4 million in damages was incurred during the described 19-year period.

Critical Facilities and Essential Services: Essential services are not likely to be significantly impacted by a winter storm. For the most part, generators have been installed at critical and essential facilities within the county and participating jurisdictions to ensure that continuity of electricity for dispatch and emergency services.

Transportation Systems: Some major transportation services could be temporarily interrupted should icing occur. Those include bridges and overpasses on Interstate 55, U.S. Routes 49 and 51 Mississippi Highways 12, 14, 17, 19 and other roads countywide.

Lifeline Utility Systems: The most likely lifeline utility system that could be affected by a winter storm would be electric power, telephone and water line service. It could be anticipated that interruption of those rural water systems that do not have access to generators, services would last long enough in Holmes County to cause a major problem.

Tornado

Location and Extent

Mississippi consistently ranks in the top 10 states with the most tornadoes in the nation. Event damages listed below show that even an EF1 magnitude tornado can cause millions of dollars in damage.

Tornado is a non-spatial hazard, meaning that all jurisdictions in the county are equally likely to experience an event. Of particular concern are persons who reside in a mobile/manufactured home, and the elderly and disabled. According to the 2010 Census, there are approximately 2196 mobile/manufactured housing units -- structures at high risk to wind events of any type. These units represent 26% of the housing stock in Holmes County.

Previous Occurrences

A total of 24 tornadoes were recorded in the NCEI database for Holmes County between the years 2000 and 2019. The most severe tornado impact for the county was recorded in 2010. This EF4 magnitude tornado caused one fatality, 40 injuries, and approximately 100 million dollars in property and crop damage. Details of other reported events are summarized below in Table D.21. The table is followed by a discussion of events mapped by the Jackson, MS office of the National Weather Service as having taken place in the year 2020. The table also includes two Funnel Cloud events because they are included in NCEI data results. A funnel cloud looks like a tornado from a distance, but the bottom of the vortex does not touch the ground.

To further demonstrate the path of historical events, Figure D.11 is presented on the subsequent page.

Table D.34 – Tornado Events 1950 to 2013 | Source: NCDC

Location	Date	Magnitude	Death-	Injury	Property Damage	Crop Damage
Goodman	4/13/2019	EF1	-	-	-	20,000
Hoffman	4/30/2017	EF1	-	-	30,000	--
Bowling Green	4/30/2017	EF1	-	-	30,000	-
Pickens	4/30/2017	EF2	-	-	3,500,000	700,000
West	4/27/2011	EF1	-	-	5,000	-
Durant	4/27/2011	EF0	-	-	25,000	-
Owens Wells	4/27/2011	EF2	-	-	100,000	400,000
Lexington	4/27/2011	EF3	-	-	600,000	600,000
Bee Lake	4/27/2011	EF1	0	0	50,000	100,000
Lexington	4/27/2011	EF3	0	0	600,000	600,000
Owens Wells	4/27/2011	EF2	0	0	100,000	400,000
Durant	4/27/2011	EF0	0	0	25,000	-
West	4/27/2011	EF1	0	0	5,000	-
Franklin	4/15/2011	EF1	0	0	10,000	500,000
Zeiglerville	4/24/2010	EF4	1	40	60,000,000	4,000,000
Zeiglerville	12/9/2008	EF2	0	0	700,000	-
Pickens	1/10/2008	EF3	0	3	3,000,000	700,000
Tolarsville	10/17/2007	EF0	0	0	-	-
Tolarsville	10/16/2006	F1	0	0	20,000	-
Cruger	9/24/2005	F0	0	0	-	25,000
Acona	9/24/2005	F0	0	0	10,000	-
Coxburg	10/23/2004	F0	0	0	2,000	-
West	3/5/2004	F0	0	0	5,000	-
Goodman	2/16/2001	F2	1	1	50,000	-
Totals:		24	2	44	68,137,000	7,040,000

Probability of Future Occurrence

NCEI data presented shows that tornado events have occurred in 10 of the 19 years being studied for hazards as part of this mitigation planning process. This suggests that there is roughly a 53% chance that Holmes County will be affected by a tornado in any given year. Equally likely is the possibility that more than one such event will occur within proximity to others – proximity in terms of time and geography.

Assessing Vulnerability

Although technology and warning system capabilities have improved significantly in recent years, tornadoes can still occur with little or no warning, and cause severe destruction, personal injury, and possible loss of life. The list of affected communities included in Table D.28 show that entire county is vulnerable to impacts from tornadoes. Particularly vulnerable are those living in mobile/ manufactured housing units, as was discussed below. The Holmes County Emergency Management Department recognizes the degree to which its population is vulnerable to tornado and other severe weather events and has included a mitigation action worksheet in this Annex that discusses its interest in building additional safe rooms.

Impacts to Life and Property: Perhaps most vulnerable to this hazard are those population segments consisting of (elderly, disabled, and poor) who may not have the ability to seek shelter in a timely manner. Older frame houses and mobile homes are particularly vulnerable to tornadoes. It was mentioned earlier that -- according to the 2018 American Community Survey, produced by the U.S. Census Bureau -- there are roughly 2196mobile homes in the county, which represents26% of the total housing units. If other structures are not built to withstand high winds, roof damage or roof failure may occur. mobile homes are placed on an anchored foundation, the force of tornado winds will likely lift and overturn the structure. Severely damaged mobile homes may not be again habitable.

Impacts to Natural Resources: Tree canopy and decorative vegetation are all subject to tornado damage. The force of a tornado is powerful enough to uproot trees and vegetation and deposit the debris in standing water, which could result in pollution. Wildlife and farm animals are not likely to survive the force of tornado winds and may be carried to distant ground or deposited in a body of water which may result in pollution. Streams can become clogged with windblown debris and downed trees, causing flooding. If debris is not removed from vacant land it could become a threat to health and safety, create a fire hazard, or create a haven for unwanted vermin or pests.

Impacts to Critical Facilities: A tornado may affect any critical facility or infrastructure. The County and its municipalities require that all new buildings and infrastructure, such as water tanks and towers, be built to high wind-resistant standards. All public and essential service buildings in Holmes County are still at risk from a direct tornado strike, but there is nothing to indicate that those buildings are more vulnerable than any other building in the County. With the unpredictable nature of tornadoes and the possibility of tornado damage, it is essential to have designated areas that are safer than other areas in all public and essential service buildings.
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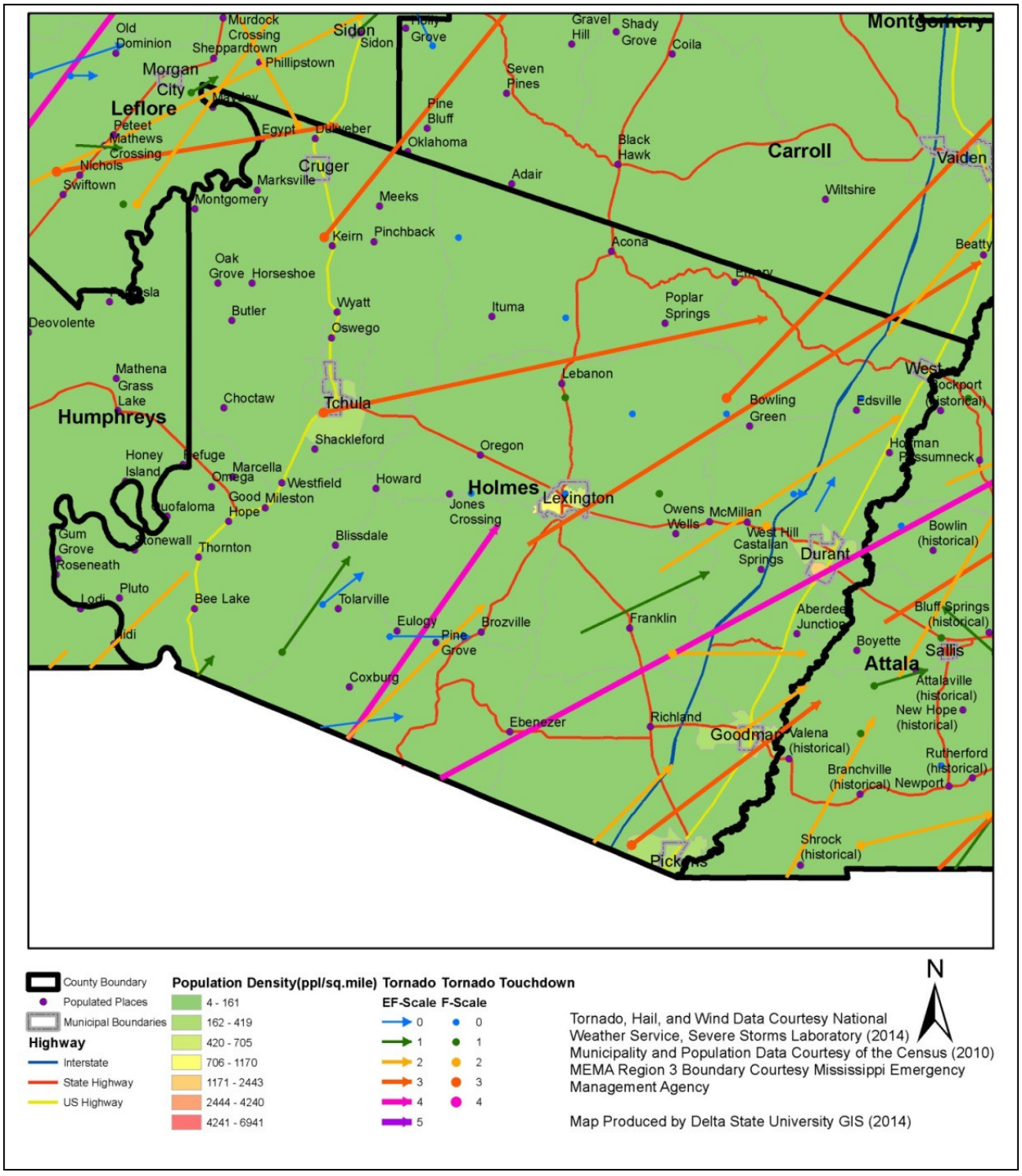
Figure D.11 – Sample of Historical Tornado Events in Holmes County



Tropical Storm / Hurricane

Location and Extent

Holmes County is situated over 200 miles from the Mississippi Gulf Coast; however, the area is vulnerable to the unavoidable effects of tropical storms/hurricanes as they reach land and continue to inland away from the coastal landing point. Storms moving inland have been known to produce violent winds, torrential rains, tornadoes, and flash flooding. Damage levels and be significant or low, depending on the hurricane path and whether it picks up strength before hitting landfall and turning moving inland.

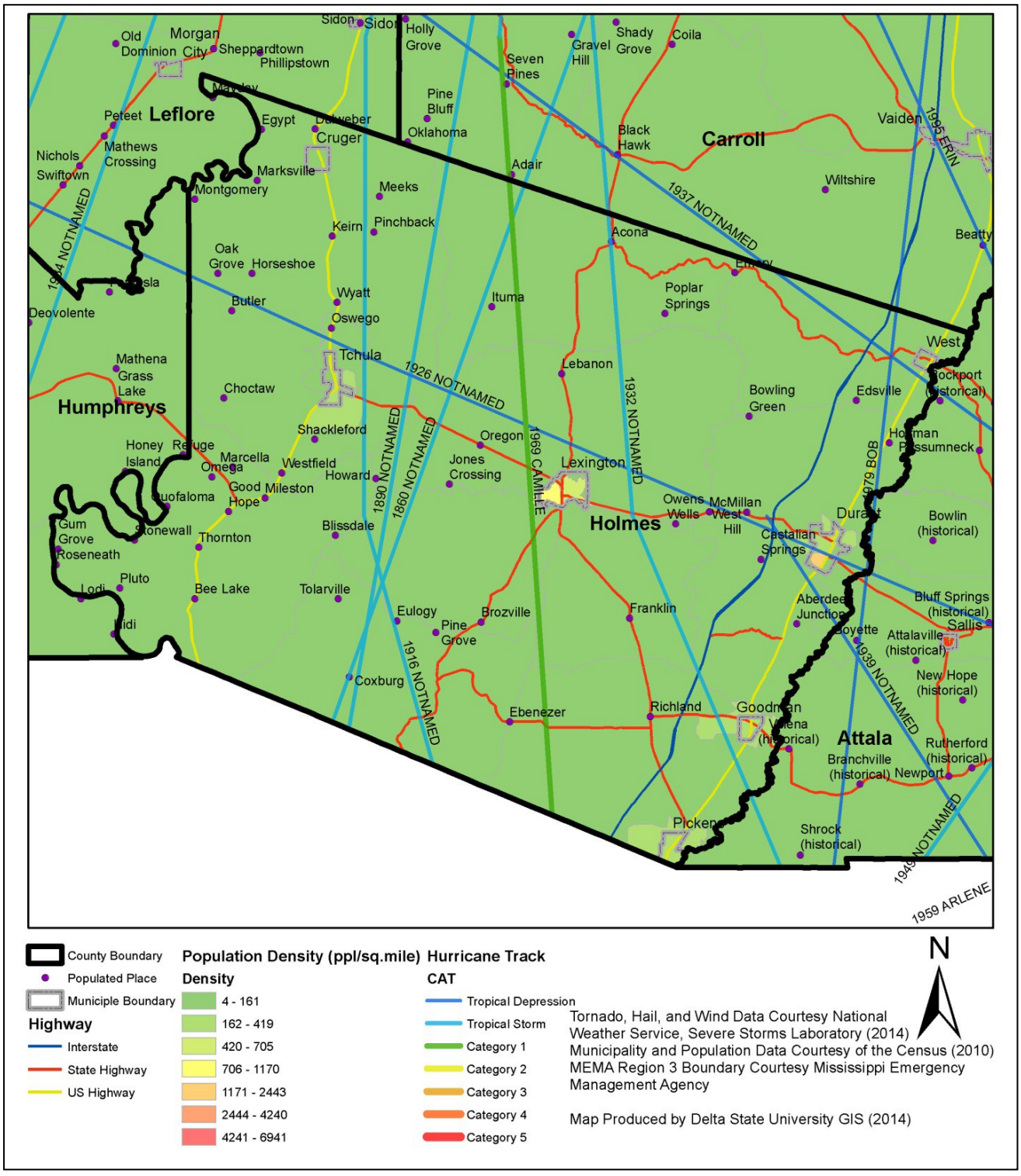
Previous Occurrences

Two recent storms documented by the National Weather Service are listed in Table D.35. They were included in the 2015 MEMA District 3 RHMP and records indicate that no subsequent events have affected the region. Hurricane Katrina caused substantial damage to all 82 Mississippi counties. To further demonstrate how tropical storms have penetrate inland over a longer period of time (since the 1959s), Figure D.12 shows Holmes County hurricane crossings since for roughly the past 70 years, although only the two events below are documented by NCEI.

Table D.35 – Tropical Storm / Hurricane | Source: NCDC

Event Name	Date	Death	Injury	Property Damage	Crop Damage
Hurricane Rita	9/24/2005	-	-	10,000	100,000
Hurricane Katrina	8/29/2005	-	-	1,000,000	15,000,000
Total		-	-	1,010,000	15,100,000

Figure D.12 – Tropical Storm/Hurricane Historical Events in Holmes County



Probability of Future Occurrence

Based on past events, the probability of tropical storm events is classified as low. Two events occurred in the past 19 years which, if averaged, would yield a 10% annual chance of occurrence. While climate change may increase the number and ferocity of hurricane events making landfall, there remains the fact that no other events are documented for the period since NCEI began keeping records in the year 1950.

Assessing Vulnerability

Hurricanes affecting the Gulf Coast usually lose strength as they make landfall and move northward, usually without hurricane force winds impacting the area. However, due to the speed, size, and magnitude of the storm, the County could still be affected by damaging winds. The entire population is at risk to tropical storms and hurricanes. Damage during these events may occur as a result from hurricane-spawned tornadoes and flooding from heavy rain.

Table D.30 includes the most recently available data secured from a HAZUS run for tropical storm/hurricane events to evaluate the potential economic losses for Holmes County. Information was not available from a more recent source.

Table D.30 – Direct Economic Losses for Buildings Annualized Losses
Source: 2013 State of Mississippi Standard Hazard Mitigation Plan

Capital Stock Losses				Income Losses				
Cost Building Damage	Cost Contents	Inventory Loss	Loss Ratio %	Relocation Loss	Capital Related Loss	Wages Loss	Rental Income Loss	Total Loss
$52,000	$18,000	0	.01	$4,000	0	0	$1,000	$75,000

The greatest threat to life and property in Holmes County would occur in a Category 5 Hurricane directly striking the coastline of Harrison County, Hancock County, St. Bernard, or Plaquemine Parishes, Louisiana. A strike at these locations could place Attala County, located approximately 200 miles north, directly in the path of the highest winds and heaviest rain bands produced by such a storm.

Impacts on People and Property: Healthy and frail populations are all vulnerable to the effects of a hurricane in an area such as Holmes County, where trees may fall on homes, businesses, crops, and people. In addition to concern about those living in mobile homes, those living in substandard housing are susceptible to the hazard if their structures are unable to withstand high winds. It a discussion of the Tornado hazard, it was mentioned that Holmes County would like to build additional safe rooms for residents who may need to evacuate their homes in the event of a potentially deadly hazard event.

Impacts on Critical Facilities: Properties at risk may include hospitals, nursing homes and housing likely to contain occupants who may not be sufficiently mobile to avoid death and injury during a flood or other emergency. Public safety facilities such as fire stations, vehicle and equipment storage facilities and emergency operations centers, could also be at risk if not properly mitigated.

Impacts on Natural Resources: The most significant risk to natural resources in tropical storms and hurricanes in Holmes County is damage to forests canopy and timberlands. Inland rivers and lakes can become clogged with wind-blown debris and trees, slowing recovery from a hurricane. Obstructions, if not removed can become a cause of flooding. Trees toppled onto the forest floor quickly become a target for infestation from insects that may spread to healthy trees. Water quality may suffer due to unwanted debris and vegetation blown in a hurricane. Potential debris from fallen trees can create fuel

for wildfires when the area dries sufficiently to allow for burning through lightning or intervention by mankind. The Mississippi State Forest Commission works continuously to ensure that, through proactive cutting and prescribed burns, fallen trees and debris will not become fuel for a wildfire. In areas where timber is a significant feature of the economy, hurricane winds wreak havoc with growing trees, causing damage that lessens the quality of the timber and increases the likelihood of insect infestation of standing trees.

Impacts on Transportation Systems: Hurricane and/or high winds from tornadoes could result in power poles blown over or broken off onto roadways result in hazardous driving conditions until they can be cleared away. Overhead lines are often still energized until linemen are able to cut power to them. These conditions result in extremely hazardous driving conditions immediately following a hurricane or other windstorm. In heavily populated areas, lack of electricity also results in lack of signal lights at major intersections, creating driving hazards. Rail traffic could be interrupted by damage to railroad lines caused by flooding and damage to bridges and overpasses.

Impact on Lifeline Utility Systems: Overhead electric and telephone lines are damaged by trees and debris blown across them, or power poles and lines are blown over by hurricane force or tornado winds. In some instances, electric power may not be restored for many days or even weeks.

In the aftermath of Hurricane Katrina, the entire grid of Mississippi Power Company was affected down and, in some areas, land lines for telephones were down for weeks or months. This situation affected electrical cooperatives such as Central Electric Power Association (Carthage, Mississippi), which serves a portion of rural Holmes County. The hurricane also damaged cell phone transmission towers and radio and television transmission towers, many of which were out of service due to electric power failure. Lack of electricity also left some water systems and sewage treatment plants unable to operate until generators could be brought in to restore partial power. Gas service to the City of Kosciusko and Ethel was not interrupted and residents with liquified petroleum (LP) storage tanks or natural gas were able to use this fuel for cooking and other needs.

Wildfire

Location and Extent

The potential for wildfires exists over the entire planning area. Holmes County has approximately 197,380 acres of forested land, which equates to 40.3 percent of the total land area. However, wildfires have the greatest potential to affect those parts of the County that are forested or at the interface between forest and other land cover. Information regarding the number of acres of forestland obtained from the Mississippi Forest Commission's 2006 Forestland Statistics report is shown in Table D.36 where Holmes County is highlighted.

Table D.36 – 2019 Forestland Statistics* | Source: www.mfc.ms.gov

		Forestland			
County	Total Land Area (Acres)	Acres	Coverage (%)	Pine	Hardwood
Attala	471,597	284,817	60.4	49.1	41.3
Bolivar	279,658	86,465	30.9	0.0	100.0
Carroll	405,982	263,067	64.7	22.5	68.5
Holmes	488,932	197,380	40.3	15.1	84.8
Humphreys	275,892	30,268	10.9	0.0	100.0
Leflore	387,967	57,537	14.8	0.0	100.0
Montgomery	260,948	161,110	61.7	36.1	54.2
Sunflower	452,541	23,174	0.05	0.0	100.0
Washington	487,198	74,984	15.3	0.0	100.0

The Wildfire discussion in the Base Plan mentioned that an analysis of the change in total forestland area from the previous plan shows that the total acreage and percent of coverage has continued on a declining trend in all MEMA District 3 counties, with Attala (-23.2%) and Holmes (-22.8%) Counties showing the greatest decline in forested land. The average loss of the other seven District 3 counties was 5.43 percent. Most forested land in the planning area is under private ownership.

Previous Occurrences

Local weather, drought conditions vegetative cover and topographic conditions may assist in the determination of the possible future forecast of wildfires. However, wildfires are difficult to predict due to the variables in how and when they start. Documenting fire events is not consistent across the planning region with the local fire departments. The NOAA National Centers for Environmental Information (NCEI), Storm Events Database, shows no reported wildfires in the fifty-nine years between January 1, 1960 and December 1, 2019 for any of the MEMA District 3 counties

Table D.37 captures wildfire data for each MEMA District 3 county for the period 2014 to 2019. Holmes County data is highlighted.

Table D.37 – Wildfire Data 2009 to 2011 | Source: www.mfc.ms.gov

County	2019		2018		2017		2016		2015		2014	
Humphreys	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned
Attala	28	782	21	392	38	468	59	1,170	52	597	32	187
Bolivar	-	-	-	-	-	-	1	80	-	-	-	-
Carroll	5	18	4	32	13	172	24	387	24	268	16	83
Holmes	13	87	15	522	27	532	39	432	43	441	36	486
Humphreys	-	-	-	-	-	-	-	-	-	-	-	-
Leflore	-	-	-	-	-	-	1	22	6	150	-	-
Montgomery	4	34	-	-	1	7	14	139	12	154	8	135
Sunflower	-	-	-	-	-	-	1	-	-	-	-	-
Washington	1	5	-	-	1	32	-	-	1	8	1	40

Information provided by the Mississippi Forestry Commission indicates that wildfires may occur during any season but, since 2012, the worst fires (determined by the number of acres burned) have occurred in late Summer and early Fall. The data presented in the table above also indicates the differences in total fires and average burned from year to year and county to county. Table D.38 below includes, an analysis of residences, commercial building and outbuildings, by county, that have been threatened or destroyed by wildfire since 2015. Within the planning area, Holmes County has recorded 219 structures threatened or destroyed. Holmes County data is highlighted.

Table D.38: Holmes County Structures Threatened and or Destroyed by Wildfire Since 2015
Source: Mississippi Forestry Commission

County	Residences Threatened	Residences Destroyed	Commercial Building Threatened	Commercial Building Destroyed	Outbuilding Threatened	Outbuilding Destroyed
Attala	149	3	4	-	75	8
Bolivar	-	-	-	-	-	-
Carroll	113	-	45	-	33	1
Holmes	116	-	3	-	98	2
Humphreys	-	-	-	-	-	-
Leflore	2	-	-	-	6	-
Montgomery	33	-	4	-	43	4
Sunflower	-	-	-	-	-	-
Washington	1	-	-	-	1	-
TOTALS	**414**	**3**	**56**	**-**	**256**	**15**

Table D.39 below shows the number of fires and acres burned each year between 2014 and 2019, along with mean and median averaged for each.

Table D.39 – Mean and Median Averages for Holmes County, Number of Fires and Acres Burned
Source: Mississippi Forestry Commission

Total Fires	2019	2018	2017	2016	2015	2014	Total	Mean	Median
Total Fires	13-	15-	27-	39-	43-	36-	173-	28.8-	27-
Acres Burned	87-	522-	532-	432-	441-	468-	2482-	413.6-	441-

Probability of Future Occurrence

Excluding the outliers, the median number of events (27) falls in the middle where a cluster of figures range between 13 and 39 events annually. It has been stated that it is difficult to develop probability of wildfire occurrence due to the range of elements that "set the stage" for a wildfire to occur. Looking at historical data for Holmes County and selecting the lowest figures, it can be stated that in any given year there is a potential for at least 13 fires to develop and burn 87 acres.

Assessing Vulnerability

Wildfires pose a threat to all areas of Holmes County, where just over 40% of acreage is forestland. Current mitigation of the fire hazard includes regular thinning of vegetative fuel, but the County Emergency Management Department works closely with County and local fire departments to educate the public about issues such as backyard burning that can lead to wildfire. Holmes County data included in Table D.38 (Residences and Structures Threatened and or Destroyed by Wildfire Since 2015) shows that many residences, commercial structures, and outbuildings have been threatened by wildfire but only eight were destroyed.

The images below are screen shots from the web site of the Southern Wildfire Risk website (www.southernwildfirerisk.com) established by the Southern Group of State Foresters. These images show the overall risk of Holmes County and its jurisdictions located in the Wildfire Urban Interface (WUI).

Figure D.13a Jurisdictional Wildfire Vulnerability- Holmes County

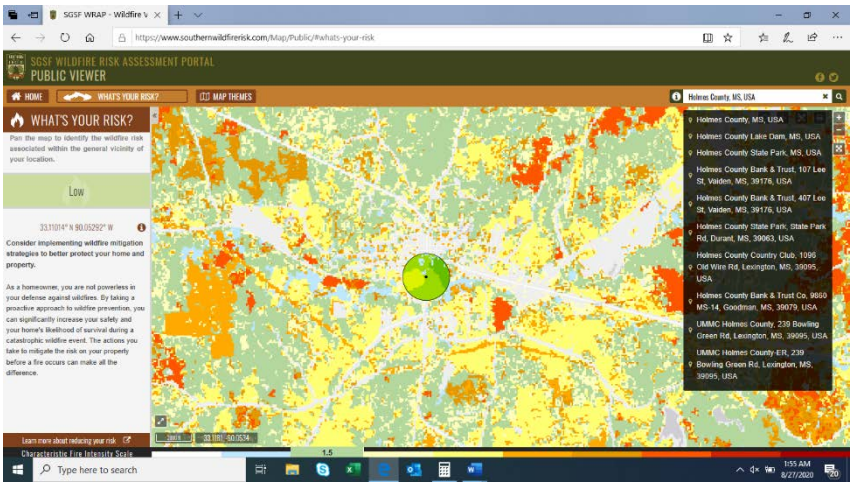


Figure D.13b Jurisdictional Wildfire Vulnerability - City of Cruger

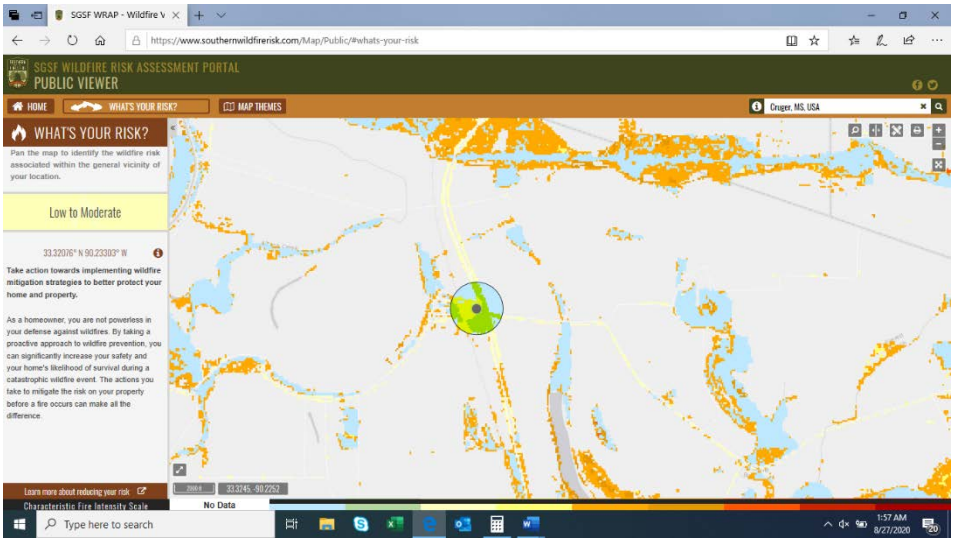


Figure D.13c: Jurisdictional Wildfire Vulnerability- City of Durant

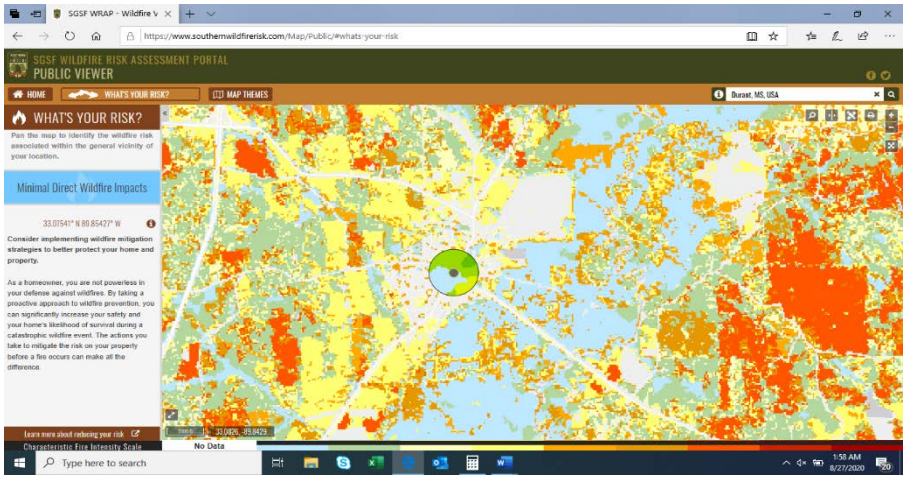


Figure D.13d: Jurisdictional Wildfire Vulnerability- Town of Goodman

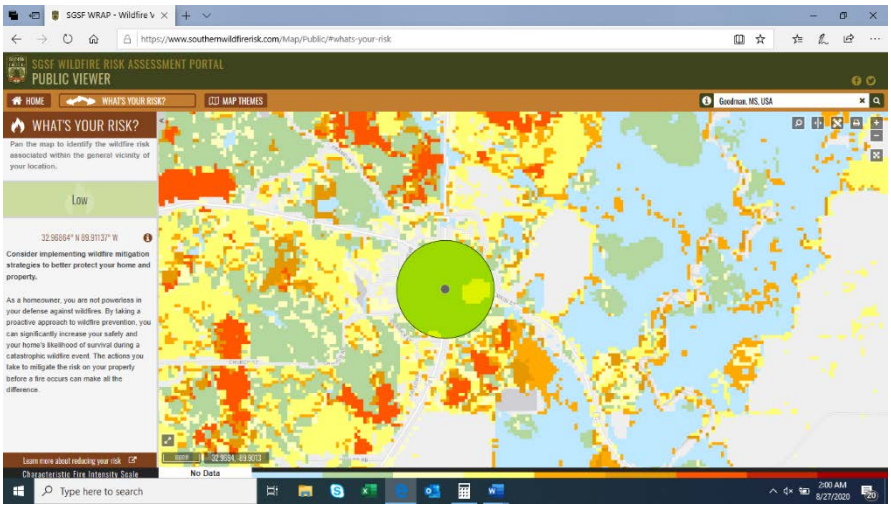


Figure D.13e Jurisdictional Wildfire Vulnerability- Town of Lexington

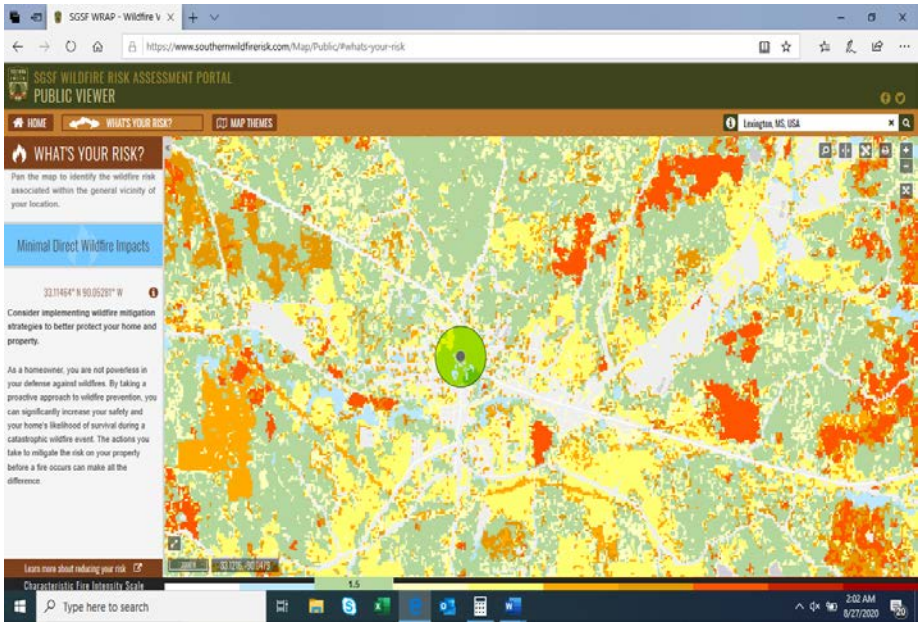


Figure D.13f: Jurisdictional Wildfire Vulnerability-Town of Pickens

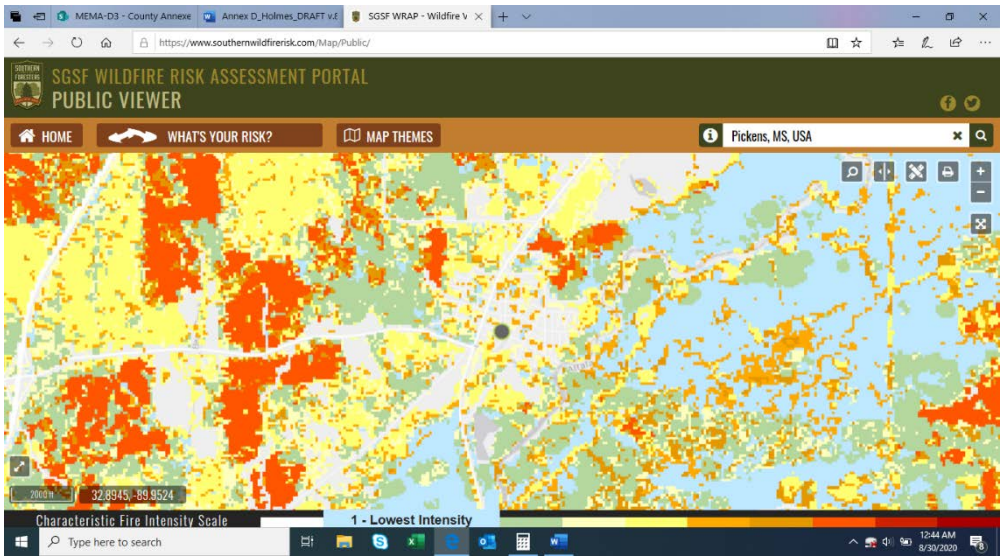


Figure D.13g: Jurisdictional Wildfire Vulnerability-Town of Tchula

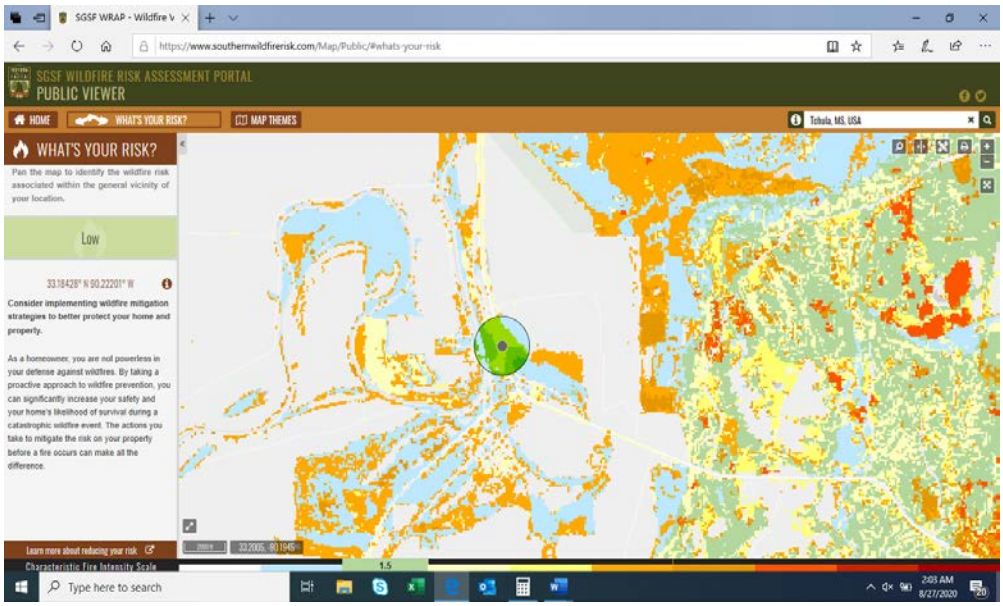
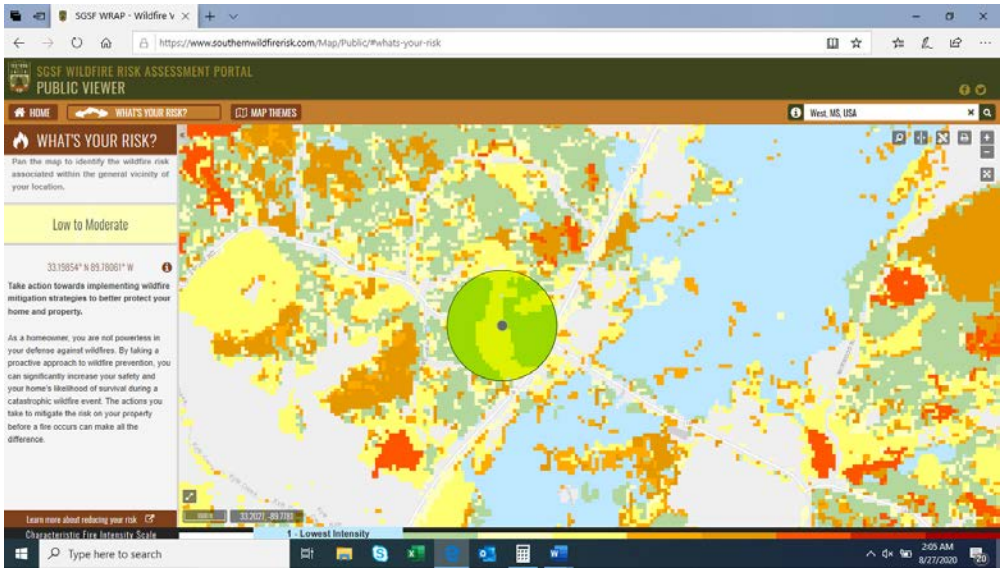


Figure D.13h: Jurisdictional Wildfire Vulnerability- Town of West



The following table summarizes the risk of Holmes County and each of its jurisdictions to wildfire:

Table D.40 Geographic Vulnerability to Wildfire by Jurisdiction

Jurisdiction	Ranking
Unincorporated Holmes County	Low to Medium
Town of Crugerl	Low
City of Durant	Low
Town of Goodman	Low
City of Lexington	Low to Medium
Town of Pickens	Low
City of Tchula	Low
Town of West	Low to Moderate
Overall Holmes County Vulnerability to Wildfire	Low

The hazard was rated as being low overall in the 2015 RHMP, and the average number events hovers around the 27 per year mark, so the vulnerability of the overall county appears to be maintained at the existing level.

The places most vulnerable to wildfires are forested areas in unincorporated areas of Holmes County. Current mitigation of fire hazard includes regular thinning of trees and removal of dead limbs and underbrush of the 197,380 acres of forestland.

Impacts to Life and Property: Wildfire could impact the community by overextending personnel and financial resources of local emergency response crews and create a need to evacuate residences and businesses. The County's vulnerability to county-wide wildland fire hazard is mitigated somewhat by the presence of fire stations in most parts of the county, as well as the presence of a Sheriff's Office, which serves as an alternate EOC and personnel to augment those resources of fire stations.

Impacts to Critical Facilities: Electrical power could be impacted by wildfire and service could be temporarily interrupted by wildfire. It is doubtful that wildfire would have a lasting impact on water and sewer systems.

Impact on Future Development: The efforts of public and non-profit water associations ensure that there will always be water available for firefighting and structural protection, particularly in rural areas of the County. Several fire stations and districts in the county are not manned on a full-time basis but rely on volunteers, assisted by the Forestry Service, to fight wildfires. This could result in a negative impact on future development especially in the rural areas. Firefighting capacity may need to be enhanced should the community reach a point where future development includes significant numbers of residents or large industrial assets.

Hazardous Material Incidents

Location and Extent

Many hazardous and toxic materials are transported through areas of Holmes County on 18-wheelers via Interstate 55, Mississippi State Highways 12, 49, and 51. The proximity of these transportation routes to residential and commercial areas of Holmes County increases the risk to residents in a five-mile radius (extent) for hazards involving transportation accidents and hazardous materials spills. A secondary risk to a transportation accident involving hazardous materials is the hazard of explosions and fires. There may also be occurrences where such materials are stored.

Previous Occurrences

There are no recorded incidents of hazardous materials incidents in Holmes County.

Probability of Future Occurrence

It is likely that an event of this type will occur in Holmes County at some point in the future given the fact that a major interstate highway and other major state and local roadways pass through the county. Specific areas where such incidents may occur are discussed under Addressing Vulnerability. The most recent figures available from the US Environmental Protection Agency (EPA) Toxic Release Inventory show that there were no events for the most recent years available (through 2018).

Assessing Vulnerability

The possible impact of a hazardous materials incident could include evacuation from homes and businesses, possible deaths or injuries from exposure, long-term environmental damage, and property losses.

Cruger is vulnerable to hazardous materials incidents caused by transportation accidents along Highway 49 and Canadian National/Illinois Central Railroad (railroad divides town in half.) There are also some quantities of farm chemicals stored on crop land near Cruger.

Durant is very vulnerable to hazardous materials incidents caused by transportation accidents along Interstate 55, which is less than 3 miles away; Highways 51 and 12, and the Canadian National/Illinois Central Railroad. There is also a large fuel storage facility, Dowdle Butane Gas Company, located on North Jackson Street, with three 19,000-gallon storage tanks. These 57,000 gallons of fuel are located near a nursing home and is about 500 yards from the railroad tracks. Natural Gas pipelines run to the southern boundary of Durant. The presence of these pipelines increases the risk for residents in the southern section of town to explosions, fires, and release of poisonous gases in the event the pipeline is disturbed.

Goodman is vulnerable to hazardous materials incidents caused by transportation accidents along Interstate 55, which is less than 3 miles away; Highway 51, and the Canadian National/Illinois Central Railroad. Natural Gas pipelines run through Goodman. The presence of these pipelines increase the risk for residents in the southern section of Goodman to explosions, fires, and release of poisonous gases in the event the pipeline is disturbed.

Lexington is vulnerable to hazardous materials incidents caused by transportation accidents along Highways 12 and 17. The Canadian National/Illinois Central Railroad has a spur to the southeast side of the city.

Pickens is vulnerable to hazardous materials incidents caused by transportation accidents along Interstate 55, which is less than 3 miles away; Highway 51, and the Canadian National/Illinois Central Railroad are possible. A Natural Gas pipeline also runs through Pickens. The presence of this pipeline increases the risk for residents in Pickens to explosions, fires, and release of poisonous gases in the event the pipeline is disturbed. The Southern Natural Gas Plant is located just across the Holmes County line, in Yazoo County. The danger of an explosion and fire at this facility affects the whole Town of Pickens. Also located in Pickens, the Burrows Paper Corporation handles hazardous waste. The gas plant, shown just south of town, is closest to the Velma Jackson High School. The Goodman-Pickens Elementary School is located farther north, about three miles outside Pickens.

Tchula is vulnerable to hazardous materials incidents caused by transportation accidents along Highways 12 and 49, and the Canadian National/Illinois Central Railroad (railroad runs through business district). The city also has a chemical facility (Helena Chemical) that handles mostly farm chemicals.

West is vulnerable to hazardous materials incidents caused by transportation accidents along Interstate 55, which is less than 3 miles away; Highway 51, and the Canadian National/Illinois Central Railroad.

Summary of Risk Assessment

Table D.41, shown at the beginning of discussion of Holmes County hazards, is presented here to as a summary of all hazards discussed.

Table D.41: Total of Holmes County Hazard Events and Damages
Source: NCEI

Hazard Type	No of Events	Property Damage	Crop Damage	Death	Injury
Dam/Levee Failure	-	-	-	-	-
Drought	13	$200,000	$3,821,200	-	-
Earthquake	-	-	-	-	-
Extreme Heat / Heat	5	-	-	-	-
Expansive Soil	-	-	-	-	-
Flood	24	$3,145,000	$300,000	-	-
Severe Storm	189	$1,741,000	$48,000	1	1
Severe Winter Weather	12	$1,445,000	-	-	-
Tornado	24	$68,137,000	$7,040,000	2	44
Tropical Storm / Hurricane	2	$1,010,000	$15,100,000	-	-
Wildfire	-	-	-	-	-
	269	$75,678,000	$26,309,000	3	45

This data shows that, in terms of number and frequency, severe storms are the most regularly occurring and the most damaging to Holmes County property and crops. Of the $101,987,000, in total damages from 269 events occurring between 2000 and 2019, crop damage represents roughly one -fourth the dollar amount of damage as that to personal property. Figures show that tornadoes and the rare hurricanes that affected Holmes County were responsible for much of the damage listed.

The Mississippi Department of Revenue 2018 Annual Report showed that there was a 2017 total property assessment value of 2017 equaled $128,374,119. A severe hazard event causing damage to 10 percent of property would cause damage in the amount of $ 1,283,742. Assuming that crop damage associated with such an event might run four times this amount, it can be anticipated that crop damage would run approximately $5,134,968. As such, overall combined damage from such an event could run as high as $ 6,418,710. Figures could vary widely depending on event type, location, magnitude, and extent.

D.3 Capability Assessment

This section assesses Holmes County's capability to implement hazard mitigation activities. More detailed information on the purpose and methodology used to conduct the capability assessment can be found in Section 5 - Capability Assessment.

Planning and Regulatory Capability

The findings of the Planning and Regulatory section of capability assessment are described below in Table D.42. This table provides a jurisdictional overview of the plans and programs in place, followed by summary statistics of the *Local Capability Assessment Surveys*. Each county and municipality were asked to self-assess their capabilities.

Table D.42 - Relevant Plans, Ordinances and Programs

Jurisdiction	Comprehensive / Master Plan	Capital Improvements Plan	Economic Development Plan	Emergency Operations Plan	Continuity of Operations Plan	Transportation Plan	Stormwater Management Plan	Community Wildfire Protection Plan	Historic Preservation Plan	Building Codes	Fire Department ISO Rating	Site Plan Review Requirements	Land Use Plan	Zoning Ordinance	Subdivision Regulation	Flood Damage Prevention Ordinance	Flood Insurance Studies	National Flood Insurance Program
Holmes County											10							
Cruger																		
Durant																		
Goodman																		
Lexington																		
Pickens																		
Tchula																		
West																		

Emergency Management Capabilities

Hazard Mitigation Plan: A hazard mitigation plan represents a community's blueprint for how they intend to reduce the impact of natural and human-caused hazards on people and the built environment. Elements of a hazard mitigation plan include a risk assessment, capability assessment and mitigation strategy.

- The jurisdictions within Holmes County participate in the development and implementation of a hazard mitigation plan.

Emergency Operations Plan: An emergency operations plan outlines the responsibilities and the means by which resources are deployed during and following an emergency or disaster.

- Survey results indicate that Holmes County, The Cities of Durant, Lexington and the Towns of Cruger, Goodman, Pickens, Tchula and West all have emergency operations plans.

Continuity of Operation Plan: A continuity of operations plan establishes a clear chain of command, line of succession, and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster.

- Survey results indicate that no jurisdictions have continuity of operations plans.

General Planning Capabilities

The implementation of hazard mitigation activities often involves individuals beyond the emergency management profession. Stakeholders may include local planners, public works officials, economic development specialists and others. Similarly, hazard mitigation planning cuts across multiple disciplines. As a result, the questions asked in the Local Capability Assessment Survey regarding general planning capabilities were designed to measure the degree to which mitigation is integrated into other planning efforts.

Comprehensive Plan: A comprehensive plan establishes the overall vision for a community and helps to guide municipal decision-making.

- Survey results indicate that no jurisdictions have comprehensive plans.

Economic Plan: An economic plan serves as a road map for economic development decision making, based on the collection of statistical data, historical perspective, and human potential.

- Survey results indicate that Holmes County, the Cities of Durant, Lexington and the Towns of Cruger, Goodman, Pickens, Tchula and West have economic plans.

Community Wildfire Protection Plan: The community wildfire protection plan is a strategic plan that identifies wild land fire issues facing the community and outlines prioritized mitigation actions.

- Survey results indicate that no jurisdictions have community wildfire protection plans.

Transportation Plan: A transportation plan identifies the means to gauge transportation demands and the options to meet those needs, while considering the social, economic and environmental characteristics of the area. The development of transportation networks can significantly impact the amount, type and location of future growth. As a result, transportation planning can have a dramatic impact on future hazard vulnerability.

- Survey results indicate that Holmes County, the Cities of Durant, Lexington and the Towns of Cruger, Goodman, Pickens, Tchula and West have transportation plans.

Capital Improvements Plan: A capital improvements plan guides the scheduling of spending on public improvements. A capital improvements plan can serve as an important mechanism to guide future development away from identified hazard areas. Limiting public spending in hazardous areas is one of the most effective long-term mitigation actions available to local governments.

- Survey results indicate that Holmes County has capital improvement plans.

Historic Preservation Plan: A historic preservation plan is intended to preserve historic structures or districts within a community. An often-overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards to include the identification of the most effective way to reduce future damages. This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of harm's way.

- Survey results indicate that Holmes County, the Cities of Durant, Lexington and the Towns of Cruger, Goodman, Pickens, Tchula and West have historic preservation plans.

Zoning Ordinances: As part of a community's police power, zoning is used to protect the public health, safety and welfare. A zoning ordinance is the mechanism through which zoning is typically implemented. Since zoning regulations enable municipal governments to limit the type and density of development, it can serve as a powerful tool when applied in identified hazard areas.

- Survey results indicate the Cities of Durant, Lexington and the Towns of Cruger, Goodman, Pickens, Tchula and West have zoning ordinances.

Subdivision Ordinances: A subdivision ordinance is intended to regulate the development of housing, commercial, industrial or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development.

- Survey results indicate the Cities of Durant, Lexington and the Towns of Cruger, Goodman, Pickens, Tchula and West have subdivision ordinances.

Building Codes, Permitting and Inspections: Building codes regulate construction standards. Decisions regarding the adoption of building codes, the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community.

- Survey results indicate that no jurisdictions have building codes, permitting and inspections.

Floodplain Management Capability

Flooding represents the greatest natural hazard facing the nation and the planning area. At the same time, the tools available to reduce the impacts associated with flooding are among the most developed when compared to other hazard-specific mitigation techniques. Information contained in this section has been gathered through surveys and the NFIP Status Book.

Storm Water Management Plan: A storm water management plan is designed to address flooding associated with storm water runoff. The storm water management plan is typically focused on design and construction measures that are intended to reduce the impact of more frequently occurring minor urban flooding.

- Survey results indicate that no jurisdictions have Storm Water Management Plans.

Flood Damage Prevention Ordinance/NFIP participation: A local Flood Damage Prevention Ordinance is a tool used by counties and municipalities to regulate the type of construction that occurs in the floodplain. If a community is an NFIP participant, a Flood Ordinance or Court Order is in place.

- Survey results indicate that Holmes County, the Cities of Durant, Lexington and the Towns of Cruger, Goodman, Pickens, Tchula and West have flood damage prevention ordinances plans.

Below is a summary from the NFIP database of the participating jurisdictions within Holmes County.

Table D.43-Holmes County NFIP Insurance Losses
Source: NFIP Policy and Loss Statistics as of 3/31/2018, 2018 State Hazard Mitigation Plan

Jurisdiction	NFIP Date	Total Losses	Closed Losses	Open Losses	CWOP Losses	Total Payments to Date ($)
Holmes County	9/15/1989	39	32	0	7	$265,594.04
Cruger	4/2/1986					
Durant	8/19/1986	4	4	0	0	$21,406.89
Goodman	6/3/1986					
Lexington	9/30/1988	43	40	0	3	$753,126.36
Pickens	8/5/1985	7	5	0	2	$33,634.31
Tchula	6/17/1986	22	20	0	2	$95,391.16
West	8/5/1985					

Continued Compliance to NFIP

Given the flood hazards in the planning area, an emphasis will be placed on continued compliance with the NFIP. The following steps will be taken by each participating community in order to meet or exceed the following minimum requirements as set by the NFIP.

- Issuing or denying floodplain development/building permits
- Inspecting all development to ensure compliance with local ordinance
- Maintaining records of floodplain development
- Assisting in the preparation and revision of flood maps/updates
- Assist residents in obtaining information on flood hazards, floodplain map data, flood insurance and proper construction measures.

Administrative and Technical Capability

Table D.44 provides a summary of the capability assessment results for Holmes County with regard to administrative and technical capabilities.

Table D.44 - Administrative and Technical Capability

Jurisdiction	Planning Commission	Participation in Emergency Management Committee (LEPC or other)	Maintenance program to reduce risk (i.e., tree trimming, clearing drainage systems)	Mutual Aid Compacts	Building Inspection Department	Floodplain Manager	Emergency Manager	Community Planner	Civil Engineer	GIS Coordinator	Warning Systems / Services (i.e., reverse 911 / outdoor warning systems)	Grant Writing Capabilities
Holmes County	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Cruger	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Durant	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Goodman	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Lexington	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Pickens	✓	✓	✓	✓	✓	✓	✓		✓	✓		
Tchula	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
West	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	

Fiscal Capability

Table D.45 provides a summary of the results of the local capability assessment for Holmes County with regard to relevant fiscal resources.

Table D.45- Relevant Financial Resources

Jurisdiction	Capital Improvements Project Funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric services	Impact fees for new development	Stormwater utility fee	Incur debt through general obligation bonds or tax bonds	Incur debt through private activities	Community Development Block Grant (CDBG)	Other federal funding programs	State funding programs
Holmes County	✓	✓	✓			✓		✓	✓	✓
Cruger	✓	✓	✓			✓		✓	✓	✓
Durant	✓	✓	✓			✓		✓	✓	✓
Goodman	✓	✓	✓			✓		✓	✓	✓
Lexington	✓	✓	✓			✓		✓	✓	✓
Pickens	✓	✓	✓			✓		✓	✓	✓
Tchula	✓	✓	✓			✓		✓	✓	✓
West	✓	✓	✓			✓		✓	✓	✓

Education and Outreach Capability

Table D.46 provides the results for the education and outreach capability for Holmes County.

Table D.46 - Relevant Education Programs and Organizations

Jurisdiction	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Ongoing public education or information programs (e.g. responsible water use, fire safety, household preparedness, environmental education)	Natural disaster or safety-related school programs	StormReady certification	Firewise Community Certification	Public / Private partnership initiatives addressing disaster-related issues
Holmes County	✓	✓	✓			✓
Cruger	✓	✓	✓			✓
Durant	✓	✓	✓			✓
Goodman	✓	✓	✓			✓
Lexington	✓	✓	✓			✓
Pickens	✓	✓	✓			✓
Tchula	✓	✓	✓			✓
West	✓	✓	✓			✓

Conclusions on Local Capability

Table D.47 shows the results of the capability assessment using the scoring system that can be found in Section 5 of the base plan. The scoring for Holmes County was based on information from the local capability survey and reviewing existing plans. According to the assessment, the average local capability score for the county and its communities is 43.38 which fall into the high capability.

Table D.47 – Capability Results Summary

Jurisdiction	Overall Capability Score	Overall Capability Rating
Holmes County	46	Moderate
Cruger	44	Moderate
Durant	44	Moderate
Goodman	41	Moderate
Lexington	44	Moderate
Pickens	42	Moderate
Tchula	43	Moderate
West	43	Moderate

D.4 Mitigation Strategy

The participating jurisdictions reviewed the mitigation goals and priorities identified in the County's previous plan. Common elements of the previous mitigation goals were used to develop regional goals designed to achieve the implementation of mitigation actions. These refined goals were adopted by the participating jurisdictions. It was determined that the priorities for each of the participating jurisdictions had not changed, although the regionwide mitigation goals and objectives were streamlined as discussed in the base plan.

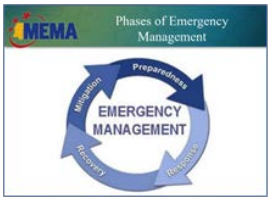
The Mitigation Strategy for Holmes County includes several changes, including those based on the streamlined list of 2020 Regional Goals and Objectives. The table of action items includes mitigation actions identified in the 2015 plan; the outcome of each; and how the strategy was updated for the 2020 plan; and newly developed mitigation actions. The 2015 plan included two separate tables of mitigation actions: one table to provide a status update on actions mentioned in the previous plan; and a second table outlining the current mitigation strategy. These have been combined into one table in the current plan update.

Previous plans included a large number of mitigation actions considering the size and available resources of some jurisdictions, including those with only a few hundred residents. An example of this is the fact that most County Emergency Management (EM) directors are the single departmental employee, or they perform their EM duties while functioning in one or more service roles in their community. The same is often true for leadership at the city or town level, where those in leadership "wear many hats."

Several changes were made to streamline the Mitigation Strategy given the following considerations.

- Actions identified as falling into the Preparedness Phase of the Emergency Management Cycle were removed and recommended for consideration under Preparedness Planning. Examples of this include disaster preparedness initiatives (such as providing weather radios to residents) and NIMS training, which represent actions a community normally does to prepare for a hazard event.

- The image at right, developed for a MEMA presentation, clearly delineates that EM agencies operationally function under four phases of emergency management, although sometimes the phases run concurrently. Professional emergency managers and their Emergency Support Functions (ESF), units called up during disaster response, develop specific plans and actions to as appropriate for each event phase.



- Actions identified as being required as part of the FEMA Hazard Mitigation Planning Process were removed because these are fully spelled out under the Plan Maintenance section of the Base Plan. Examples of this include reviewing the mitigation plan and meeting to discuss needed plan updates after a disaster occurs in the community.

- It was recommended that actions identifying similar activities be combined into one action. For example, there were previously separate action items for educating the public about natural hazards and for educating the public about manmade (technological, biological, health-related)

hazards. A single outreach plan using multiple communications channels can incorporate education about all hazards to all audiences if the outreach plan is fully developed.

- In some instances, extensive description of previous actions was shortened for plan readability.

- Most action items were identified by all jurisdictions. In these cases, a countywide action was recommended developed that would be jointly implemented by all participating jurisdictions.

It is hoped that the streamlined mitigation strategy a useful tool for the District 3 Counties and its jurisdictions to implement.

Progress Made on Mitigation Strategies and Updated Mitigation Strategy

Holmes County jurisdictions have been proactive in implementing mitigation strategies identified in their previous plan. Actions included in Table D.38 have been sorted so that deleted actions appear at the beginning of each jurisdictional listing. They are highlighted, and a reason for deletion is listed in the column labeled "2020 Status." This column includes use of the following designations to show action status:

Designation	Meaning	Description
D	Deleted	Action was deleted from the plan for the reason described under the Column 2020 Status Description
N	New	New action for the 2020 Plan Update
`R	Retained	Action previously included in the 2015 plan, with a description of how it will be continued in the 2020 plan
IP	In Progress	

Table D.38: Holmes County Mitigation Actions

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status (C=Complete; D=Deleted; R=Retain; N=New; IP=In Progress)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source	Year Proposed
Town of Cruger													
CRU-01	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including installation, testing and inspection	Town of Cruger	Holmes County EMA, Mayor's Office, MEMA	Severe Weather, Tornado	$35,000	D	Move to Preparedness Planning Initiative	Continuous Action	1.1	H	HMGP, Local Funds	2015
CRU-02	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Cruger	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Move to Preparedness Planning Initiative	2015-2020	1.1	M	NWS	2015

CRU-03	Develop weather radio program for vulnerable populations	Outdoor warning sirens, text messaging, television and other forms of communication have been implemented to alert the public; however, areas/population that may not receive notifications due to location and/or lack of communication devices: develop committee to explore benefit/ cost, vendors, funding options, etc. to provide weather radios to vulnerable populations.	Town of Cruger	MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	Tornado, Severe Storm	Undetermined	D	Move to Preparedness Planning Initiative	2 yr.	1.1	H	NWS, Private Funds	2015
CRU-11	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	Town of Cruger	Mayor's Office	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove. Routine maintenance is not considered mitigation.	N/A	1.5	H	General budget	2015

CRU-12	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives	Town of Cruger	Planning Department, Building Official, Holmes County EMA	Multi-hazard	N/A	D	Moved to Preparedness Planning	Continuous Action	1.6	H	General budget	2015
CRU-14	Integrate hazard mitigation into local planning	Provide a copy of the MEMA 3 RHMP to applicable departments responsible for the enforcement or development of policies and planning initiatives	Town of Cruger	Holmes Co. EMA, Mayor's Office, MEMA, applicable departments	Multi-hazard	N/A	D	Remove, requirement of the plan	Continuous Action	2.2	H	General budget	2015
CRU-15	Conduct annual first responder training for all hazards	Lessons learned during drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county/city	Town of Cruger	Holmes Co. EMA, Fire and Police	Multi-hazard	N/A	D	Moved to Preparedness Planning	Continuous Action	2.3	H	General budget	2015
CRU-16	Conduct annual NIMS training for first responders, officials and critical employees	Conduct training and verify new employees are integrated into training programs as necessary	Town of Cruger	Fire, Police, Holmes Co. EMA	Multi-hazard	N/A	D	Moved to Preparedness Planning	Continuous Action	2.3	H	General budget	2015

CRU-17	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	Town of Cruger	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazard	N/A	D	Remove, requirement of the plan	N/A	2.4	H	HMGP, General budget	2015
CRU-19	Conduct annual reviews of MEMA District 3 RHMP	Complete the worksheets provided and attend RHMC meetings as they are scheduled.	Town of Cruger	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Remove, requirement of the plan	Continuous Action	2.4	H	General budget	2015
CRU-21	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	Continue to participate in the NFIP and seek opportunities to join/improve CRS rating through documentation of activities and projects	Town of Cruger	Mayor's office, Holmes Co. EMA, MEMA	Flood	N/A	D	Remove, requirement of the plan	Continuous Action	2.5	H	General budget	2015
CRU-22	Become a Certified NWS StormReady Community	Contact NWS before applying, complete application, schedule verification meeting and receive approval.	Town of Cruger	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	2015-2020	2.5	H	General budget	2015
CRU-25	Promote workshops for emergency preparedness/continuity of operation plans	Provide applicable support to non-profit agencies, Chamber of Commerce, Planning and Development	Town of Cruger	Holmes County EMA, Mayor's Office	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	N/A	3.2	H	Private funds	2015

		District and other organizations that assist families and business owners with the development of disaster plans.											
CRU-04	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Cruger	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Continue emphasis on storm proofing and retrofit of critical facilities	2015-2025	1.2	M	HMGP, CDBG, general budget	2015
CRU-05	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards.	Town of Cruger	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Continue emphasis on storm proofing and retrofit of critical facilities	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

		Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc. Potential hardening projects may include any municipal building and public infrastructure. Specific buildings in need of upgrades include the fire department.											
CRU-06	Secure generators for existing and new critical facilities and infrastructure	As funding becomes available, Lexington will apply for grants to install generators to support critical facilities/infrastructure. Generators are needed for lift stations, city hall, Lexington Multi-Complex Building (public shelter).	Town of Cruger	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	$300,000	R	Continue emphasis on storm proofing and retrofit of critical facilities	2015-2025	1.4	H	HMGP, general budget	2015

CRU-07	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events - areas in need of improved systems include: MLK Dr, Swinney Ln, Cemetery, Mulberry, Mulberry Cir., Morgan, Spring, Boulevard, Pecan Grove Subdivision and Jackson and other areas in the town should be considered as needs and funding opportunities arise.	Town of Cruger	Mayor's office, Public Works, Drainage Districts	Flood	Undetermined	R	Move forward to this planning cycle	2015-2040	1.5	H	HMGP, CDBG, CIAP funding or part of developer agreements	2015
CRU-08	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Consider program to establish lightning grounding systems on critical water and sewer system elements and other facilities prone to strikes to ensure that essential county service continue.	Town of Cruger	Public Works, Mayor's office	Severe Weather	Undetermined	R	Move forward to this planning cycle	2020-2025	1.5	H	General funds	2015

		Facilities impacted include Hwy 12 W water tank and water well locations.											
CRU-09	Monitor water supply and establish conservation regulations	Consider establishing water conservation ordinances and implement water conservation techniques by regularly checking for leaks to minimize water supply loss.	Town of Cruger	Public Works, Building Official, Mayor's Office	Drought	Undetermined	R	Move forward to this planning cycle	Continuous Action	1.5	H	General budget	2015
CRU-10	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	Town of Cruger	Mayor's Office	Human Infect. Disease	Undetermined	R	Move forward to this planning cycle	Continuous Action	1.5	H	General budget	2015
CRU-12	Develop Critical Infrastructure and Key Resources (CIKR) database	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin	Town of Cruger	Holmes County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information	Multi-hazard	Undetermined	R	Participate in state-level data gathering efforts	2021	1.6	H	General budget	2015

		gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities and infrastructure for the County and its jurisdictions. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.		Systems, MEMA									
CRU-13	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	Update and/or develop ordinances and regulations as required to address all hazards prone to Cruger and include any	Town of Cruger	Mayor's office	Multi-hazard	N/A	R	Move forward to this planning cycle	Continuous Action	2.2	M	General budget	2015

		changes in future development areas											
CRU-18	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	The city can gain valuable data and insight into impacts as they occur to assess and define appropriate actions in the way of implementing an existing mitigation action or identifying a new need. Convene as soon as appropriate after an event to conduct an after-action report and document this in the appendix of the mitigation plan.	Town of Cruger	Mayor's Office, Holmes County EMA	Multi-hazard	N/A	R	Move forward with focus on mitigation actions post-disaster	Continuous Action	2.4	H	General funds	2015
CRU-23	Continue efforts on public information and awareness for natural hazards	The Town has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to	Town of Cruger	Holmes County EMA, applicable departments, MEMA, NWS, FEMA	Multi-hazard	N/A	R	Move forward with focus on mitigation actions	Continuous Action	3.1	H	General funds	2015

		preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient. Continue to provide information on all hazards that may include but not be limited to educational information, evacuation routes/procedures, workshop/training programs, alert systems and the like.											
CRU-24	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the town that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings	Town of Cruger	Holmes County EMA, MSDH, Mayor's Office	Human Infectious Disease, Hazardous Materials	N/A	R	Move forward with focus on mitigation actions	Continuous Action	3.1	H	MSD, EMPG, Homeland Security, general funds	2015

		and on the town's web page											
CRU-26	Encourage the development of training and emergency planning for private companies that handle hazardous materials	It is recommended that the Town officials coordinate educational programs to improve onsite hazardous material safety and increase awareness of chemical issues and reporting procedures.	Town of Cruger	Holmes County EMA, Police and Fire Officials	Hazardous Materials	N/A	R	Move forward with focus on mitigation actions	Continuous Action	3.2	M	General budget	2015
CRU-27	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals.	The county/Town will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives	Town of Cruger	Holmes County EMA, Mayor's Office	Multi-hazard	N/A	R	Explore public-private partnerships	Continuous Action	3.2	M	General budget	2015
Project #	**Action Title**	**Action Description**	**Jurisdiction(s)**	**Agency**	**Hazard**	**Estimated Cost**	**2020 Status (C=Complete; D=Deleted; R=Retain; N=New; IP=In Progress)**	**2020 Status Description**	**Implementation Timeframe**	**Mitigation Goal/Objectives**	**Priority Ranking**	**Potential Funding Source**	**Year Proposed**
City of Durant													

DUR-01	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	City of Durant	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning	2015-2020	1.1	M	NWS	2015
DUR-02	Develop weather radio program for vulnerable populations	Outdoor warning sirens, text messaging, television and other forms of communication have been implemented to alert the public; however, areas/population that may not receive notifications due to location and/or lack of communication devices: develop committee to explore benefit/ cost, vendors, funding options, etc. to provide weather radios to vulnerable populations.	City of Durant	MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	Tornado, Severe Storm	Undetermined	D	Moved to Preparedness Planning	2 yr.	1.1	H	NWS, Private Funds	2015
DUR-05	Secure generators for existing and new critical facilities and infrastructure	As funding becomes available, Lexington will apply for grants to install generators to	City of Durant	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	$300,000	D	Moved to Preparedness Planning	2015-2025	1.4	H	HMGP, general budget	2015

		support critical facilities/infrastructure. Generators are needed for lift stations, city hall, Lexington Multi-Complex Building (public shelter).											
DUR-08	Secure generators for existing and new critical facilities and infrastructure	As funding becomes available, Lexington will apply for grants to install generators to support critical facilities/infrastructure. Generators are needed for lift stations, city hall, Lexington Multi-Complex Building (public shelter).	City of Durant	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	$300,000	D	Remove - Duplicate of DUR-05	2015-2025	1.4	H	HMGP, general budget	
DUR-10	Implement maintenance program for storm water conveyance and detention structures	Continue to implement preventive maintenance to water conveyance systems	City of Durant	Public Works Dept.	Flood	Undetermined	D	Remove - relates to ongoing maintenance	N/A	1.5	M	CDBG, CIAP, general budget	2015
DUR-13	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and	City of Durant	Planning Department, Building Official, Holmes County EMA	Multi-hazard	N/A	D	Moved to Preparedness Planning	Continuous Action	1.6	H	General budget	2015

		regulatory initiatives											
DUR-16	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	Update and/or develop ordinances and regulations as required to address all hazards prone to Durant and include any changes in future development areas	City of Durant	Mayor's office	Multi-hazard	N/A	D	Remove - component of HMP maintenance	Continuous Action	2.2	M	General budget	2015
DUR-17	Integrate hazard mitigation into local planning	Provide a copy of the MEMA 3 RHMP to applicable departments responsible for the enforcement or development of policies and planning initiatives	City of Durant	Holmes Co. EMA, Mayor's Office, MEMA, applicable departments	Multi-hazard	N/A	D	Remove - component of HMP maintenance	Continuous Action	2.2	H	General budget	2015
DUR-18	Conduct annual first responder training for all hazards	Lessons learned during drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county/city	City of Durant	Holmes Co. EMA, Fire and Police	Multi-hazard	N/A	D	Moved to Preparedness Planning	Continuous Action	2.3	H	General budget	2015
DUR-19	Conduct annual NIMS training for first responders, officials and	Conduct training and verify new employees are integrated into training	City of Durant	Fire, Police, Holmes Co. EMA	Multi-hazard	N/A	D	Moved to Preparedness Planning	Continuous Action	2.3	H	General budget	2015

	critical employees	programs as necessary											
DUR-20	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	City of Durant	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazard	N/A	D	Remove - component of HMP maintenance	N/A	2.4	H	HMGP, General budget	2015
DUR-22	Conduct annual reviews of MEMA District 3 RHMP	Complete the worksheets provided and attend RHMC meetings as they are scheduled.	City of Durant	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Remove - component of HMP maintenance	Continuous Action	2.4	H	General budget	2015
DUR-23	Pursue training and funding opportunities for mitigation actions	Continue to seek funding for eligible mitigation actions as they arise. Participate in training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques of completing an effective application and benefit cost analysis	City of Durant	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Remove - component of HMP maintenance	Continuous Action	2.4	M	HMGP, general budget	2015

DUR-25	Become a Certified NWS StormReady Community	Contact NWS before applying, complete application, schedule verification meeting and receive approval.	City of Durant	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Moved to Preparedness Planning	2015-2020	2.5	H	General budget	2015
DUR-28	Promote workshops for emergency preparedness/continuity of operation plans	Provide applicable support to non-profit agencies, Chamber of Commerce, Planning and Development District and other organizations that assist families and business owners with the development of disaster plans.	City of Durant	Holmes County EMA, Mayor's Office	Multi-hazard	N/A	D	Moved to Preparedness Planning	N/A	3.2	H	Private funds	2015
DUR-03	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	City of Durant	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Retain - emphasis on critical facilities and infrastructure	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

DUR-04	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc. Potential hardening projects may include any municipal building and public infrastructure. Specific buildings in need of upgrades include the fire department.	City of Durant	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Retain - emphasis on critical facilities and infrastructure	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

DUR-06	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the City are frequently impacted by flash flood and severe weather events - areas in need of improved systems include: areas in the town should be considered as needs and funding opportunities arise.	City of Durant	Mayor's office, Public Works, Drainage Districts	Flood	Undetermined	R	Retain - emphasis on critical facilities and infrastructure	2015-2040	1.5	H	HMGP, CDBG, CIAP funding or part of developer agreements	2015
DUR-07	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	City of Durant	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Retain - emphasis on critical facilities and infrastructure	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

DUR-08	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and city property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc. Potential hardening projects may include any municipal building and public infrastructure. Specific buildings in need of upgrades include the fire department.	City of Durant	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	D	Duplicate of DUR-04	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

DUR-09	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the City are frequently impacted by flash flood and severe weather events - areas in need of improved systems include areas in the City which should be considered as needs and funding opportunities arise.	City of Durant	Mayor's office, Public Works, Drainage Districts	Flood	Undetermined	D	Duplicate of DUR-05	2015-2040	1.5	H	HMGP, CDBG, CIAP funding or part of developer agreements	
DUR-12	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	City of Durant	Mayor's Office	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove - routine maintenance is not a mitigation action	N/A	1.5	H	General budget	2015
DUR-11	Monitor water supply and establish conservation regulations	The County should consider establishing water conservation ordinances and implement	City of Durant	Public Works, Building Official, Mayor's Office	Drought	Undetermined	R	Establish water conservation ordinances	Continuous Action	1.5	H	General budget	2015

		water conservation techniques by regularly checking for leaks to minimize water supply loss.											
DUR-14	Develop Critical Infrastructure and Key Resources (CIKR) database	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities and infrastructure for the County and its jurisdictions. The county EMA should serve as a liaison to the Coordinating Council for	City of Durant	Holmes County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Participate in state-level data gathering efforts	2021	1.6	H	General budget	2015

		Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.											
DUR-15	Develop/update Stormwater Management Plan	Review stormwater management policies and regulations to initiate multi-agency planning process that considers repetitive flood/flash flood issues and best practices	City of Durant	Public Works, Building Official, EMA, Mayor's office	Flood	Undetermined	R	Develop city stormwater management policy and plan	2020-2025	2.1	H	General budget	2015
DUR-21	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	The city can gain valuable data and insight into impacts as they occur to assess and define appropriate actions in the way of implementing an existing mitigation action or identifying a new need. Convene as soon as appropriate after an event to conduct an after action report and document this in the	City of Durant	Mayor's Office, Holmes County EMA	Multi-hazard	N/A	R	Focus on mitigation opportunities	Continuous Action	2.4	H	General funds	2015

		appendix of the mitigation plan.											
DUR-24	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	Continue to participate in the NFIP and seek opportunities to join/improve CRS rating through documentation of activities and projects	City of Durant	Mayor's office, Holmes Co. EMA, MEMA	Flood	N/A	R	Focus on CRS participation	Continuous Action	2.5	H	General budget	2015
DUR-26	Continue efforts on public information and awareness for natural hazards	The City has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient. Continue to provide information on all hazards that may include but not be limited to educational information,	City of Durant	Holmes County EMA, applicable departments, MEMA, NWS, FEMA	Multi-hazard	N/A	R	Focus on hazard mitigation measures	Continuous Action	3.1	H	General funds	2015

		evacuation routes/procedures, workshop/training programs, alert systems and the like.											
DUR-27	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the town that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the city's web page	City of Durant	Holmes County EMA, MSDH, Mayor's Office	Human Infectious Disease, Hazardous Materials	N/A	R	Focus on mitigation measures	Continuous Action	3.1	H	MSD, EMPG, Homeland Security, general funds	2015
DUR-29	Encourage the development of training and emergency planning for private companies that handle hazardous materials	It is recommended that the Town officials coordinate educational programs to improve onsite hazardous material safety and increase awareness of chemical issues and reporting procedures.	City of Durant	Holmes County EMA, Police and Fire Officials	Hazardous Materials	N/A	R	Focus on mitigation measures	Continuous Action	3.2	M	General budget	2015

DUR-30	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals.	The county/city will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives	City of Durant	Holmes County EMA, Mayor's Office	Multi-hazard	N/A	R	Focus on mitigation measures	Continuous Action	3.2	M	General budget	2015
Project #	**Action Title**	**Action Description**	**Jurisdiction(s)**	**Agency**	**Hazard**	**Estimated Cost**	**2020 Status (C=Complete; D=Deleted; R=Retain; N=New; IP=In Progress)**	**2020 Status Description**	**Implementation Timeframe**	**Mitigation Goal/Objectives**	**Priority Ranking**	**Potential Funding Source**	**Year Proposed**
Town of Goodman													
GDM-01	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Goodman	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Move to Preparedness Planning Initiative	2015-2020	1.1	M	NWS	2015
GDM-02	Develop weather radio program for vulnerable populations	Outdoor warning sirens, text messaging, television and other forms of communication have been implemented to alert the public; however, areas/population that may not receive	Town of Goodman	MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	Tornado, Severe Storm	Undetermined	D	Move to Preparedness Planning Initiative	2 yr.	1.1	H	NWS, Private Funds	2015

		notifications due to location and/or lack of communication devices: develop committee to explore benefit/ cost, vendors, funding options, etc. to provide weather radios to vulnerable populations.											
GDM-05	Secure generators for existing and new critical facilities and infrastructure	As funding becomes available, Lexington will apply for grants to install generators to support critical facilities/infrastructure. Generators are needed for lift stations, city hall, Lexington Multi-Complex Building (public shelter).	Town of Goodman	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	$300,000	D	Move to Preparedness Planning Initiative	2015-2025	1.4	H	HMGP, general budget	2015
GDM-07	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of	Town of Goodman	Mayor's Office	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove - routine maintenance is not a mitigation action	N/A	1.5	H	General budget	2015

		concern free of unnecessary debris											
GDM-08	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives	Town of Goodman	Mayor's Office, Holmes County EMA	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	Continuous Action	1.6	H	General budget	2015
GDM-11	Integrate hazard mitigation into local planning	Provide a copy of the MEMA 3 RHMP to applicable departments responsible for the enforcement or development of policies and planning initiatives	Town of Goodman	Holmes Co. EMA, Mayor's Office, MEMA, applicable departments	Multi-hazard	N/A	D	Remove - component of HMP implementation	Continuous Action	2.2	H	General budget	2015
GDM-12	Conduct annual first responder training for all hazards	Lessons learned during drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county/city	Town of Goodman	Holmes Co. EMA, Fire and Police	Multi-hazard	N/A	D	Move to Preaprednes s Planning Initiative	Continuous Action	2.3	H	General budget	2015
GDM-13	Conduct annual NIMS training for first responders, officials and	Conduct training and verify new employees are integrated into training	Town of Goodman	Fire, Police, Holmes Co. EMA	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	Continuous Action	2.3	H	General budget	2015

	critical employees	programs as necessary											
GDM-14	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	Town of Goodman	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazard	N/A	D	Remove - component of HMP maintenance	N/A	2.4	H	HMGP, General budget	2015
GDM-16	Conduct annual reviews of MEMA District 3 RHMP	Complete the worksheets provided and attend RHMC meetings as they are scheduled.	Town of Goodman	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Remove - component of HMP maintenance	Continuous Action	2.4	H	General budget	2015
GDM-17	Pursue training and funding opportunities for mitigation actions	Continue to seek funding for eligible mitigation actions as they arise. Participate in training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques of completing an effective application and benefit cost analysis	Town of Goodman	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Remove - component of HMP maintenance	Continuous Action	2.4	M	HMGP, general budget	2015

GDM-19	Become a Certified NWS StormReady Community	Contact NWS before applying, complete application, schedule verification meeting and receive approval.	Town of Goodman	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	2015-2020	2.5	H	General budget	2015
GDM-22	Promote workshops for emergency preparedness/continuity of operation plans	Provide applicable support to non-profit agencies, Chamber of Commerce, Planning and Development District and other organizations that assist families and business owners with the development of disaster plans.	Town of Goodman	Holmes County EMA, Mayor's Office	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	N/A	3.2	H	Private funds	2015
GDM-03	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Goodman	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Retain - emphasis on critical facilities and infrastructure	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

GDM-04	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc. Potential hardening projects may include any municipal building and public infrastructure. Specific buildings in need of upgrades include the fire department.	Town of Goodman	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Retain - emphasis on critical facilities and infrastructure	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

GDM-06	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the City are frequently impacted by flash flood and severe weather events - areas in need of improved systems include: areas in the town should be considered as needs and funding opportunities arise.	Town of Goodman	Mayor's office, Public Works, Drainage Districts	Flood	Undetermined	R	Retain - emphasis on critical facilities and infrastructure	2015-2040	1.5	H	HMGP, CDBG, CIAP funding or part of developer agreements	2015
GDM-09	Develop Critical Infrastructure and Key Resources (CIKR) database	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant	Town of Goodman	Holmes County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Participate in state-level data gathering efforts	2021	1.6	H	General budget	2015

		information on critical facilities and infrastructure for the County and its jurisdictions. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.											
GDM-10	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	Update and/or develop ordinances and regulations as required to address all hazards prone to Durant and include any changes in future development areas	Town of Goodman	Mayor's office	Multi-hazard	N/A	R	Conduct study of existing ordinances and regulations	Continuous Action	2.2	M	General budget	2015
GDM-15	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	The city can gain valuable data and insight into impacts as they occur to assess and define appropriate actions in the way of	Town of Goodman	Mayor's Office, Holmes County EMA	Multi-hazard	N/A	R	Focus on mitigation actions	Continuous Action	2.4	H	General funds	2015

		implementing an existing mitigation action or identifying a new need. Convene as soon as appropriate after an event to conduct an after action report and document this in the appendix of the mitigation plan.											
GDM-18	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	Continue to participate in the NFIP and seek opportunities to join/improve CRS rating through documentation of activities and projects	Town of Goodman	Mayor's office, Holmes Co. EMA, MEMA	Flood	N/A	R	Focus on mitigation actions	Continuous Action	2.5	H	General budget	2015
GDM-20	Continue efforts on public information and awareness for natural hazards	The City has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the	Town of Goodman	Holmes County EMA, applicable departments, MEMA, NWS, FEMA	Multi-hazard	N/A	R	Focus on mitigation actions	Continuous Action	3.1	H	General funds	2015

		public fosters their ability to become self-sufficient. Continue to provide information on all hazards that may include but not be limited to educational information, evacuation routes/procedures, workshop/training programs, alert systems and the like.											
GDM-21	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the town that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the city's web page	Town of Goodman	Holmes County EMA, MSDH, Mayor's Office	Human Infectious Disease, Hazardous Materials	N/A	R	Focus on mitigation actions	Continuous Action	3.1	H	MSD, EMPG, Homeland Security, general funds	2015

GDM-23	Encourage the development of training and emergency planning for private companies that handle hazardous materials	It is recommended that the Town officials coordinate educational programs to improve onsite hazardous material safety and increase awareness of chemical issues and reporting procedures.	Town of Goodman	Holmes County EMA, Police and Fire Officials	Hazardous Materials	N/A	R	Focus on mitigation actions	Continuous Action	3.2	M	General budget	2015
GDM-24	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals.	The county/city will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives	Town of Goodman	Holmes County EMA, Mayor's Office	Multi-hazard	N/A	R	Focus on mitigation actions	Continuous Action	3.2	M	General budget	2015
Project #	**Action Title**	**Action Description**	**Jurisdiction(s)**	**Agency**	**Hazard**	**Estimated Cost**	**2020 Status (C=Complete; D=Deleted; R=Retain; N=New; IP=In Progress)**	**2020 Status Description**	**Implementation Timeframe**	**Mitigation Goal/Objectives**	**Priority Ranking**	**Potential Funding Source**	**Year Proposed**
Holmes County													
HC-11	Implement maintenance program for storm water conveyance and detention structures	Continue to implement preventive maintenance to water conveyance systems	Holmes County	Public Works Dept.	Flood	Undetermined	D	Remove - routine maintenance is not a mitigation action	N/A	1.5	M	CDBG, CIAP, general budget	2015

HC-15	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	Holmes County	Road Department, Public Works, BOS	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove - routine maintenance is not a mitigation action	N/A	1.5	H	General budget	2015
HC-17	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives	Holmes County	Planning Department, Building Official, Holmes County EMA	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	Continuous Action	1.6	H	General budget	2015
HC-19	Update the Comprehensive Emergency Management Plan (CEMP)	Update the CEMP to include procedures for all hazards prone to the County. The CEMP should be evaluated following major events to ensure the effectiveness of the procedures outlined in the plan.	Holmes County	County EMA, Police and Fire Departments	Multi-hazard	Undetermined	D	Move to Preparedness Planning Initiative	N/A	2.1	H	Homeland Security, EMPG	2015

HC-25	Integrate hazard mitigation into local planning	Provide a copy of the MEMA 3 Regional Hazard Mitigation Plan to county departments responsible for the enforcement or development of policies and planning initiatives.	Holmes County	Holmes County EMA, BOS, applicable departments	Multi-hazard	N/A	D	Remove - component of mitigation plan	Continuous Action	2.2	H	General budget	2015
HC-26	Conduct annual first responder training for all hazards	Lessons learned during the drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county	Holmes County	Holmes County EMA, Fire and Police	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	Continuous Action	2.3	H	General funds	2015
HC-27	Conduct annual NIMS training for first responders, officials and critical employees	Conduct training and verify new employees are integrated into the training programs as necessary	Holmes County	Fire and Police Dept.., Holmes County EMA	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	Continuous Action	2.3	H	General budget	2015
HC-28	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	Holmes County	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazard	N/A	D	Remove - component of mitigation plan	N/A	2.4	H	HMGP, General budget	2015

HC-30	Conduct annual reviews of MEMA District 3 RHMP	Complete the worksheets provided and attend RHMC meetings as they are scheduled.	Holmes County	Holmes Co. EMA, applicable departments	Multi-hazard	N/A	D	Remove - component of mitigation plan	Continuous Action	2.4	H	General budget	2015
HC-31	Pursue training and funding opportunities for mitigation actions	Continue to seek funding for eligible mitigation actions as they arise. Participate in training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques of completing an effective application and benefit cost analysis	Holmes County	Holmes Co. EMA, applicable departments	Multi-hazard	N/A	D	Remove - component of mitigation plan	Continuous Action	2.4	M	HMGP, general budget	2015
HC-37	Promote disaster preparedness planning for families and area businesses.	Provide applicable support to non-profit agencies, Chamber of Commerce, North Delta Planning and Development District and other organizations that assist families and business owners with the development of disaster plans.	Holmes County	Holmes County EMA, BOS	Multi-hazard	N/A	D	Move to Preaprednes s Planning Initiative	Continuous Action	3.2	H	Private funds	2015

HC-51	Pursue training and funding opportunities for mitigation actions	Continue to seek funding for eligible mitigation actions as they arise. Participate in training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques of completing an effective application and benefit cost analysis	Town of Cruger	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Remove - duplicate of HC-31	Continuous Action	2.4	M	HMGP, general budget	2015
HC-01	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including installation, testing and inspection	Holmes County	Holmes County EMA, Mayor's Office, MEMA	Severe Weather, Tornado	$35,000	R	Retain - focus on mitigation	Continuous Action	1.1	H	HMGP, Local Funds	2015

HC-02	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Holmes County	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	R	Retain - focus on mitigation	2020-2025	1.1	M	NWS	2015
HC-03	Develop weather radio program for vulnerable populations	Outdoor warning sirens, text messaging, television and other forms of communication have been implemented to alert the public; however, areas/population that may not receive notifications due to location and/or lack of communication devices: develop committee to explore benefit/ cost, vendors, funding options, etc. to provide weather radios to vulnerable populations.	Holmes County	MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	Tornado, Severe Storm	Undetermined	R	Retain - focus on mitigation	2020-2022	1.1	M	NWS, Private Funds	2015
HC-04	Install electronic information alert signs over major evacuation routes to alert residents and	Permanent and portable message boards have been installed throughout on state key	Holmes County	MDOT, FHWA, DOX, Holmes County EMA	Multi-hazard	N/A	R	Retain - focus on mitigation	2020-2025	1.1	M	MDOT.FHWA	2015

	travelers of threat conditions	transportation routes. More systems should be installed as funding becomes available in the I-55 North area.											
HC-05	Storm proof/retrofit new critical facilities and infrastructure	The county would like to build a FEAM 361 Safe Room. During the planning process, no other new facilities or infrastructure were identified; however, the County's needs may require new construction over the next five years. The county will develop plans and specifications to include mitigation measures where practical on future new construction initiatives	Holmes County	BOS, Holmes County EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Retain - focus on critical facilities and infrastructure	2020-2025	1.2	M	HMGP, CDBG, general budget	2015

HC-06	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Holmes County	BOS, Holmes County EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Retain - focus on critical facilities and infrastructure	2020-2025	1.2	M	HMGP, CDBG, general budget	2015
HC-07	Mitigate deficient/obsolete bridges	Work with applicable local, federal and state agencies to develop a priority system for improvements. There are 46 structurally deficient and 6 functionally obsolete	Holmes County	Community officials/engineers, MDOT, FHWA, State Aid	Earthquake, Flood	Undetermined	R	Retain - focus on critical facilities and infrastructure	2020-2040	1.2	M	State Aid, MDOT, FHWA	2015

		reported for Holmes County on the 2012 National Bridge Inventory List.											
HC-08	Promote/build storm water detention ponds when appropriate	Implement when applicable	Holmes County	Public works	Flood	Undetermined	R	Retain - focus on critical facilities and infrastructure	Continuous Action	1.3	M	CDBG, developers	2015
HC-09	Secure generators for existing and new critical facilities and infrastructure	As funding becomes available, Holmes County will apply for grants to install generators to support new or existing critical facilities/infrastructure. Generators are needed for the EOC/911 Office, Sheriff, and lift stations	Holmes County	BOS, Holmes County EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Retain - focus on critical facilities and infrastructure	2020-2025	1.4	H	HMGP, general budget	2015
HC-10	Upgrade drainage systems and culverts	Drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	Holmes County	BOS, Road Dept., Public Works, Drainage Districts	Flood	Undetermined	R	Retain - focus on critical facilities and infrastructure	2020-2040	1.5	M	HMGP, CDBG, CIAP funding or part of developer agreements	2015

HC-12	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	The county should consider a program to establish lightning grounding systems on critical water and sewer system elements and other facilities prone to strikes to ensure that essential county services continue. Facilities that have been impacted by previous lightning strikes include the following: Courthouse, Holmes/Humphreys Correction Facility, Sherriff's Department, and Maintenance Shop.	Holmes County	Public Works Dept, BOS	Severe Weather	Undetermined	R	Retain - focus on critical facilities and infrastructure	2020-2022	1.5	H	General Funds	2015
HC-13	Monitor water supply and establish conservation regulations	The County should consider establishing water conservation ordinances and implement water conservation techniques by regularly checking for leaks to	Holmes County	Public Works, Building Official, BOS	Drought	Undetermined	R	Focus on conservation measures for mitigation	Continuous Action	1.5	H	General budget	2015

		minimize water supply loss.											
HC-14	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	Holmes County	BOS, Public Works	Human Infectious Disease (WNV/ other vector-borne illnesses	Undetermined	R	Focus on mitigation measures	Continuous Action	1.5	M	General budget	2015
HC-16	Preserve natural wetlands and riparian areas through use of conservation easements	The Land Trust works with the landowner to purchase property or secure an easement on the property so that the property remains undeveloped, and also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space can preserve critical drainage ways and wetlands or can maintain easements	Holmes County	Individual landowners	Flood	Undetermined	R	Focus on mitigation measures	Continuous Action	1.5	H	Private funds	2015

		adjacent to rivers, streams and bayous which are the floodways of the system. Leaving this property undeveloped allows the natural drainage system to continue to provide a function to the community. Implement when opportunities present themselves and practical.											
HC-18	Develop Critical Infrastructure and Key Resources (CIKR) database	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant	Holmes County	Holmes County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Participate in state-level data gathering efforts	2021	1.6	H	General budget	2015

		information on critical facilities and infrastructure for the County and its jurisdictions. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council											
HC-20	Develop Community Wildfire Protection Plan (CWPP)	A CWPP is the most effective way to influence where and how federal agencies implement fuel reduction projects on federal lands. Additionally, communities with CCWPPs in place will be given priority for funding of hazardous fuels reduction projects carried out under the auspices of the HFRA	Holmes County	Fire Department, Holmes County EMA	Wildfire	Undetermined	R	Focus on mitigation of personal property	2020-2025	2.1	H	MFC, general budget, State Fire Marshall	2015

HC-21	Develop/update Emergency Action Plans (EAP) for high and significant hazard dams.	Coordinate the development of an EAP for Eagles Nest Dam (MS03274) classified as a significant hazard dam and FW-90-02-Site Number 30 Dam (MS04375) classified as high hazard by MDEQ Dam Safety Division. The County should also review the EAPs for other high and significant hazard dams to determine if updates are necessary due to changes in population and land development	Holmes County	Holmes County EMA, Dam Owners, BOS	Dam Failure	Undetermined	R	Focus on mitigation measures	2020-2025	2.1	H	General Funds, HMEP, MDEQ	2015
HC-22	Develop/update Stormwater Management Plan	The County should consider developing a stormwater management plan. A Stormwater Management Plan outlines what is currently being done to prevent stormwater pollution, and what will be done in the	Holmes County	Public Works	Flood	Undetermined	R	Focus on mitigation measures	2020-2022	2.1	H	General budget	2015

		future. Six minimum measures must be incorporated into the plan: Public Education and Outreach, Public Participation and Involvement, Illicit Discharge Detection and Elimination, Construction Site Runoff Control, Post-Construction Runoff Control, Pollution Prevention and Good Housekeeping.											
HC-23	Develop a Commodity Flow Study	The County should consider assembling a committee to determine if a Commodity Flow Study would benefit the County's overall preparedness and response efforts as it relates to hazard material incidents.	Holmes County	Fire Department, Holmes County EMA	Hazardous Materials	$50,000-$75,000	R	Focus on mitigation measures	2020-2022	2.1	L	HMEP	2015
HC-24	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The County has ordinances and regulations in place to guide the development and	Holmes County	BOS, applicable departments	Multi-hazard	N/A	R	Focus on ordinances that support mitigation measures	Continuous Action	2.2	M	General funds	2015

		enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the County and includes any changes in future development areas											
HC-29	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	The county can gain valuable data and insight into impacts as they occur to assess and define appropriate actions in the way of implementing an existing mitigation action or identifying a new need. Convene as soon as appropriate after an event to conduct an after action report and document this in the appendix of the mitigation plan.	Holmes County	Holmes County EMA	Multi-hazard	N/A	R	Focus on mitigation opportunities	Continuous Action	2.4	H	General funds	2015

HC-32	Improve / maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) programs	Continue to participate in the NFIP and seek opportunities to join / improve CRS rating through documentation of activities and projects	Holmes County	BOS, applicable departments, Holmes County EMA, MEMA	Flood	N/A	R	Focus on CRS participation	Continuous Action	2.5	H	General budget	2015
HC-33	Become a Firewise Community	Obtain a wildfire risk assessment from the State Firewise liaison, form a committee and create an action plan based on assessment, conduct a Firewise day event, and submit an application to State Firewise liaison.	Holmes County	Fire Department, BOS, MFC	Wildfire	Undetermined	R	Focus on mitigation opportunities	2020-2022	2.5	M	MFC, General funds	2015
HC-34	Become a Certified NWS StormReady Community	Contact NWS before applying, complete application, schedule verification meeting and receive approval.	Holmes County	Holmes County EMA, BOS, NWS.	Multi-hazard	Undetermined	R	Focus on mitigation actions	2020-2025	2.5	H	General budget	2015

HC-35	Continue efforts on public information and awareness for natural hazards	The County has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient. Continue to provide information on all hazards that may include but not be limited to educational information, evacuation routes/procedures, workshop/training programs, alert systems and the like.	Holmes County	Holmes County EMA, applicable departments, MEMA, NWS, FEMA	Multi-hazard	N/A	R	Focus on mitigation actions	Continuous Action	3.1	H	General funds	2015
HC-36	Enhance public education and awareness of technological, man-made and	A process needs to be developed to address public education and awareness	Holmes County	Holmes County EMA, MSDH, applicable departments	Human Infectious Disease, Hazardo	N/A	R	Focus on mitigation actions	Continuous Action	3.1	H	MSD, EMPG, Homeland Security,	2015

	health-related hazards	programs for non-natural hazards. Identify areas/groups within the County that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the county's web page			us Materials							general funds	
HC-38	Encourage the development of training and emergency planning for private companies that handle hazardous materials	It is recommended that the County officials coordinate educational programs to improve onsite hazardous material safety and increase awareness of chemical issues and reporting procedures.	Holmes County	Holmes County EMA, Police and Fire Officials	Hazardous Materials	N/A	R	Focus on mitigation actions	Continuous Action	3.2	M	General budget	2015
HC-39	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals.	The county will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives	Holmes County	Holmes County EMA, applicable departments	Multi-hazard	N/A	R	Focus on mitigation actions	Continuous Action	3.2	M	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status (C=Complete; D=Deleted; R=Retain; N=New; IP=In Progress)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source	Year Proposed
City of Lexington													
Lex-01	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including installation, testing and inspection	City of Lexington	Holmes County EMA, Mayor's Office, MEMA	Severe Weather, Tornado	$35,000	D	Move to Preparedness Planning Initiative	Continuous Action	1.1	H	HMGP, Local Funds	2015
Lex-02	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	City of Lexington	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Move to Preparedness Planning Initiative	2015-2020	1.1	M	NWS	2015

Lex-03	Develop weather radio program for vulnerable populations	Outdoor warning sirens, text messaging, television and other forms of communication have been implemented to alert the public; however, areas/population that may not receive notifications due to location and/or lack of communication devices: develop committee to explore benefit/ cost, vendors, funding options, etc. to provide weather radios to vulnerable populations.	City of Lexington	MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	Tornado, Severe Storm	Undetermined	D	Move to Preparedness Planning Initiative	2 yr.	1.1	H	NWS, Private Funds	2015
Lex-10	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintenance to water conveyance systems	City of Lexington	Public Works	Flood	Undetermined	D	Remove - routine maintenance is not a mitigation action	Continuous action	1.5	M	CDBG, CIAP, general budget	2015

Lex-14	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Keep areas of concern free of unnecessary debris	City of Lexington	Road Department, Public Works, Mayor's office	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove - routine maintenance is not a mitigation action	Continuous Action	1.5	H	General budget	2015
Lex-15	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	City of Lexington	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	N/A	D	Remove - component of mitigation plan	Continuous Action	1.6	H	General budget	2015
Lex-19	Integrate hazard mitigation into local planning	Provide a copy of the MEMA 3 RHMP to applicable departments responsible for the enforcement or development of policies and planning initiatives	City of Lexington	Holmes Co. EMA, Mayor's Office, MEMA, applicable departments	Multi-hazard	N/A	D	Remove - component of mitigation plan implementation	Continuous Action	2.2	H	General budget	2015
Lex-20	Conduct annual first responder training for all hazards	Lessons learned during drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county/city	City of Lexington	Holmes Co. EMA, Fire and Police	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	Continuous Action	2.3	H	General budget	2015

Lex-21	Conduct annual NIMS training for first responders, officials and critical employees	Conduct training and verify new employees are integrated into training programs as necessary	City of Lexington	Fire, Police, Holmes Co. EMA	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	Continuous Action	2.3	H	General budget	2015
Lex-22	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Coordinate plan update with MEMA Mitigation Planning Bureau and participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	City of Lexington	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazard	Undetermined	D	Remove - component of plan maintenance	2020	2.4	H	HMGP, general budget	2015
Lex-24	Conduct annual reviews of MEMA District 3 RHMP	Complete the worksheets provided and attend RHMC meetings as they are scheduled.	City of Lexington	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Remove - component of plan maintenance	Continuous Action	2.4	H	General budget	2015
Lex-25	Pursue training and funding opportunities for mitigation actions	Continue to seek funding for eligible mitigation actions as they arise. Participate in training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques of completing an effective application and benefit cost analysis	City of Lexington	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Remove - component of mitigation plan implementation	Continuous Action	2.4	M	HMGP, general budget	2015

Lex-27	Become a Certified NWS StormReady Community	Contact NWS before applying, complete application, schedule verification meeting and receive approval.	City of Lexington	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	2015-2020	2.5	H	General budget	2015
Lex-30	Promote workshops for emergency preparedness/continuity of operation plans	Provide applicable support to non-profit agencies, Chamber of Commerce, Planning and Development District and other organizations that assist families and business owners with the development of disaster plans.	City of Lexington	Holmes County EMA, Mayor's Office	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	N/A	3.2	H	Private funds	2015
Lex-31	Encourage the development of training and emergency planning for private companies that handle hazardous materials	It is recommended that the Town officials coordinate educational programs to improve onsite hazardous material safety and increase awareness of chemical issues and reporting procedures.	City of Lexington	Holmes County EMA, Police and Fire Officials	Hazardous Materials	N/A	D	Move to Preparedness Planning Initiative	Continuous Action	3.2	M	General budget	2015

Lex-33	Replace access road to the City of Lexington sewage treatment lagoon	Recent flooding blew out the road to access the lagoon. Grant funding to repair erosion damage to the levee protecting the lagoon is available; however, access to the site is necessary and the funding opportunity will be lost without the road replacement.	City of Lexington	Mayor's office, Public Works, Drainage Districts	Flood		N	New action to support critical infrastructure repair	2020-2021	1.2	H		2020
Lex-04	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	City of Lexington	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Focus on critical facilities and infrastructure	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

Lex-05	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	City of Lexington	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Focus on critical facilities and infrastructure	2015-2025	1.2	M	HMGP, CDBG, general budget	2015
Lex-06	Construct flood control measures	Conduct study to determine appropriate actions to eliminate/reduce flooding; identify funding and implement project when feasible.	City of Lexington	USACE, County EMA, Mayor's office, MEMA	Flood	Undetermined	R	Focus on mitigation opportunities	2015-2025	1.3	M	General budget, USACE, HMGP	2015
Lex-07	Secure generators for existing and new	As funding becomes available,	City of Lexington	Mayor's office,	Multi-hazard	$300,000	R	Focus on critical facilities and	2015-2025	1.4	H	HMGP, general budget	2015

	critical facilities and infrastructure	Lexington will apply for grants to install generators to support critical facilities/infrastructure. Generators are needed for lift stations, city hall, Lexington Multi-Complex Building (public shelter).		Holmes Co. EMA, MEMA				infrastructure					
Lex-08	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Reference - Table of RFC/SRL properties that have not been mitigated. Lexington will explore mitigation options with property owners as funding and opportunities arise.	City of Lexington	Holmes County EMA, Mayor's Office, MEMA	Flood	Undetermined	R	Flood mitigation initiative	Continuous Action	1.5	M	FMA	2015
Lex-09	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events - areas in need of improved systems include: MLK Dr, Swinney Ln, Cemetery, Mulberry, Mulberry Cir.,	City of Lexington	Mayor's office, Public Works, Drainage Districts	Flood	Undetermined	R	Flood mitigation initiative	2015-2040	1.5	H	HMGP, CDBG, CIAP funding or part of developer agreements	2015

		Morgan, Spring, Boulevard, Pecan Grove Subdivision and Jackson and other areas in the town should be considered as needs and funding opportunities arise.											
Lex-11	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Consider program to establish lightning grounding systems on critical water and sewer system elements and other facilities prone to strikes to ensure that essential county service continue. Facilities impacted include Hwy 12 W water tank and water well locations.	City of Lexington	Public Works, Mayor's office	Severe Weather	Undetermined	R	Focus on mitigation actions	2020-2025	1.5	H	General funds	2015
Lex-12	Monitor water supply and establish conservation regulations	Consider establishing water conservation ordinances and implement water conservation techniques by regularly checking for	City of Lexington	Public Works, Building Official, Mayor's Office	Drought	Undetermined	R	Focus on mitigation opportunities	Continuous Action	1.5	H	General budget	2015

		leaks to minimize water supply loss.											
Lex-13	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	City of Lexington	Mayor's Office	Human Infect. Disease	Undetermined	R	Focus on mitigation actions	Continuous Action	1.5	H	General budget	2015
Lex-16	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	City of Lexington	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Participate in state-level data gathering efforts	2021	1.6	H	General budget	2015

Lex-17	Develop/update Stormwater Management Plan	Review stormwater management policies and regulations to initiate multi-agency planning process that considers repetitive flood/flash flood issues and best practices	City of Lexington	Public Works, Building Official, EMA, Mayor's office	Flood	Undetermined	R	Focus on mitigation actions	2020-2025	2.1	H	General budget	2015
Lex-18	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	Update and/or develop ordinances and regulations as required to address all hazards prone to Lexington and include any changes in future development areas	City of Lexington	Mayor's office	Multi-hazard	N/A	R	Conduct study of existing ordinances and regulations	Continuous Action	2.2	M	General budget	2015
Lex-23	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Convene as soon as appropriate after an event to conduct an after action report and document this in the appendix of the mitigation plan.	City of Lexington	Holmes Co. EMA	Multi-hazard	N/A	R	Focus on mitigation opportunities	Continuous Action	2.4	H	General budget	2015
Lex-26	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	Continue to participate in the NFIP and seek opportunities to join/improve CRS rating through documentation	City of Lexington	Mayor's office, Holmes Co. EMA, MEMA	Flood	N/A	R	Focus on CRS participation	Continuous Action	2.5	H	General budget	2015

		of activities and projects											
Lex-28	Continue efforts on public information and awareness for natural hazards	The City has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient. Continue to provide information on all hazards that may include but not be limited to educational information, evacuation routes/procedures, workshop/training programs, alert systems and the like.	City of Lexington	Holmes County EMA, applicable departments, MEMA, NWS, FEMA	Multi-hazard	N/A	R	Focus on mitigation actions	Continuous Action	3.1	H	General funds	2015

Lex-29	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the town that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the city's web page	City of Lexington	Holmes County EMA, MSDH, Mayor's Office	Human Infectious Disease, Hazardous Materials	N/A	R	Focus on mitigation actions	Continuous Action	3.1	H	MSD, EMPG, Homeland Security, general funds	2015
Lex-32	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals.	The county/city will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives	City of Lexington	Holmes County EMA, Mayor's Office	Multi-hazard	N/A	R	Focus on mitigation actions	Continuous Action	3.2	M	General budget	2015
Lex-33	Replace access road to the City of Lexington sewage treatment lagoon	Recent flooding blew out the road to access the lagoon. Grant funding to repair erosion damage to the levee protecting the lagoon is available; however, access to the site is necessary and	City of Lexington	Mayor's Office, Public Works, Drainage Districts	Flood	Undetermined	N	Flood mitigation action	2020-2021	1.2	H	General budget, Drainage district funding	2020

		the funding opportunity will be lost without the road replacement.											
Project #	**Action Title**	**Action Description**	**Jurisdiction(s)**	**Agency**	**Hazard**	**Estimated Cost**	**2020 Status (C=Complete; D=Deleted; R=Retain; N=New; IP=In Progress)**	**2020 Status Description**	**Implementation Timeframe**	**Mitigation Goal/Objectives**	**Priority Ranking**	**Potential Funding Source**	**Year Proposed**
Town of Pickens													
PIC-01	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including installation, testing and inspection	Town of Pickens	Holmes County EMA, Mayor's Office, MEMA	Severe Weather, Tornado	$35,000	D	Move to Preparedness Planning Initiative	Continuous Action	1.1	H	HMGP, Local Funds	2015
PIC-02	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in	Town of Pickens	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Move to Preparedness Planning Initiative	2015-2020	1.1	M	NWS	2015

		Little Rock, Memphis and Jackson.											
PIC-03	Develop weather radio program for vulnerable populations	Outdoor warning sirens, text messaging, television and other forms of communication have been implemented to alert the public; however, areas/population that may not receive notifications due to location and/or lack of communication devices: develop committee to explore benefit/ cost, vendors, funding options, etc. to provide weather radios to vulnerable populations.	Town of Pickens	MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	Tornado, Severe Storm	Undetermined	D	Move to Preparedness Planning Initiative	2 yr.	1.1	H	NWS, Private Funds	2015
PIC-06	Secure generators for existing and new critical facilities and infrastructure	As funding becomes available, Lexington will apply for grants to install generators to support critical facilities/infrastructure. Generators are needed for lift stations, city hall, Lexington Multi-Complex	Town of Pickens	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	$300,000	D	Move to Preparedness Planning Initiative	2015-2025	1.4	H	HMGP, general budget	2015

		Building (public shelter).											
PIC-09	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintenance to water conveyance systems	Town of Pickens	Public Works	Flood	Undetermined	D	Remove - routine maintenance is not a mitigation action	Continuous action	1.5	M	CDBG, CIAP, general budget	2015
PIC-13	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Keep areas of concern free of unnecessary debris	Town of Pickens	Road Department, Public Works, Mayor's office	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove - routine maintenance is not a mitigation action	Continuous Action	1.5	H	General budget	2015
PIC-14	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Town of Pickens	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	Continuous Action	1.6	H	General budget	2015

PIC-17	Integrate hazard mitigation into local planning	Provide a copy of the MEMA 3 RHMP to applicable departments responsible for the enforcement or development of policies and planning initiatives	Town of Pickens	Holmes Co. EMA, Mayor's Office, MEMA, applicable departments	Multi-hazard	N/A	D	Remove - component of mitigation plan	Continuous Action	2.2	H	General budget	2015
PIC-18	Conduct annual first responder training for all hazards	Lessons learned during drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county/city	Town of Pickens	Holmes Co. EMA, Fire and Police	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	Continuous Action	2.3	H	General budget	2015
PIC-19	Conduct annual NIMS training for first responders, officials and critical employees	Conduct training and verify new employees are integrated into training programs as necessary	Town of Pickens	Fire, Police, Holmes Co. EMA	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	Continuous Action	2.3	H	General budget	2015
PIC-20	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Coordinate plan update with MEMA Mitigation Planning Bureau and participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	Town of Pickens	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazard	Undetermined	D	Remove - component of mitigation plan	2020	2.4	H	HMGP, general budget	2015

PIC-22	Conduct annual reviews of MEMA District 3 RHMP	Complete the worksheets provided and attend RHMC meetings as they are scheduled.	Town of Pickens	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Remove - component of mitigation plan	Continuous Action	2.4	H	General budget	2015
PIC-24	Become a Certified NWS StormReady Community	Contact NWS before applying, complete application, schedule verification meeting and receive approval.	Town of Pickens	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	2015-2020	2.5	H	General budget	2015
PIC-27	Promote workshops for emergency preparedness/continuity of operation plans	Provide applicable support to non-profit agencies, Chamber of Commerce, Planning and Development District and other organizations that assist families and business owners with the development of disaster plans.	Town of Pickens	Holmes County EMA, Mayor's Office	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	N/A	3.2	H	Private funds	2015
PIC-28	Encourage the development of training and emergency planning for private companies that handle hazardous materials	It is recommended that the Town officials coordinate educational programs to improve onsite hazardous material safety and increase awareness of chemical issues	Town of Pickens	Holmes County EMA, Police and Fire Officials	Hazardous Materials	N/A	D	Move to Preparedness Planning Initiative	Continuous Action	3.2	M	General budget	2015

		and reporting procedures.											
PIC-04	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Pickens	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Focus on critical facilities and infrastructure	2015-2025	1.2	M	HMGP, CDBG, general budget	2015
PIC-05	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame	Town of Pickens	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Focus on critical facilities and infrastructure	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

		enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.											
PIC-07	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Reference - Table of RFC/SRL properties that have not been mitigated. Lexington will explore mitigation options with property owners as funding and opportunities arise.	Town of Pickens	Holmes County EMA, Mayor's Office, MEMA	Flood	Undetermined	R	Flood mitigation initiative	Continuous Action	1.5	M	FMA	2015
PIC-08	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events. Areas in need of improved systems include the following streets: Peach/Pearl, Lexington, First, Madison, Sheffield and Jackson and other areas in the town should be considered as	Town of Pickens	Mayor's office, Public Works, Drainage Districts	Flood	Undetermined	R	Flood mitigation initiative	2015-2040	1.5	H	HMGP, CDBG, CIAP funding or part of developer agreements	2015

		needs and funding opportunities arise											
PIC-10	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Consider program to establish lightning grounding systems on critical water and sewer system elements and other facilities prone to strikes to ensure that essential county service continue. Facilities impacted include Hwy 12 W water tank and water well locations.	Town of Pickens	Public Works, Mayor's office	Severe Weather	Undetermined	R	Focus on mitigation actions	2020-2025	1.5	H	General funds	2015
PIC-11	Monitor water supply and establish conservation regulations	Consider establishing water conservation ordinances and implement water conservation techniques by regularly checking for leaks to minimize water supply loss.	Town of Pickens	Public Works, Building Official, Mayor's Office	Drought	Undetermined	R	Focus on water conservation measures	Continuous Action	1.5	H	General budget	2015
PIC-12	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations.	Town of Pickens	Mayor's Office	Human Infect. Disease	Undetermined	R	Focus on mitigation opportunities	Continuous Action	1.5	H	General budget	2015

		Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.											
PIC-15	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	Town of Pickens	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Participate in state-level data gathering efforts	2021	1.6	H	General budget	2015
PIC-16	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	Pickens has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop	Town of Pickens	Mayor's office	Multi-hazard	N/A	R	Focus on mitigation opportunities	Continuous Action	2.2	M	General budget	2015

		ordinances and regulations as required to address all hazards prone to Lexington and include any changes in future development areas											
PIC-21	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Convene as soon as appropriate after an event to conduct an after action report and document this in the appendix of the mitigation plan.	Town of Pickens	Holmes Co. EMA	Multi-hazard	N/A	R	Focus on mitigation opportunities	Continuous Action	2.4	H	General budget	2015
PIC-23	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	Continue to participate in the NFIP and seek opportunities to join/improve CRS rating through documentation of activities and projects	Town of Pickens	Mayor's office, Holmes Co. EMA, MEMA	Flood	N/A	R	Focus on CRS participation	Continuous Action	2.5	H	General budget	2015
PIC-25	Continue efforts on public information and awareness for natural hazards	The City has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational	Town of Pickens	Holmes County EMA, applicable departments, MEMA, NWS, FEMA	Multi-hazard	N/A	R	Focus on mitigation actions	Continuous Action	3.1	H	General funds	2015

		information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient. Continue to provide information on all hazards that may include but not be limited to educational information, evacuation routes/procedures, workshop/training programs, alert systems and the like.											
PIC-26	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the town that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at	Town of Pickens	Holmes County EMA, MSDH, Mayor's Office	Human Infectious Disease, Hazardous Materials	N/A	R	Focus on mitigation actions	Continuous Action	3.1	H	MSD, EMPG, Homeland Security, general funds	2015

		public meetings and on the city's web page											
PIC-29	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals.	The county/city will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives	Town of Pickens	Holmes County EMA, Mayor's Office	Multi-hazard	N/A	R	Focus on mitigation opportunities	Continuous Action	3.2	M	General budget	2015
Project #	**Action Title**	**Action Description**	**Jurisdiction(s)**	**Agency**	**Hazard**	**Estimated Cost**	**2020 Status (C=Complete; D=Deleted; R=Retain; N=New; IP=In Progress)**	**2020 Status Description**	**Implementation Timeframe**	**Mitigation Goal/Objectives**	**Priority Ranking**	**Potential Funding Source**	**Year Proposed**
Town of Tchula													
TCH-01	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including installation, testing and inspection	City of Tchula	Holmes County EMA, Mayor's Office, MEMA	Severe Weather, Tornado	$35,000	D	Move to Preparedness Planning Initiative	Continuous Action	1.1	H	HMGP, Local Funds	2015

TCH-02	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	City of Tchula	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Move to Preparedness Planning Initiative	2015-2020	1.1	M	NWS	2015
TCH-03	Develop weather radio program for vulnerable populations	Outdoor warning sirens, text messaging, television and other forms of communication have been implemented to alert the public; however, areas/population that may not receive notifications due to location and/or lack of communication devices: develop committee to explore benefit/ cost, vendors, funding options, etc. to provide weather radios to vulnerable populations.	City of Tchula	MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	Tornado, Severe Storm	Undetermined	D	Move to Preparedness Planning Initiative	2 yr.	1.1	H	NWS, Private Funds	2015
TCH-06	Secure generators for existing and new critical facilities and infrastructure	As funding becomes available, Lexington will apply for grants to install generators to	City of Tchula	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	$300,000	D	Move to Preparedness Planning Initiative	2015-2025	1.4	H	HMGP, general budget	2015

		support critical facilities/infrastructure. Generators are needed for lift stations, city hall, Lexington Multi-Complex Building (public shelter).											
TCH-09	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintenance to water conveyance systems	City of Tchula	Public Works	Flood	Undetermined	D	Remove - routine maintenance is not a mitigation action	Continuous action	1.5	M	CDBG, CIAP, general budget	2015
TCH-13	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Keep areas of concern free of unnecessary debris	City of Tchula	Road Department, Public Works, Mayor's office	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove - routine maintenance is not a mitigation action	Continuous Action	1.5	H	General budget	2015
TCH-14	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and	City of Tchula	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	N/A	D	Remove - component of mitigation plan	Continuous Action	1.6	H	General budget	2015

		regulatory initiatives.											
TCH-18	Integrate hazard mitigation into local planning	Provide a copy of the MEMA 3 RHMP to applicable departments responsible for the enforcement or development of policies and planning initiatives	City of Tchula	Holmes Co. EMA, Mayor's Office, MEMA, applicable departments	Multi-hazard	N/A	D	Remove - component of mitigation plan	Continuous Action	2.2	H	General budget	2015
TCH-19	Conduct annual first responder training for all hazards	Lessons learned during drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county/city	City of Tchula	Holmes Co. EMA, Fire and Police	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	Continuous Action	2.3	H	General budget	2015
TCH-20	Conduct annual NIMS training for first responders, officials and critical employees	Conduct training and verify new employees are integrated into training programs as necessary	City of Tchula	Fire, Police, Holmes Co. EMA	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	Continuous Action	2.3	H	General budget	2015
TCH-21	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Coordinate plan update with MEMA Mitigation Planning Bureau and participating jurisdictions in MEMA District 3 to schedule plan	City of Tchula	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazard	Undetermined	D	Remove - component of mitigation plan	2020	2.4	H	HMGP, general budget	2015

		updates as they become due.											
TCH-23	Conduct annual reviews of MEMA District 3 RHMP	Complete the worksheets provided and attend RHMC meetings as they are scheduled.	City of Tchula	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Remove - component of plan maintenance	Continuous Action	2.4	H	General budget	2015
TCH-24	Pursue training and funding opportunities for mitigation actions	Continue to seek funding for eligible mitigation actions as they arise. Participate in training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques of completing an effective application and benefit cost analysis	City of Tchula	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Remove - component of mitigation plan implementation	Continuous Action	2.4	M	HMGP, general budget	2015
TCH-26	Become a Certified NWS StormReady Community	Contact NWS before applying, complete application, schedule verification meeting and receive approval.	City of Tchula	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	2015-2020	2.5	H	General budget	2015
TCH-29	Promote workshops for emergency preparedness/continuity of operation plans	Provide applicable support to non-profit agencies, Chamber of Commerce, Planning and	City of Tchula	Holmes County EMA, Mayor's Office	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	N/A	3.2	H	Private funds	2015

		Development District and other organizations that assist families and business owners with the development of disaster plans.											
TCH-30	Encourage the development of training and emergency planning for private companies that handle hazardous materials	It is recommended that the Town officials coordinate educational programs to improve onsite hazardous material safety and increase awareness of chemical issues and reporting procedures.	City of Tchula	Holmes County EMA, Police and Fire Officials	Hazardous Materials	N/A	D	Move to Preparedness Planning Initiative	Continuous Action	3.2	M	General budget	2015
TCH-04	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	City of Tchula	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Focus on critical facilities and infrastructure	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

TCH-05	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	City of Tchula	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Focus on critical facilities and infrastructure	2015-2025	1.2	M	HMGP, CDBG, general budget	2015
TCH-07	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Reference - Table of RFC/SRL properties that have not been mitigated. Lexington will explore mitigation options with property owners as funding and opportunities arise.	City of Tchula	Holmes County EMA, Mayor's Office, MEMA	Flood	Undetermined	R	Flood mitigation initiative	Continuous Action	1.5	M	FMA	2015

TCH-08	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events. Areas in need of improved systems include the following streets: Peach/Pearl, Lexington, First, Madison, Sheffield and Jackson and other areas in the town should be considered as needs and funding opportunities arise	City of Tchula	Mayor's office, Public Works, Drainage Districts	Flood	Undetermined	R	Focus on mitigation actions	2015-2040	1.5	H	HMGP, CDBG, CIAP funding or part of developer agreements	2015
TCH-10	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Consider program to establish lightning grounding systems on critical water and sewer system elements and other facilities prone to strikes to ensure that essential county service continue. Facilities impacted	City of Tchula	Public Works, Mayor's office	Severe Weather	Undetermined	R	Focus on mitigation actions	2020-2025	1.5	H	General funds	2015

		include Hwy 12 W water tank and water well locations.											
TCH-11	Monitor water supply and establish conservation regulations	Consider establishing water conservation ordinances and implement water conservation techniques by regularly checking for leaks to minimize water supply loss.	City of Tchula	Public Works, Building Official, Mayor's Office	Drought	Undetermined	R	Focus on regulatory actions	Continuous Action	1.5	H	General budget	2015
TCH-12	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	City of Tchula	Mayor's Office	Human Infect. Disease	Undetermined	R	Focus on mitigation actions	Continuous Action	1.5	H	General budget	2015
TCH-15	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating	City of Tchula	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Participate in state-level data gathering efforts	2021	1.6	H	General budget	2015

		Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.											
TCH-16	Develop/update Stormwater Management Plan	Review stormwater management policies and regulations to initiate multi-agency planning process that considers repetitive flood/flash flood issues and best practices	City of Tchula	Public Works, Building Official, EMA, Mayor's office	Flood	Undetermined	R	Focus on regulatory actions	2020-2025	2.1	H	General budget	2015
TCH-17	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	Update and/or develop ordinances and regulations as required to address all hazards prone to Lexington and include any changes in future development areas	City of Tchula	Mayor's office	Multi-hazard	N/A	R	Focus on regulatory actions	Continuous Action	2.2	M	General budget	2015
TCH-22	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Convene as soon as appropriate after an event to conduct an after action report and document this in the	City of Tchula	Holmes Co. EMA	Multi-hazard	N/A	R	Focus on mitigation opportunities	Continuous Action	2.4	H	General budget	2015

		appendix of the mitigation plan.											
TCH-25	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	Continue to participate in the NFIP and seek opportunities to join/improve CRS rating through documentation of activities and projects	City of Tchula	Mayor's office, Holmes Co. EMA, MEMA	Flood	N/A	R	Focus on CRS participation	Continuous Action	2.5	H	General budget	2015
TCH-27	Continue efforts on public information and awareness for natural hazards	The City has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient. Continue to provide information on all hazards that may include but not be limited to	City of Tchula	Holmes County EMA, applicable departments, MEMA, NWS, FEMA	Multi-hazard	N/A	R	Focus on mitigation actions	Continuous Action	3.1	H	General funds	2015

		educational information, evacuation routes/procedures, workshop/training programs, alert systems and the like.											
TCH-28	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the town that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the city's web page	City of Tchula	Holmes County EMA, MSDH, Mayor's Office	Human Infectious Disease, Hazardous Materials	N/A	R	Focus on mitigation actions	Continuous Action	3.1	H	MSD, EMPG, Homeland Security, general funds	2015
TCH-31	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals.	The county/city will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives	City of Tchula	Holmes County EMA, Mayor's Office	Multi-hazard	N/A	R	Focus on mitigation actions	Continuous Action	3.2	M	General budget	2015

TCH-32	Develop property acquisition project for property in the flood zone.	The city will coordinate with property owners to develop a strategic project that targets homes damaged in flood zones.	City of Tchula	Holmes County EMA, Mayor's Office	Flood	Undetermined	N	NEW – added to address repetitive flood loss properties	2020-2025	1.5	H	HMGP, FMA, BRIC	2020
Project #	**Action Title**	**Action Description**	**Jurisdiction(s)**	**Agency**	**Hazard**	**Estimated Cost**	**2020 Status (C=Complete; D=Deleted; R=Retain; N=New; IP=In Progress)**	**2020 Status Description**	**Implementation Timeframe**	**Mitigation Goal/Objectives**	**Priority Ranking**	**Potential Funding Source**	**Year Proposed**
Town of West													
WES-01	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including installation, testing and inspection	Town of West	Holmes County EMA, Mayor's Office, MEMA	Severe Weather, Tornado	$35,000	D	Move to Preparedness Planning Initiative	Continuous Action	1.1	H	HMGP, Local Funds	2015

WES-02	Support installation of NEXRAD Doppler Radar site within District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of West	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Move to Preparedness Planning Initiative	2015-2020	1.1	M	NWS	2015
WES-03	Develop weather radio program for vulnerable populations	Outdoor warning sirens, text messaging, television and other forms of communication have been implemented to alert the public; however, areas/population that may not receive notifications due to location and/or lack of communication devices: develop committee to explore benefit/ cost, vendors, funding options, etc. to provide weather radios to vulnerable populations.	Town of West	MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	Tornado, Severe Storm	Undetermined	D	Move to Preparedness Planning Initiative	2 yr.	1.1	H	NWS, Private Funds	2015
WES-09	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow	Town of West	Public Works	Flood	Undetermined	D	Remove - routine maintenance is not a mitigation action	Continuous action	1.5	M	CDBG, CIAP, general budget	2015

		as designed for typical events. Continue to implement preventive maintenance to water conveyance systems											
WES-11	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Keep areas of concern free of unnecessary debris	Town of West	Road Department, Public Works, Mayor's office	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove - routine maintenance is not a mitigation action	Continuous Action	1.5	H	General budget	2015
WES-12	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Town of West	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	Continuous Action	1.6	H	General budget	2015
WES-15	Integrate hazard mitigation into local planning	Provide a copy of the MEMA 3 RHMP to applicable departments responsible for the enforcement or development of policies and planning initiatives	Town of West	Holmes Co. EMA, Mayor's Office, MEMA, applicable departments	Multi-hazard	N/A	D	Remove - component of mitigation plan	Continuous Action	2.2	H	General budget	2015

WES-16	Conduct annual first responder training for all hazards	Lessons learned during drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county/city	Town of West	Holmes Co. EMA, Fire and Police	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	Continuous Action	2.3	H	General budget	2015
WES-17	Conduct annual NIMS training for first responders, officials and critical employees	Conduct training and verify new employees are integrated into training programs as necessary	Town of West	Fire, Police, Holmes Co. EMA	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	Continuous Action	2.3	H	General budget	2015
WES-18	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Coordinate plan update with MEMA Mitigation Planning Bureau and participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	Town of West	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazard	Undetermined	D	Remove - component of mitigation plan maintenance	2020	2.4	H	HMGP, general budget	2015
WES-20	Conduct annual reviews of MEMA District 3 RHMP	Complete the worksheets provided and attend RHMC meetings as they are scheduled.	Town of West	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Remove - component of mitigation plan maintenance	Continuous Action	2.4	H	General budget	2015
WES-21	Pursue training and funding opportunities for mitigation actions	Continue to seek funding for eligible mitigation actions as they arise. Participate in	Town of West	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Remove - component of mitigation plan implementation	Continuous Action	2.4	M	HMGP, general budget	2015

		training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques of completing an effective application and benefit cost analysis											
WES-23	Become a Certified NWS StormReady Community	Contact NWS before applying, complete application, schedule verification meeting and receive approval.	Town of West	Holmes Co. EMA, Mayor's office	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	2015-2020	2.5	H	General budget	2015
WES-26	Promote workshops for emergency preparedness/continuity of operation plans	Provide applicable support to non-profit agencies, Chamber of Commerce, Planning and Development District and other organizations that assist families and business owners with the development of disaster plans.	Town of West	Holmes County EMA, Mayor's Office	Multi-hazard	N/A	D	Move to Preparedness Planning Initiative	N/A	3.2	H	Private funds	2015
WES-27	Encourage the development of training and emergency planning for private	It is recommended that the Town officials coordinate educational	Town of West	Holmes County EMA, Police and Fire Officials	Hazardous Materials	N/A	D	Move to Preparedness Planning Initiative	Continuous Action	3.2	M	General budget	2015

	companies that handle hazardous materials	programs to improve onsite hazardous material safety and increase awareness of chemical issues and reporting procedures.											
WES-04	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of West	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Focus on critical facilities and infrastructure	2015-2025	1.2	M	HMGP, CDBG, general budget	2015
WES-05	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards.	Town of West	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Focus on critical facilities and infrastructure	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

		Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.											
WES-06	Secure generators for existing and new critical facilities and infrastructure	As funding becomes available, Lexington will apply for grants to install generators to support critical facilities/infrastructure. Generators are needed for lift stations, city hall, Lexington Multi-Complex Building (public shelter).	Town of West	Mayor's office, Holmes Co. EMA, MEMA	Multi-hazard	$300,000	R	Focus on critical facilities and infrastructure	2015-2025	1.4	H	HMGP, general budget	2015
WES-07	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Reference - Table of RFC/SRL properties that have not been mitigated. Lexington will explore mitigation options with property owners as funding and	Town of West	Holmes County EMA, Mayor's Office, MEMA	Flood	Undetermined	R	Flood mitigation initiative	Continuous Action	1.5	M	FMA	2015

		opportunities arise.											
WES-08	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events. Areas in need of improved systems include the following streets: Peach/Pearl, Lexington, First, Madison, Sheffield and Jackson and other areas in the town should be considered as needs and funding opportunities arise	Town of West	Mayor's office, Public Works, Drainage Districts	Flood	Undetermined	R	Focus on mitigation opportunities	2015-2040	1.5	H	HMGP, CDBG, CIAP funding or part of developer agreements	2015
WES-10	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	Town of West	Mayor's Office	Human Infect. Disease	Undetermined	R	Focus on mitigation opportunities	Continuous Action	1.5	H	General budget	2015

WES-13	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	Town of West	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Participate in state-level data gathering efforts	2021	1.6	H	General budget	2015
WES-14	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	Update and/or develop ordinances and regulations as required to address all hazards prone to Lexington and include any changes in future development areas	Town of West	Mayor's office	Multi-hazard	N/A	R	Focus on regulatory actions	Continuous Action	2.2	M	General budget	2015
WES-19	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Convene as soon as appropriate after an event to conduct an after action report and document this in the	Town of West	Holmes Co. EMA	Multi-hazard	N/A	R	Focus on mitigation opportunities	Continuous Action	2.4	H	General budget	2015

		appendix of the mitigation plan.											
WES-22	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	Continue to participate in the NFIP and seek opportunities to join/improve CRS rating through documentation of activities and projects	Town of West	Mayor's office, Holmes Co. EMA, MEMA	Flood	N/A	R	Focus on CRS participation	Continuous Action	2.5	H	General budget	2015
WES-24	Continue efforts on public information and awareness for natural hazards	The City has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient. Continue to provide information on all hazards that may include but not be limited to educational	Town of West	Holmes County EMA, applicable departments, MEMA, NWS, FEMA	Multi-hazard	N/A	R	Focus on mitigation actions	Continuous Action	3.1	H	General funds	2015

		information, evacuation routes/procedures, workshop/training programs, alert systems and the like.											
WES-25	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the town that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the city's web page	Town of West	Holmes County EMA, MSDH, Mayor's Office	Human Infectious Disease, Hazardous Materials	N/A	R	Focus on mitigation actions	Continuous Action	3.1	H	MSD, EMPG, Homeland Security, general funds	2015
WES-28	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals.	The county/city will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives	Town of West	Holmes County EMA, Mayor's Office	Multi-hazard	N/A	R	Focus on mitigation opportunities	Continuous Action	3.2	M	General budget	2015

Mitigation Action Worksheets

Holmes County elected to more fully describe two mitigation actions on a Mitigation Action Worksheet. The two worksheets address the following initiatives:

1. Retrofitting of hazard critical infrastructure to provide protection from floods and high wind events.

2. Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others.

It was decided that all jurisdictions within the county will work on these two actions, so a separate action worksheet for each jurisdiction working on both each is included in the Action Worksheets section. The Action Worksheets for Holmes County are included first and then jurisdictional worksheets follow.

Mitigation Action Worksheet

Name of Jurisdiction: Name of Haz. Mitigation Plan:	Holmes County, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan
Risk / Vulnerability	
2. Problem being Mitigated:	Throughout the county severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structures of light construction, particularly manufactured homes.
Potential Actions/Projects (not being Implemented at this time)	
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden designated building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructure in identified high hazard zones that do not meet current International Building Code standards for designated flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.
Action or Project Intended for Implementation	
4. Action/Project Number: Name of Action or Project:	Action #: Holmes County-1 Storm proof/retrofit new and existing buildings and infrastructure throughout the county to develop disaster resilient communities.
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amounts of debris to be cleaned up after hazard event. COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation	
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies
8. Action/Project Priority (STAPLEE Score):	20 – High
9. Timeline for Completion:	Two years
10. Useful Life:	50 years
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding
12. Local Planning Mechanisms to be Used in Implementation, if any:	Holmes County Emergency Management Plan
Progress Report	

13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Holmes County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Holmes County, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiates through him/her and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Holmes County annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Holmes County-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Holmes Emergency Management Director and North Central PDC, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	County Emergency Management Department, Mayor's Office, Board of Aldermen, PDC	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Holmes County Operations Plan, Holmes County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Cruger, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the county severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structures of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden designated building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructure in identified high hazard zones that do not meet current International Building Code standards for designated flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Town of Cruger-1 Storm proof/retrofit new and existing buildings and infrastructure throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Town Public Works Director will work with jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amounts of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office. Public Works, Jurisdictional legislative body	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	City Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Holmes County Emergency Management Plan	
Progress Report		

13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Holmes County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Cruger, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiates through him/her and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Holmes County annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Town of Cruger-2 Work with the County Emergency Management Department and PDC to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Holmes Emergency Management Director and North Central PDC, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	County Emergency Management Department, Mayor's Office, Board of Aldermen, PDC	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Holmes County Operations Plan, Holmes County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Durant, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the county severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structures of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden designated building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructure in identified high hazard zones that do not meet current International Building Code standards for designated flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: City of Durant-1 Storm proof/retrofit new and existing buildings and infrastructure throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The City Public Works Director will work with jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amounts of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Public Works, Jurisdictional legislative body	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	City Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Holmes County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Holmes County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Durant, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiates through him/her and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Holmes County annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: City of Durant-2 Work with the County Emergency Management Department and PDC to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Holmes Emergency Management Director and North Central PDC, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	County Emergency Management Department, Mayor's Office, Board of Aldermen, PDC	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Holmes County Operations Plan, Holmes County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Goodman, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the county severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structures of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden designated building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructure in identified high hazard zones that do not meet current International Building Code standards for designated flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Town of Goodman-1 Storm proof/retrofit new and existing buildings and infrastructure throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The City Public Works Director will work with jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amounts of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Public Works, Jurisdictional legislative body	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	City Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Holmes County Emergency Management Plan	
Progress Report		

13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Holmes County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Goodman, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiates through him/her and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Holmes County annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Town of Goodman-2 Work with the County Emergency Management Department and PDC to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Holmes Emergency Management Director and North Central PDC, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	County Emergency Management Department, Mayor's Office, Board of Aldermen, PDC	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Holmes County Operations Plan, Holmes County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Lexington, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the county severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structures of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden designated building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructure in identified high hazard zones that do not meet current International Building Code standards for designated flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: City of Lexington-1 Storm proof/retrofit new and existing buildings and infrastructure throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The City Public Works Director will work with jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
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Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Public Works, Jurisdictional legislative body	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	City Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Holmes County Emergency Management Plan	
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Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Pickens, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the county severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structures of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden designated building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructure in identified high hazard zones that do not meet current International Building Code standards for designated flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
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Plan for Implementation		
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8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDC	
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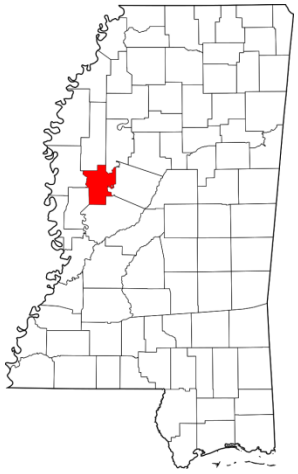
HUMPHREYS COUNTY

E.1 Community Profile



Geography

Located in central Mississippi, Humphreys County is adjacent to Sunflower and Leflore Counties to the north, Holmes County to the east, and Yazoo County to the south and Sharkey and Washington Counties to the west. Humphreys County is 72 miles north of Jackson, Mississippi and 166 miles south of Memphis, Tennessee. It includes the following communities (Figure E.1):

City	Towns	Unincorporated
Belzoni	Isola Louise Silver City	Lodi Midnight

The total area of the county is 431.16 square miles which includes 13.07 square miles of water. Humphreys County is in the Delta region of Mississippi, Flat plain is the general topography of the region. The Delta soil is characterized as mildly acidic to mildly alkaline. The Yazoo and Big Sunflower Rivers frame the east and west side of the county.

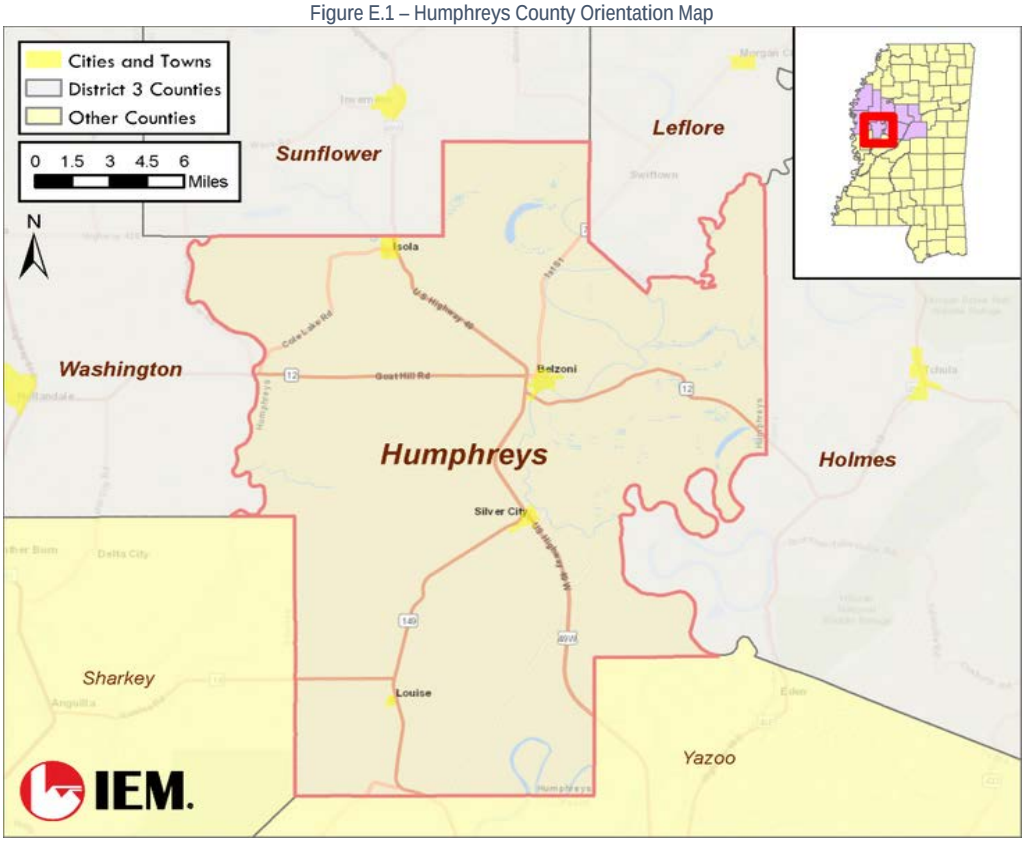
Belzoni is the county seat of Humphreys County. It is located on U.S. Highway 49W and MS State Route 12. With an approximate land area of 1.0 square miles, Belzoni's elevation is about 112 feet above sea level. The main industry in Belzoni is farm-raised catfish which utilizes 40,000 acres of catfish ponds for production.

Isola is located on U.S. Highway 49W. With an approximate land area of 0.7 square miles, Isola's elevation is about 115 feet above sea level.

Silver city is located on U.S. Highway 49W. With an approximate land area of 0.6 square miles, of which 0.6 square miles is land and 0.04 square miles is water, Silver City's elevation is about 108 feet above sea level.

Louise is located on MS State Highway 14. With an approximate land area of 0.2 square miles, Louise's elevation is about 108 feet above sea level. Louise is mostly an agricultural community due in part it has some of the best farming land off of Silver Creek.

Figure E.1 – Humphreys County Orientation Map



Population and Demographics

As shown in Table E.1, there has been a decline in population between the 2010 and 2019 Census reports. The largest decline in population occurred in Silver City with a loss of 16 percent of their population relocating outside its jurisdiction. To further demonstrate the changes in population, Figure E.2 and E.3a-b are provided showing the current population based on census block data.

Table E.1 - Jurisdiction Population and Demographics I Source: US Census Bureau 2010 and 2018 American Community Survey 5-Year Estimates

Location	Population				Demographics					
	2010 Census	2018 Census	Net Change	Percent Change	White	Black	Hispanic	Asian	Native American	2+ Races
Humphreys County	9375	8539	-836	-8	22.4%	75.8%	3.7%	.4%	.2%	1.2%
Belzoni	2,235	1830	-285	-18.12%	19.76%	76.76%	1.3%	.6%	.3%	.3%
Isola	713	592	-85	-16.97%	17.3%	82.7%	%	.3%	.0%	.6%
Louise	199	167	-22	-16.08%	30.6%	65.68	.5%	2.5	.0%	.5%
Silver City	337	267	-54	-20.77%	16.12%	83.88%	.0%	.9%	.0%	.0%

Special Populations (elderly, disabled, and low income): Poverty and other social factors were also considered in assessing the vulnerability of Humphreys County and its municipalities. Within the unincorporated areas of Humphreys County, there are some areas of extreme poverty, where individual resources for dealing with hazards are extremely limited. These are neighborhoods in which residents would be most dependent on public resources after a disaster and could therefore be considered as good investment areas for hazard mitigation activities. By focusing on these areas, Humphreys County can not only help to reduce the vulnerability of individuals but can also help reduce the future impacts on public services. A summary of the percent of population falling into the special population category is listed in Table E.2.

Other social factors, such as single mother households living below the poverty level, and children living with elderly grandparents may indicate areas where special childcare considerations may be necessary. Many communities within Humphreys County have at least 51.1 percent of the total number of grandparents responsible for the basic needs of their grandchildren. Persons with disabilities and the elderly may not be able to evacuate or seek other preventive measures during a disaster. These individuals may be more vulnerable to severe storms, tornadoes and severe winter storms/freezes.

Table E.2 – Special Populations I Source: US Census Bureau 2010 and 2018 American Community Survey 5-Year Estimates

Jurisdiction	Below Poverty	Elderly (65 and older)	Disabled (non institutionalized)
Humphreys County	40.52	4.8%	17.1%
Belzoni	35.95	3.8%	20.2%
Isola	50.18	3.8	20.4%
Louise	31.78	23.1	8.9%
Silver City	59.40	13.1	20.3%

While population vulnerability within the assessment of each hazard identified as affecting Humphreys County, the Centers for Disease Control and Prevention (CDC) produces a county-based Social Vulnerability Index (SOVI, 2016) that discusses social vulnerability overall, as well as vulnerability according to “themes” that include socioeconomic status. Images on the next two tables show the SOVI breakdown using these factors to measure vulnerability in Humphreys County.

Figure E.2a - CDC's Social Vulnerability Index 2016

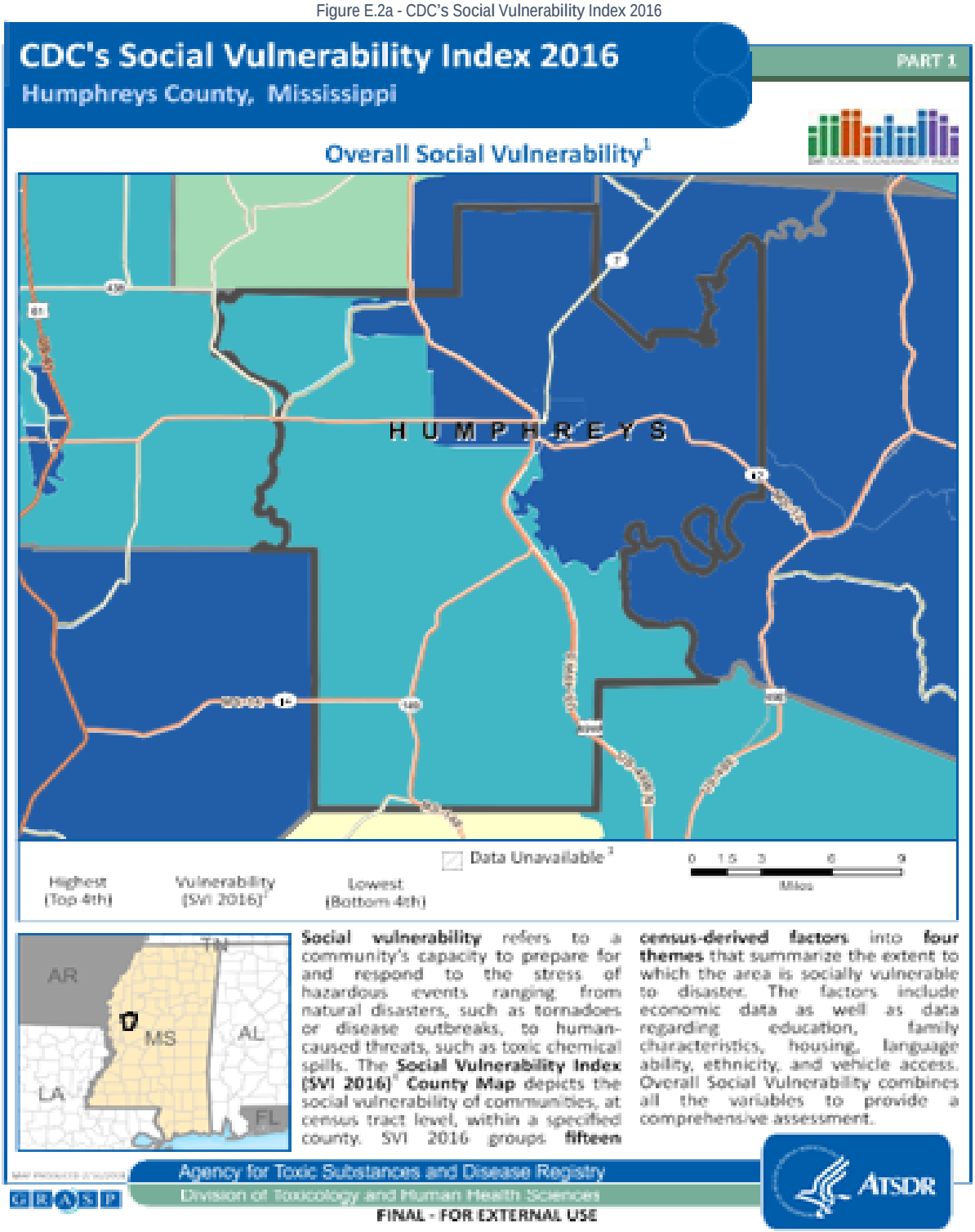
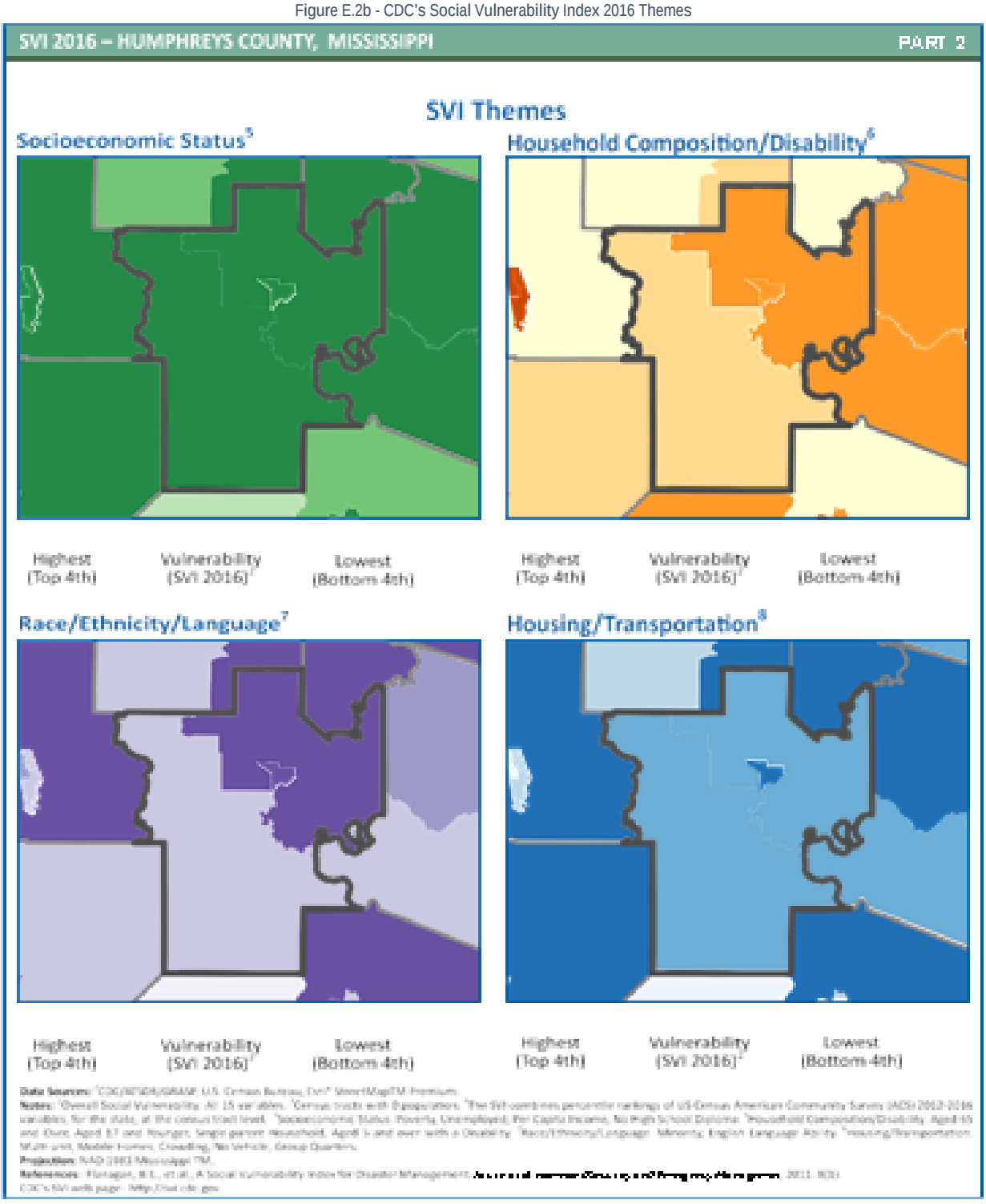


Figure E.2b - CDC's Social Vulnerability Index 2016 Themes



Housing, Growth Trends, and Land Use

Housing: Housing data was obtained from the 2018 AMERICAN Community Survey 5-Year Estimate is shown below in Table E.3. In summary, between 2014 and 2018 there were 3,826 housing units, with 3,271 households in Humphreys County and an average household size of 2.6 people. In addition, 83 percent of housing is occupied, 9 percent of housing is mobile home/manufactured housing, and the majority of the homes were constructed prior to 1970. The percent of unoccupied housing units decreased from 18.4 percent in 2010 to 17 percent in 2018.

Table E.3 – Housing Statistics I Source: US Census Bureau 2010 and 2018 American Community Survey 5-Year Estimates

Subject	Humphreys County, Mississippi	
	Estimate	Percent
HOUSING OCCUPANCY		
Total housing units	3826	100%
Occupied housing units	3171	83.0 %
Vacant housing units	662	17.0 %
UNITS IN STRUCTURE		
1-unit, detached	3073	80.3%
1-unit, attached	23	0.6
2 units	109	2.8%
3 or 4 units	125	3.2%
5 to 9 units	11160	2.9%
10 to 19 units	4	0.1%
20 or more units	21	0.5%
Mobile home	348	9.0%
Boat, RV, van, etc.	19	0.4%
YEAR STRUCTURE BUILT		
Built 2014 or later	90	2.3%
Built 2010 or later	102	2.7%
Built 2000 to 2009	386	10.0%
Built 1990 to 1999	522	13.7%
Built 1980 to 1989	565	14.8%
Built 1970 to 1979	832	21.8%
Built 1960 to 1969	540	14.1%
Built 1950 to 1959	268	7.0%
Built 1940 to 1949	247	6.4%
Built 1939 or earlier	281	7.3%
HOUSING TENURE		
Occupied housing units	3171	100%
Owner-occupied	1919	61.0%
Renter-occupied	1252	39.0.0%
HOUSE HEATING FUEL		
Occupied housing units	3171	100%
Utility gas	1481	47.0%
Bottled, tank, or LP gas	458	14.4%
Electricity	1028	32.4%
Wood	0	0.0%
Solar energy	0	0.0%
Other fuel	21	6.0%

Growth Trends: There have been no significant changes in development since the previous plan. New construction and redevelopment have been minimal and there are no known changes in conditions that may affect the risks or vulnerabilities for the participating jurisdictions. The communities in Humphreys County have all experienced a decline in population. Population projections for the county indicates a 9 percent drop in population since 2015. This trend may continue unless strategies are put in place and actively pursued. The majority of the land in Humphreys County is in rural areas and is primarily used for agriculture and timber industries.

Land Use: The primary use of land in the Humphreys County is open space and agricultural lands. There is some "urban" development relegated primarily to the county's municipalities because of the presence of centralized sewer in and around those communities. The value of prime agricultural lands, the lack of sewer service, and the presence of environmentally sensitive areas keeps most land in agricultural use. There are scattered commercial and ag serving industrial uses outside the municipal limits mostly around the unincorporated settlements. Only Belzoni has a land use plan. The Hazard Mitigation Plan will be made available to officials who will be able to use the information in future planning decisions.

Employment and Industry

The economy of the area is predominantly farm-raised catfish and provides for approximately 60 percent of catfish within a 65-mile radius of Belzoni. According to the Belzoni-Humphreys County Development Authority, the largest employers are the following:

- Consolidated Catfish
- Freshwater Farms
- Guaranty Bank and Trust
- Mid-Delta Home Health
- Patients Choice Hospital

The Mississippi Department of Employment Securities (MDES) assists individuals in obtaining employment. Through their network of WIN Job Centers, MDES matches qualified, prospective employees with employers. Tables E.4 and E.5 summarize county employment statistics.

Table E.4 - Mississippi Department of Employment Security Annual Labor Force Report I Source: Mississippi Economic Development Council

Residence Based Amounts – 2018						
County	Average Civilian Labor Force (2018)	Average No. Unemployed (2018)	Average No. Employed (2018)	Average Annual Wage (2018)	Per Capita Income (201)	Percent Below Poverty (20188)
Humphreys	2200	270	1930	$27,758	$31,864	40.5%
Mississippi				$38,099	$37,834	21.5%

Table E.5 - Mississippi Department of Employment Security Annual Labor Force Report I Source: Mississippi Economic Development Council

*Establishment Based Amounts 2013				
Manufacturing Total				**700**
Non-Manufacturing Total				**2,060**
Agriculture, Forestry, Fishing & Hunting	0		Professional & Business Service	10
Mining	0		Management of Companies & Enter	20
Utilities	10		Admin Support & Waste Management	10
Construction	30		Educational Services	40
Wholesale Trade	40		Health Care & Social Assistance	210
Retail Trade	160		Arts, Entertain & Recreation	0
Transportation & Warehousing	40		Accommodation & Food Service	80
Information	20		Other Service (except public admin)	10
Finance & Insurance	120		Government	550
Real Estate, Rental & Leasing	10		Education	290

Note: *Establishment based amounts are estimates and do not include self-employed individuals, religious entities or non-profit institutions. Amounts include a pro-rata share of unclassified employment.

Lifeline Sector, Critical Assets and Infrastructure

Lifeline sectors provide the framework from which individual critical assets and infrastructure are identified. A lifeline is a sector that provides an indispensable service which enables the continuous operation of critical business and government functions and is critical to human health and safety or economic security. Infrastructure associated with lifelines is a mix of public and private ownership and has many interdependencies. As an example, maintaining the function of a hospital during an event that results in a power failure, is dependent on communication infrastructure and access to temporary power to prevent interruption of services. Assessing these sectors helps to identify root causes of impacts and consequences from previous hazard events and prioritizes the highest issue areas and interdependencies in order to create effective mitigation solutions.

This section provides a listing of those assets and facilities that are considered as critical in nature to the planning area. These facilities are identified in tables and figures based on best available data. Shelters and outdoor warning sirens are also considered as essential and their locations are provided as a figure in the Mitigation Strategy section of this Annex.

Critical Assets and Facilities: Table E.6 provides a listing of the critical assets identified for Humphreys County. A mitigation action has been included to expand the Critical Infrastructure Key Resource (CIKR) database and send to the Remote Sensing Council for inclusion in the statewide CIKR database.

Critical Assets and Infrastructure

Certain assets and facilities are considered as being of critical importance for Humphreys County and the surrounding region. Those identified in the following tables are based on best available data and conversations with the Humphreys County Emergency Management Agency. Shelters and outdoor warning sirens are also considered as essential and their locations are provided as a figure in the Mitigation Strategy section of this Annex.

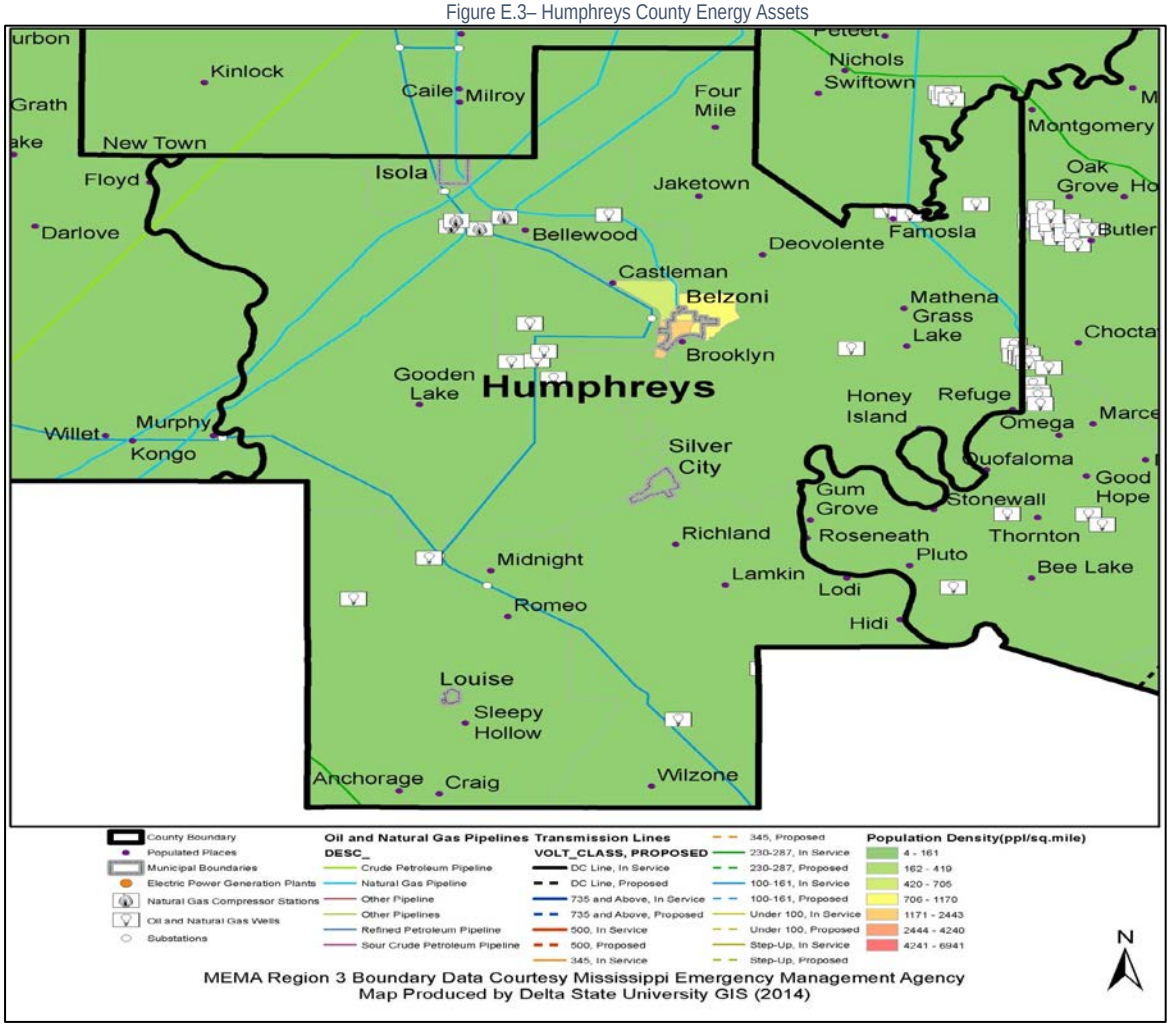
Transportation: As shown in Table E.6, Humphrey County has many major thoroughfares, rail lines and airport access.

Table E.6 – Humphreys County Transportation Routes

Roadway	Rail	Aviation
U.S. Highway 49W Mississippi Highway 7 Mississippi Highway 12 Mississippi Highway 14 Mississippi Highway 16	None	Belzoni Municipal Airport

Energy Assets: Oil, natural gas pipelines and electric transmission lines transverse through Humphreys County. Figure E.3 provides the locations of these systems. The County Emergency Management Department confirm the map assets produced for the 2015 RHMP, remains essentially accurate.

Figure E.3– Humphreys County Energy Assets



Critical Assets and Facilities: Table E.7 provides a listing of the critical assets identified for Humphreys County. An updated mitigation actions is included recommending that the list of critical assets and facilities to be sent to the Remote Sensing Council for inclusion into the Infrastructure Key Resource (CIKR) database.

Table E.7 –Humphreys County Summary of Critical Assets and Facilities

Facilities		Use
Humphreys County Hospital Humphreys County Health Department	Humphreys County Nursing Home	Health Care Facilities
Belzoni Water Wells (3) Midnight Water Well Brooklyn Water Well	Jaketown Water Well Sixteenth Section Water Well Humphreys County Water Association	Public Utility
Belzoni Fire and Police Departments Isola Fire and Police Departments Louise Fire Department	Humphreys County Sheriff's Dept. Humphreys County EOC	Public Safety
Louise City Hall Belzoni City Hall	Isola City Hall Humphreys County Courthouse	Government Facilities
Lonnie W. Hayes, Admin Complex O.M. McNair Upper Elementary Ida Greene Lower Elementary	Thomas C. Randle Career and Technical Center Humphreys County Junior and High School	Educational Facilities

As a complement to the previous table, researchers consulted the Mississippi Public Service Commission web site to review the list of utilities shown there. The following Humphreys County utilities companies are included on the web site. Some of these are the same as the ones listed above, and others are not included. It was decided that both tables should be incorporated into the District 3 Base Plan and into each of the county annexes for the sake of thorough documentation.

Table E.8: Mississippi Public Service Commission – County Utilities Listings I Source: Mississippi Public Service Commission – Humphreys County Utilities

Gas Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
GC-123-0081-00	Atmos Energy Corporation	Mr. Mathew B. Davidson V-Pres.	790 Liberty Road Flowood, MS 39232-9321	601.420.5020	601.420.5020

Electric Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
EA-103-0048-00	Delta EPA	Mr. David O'Bryan Gen. Mgr.	P.O. Box 9399 Greenwood, MS 38930		662.453.6352
EC-123-0082-00	Entergy Mississippi Inc.	Mr. Martin McGee Customer Service Support	P.O. Box 1640 Jackson, MS 39215-1640		601.969.2336
EA-100-0042-00	Twin County EPA	Mr. Tim Perkins Manager	P.O. Box 158 Hollandale, MS 38748		662.827.2262
EA-100-0049-00	Yazoo Valley EPA	Mr. Ronald White Manager	P.O. Box 8 2255 Gordon Ave. Yazoo City, MS 39194		662.746.4251

Sewer Utilities

Humphreys County has no Regulated Sewer Utilities

Water Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
WA-100-0748-00	Humphreys County Water Assn. Inc.	Mr. Sterling Long Manager	454 Parsonage Road Belzoni, MS 39038		662.247.4145
WA-100-0632-00	Lake City Water Assn. Inc.	Mr. Harry Simmons President	315 Shoemake Road Yazoo City, MS 39194		662.746.5687
WA-100-0621-00	South Sunflower Water Assoc. Inc.	Mr. Joe Poe Pres.	P. O. Box 88 Inverness, MS 38753		662.265.5219

Telecommunications Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
TC-123-0001-00	BellSouth Telecommunications, LLC	Mr. C. D. Smith Regulatory	2310 7th Street Meridian, MS 39301	601.592.6510	601.917.8787
TC-100-0018-00	Delta Telephone Co. Inc.	Ms. Helen Simmons VP	1018 Highland Colony Parkway Suite 700 Ridgeland, MS 39157	601.384.3350	601.355.1522

Historical / Cultural Resources: Historical and cultural resources are of a particular concern, not because they are critical to the day-to-day operations of a community, but because they are irreplaceable and contribute to the economic well-being of the communities.

- Belzoni Mount
- Jaketown Site
- Midnight Mound Site
- Parker-Summerfield Mound Site
- Slate archaeological Site

E.2 Hazard Identification and Risk Assessment

This section includes a brief summary of hazards to which Humphreys County is prone, and includes the location and extent, historical events, and probability of future occurrence. Vulnerability assessments are included in this Annex only for hazards for which county-based data is available. Section 4 of the Base Plan includes hazard descriptions for hazards applicable to all jurisdictions covered by the 2020 RHMP Update. Health-related hazards, such as Pandemic Influenza and West Nile virus, are of concern to the County, but there is no county-level data to add to the discussion of this hazard as it is addressed in Section 4 of the Base Plan. That section also includes the most recently available information about Coronavirus Disease of 2019 (COVID-19) at the time of this plan's publication.

Hazard Ranking

As discussed in Section 4 of the Base Plan - Hazard Identification and Risk Assessment, each county evaluated the number of events and damage claims from impacts over the past 10 years to determine their hazard risk ranking.

Humphreys County determined their probability of future occurrence based on reported data and local knowledge of previous events. Definitions for the classifications are provided below:

- Highly Likely – More than 8 occurrences over last 10 years
- Likely – 5 - 7 occurrences over last 10 years
- Low – 1 - 4 occurrences over last 10 years
- Susceptible – Conditions are favorable or there are historic events (greater than 50 years) or local knowledge of unreported events.

Table E.9 provides a summary of the hazard events for Humphreys County and Table E.10 includes the results of their risk ranking exercise.

Table E.9 – Humphreys County Summary of Hazard Events 20000 – 2019 I Source: NCEI, MDEQ, USGS

Hazard Type	No of Events	Death	Injury	Property Damage	Crop Damage
Dam/Levee Failure	-	-	-	-	-
Drought	10	-	-	$ 130,000	$ 6,991,000
Earthquake	-	-	-	-	-
Extreme Heat	5	-	-	-	-
Expansive Soil	-	-	-	-	-
Flood	16	-	-	$ 1,897,000	1,100,000
Severe Storm	112	-	-	$ 821,500	$ 150,000
Severe Winter Weather	12	-	-	$ 910,000	-
Tornado	12	1	10	$ 6,383,000	$ 705,000
Tropical Storm / Hurricane	2	-	-	$ 530,000	$8,200,000
Wildfire	-	-	-	-	-
Totals	169	1	10	$ 10,671,000	$ 17,146,000

* Damage estimates not available

Table E.10 – Humphreys County Risk Ranking Results

Hazard Type	Area Impacted	Health/Safety	Property Damage	Environmental Damage	Economic Disruption	Total	Future Occurrence	Risk	Risk Level
Dam/Levee Failure	4	0	4	4	4	16	2	32	Low
Drought	3	0	2	2	2	9	3	27	Low
Earthquake	1	0	2	2	1	6	2	12	Low
Expansive Soils	1	0	2	2	1	6	2	12	Low
Extreme Heat	1	0	0	1	1	3	3	9	Low
Flood	4	0	4	4	4	16	5	80	High
Severe Storm (thunderstorm, lightning, hail and high wind)	3	0	3	2	1	9	5	45	Medium
Severe Winter Weather	2	0	1	1	2	6	4	24	Low
Tornado	3	3	3	3	2	14	4	56	Medium
Tropical Storm / Hurricane	4	0	2	2	2	10	2	20	Low
Wildfire	1	0	1	1	2	5	1	5	Low

Table E.11 summarizes the vulnerability of each jurisdiction to each hazard. This information is based on community input, NCEI data, and available resources that discuss each hazard. An example of the latter would be the Mississippi DEQ web site Dam Safety Division, which provides maps illustrating the number and types of dams in each jurisdiction.

Table E.11 – Summary of Hazard Ranking, All Jurisdictions in Humphreys County

Hazard Type	Unincorporated Humphreys County	Town of Belzoni	Town of Isola	Town of Louise	City of Silver City
Dam/Levee Failure	*Medium*	*Low*	*Low*	*Low*	*Low*
Drought	*Medium*	*Low*	*Low*	*Low*	*Low*
Earthquake	*Low*	*Low*	*Low*	*Low*	*Low*
Extreme Heat/Heat	*Low*	*Low*	*Low*	*Low*	*Low*
Expansive Soils	*Low*	*Low*	*Low*	*Low*	*Low*
Flood	*Medium*	*Low*	*Low*	*Low*	*Low*
Severe Storm	*Medium*	*Medium*	*Medium*	*Medium*	*Medium*
Severe Winter Weather	*Low*	*Low*	*Low*	*Low*	*Low*
Tornado	*Medium*	*Medium*	*Medium*	*Medium*	*Medium*
Tropical Storm/Hurricane	*Low*	*Low*	*Low*	*Low*	*Low*
Wildfire	*Low*	*Low*	*Low*	*Low*	*Low*

Mitigation planning researchers are fortunate to have access to the Data Visualization Tool included on the FEMA website. This site provides county-level data on the breakdown of flood events and hazards included in federal emergency and disaster declarations, as well as for flood events recorded by FEMA. The information is updated through June 2020 and shows the disaster

name, event type, number of events, and occurrence date. The data includes information from the time FEMA first recording disaster events in the format currently used. While this time frame is longer than that included in this RHMP Update, the following page provides a one-page snapshot of Humphreys County disasters that have been documented by FEMA.

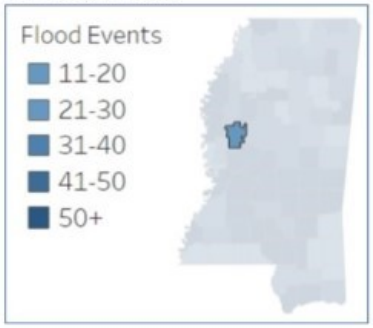
Figure E.4- Humphreys County FEMA Declarations Statistics

FEMA Declarations: Humphreys County Statistics: 1953 - 2020 ***Source:*** FEMA Data Visualization Web Site

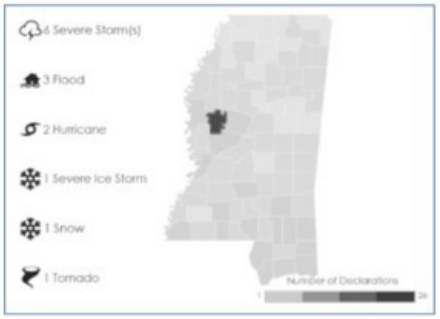
Not Included in data sourced 3/31/2020

- Mississippi COVID EM-3474 (Declared 3/13/2020)

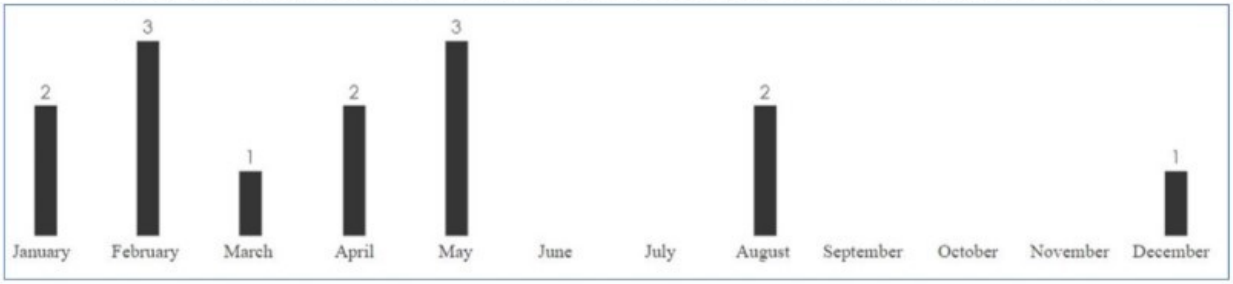
30 Flood Events

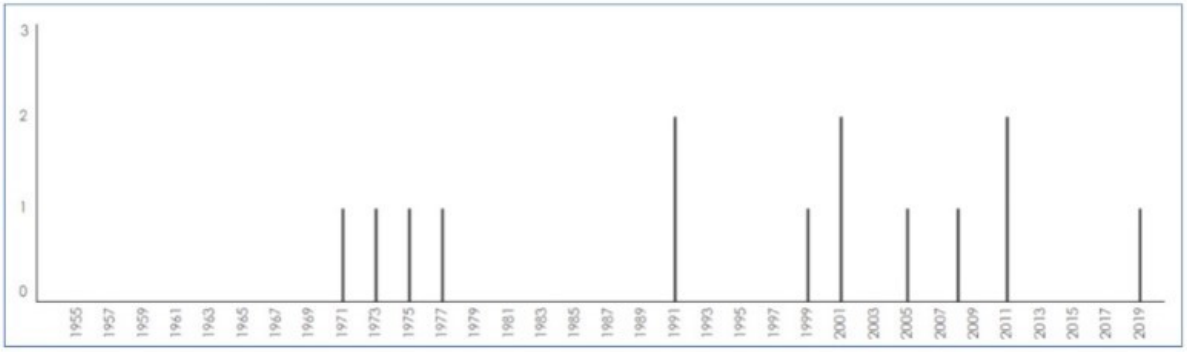


14 Declared Events



The charts below show the months and years in which disasters have occurred in Humphreys County





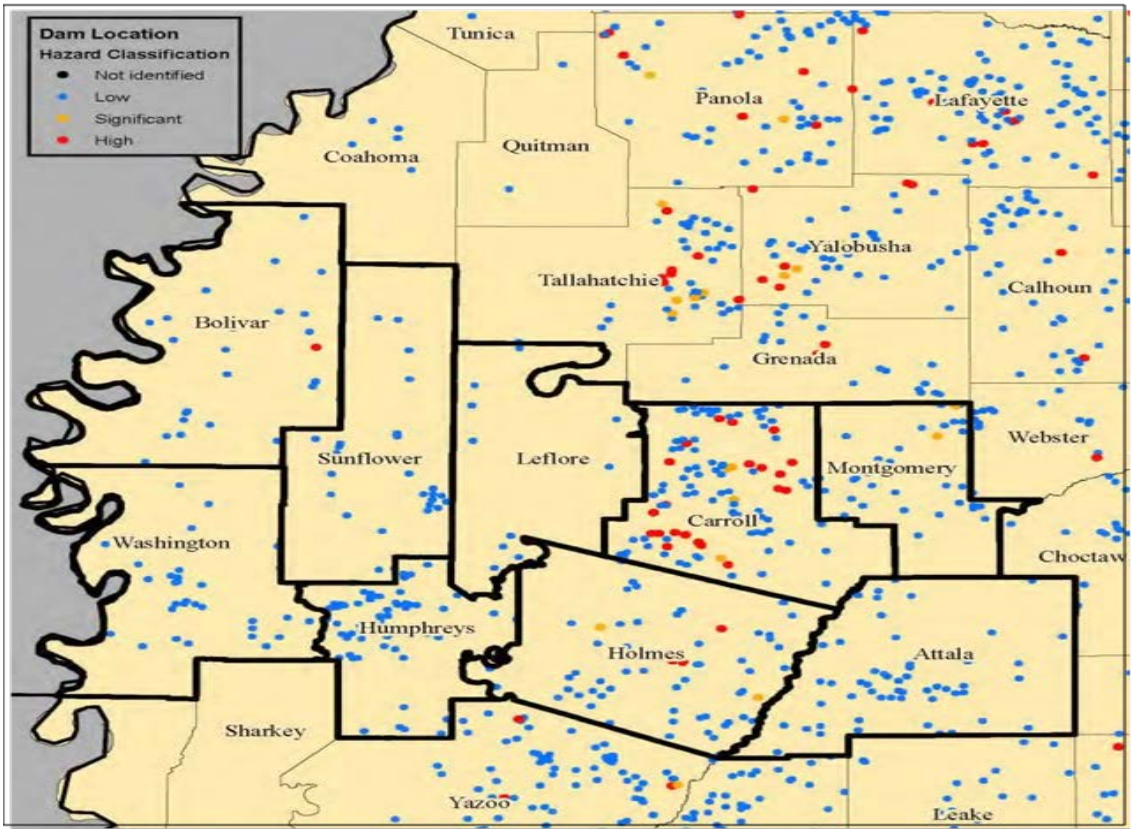
FEMA Declarations for Humphreys County (14)

Year	Declaration Name	Disaster Number	Year	Declaration Name	Disaster Number
1971	Storms & Tornadoes	302	2001	Severe Storms & Tornadoes	1360
1973	Heavy Rains, Tornadoes & Flooding	368	2001	Severe Storms, Tornadoes & Flooding	1398
1975	Heavy Rains & Flooding	3010	2005	Hurricane Katrina	1604
1977	Drought & Freezing	3032	2008	Hurricane Gustav	3291
1991	Severe Storms, Tornadoes & Flooding	888	2011	Flooding	1983
1991	Severe Storms, Tornadoes & Flooding	906	2011	Flooding	3320
1999	Severe Winter Storms, Ice, Freezing Rain	1265	2019	Severe Storms, Straight-line Winds, Tornadoes, and Flooding	4429

Dam/Levee Failure

Figure E.5 below shows a list of dams mapped based on 2015 data secured from the Mississippi Department of Environmental Quality (MDEQ) and included in the previous District 3 RHMP.

Figure E.5: Dams Mapped by the State of Mississippi I Source: MDEQ, Delta State University



Location and Extent

The 2018 SHMP included a District 3 Dam Inventory by County, breaking the numbers down for low, high, and significant hazard dams. The numbers of dams for all nine counties in the District are included for the purpose of comparing Humphreys County's level of risk to that of surrounding counties. The table shows that there are fewer in Humphreys than each of the other District 3 Counties with the exception of Humphreys County, which has 3 low hazard dams.

Table B.12: MEMA Region 3 Dam Inventory by County – Bolivar County I Source: 2018 Mississippi SHMP

County	Significant	High	Low	Total
Region 3				
Atalla	1	2	44	47
Bolivar	-	-	14	14
Carroll	4	23	86	113
Holmes	1	5	39	45
Humphreys	-	-	4	4
Leflore	-	-	-	-
Montgomery	-	2	22	24
Sunflower	-	-	12	12
Washington	-	-	3	3

There are no significant or high hazard dams in Humphreys County. The Mississippi Department of Environmental Quality provided a copy of the most recent dam inventory to the research team and Humphreys County has 4 low hazard dams.

Table E.13 provides a listing of all low hazard dams in the county. This list does not include dams whose structure has not been categorized.

Table E.13 – Humphreys County Low Hazard Dams I Source: MDEQ Dam Safety Division, March 2020

Dam Name	State ID	Latitude	Longitude
Tisdale Lake Dam	MS00475	33.2233	-90.6217
Beckwith Lake Dam	MS00801	33.1583	-90.6083
Belzoni Lagoon Dam	MS00838	33.1567	-90.4950

Previous Occurrences

There are no records of dam/levee breaches having occurred in Humphreys County.

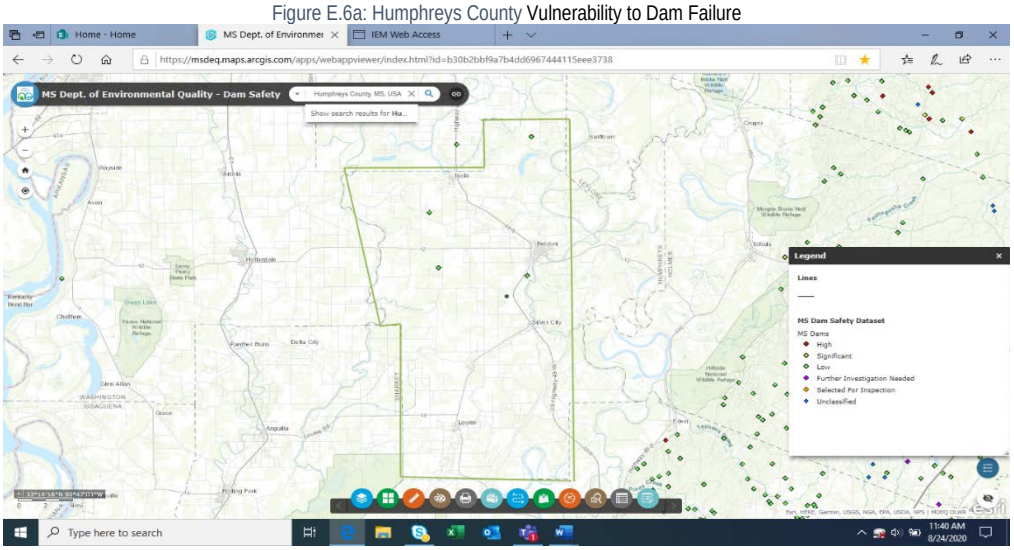
Probability of Future Occurrence

Dam failure is not considered to be among the highest hazards of concern in the county but, since the reclassification there is increased awareness among officials about monitoring such structures. The probability of future occurrence of dam breach is classified as low. It is not possible to develop a statistical probability when there is no recent historical data.

Assessing Vulnerability

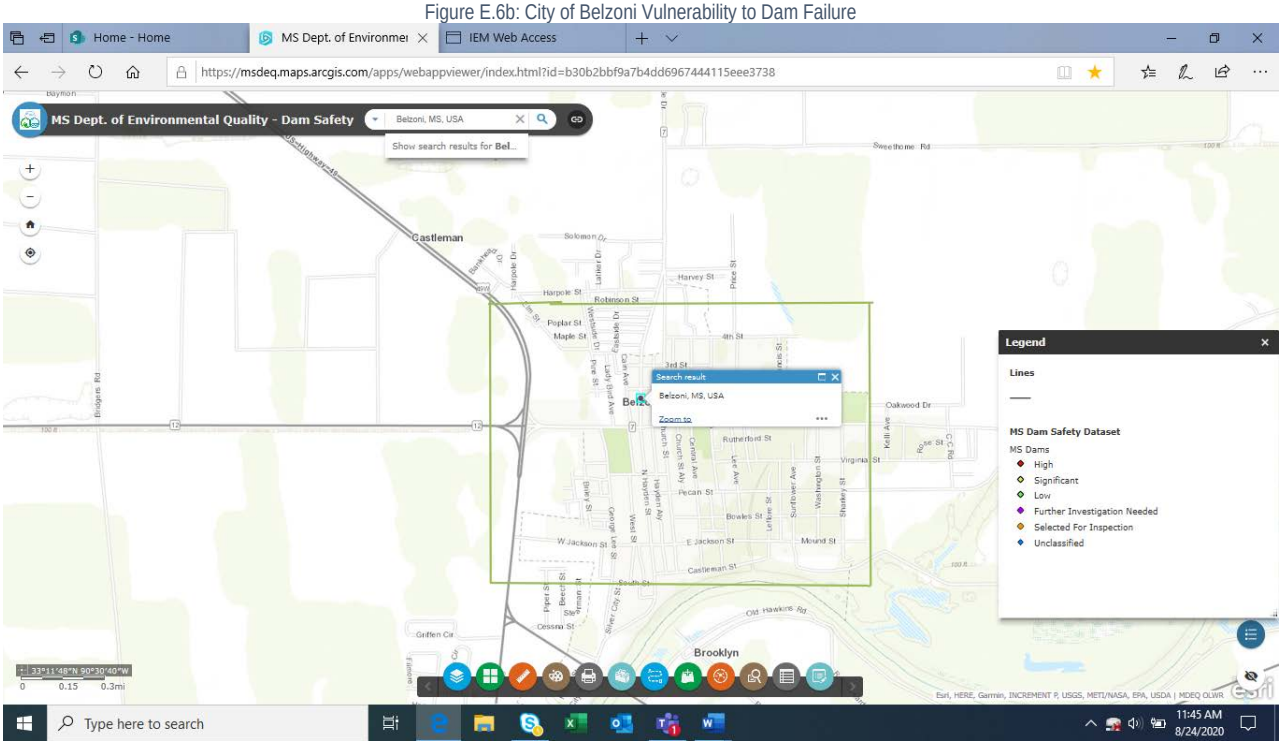
If breached, even a low hazard dam could cause damage to nearby property. The maps below, included as Figures E.6a through E.6e, and taken from the MDEQ mapping web site, show the close-up views of the location of dams in all of Humphreys County and for each of its jurisdictions. In each screen shot, the name of the community is shown in the Search Box, and a legend is included to show the degree of hazard for each identified dam.

Figure E.6a: Humphreys County Vulnerability to Dam Failure



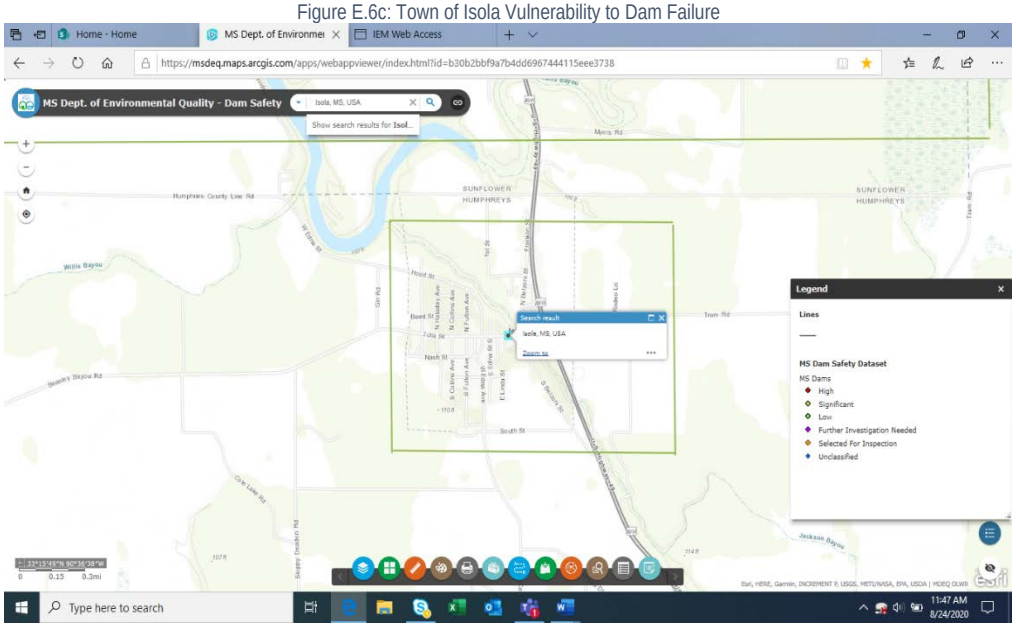
There are no significant or high hazard dams located in Humphreys County. The data presented here suggests that unincorporated Humphreys County overall is at a low risk.

Figure E.6b: City of Belzoni Vulnerability to Dam Failure



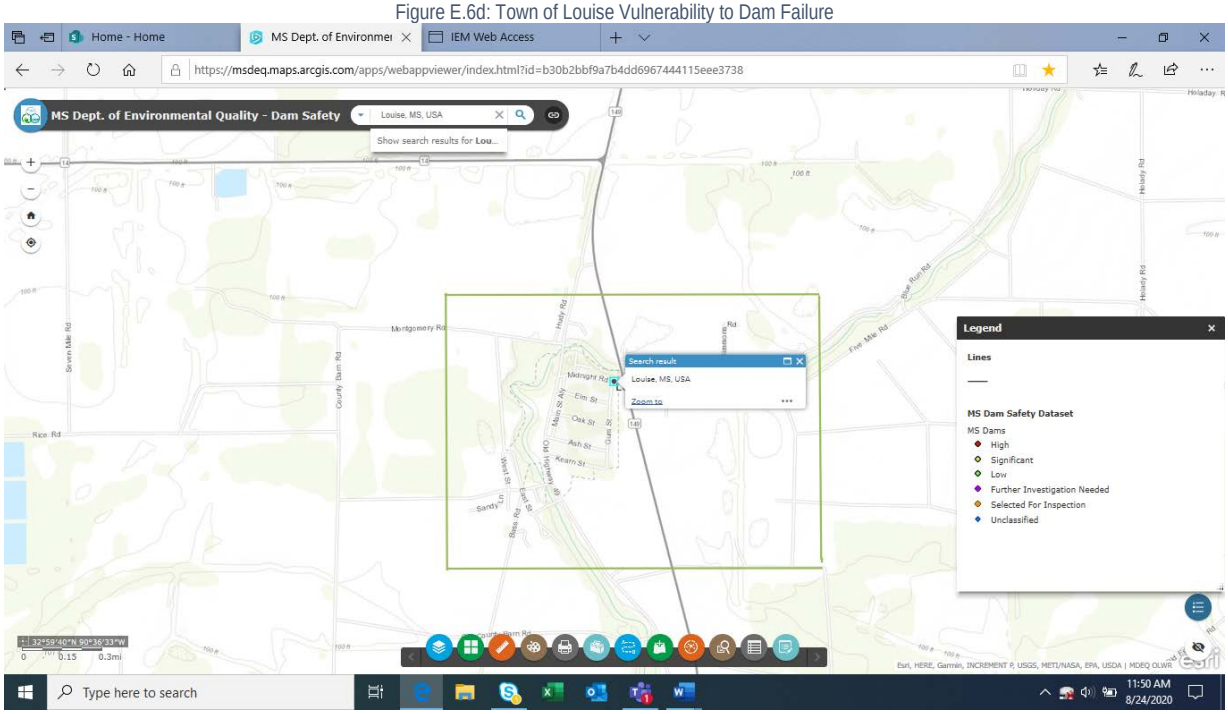
There are no dams within in a short distance of the City of Belzoni. The city's population center is well away from any identified dams and they pose little risk to the community. As such the City is at a low risk to dam failure.

Figure E.6c: Town of Isola Vulnerability to Dam Failure



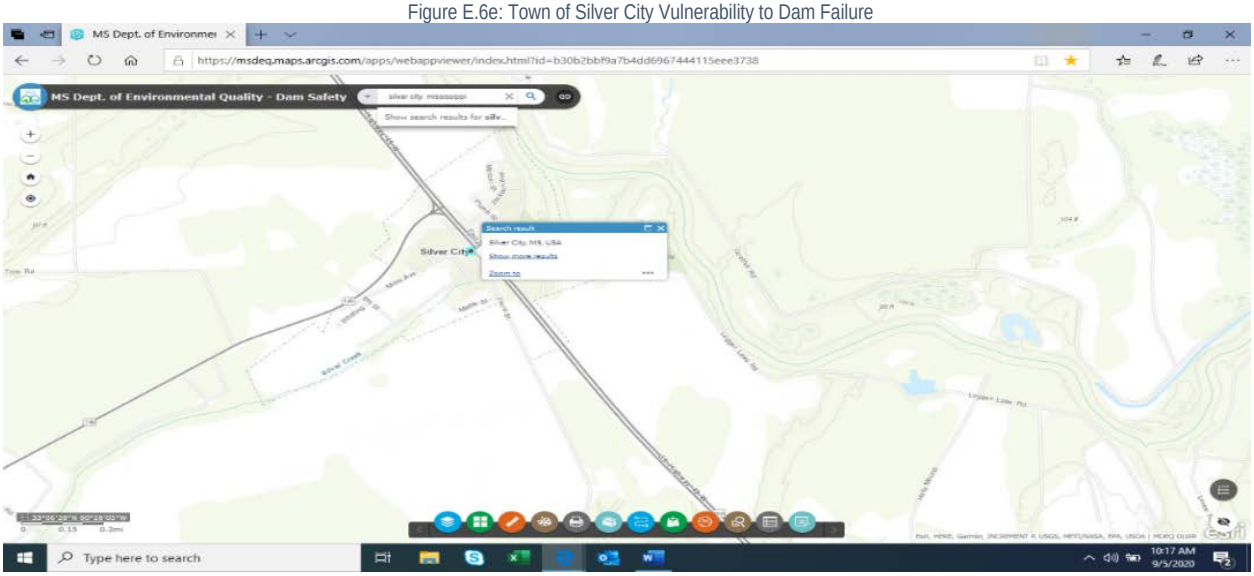
There are no dams within in a short distance of the Town of Isola. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Figure E.6d: Town of Louise Vulnerability to Dam Failure



There are no dams within in a short distance of the Town of Louise. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Figure E.6e: Town of Silver City Vulnerability to Dam Failure



There are no dams within in a short distance of the Town of Silver City. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Overall Vulnerability to Dam Failure

The following table summarizes the vulnerability of each jurisdiction to dam failure.

Table E.14: Geographic Vulnerability to Dam Failure by Jurisdiction-Humphreys County I Source: MDEQ

Jurisdiction	Ranking
Unincorporated Humphreys County	Low
City of Belzoni	Low
Town of Isola	Low
Town of Louise	Low
Town of Silver City	Low
Overall County Vulnerability to Drought	Low

There are no significant or high hazard dams in Humphreys County. Therefore, dam failure is rated as low risk to Humphreys County overall.

Drought

Location and Extent

Drought covers a large area and cannot be confined within geographic boundaries. Therefore, all of Humphreys County could be exposed to drought conditions. The extent of damage from drought typically does not pose a threat to property but can impact agricultural assets within the county.

Previous Occurrences

Table E.15 lists 10 events reported in the years of 2000 through 2019 as shown in the National Weather Service Storm Events Database, housed at the National Center for Environmental Information (NCEI). It is important to note that the lack of data during that a given time frame does not mean drought conditions did not exist-they simply were not reported. NCEI reports drought on a countywide basis and not by jurisdiction. The figures show that most drought-related damage is related to agricultural losses.

Table E.15: Drought Occurrences 2000 to 2019 I Source: NCEI

Date	Death	Injury	Property Damage	Crop Damager
12/1/2016	-	-	-	50,000
11/1/2016	-	-	50,000	-
10/18/16	-	-	-	40,000
10/1/2015	-	-	-	1,200
9/1/2015	-	-	-	400,000
10/1/2010	-	-	-	500,000
7/1/2007	-	-	80,000	-
6/1/2007	-	-	-	2,000,000
5/1/2007	-	-	-	1,000,000
10/1/2006	-	-	-	3,000,000
Total	-	-	**$130,000**	**$6,991,000**

Probability of Future Occurrence

Historical data listed in Table E.16 suggest that drought is likely. It may occur one or more times in a given year or may experience a drought-free period of several years. It is also likely that drought may occur as a result of climate change throughout the United States, which would affect the region's significant agriculture holdings. Of the nineteen years included in NCEI research, a drought has occurred in five years. A probability developed by dividing the number of drought years by the total number of years results in a 26% probability that a drought will occur in any given year.

Assessing Vulnerability

Drought occurs with advance warning because those in farm communities are able to tell when patterns of water availability changes. Drought is monitored by the National Weather Service and the State of Mississippi State University Extension Service, the latter of which has offices in each county. Two tools are available for Extension staff and others who monitor drought: the Keetch-Bynum Drought Index and the Palmer, the Drought Severity Index, which are discussed in Section 4 of the Base Plan as tools for drought monitoring. Drought is not known to cost human lives, but it affects lifestyles and the economic effects may be felt countywide. However, the catfish and agricultural resources of Humphreys County are particularly vulnerable to drought. The NCEI database indicates there have been no known deaths or injuries from drought in the planning area.

All NCEI events are listed as occurring in the Humphreys Zone, so it can be deducted that the entire county is equally at risk to the hazard. However, because the unincorporated areas, which include agricultural assets, are more affected by drought than municipalities, this are ranks as medium for unincorporated areas. Other areas of the county are determined to be low vulnerability to drought, so the County overall is listed as having low vulnerability.

Table E.16: Humphreys County Jurisdictional Vulnerability to Drought

Jurisdiction	Ranking
Unincorporated Humphreys County	Medium
City of Belzoni	Low
Town of Isola	Low
Town of Louise	Low
Town of Silver City	Low
Overall Humphreys County Vulnerability to Drought	Low

Earthquake

Location and Extent

Humphreys County, like most of North Central Mississippi, is located within the Modified Mercalli Zone VI. Should an event occur that has a 5.9 to 6.0 magnitude on the Richter Scale, some or all of the following may occur based on descriptions included in the Scale:

- The event would be felt by all or nearly everyone
- People may be awakened from sleep if the event occurs at night
- Widespread frightened population
- Some dishes and windows would be broken.
- Unstable objects would be overturned.
- Pendulum clocks may stop.
- Heavy furniture moved
- Instances of fallen plaster
- Slight damage

Previous Occurrences

No earthquakes have been reported as having taken place in or affected Humphreys County.

Probability of Future Occurrence

In 2002, a study by the Center for Earthquake Research and Information (CERI) at the University of Memphis reported that, in any given 50-year interval, there is a seven to ten percent probability of the region experiencing an event at the level of the devastating 1811-1812 sequence of earthquakes in the New Madrid Zone. The study also estimated that there is an estimated 25 to 40 percent probability that a 6.0 magnitude event occurring a 50-year time period. The community relies on studies such as this for probability estimates because there is no locally available occurrence data.

Assessing Vulnerability

The level of vulnerability is the same for all areas of the county given that there is no substantive geographic variation in distance from one end of the county to the city of New Madrid, MO, the epicenter of the New Madrid Seismic Zone. The distance between New Madrid and the Town of Isola, in the northwest corner of the county, is an estimated 268 miles, and the distance to the Town of Louise is an estimated additional 31 miles further south. There is not enough a distance in proximity to New Madrid to say that one community is more vulnerable than the other.

There has been no recorded deaths, injuries, or property damage from earthquakes in Humphreys County. There is little likelihood of any detrimental effect on the County's economy, residents' lifestyle, or physical structures. However, the effects on life and property in the area and low hazard dams could be significant if a large earthquake were to occur given the nature of the built environment. In estimates derived from a report by the U.S. Geological Survey (USGS) "New Madrid Earthquake Project," the relative risk for Humphreys County and other sectors of District 3 for a potential seismic event with a magnitude of between 3 and 4 on the Richter scale.

Based on research completed by the USGS Earthquake Hazard Program, buildings constructed using load-bearing masonry walls are vulnerable to damage by earthquakes, while steel and wood-frame buildings have a lower seismic vulnerability. Low-rise reinforced concrete buildings are also in this lower seismic risk category. Damage expected in such an event within the unincorporated areas of Humphreys County could include buildings not secured to a solid foundation being shaken off their supports, and chimneys falling away from houses. Multi-story structures built with un-reinforced masonry buildings could be substantially damaged.
In reviewing earthquake effects on dams, the SHMP overlaid significant high hazard dams with historic seismic recordings and developed a dam inventory for earthquake prone counties. Dam/levee systems are also vulnerable to earthquake events as shown by the table below, which was presented earlier as Table E.17.

Table E.17 Dam Inventory in Relation to Earthquake Prone Counties by Dam Type I Source: 2018 Mississippi SHMP

MEMA DISTRICT 3				
County	Significant	High	Medium	Low
Attala	1	2	44	47
Bolivar	-	-	14	14
Carroll	4	23	86	113
Holmes	1	5	39	45
Humphreys	-	-	4	4
Leflore	-	-	-	-
Montgomery	2	22	24	2

Sunflower	-	-	12	12
Washington	-	-	3	3

Extreme Heat

Location and Extent

Heat waves cover a large area and cannot be confined within geographic boundaries. Therefore, all of Humphreys County could be exposed to excessive heat conditions. The extent of damage from heat events typically does not pose a threat to property or crops but can impact people with heat-related injuries or fatalities. The elderly, infants and disabled are most vulnerable to excessive heat conditions.

Previous Occurrences

As shown in Table E.18, there have been five recorded heat events from 2000 to 2019, and none since the 2015 RHMP was written. There were no damages, or loss of life/injury documented from these events.

Table E.18: Extreme Heat Occurrences 2000 to 2019 I Source: NCEI

Date	Event	Death	Injury	Property Damage	Crop Damage
8/1/2010	Excessive Heat	-	-	-	-
8/5/2007	Heat	-	-	-	-
7/15/2006	Heat	-	-	-	-
8/17/2005	Heat	-	-	-	-
7/23/2005	Heat	-	-	-	-

The National Weather Service event narrative for the most recent occurrence (8/1/2010) is typical of how extent is described in the other four events.

> A four day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS Jackson, MS forecast area, 19 record highs were set between August 1st and 4th. On August 2nd, the 2nd warmest average temperature was recorded. The low was 78 and the high 105, this resulted in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in 3 fatalities across the forecast area.

One of the deaths mentioned in this description occurred in Bolivar County a man was found lying near a tree in his yard in Cleveland. Bolivar County officials said the man lived alone and had been dead at least a day. A jug of water was found near his body. It is not feasible to discuss vulnerability broken down by jurisdiction because NCEI data for this hazard is reported countywide.

Probability of Future Occurrence

While five events are listed in the table of historic events, two of these appear to be from an extended event that occurred over a two-month period. As such, for the purpose of determining probability, it is accurate to say that four events took place over a 19-year period, so there is a 21% percent chance of occurrence in any given year.

Assessing Vulnerability

Extreme Heat can affect certain populations but generally causes no property damage. During periods of extreme heat, there is little physical destruction, although roads can buckle, and livestock die. Extreme heat conditions can pose problems for those not accustomed to the climate or who are outside for prolonged periods of time. Extreme heat can create a threat even to individuals and communities that are accustomed to high temperatures. Excessive heat can also cause utility outages due to an increased demand for electricity.

All of the following populations are prone to heat-related conditions: the elderly; young children; those who are immobile; persons who live alone especially without air conditioning; people without transportation; and people suffering from serious illnesses. Because NWS reports are county-based and events described are often regional occurrences, it is safe to say that the entire population of all county locations are vulnerable.

Expansive Soil

Location and Extent

Expansive soils are present throughout Mississippi and have been known to cause considerable damage to housing and infrastructure. Less than 50 percent of soils in Humphreys County consist of clay that is susceptible to swelling.

Previous Occurrences

There has been no record of expansive soil issues in Humphreys County.

Probability of Future Occurrence

The probability of expansive soils is classified as low. While it may be realistic to say that there is a zero percent chance of occurrence, it is not possible to document probability with no historic data. The fact that the community chose to keep this hazard in the plan and to profile it despite the lack of occurrences suggests that there is cause for low-level concern.

Assessing Vulnerability

Expansive soils could cause damage to infrastructure and both business and residential structures within Humphreys County. Community leaders agreed that this is a hazard of low-level concern but wanted to retain it in the 2020 RHMP update to document that a discussion about the hazard took place.

Flood

Location and Extent

The entire geographic region of Humphreys County is at risk to riverine, flash flooding, and flooding caused by undersized overburdened stormwater management systems. All of the flood events cited from recent NCEI data below are documented as flash floods. Flood data shown below shows that all locations in the county are susceptible to flooding, and the extent of some events is listed as countywide.

Flash floods often occur when rain falls on the built environment where impervious surfaces, gutters, and storm sewers hasten the flow of run-off. Flowing waters can become raging torrents of water that course through streambeds and streets, sweeping away everything in their path.

Previous Occurrences

Table E.19 provides a summary of the 15 flood events recorded from 2000 to 2019, and Table E.20 shows the events sorted by location within the county. While inadequate stormwater management capability likely contributes to flash flooding in all areas, it is noted where local creeks, rivers and their tributaries are located nearby and may be potential sources of overflow.

Table E.19: Flood Events 2000 to 2019 I Source: NCEI

Location	Date	Event Type	Death	injury	Property Damage	Crop Damage
Louise	4/14/2014	Flash Flood	-	-	5,000	-
Belzoni	7/11/2012	Flash Flood	-	-	5,000	-
Anchorage	5/8/2011	Flood	-	-	500,000	200,000
Louise	4/15/2011	Flash Flood	-	-	5,000	-
Brooklyn	12/31/2010	Flash Flood	-	-	5,000	-
Humphreys Co.	5/3/2009	Flash Flood	-	-	50,000	-
Castleman	9/14/2008	Flash Flood	-	-	15,000	-
Belzoni	5/15/2008	Flash Flood	-	-	10,000	700,000
Belzoni	4/22/2008	Flash Flood	-	-	1,000,000	-
Louise	10/16/2006	Flash Flood	-	-	300,000	200,000
Belzoni	12/7/2004	Flash Flood	-	-	-	-
Countywide	9/26/2002	Flash Flood	-	-	2,000	-
Countywide	12/13/2001	Flash Flood	-	-	-	-
Countywide	11/29/2001	Flash Flood	-	-	-	-
Countywide	11/29/2001	Flash Flood	-	-	-	-
Total					**$1,397,000**	**$900,000**

Table E.20: Humphreys County Flood Events 20001 to 2019 – Sorted by Location I Source: FEMA FIS Humphrey County 2018

Location	*# Events*	*Major Water Bodies*
Belzoni	4	Burton Bayou
Isola	-	Jackson Bayou
Louise	3	Silver Creek Yazoo River
Silver City	-	Silver Creek Yazoo River
Countywide	8	Brown Bayou Fisk Bayou Yazoo River Steel Bayou

Information from the same table can be further sorted to assess vulnerability for the jurisdictions and unincorporated areas of the Humphreys County. All unincorporated communities, reference to part of the County, will be counted toward incidents not within an identified municipality.

While there is a section devoted to flood vulnerability further in this annex, vulnerability will also be addressed here, in proximity to the previous information.

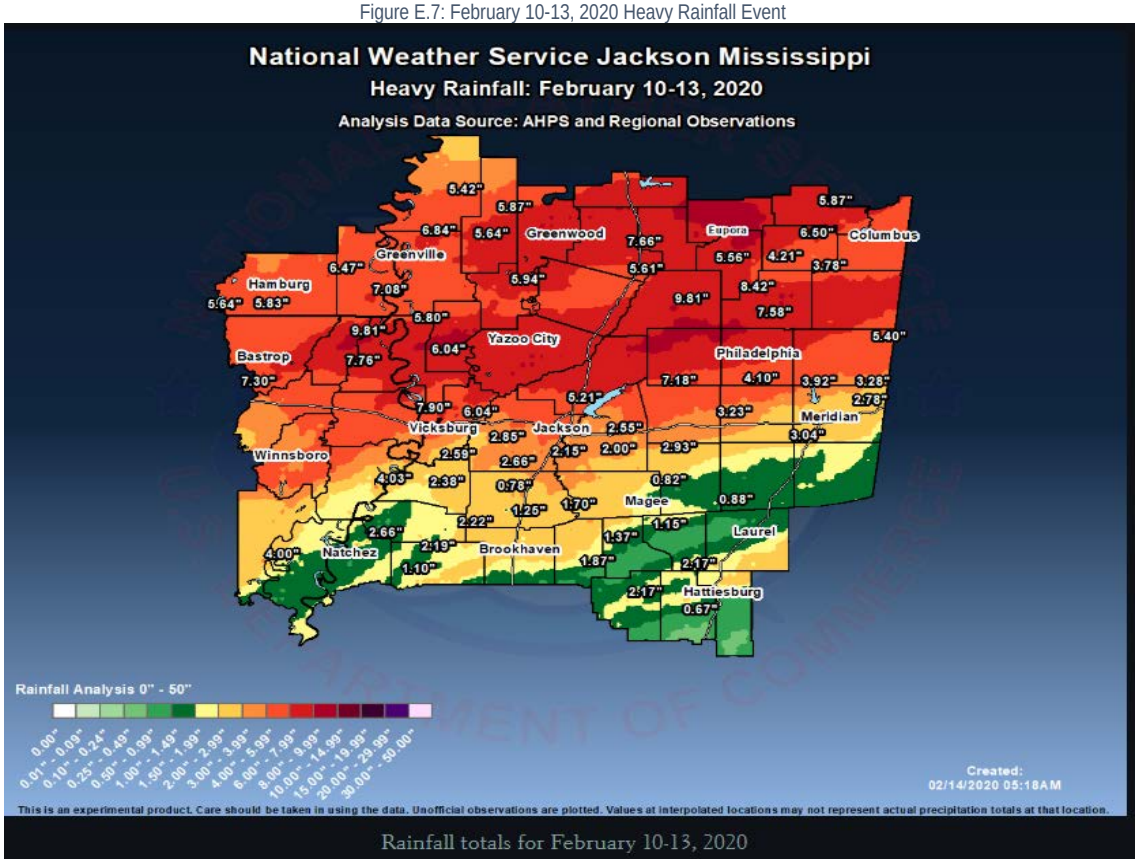
Table E.21: Geographic Vulnerability to Flood by Jurisdiction I Source: NCEI

Location	# Events	Vulnerability Level	Critical Points
Countywide Central Portion, East Portion	7	Moderate	Presence of major rivers and tributaries covering most of the county
City of Belzoni	4	Low	Location near major river and tributaries
Town Isola	-	Low	Location of minor canals throughout the town
Town of Louise	3	Low	Location of major river running through town
Town of Silver	-	Low	No SFHAs located in the jurisdiction
Overall vulnerability of Humphreys County		Moderate	Number events, that do not affect structures, input from the Office of Emergency Management

The planning region overall rated the community as moderately vulnerable to flooding based on the fact most of vulnerable land does not include at-risk structures. Also, the total dollar value of damages is relative given the length of time studied.

In addition to the events documented as occurring through 2019, District 3 experienced significant rainfall in early 2020 that had not yet been fully documented by NCEI at the time of plan development. The visual included on the next page as Figure E.12 shows that during the period of February 10-13, 2020, communities districtwide received between 3 to 14 inches of rain, and rain continued to fall – at times heavily – through the rest of the month. The Humphreys County Emergency Management Director said that rainfall affected roadways and caused his department to recognize the need for road improvements in certain areas to mitigate against future flooding. The map shows that Humphreys County received 5.94 inches during the documented period.

Figure E.7: February 10-13, 2020 Heavy Rainfall Event



Rainfall totals for February 10-13, 2020

Humphreys County and two of its three municipalities participate in the National Flood Insurance Program (NFIP). The Town of Silver City is the only non-participating community.

Based on losses outlined in the 2013 SHMP, the following HAZUS Flood Results were listed for Humphreys County. Comparable data from the 2018 SHMP was not available to researchers working on the 2020 RHMP Update

Table E.22 – Humphreys County HAZUS Flood Results I Source: HAZUS (2013 State of Mississippi Standard Hazard Mitigation Plan)

Structural Damage	Contents Damage	Inventory Loss	Total Building Loss	Income loss	Total Building and Income Loss	Bldg. Loss Ratio
$35,992,000	$32,767,000	$1,000,000	$69,759,000	$721,000	$70,480,000	14.5%

Residential at Risk	Other at Risk	Total Bldgs. Risk	No. of Bldgs. Substantially Damaged	No. of house-holds	No. of people needing shelter	Countywide Building Exposure
695	2	697	60	1,666	4,459	$377,678,000

The next two tables were also taken from the 2018 SHMP and, respectively, show the number of RL/SRL properties for Humphreys County and the eight other counties included in District 3 and the number of NFIP participating communities for each county and number of properties mitigated.

Table E.23: District 3 Repetitive Loss and Sever Repetitive Loss Properties – Over time and by County I Source: 2018 Mississippi State Hazard Mitigation Plan

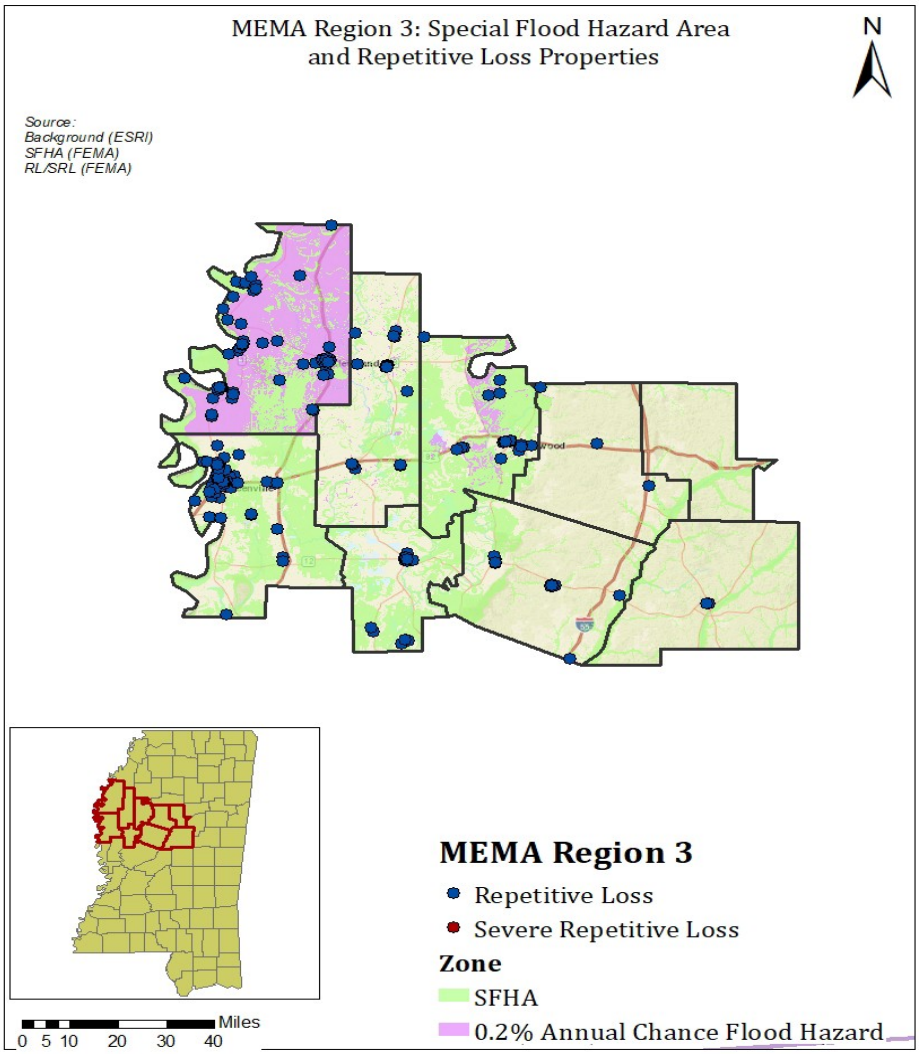
County	Repetitive Loss				Severe Repetitive Loss			
	No. of Properties 2009	No. of Properties 2011	No. of Properties 2016	No. of Flood Claims	No. of Properties 2009	No. of Properties 2011	No. of Properties 2016	No. of Flood Claims
Attala	0	0	1	2	0	0	0	0
Bolivar	155	108	210	631	2	48	2	228
Carroll	4	4	4	8	0	0	0	0
Holmes	11	12	12	27	0	0	0	0
Humphreys	40	31	46	161	2	10	1	61
Leflore	29	27	27	71	0	2	0	8
Montgomery	0	0	0	0	0	0	0	0
Sunflower	19	16	20	72	1	4	0	21
Washington	152	115	191	631	14	48	8	250
Totals	410	313	511	1,603	19	112	11	568

Table E.24: District 3 Participating Communities and Number of Mitigated Properties by County I Source: 2018 Mississippi State Hazard Mitigation Plan

County	No. of NFIP Communities	No. of Mitigated Properties
Attala	5	0
Bolivar	16	20
Carroll	4	0
Holmes	8	0
Humphreys	5	1
Leflore	6	1
Montgomery	4	0
Sunflower	8	4
Washington	6	26
Totals	61	52

The Capabilities Assessment of this Annex identifies NFIP participation and also the fact that a Flood insurance Study was conducted when FEMA developed local Flood Insurance Rate Maps (FIRMs). As of 2016, there were 41 repetitive loss properties in the county. The map below, also from the 2018 SHMP shows the location of Special Flood Hazard Areas (SFHAs) and RL structures for each county in Region 3 (including the ones in Humphreys County).

Figure E.8X: District 3 Special Flood Hazard Area (SHFA) and Repetitive Loss Structures I Source: 2018 Mississippi State Hazard Mitigation Plan



Repetitive Flood and Severe Repetitive Loss

Based on best available data, as shown in Table E.26, there are a total of 41 properties listed on the state's repetitive loss property database, of which none have been mitigated. These properties probably have not been mitigated due to the fact that providing replacement housing and relocation assistance for the low-income residents in this area is an issue. Additional information regarding these properties is provided in the mitigation strategy chapter of this plan.

Residents of Humphreys County participating in the National Flood Insurance Program (NFIP) have received over $8,454,466 in flood loss payments. Details regarding the NFIP program by community are provided in the capability's assessment section of this annex.

Table E.25: Repetitive Flood and Severe Repetitive Loss Properties I Source: MEMA RL Listing 02-28-2011

Jurisdiction	Repetitive Flood							
	Community ID	No. of properties	No. Mitigated	No. Insured	Total Losses	Total Bldg. Payments	Total Contents	Total Paid
Humphreys County	280192	46	0	5	67	359,734.85	115,268.55	475,003.40
Belzoni	280080	7	0	3	16	96,332.87	56,523.64	152,856.51
Total Repetitive Flood		**31**	**0**	**8**	**83**	**456,067.72**	**171,792.19**	**627,859.91**
Jurisdiction	**Severe Repetitive Loss**							
	Community ID	**No. of properties**	**No. Mitigated**	**No. Insured**	**Total Losses**	**Total Bldg. Payments**	**Total Contents**	**Total Paid**
Humphreys County	280192	1	0	0	45	363,001.80	212,181.59	575,183.39
Belzoni	280080	4	0	0	16	161,577.53	45,277.16	206,854.69
Total Severe Repetitive Loss		**10**	**0**	**0**	**61**	**524,579.33**	**257,458.75**	**782,038.08**
Total		**41**	**0**	**8**	**144**	**980,647.05**	**429,250.94**	**1,409,897.99**

Probability of Future Occurrence

Flooding events continue to be a threat in Humphreys County and the probability of future occurrences will remain as highly likely given the history of flood events; the presence of an overtaxed drainage system; and location in the region of the Yazoo River and its many tributaries. NCEI data shows that one or more portions of the County reported flooding in 10 of the 19 years of data being studied. This suggests that there is a 53% chance of flooding in any given year. As such, it is highly likely that the community will see flooding roughly once every 18 to 24 months.

Assessing Vulnerability

Impact on Transportation Systems: Humphreys: County includes several state-owned bridges located on US Highways 49W and State Highways 7, 12, 14 and 16. These serve as vital transportation and evacuation routes for the county and surrounding areas. These bridges cross portions of delineated floodplains and are susceptible to flood damage.

In addition to bridges, roadways are subject to inundation and overtopping by periods of heavy rain, which appear likely to occur more frequently given climate change observations. Storm events generally projected to occur as 100-year flood events are occurring more frequently. The potential loss could include up to the full replacement value of the bridge structure if flooding

results in a bridge collapse. In severe cases, roadways could also be undermined, causing complete or partial washout of roadbed and collapse of the road surface. Bridges and roadways with a history of flood impact could benefit from mitigation projects.

Impact on Lifeline Utility Systems: Lifeline utility systems such as electric power, gas, utility and water distribution and telephone service are generally not significantly affected by flood events, although flooded lift stations could result in storm water infiltration into treatment facilities. A facility's power source could be interrupted during a flood and result in expensive repairs unless the supply is elevated.

Severe Storm (Lightning, Hail and Severe Wind)

Location and Extent

Severe storms include non-spatial elements and, therefore, can be described as equally affecting all areas of Humphreys County. All municipalities and unincorporated areas are susceptible to lightning, hail and severe wind events. Of particular concern are persons who reside in a mobile/manufactured home, the elderly and disabled. It is strongly recommended that all manufactured housing be fastened to the ground. The National Association of Certified Home Inspectors (NACHI) describes a housing tie down as a system of "heavy-duty straps and anchors designed to stabilize manufactured homes (also known as mobile homes) during high winds." The organization points out that failure to properly install and maintain tie-downs results in reduced capacity to resist sliding and overturning.

Previous Occurrences

The next four tables and subsequent two figures show numerous severe storm events have occurred countywide.

Table E.26: Total Severe Storm Events in Humphreys County I Source: NCEI

Hazard Event	No of Events	Property Damage	Crop Damage	Deaths	Injuries
Lightning	1	10,000	-	-	-
Hail	28	37,000	-	-	-
Severe Wind	55	774,500	150,000	-	-
Totals	84	$821,500	$150,000	-	-

Table E.27 – Lightning Events 2000 to 2019 I Source: NCEI

Location	Date	Time	Death	Injury	Property Damage	Crop Damage
Lake City	5/31/2012	12:50	-	-	10,000	-

Between the years 2000 and 2019, one lighting event is listed as having to occur in unincorporated Lake City area.

Between 2000 and 2019, 28 hail events were recorded by the National Weather Service as affecting Humphreys County. Captured in the table below, the data shows that all incorporated and unincorporated areas of the county were affected, and the recorded hail magnitude ranged from .75" to 2.50" and total recorded damage was $37,000.

Table E.28 – Hail Events 2000 to 2019 I Source: NCEI

Location	Date	Event	Mag	Death	Injury	Property Damage	Crop Damage
Silver City	4/6/2019	Hail	1.25 in	-	-	5,000	-
Bellewood	3/10/2018	Hail	2.00 in	-	-	25,000	-
Isola	3/31/2015	Hail	1.00 in	-	-	-	-
Brooklyn	3/30/2015	Hail	1.25 in	-	-	-	-
Louise	4/27/2014	Hail	0.75	-	-	-	-
Belzoni	3/18/2013	Hail	1.00 in.	-	-	-	-
Belzoni	3/2/2012	Hail	1.75 in.	-	-	5,000	-
Anchorage	9/22/2009	Hail	0.75 in.	-	-	-	-
Silent Shade	6/13/2009	Hail	0.75 in.	-	-	-	-
Humphreys Co.	5/2/2009	Hail	1.00 in.	-	-	-	-
Humphreys Co.	5/2/2009	Hail	1.50 in.	-	-	2,000	-
Gooden Lake	5/2/2008	Hail	0.75 in.	-	-	-	-
Belzoni	4/22/2008	Hail	1.00 in.	-	-	-	-
Romeo	4/22/2008	Hail	0.88 in.	-	-	-	-
Gooden Lake	3/14/2008	Hail	1.00 in.	-	-	-	-
Belzoni	6/8/2007	Hail	1.00 in.	-	-	-	-
Belzoni	5/15/2007	Hail	1.00 in.	-	-	-	-
Gooden Lake	5/3/2007	Hail	0.88 in.	-	-	-	-
Isola	4/3/2007	Hail	0.75 in.	-	-	-	-
Louise	6/21/2006	Hail	0.88 in.	-	-	-	-
Isola	4/7/2006	Hail	1.50 in.	-	-	-	-
Isola	4/7/2006	Hail	1.75 in.	-	-	-	-
Belzoni	2/2/2006	Hail	0.88 in.	-	-	-	-
Belzoni	4/11/2005	Hail	0.88 in.	-	-	-	-
Belzoni	4/11/2005	Hail	1.00 in.	-	-	-	-
Honey Is	10/23/2004	Hail	2.50 in.	-	-	-	-
Midnight	4/29/2004	Hail	0.75 in.	-	-	-	-
Midnight	4/29/2004	Hail	0.75 in.	-	-	-	-
Totals				**-**	**-**	**$37,000**	**-**

Historical data for severe wind events shows that they occur frequently in all incorporated and unincorporated sections of the county. While agricultural damage was reported in one instance, events primarily create general property damage totaling over $774,500 in property damage and $150,000 in crop damage.

Table E.29 – Severe Wind Events 2000 to 2019 I Source: NCEI

Location	Date	Event Type	Magnitude	Death	Injury	Property Damage	Crop Damage
Belzoni	12/16/2019	Thunderstorm Wind	50 kts EG	-	-	2,000	-
Brooklyn	6/19/2019	Thunderstorm Wind	53 kts EG	-	-	10,000	-
Belzoni	4/25/2019	Thunderstorm Wind	52 kts EG	-	-	15,000	-
Silver City	12/27/2018	Thunderstorm Wind	52 kts EG	-	-	15,000	-
Louise	10/27/2018	Thunderstorm Wind	50 kts EG	-	-	2,000	-
Belzoni	11/1/2018	Thunderstorm Wind	50 kts EG	-	-	5,000	-
Belzoni	7/21/2018	Thunderstorm Wind	50 kts EG	-	-	3,000	-
Isola	7/21/18	Thunderstorm Wind	50 kts EG	-	-	10,000	-
Richland	4/3/18	Thunderstorm Wind	55 kts EG	-	-	12,000	-

Location	Date	Event Type	Magnitude	Death	Injury	Property Damage	Crop Damage
Belzoni	7/8/17	Thunderstorm Wind	50 kts EG	-	-	5,000	-
Isola	3/25/17	Thunderstorm Wind	50 kts EG	-	-	3,000	-
Belzoni	11/28/16	Thunderstorm Wind	53 kts EG	-	-	9,000	-
Brooklyn	6/17/16	Thunderstorm Wind	50 kts EG	-	-	8,000	-
Belzoni	4/11/16	Thunderstorm Wind	60 kts EG	-	-	15,000	-
Belzoni Mun. Apt.	4/11/16	Thunderstorm Wind	75 kts EG	-	-	50,000	-
Golden Lake	4/11/16	Thunderstorm Wind	60 kts EG	-	-	5,000	-
Isola	6/24/15	Thunderstorm Wind	50 kts EG	-	-	4,000	-
Isola	3/31/15	Thunderstorm Wind	55 kts EG	-	-	15,000	-
Brooklyn	4/24/14	Thunderstorm Wind	50 kts EG	-	-	1,000	-
Belzoni	4/24/14	Thunderstorm Wind	50 kts EG	-	-	1,000	-
Isola	2/20/14	Thunderstorm Wind	52 kts EG	-	-	-	-
Belzoni	6/28/2013	Thunderstorm Wind	50 kts. EG	-	-	7,000	-
Silver City	2/10/2013	Thunderstorm Wind	55 kts. EG	-	-	25,000	-
Belzoni	10/17/2012	Thunderstorm Wind	50 kts. EG	-	-	2,000	-
Brooklyn	7/19/2012	Thunderstorm Wind	54 kts. EG	-	-	10,000	-
Belzoni	7/19/2012	Thunderstorm Wind	52 kts. EG	-	-	7,000	-
Belzoni	6/11/2012	Thunderstorm Wind	55 kts. EG	-	-	5,000	-
Isola	6/11/2012	Thunderstorm Wind	70 kts. MG	-	-	7,000	-
Belzoni	6/4/2012	Thunderstorm Wind	50 kts. EG	-	-	-	-
Lake City	5/7/2012	Thunderstorm Wind	43 kts. MG	-	-	500	-
Belzoni	4/2/2012	Thunderstorm Wind	50 kts. EG	-0	-	5,000	-
Belzoni	3/2/2012	Thunderstorm Wind	60 kts. EG	-0	-	20,000	-
Isola	2/29/2012	Thunderstorm Wind	60 kts. EG	-0	-	70,000	-
Gooden Lake	9/25/2011	Thunderstorm Wind	50 kts. EG	-0	-	10,000	-
Anchorage	4/27/2011	Thunderstorm Wind	75 kts. EG	-0	-	35,000	-
Isola	4/4/2011	Thunderstorm Wind	50 kts. EG		-	2,000	-
Belzoni	2/24/2011	Thunderstorm Wind	60 kts. EG	-	-	10,000	-
Belzoni Muni Arpt	7/30/2009	Thunderstorm Wind	67 kts. EG	-	-	150,000	-
Romeo Co.	5/11/2009	Thunderstorm Wind	63 kts. EG	-	-	8,000	-
Louise.	5/9/2009	Thunderstorm Wind	65 kts. EG	-	-	10,000	-
Belzoni Muni Arpt	5/2/2009	Thunderstorm Wind	67 kts. EG	-	-	50,000	-
Humphreys (Zone)	4/18/2009	Strong Wind	43 kts. EG	-	-	12,000	-
Belzoni	9/14/2008	Thunderstorm Wind	55 kts. EG	-	-	20,000	-
Belzoni	6/19/2007	Thunderstorm Wind	56 kts. EG	-	-	3,000	150,000
Isola	5/3/2007	Thunderstorm Wind	65 kts. EG	-	-	80,000	-
Belzoni	11/15/2006	Thunderstorm Wind	50 kts. EG	-	-	-	-
Louise	11/15/2006	Thunderstorm Wind	55 kts. EG	-	-	8,000	-
Belzoni	3/9/2006	Thunderstorm Wind	57 kts. EG	-	-	-	-
Lamkin	4/6/2005	Thunderstorm Wind	53 kts. EG	-	-	2,000	-
Belzoni	12/7/2004	Thunderstorm Wind	50 kts. EG	-	-	-	-

Location	Date	Event Type	Magnitude	Death	Injury	Property Damage	Crop Damage
Isola	6/21/2004	Thunderstorm Wind	58 kts. EG		--	1,000	-
Belzoni	10/25/2003	Thunderstorm Wind	55 kts. ES	-	-	15,000	-
Silver City	10/25/2003	Thunderstorm Wind	50 kts. ES	-	-	5,000	-
Belzoni	6/2/2003	Thunderstorm Wind	55 kts. ES	-	-	15,000	-
Belzoni	2/19/2002	Thunderstorm Wind	52 kts. E	-	-	1,000	-
Total				**-**	**1**	$774.500	$150.000

Probability of Future Occurrence

Historical NCEI data suggests a lighting event has a 5.2% change of occurring annually since there has been one event in a 19-year period. There is a 63% chance of a hail event occurring in annually and an 89% chance of a severe wind event will occur annually throughout the county.

Assessing Vulnerability

Severe weather events are non-spatial may occur anywhere in the county. While they cause total property damages of $821,500 and $150,000 in crop damages, and the dollar value for most events is relatively low. As such, the county is ranked as having a medium vulnerability to severe weather.

Impact on Life and Property: severe storms (high wind, hail, and lightning) do not have particular impacts in any one geographical section of the County but, hail and heavy rain would have the greatest impact on the agricultural community. Critical County infrastructure is unlikely to be affected by this hazard.
Humphreys County's entire population is considered at medium risk to severe weather, because many events, but the level of damage per event is lower than for an event as potentially deadly as a tornado or hurricane. Those living in rural areas and special populations, such as those living in mobile homes, the elderly and disabled, may be most vulnerable.

Maps on the next two pages show a sampling of historic hail and severe wind events that have crossed the county.

Figure E.9 – Sample of Historic Hail Events- Humphreys County

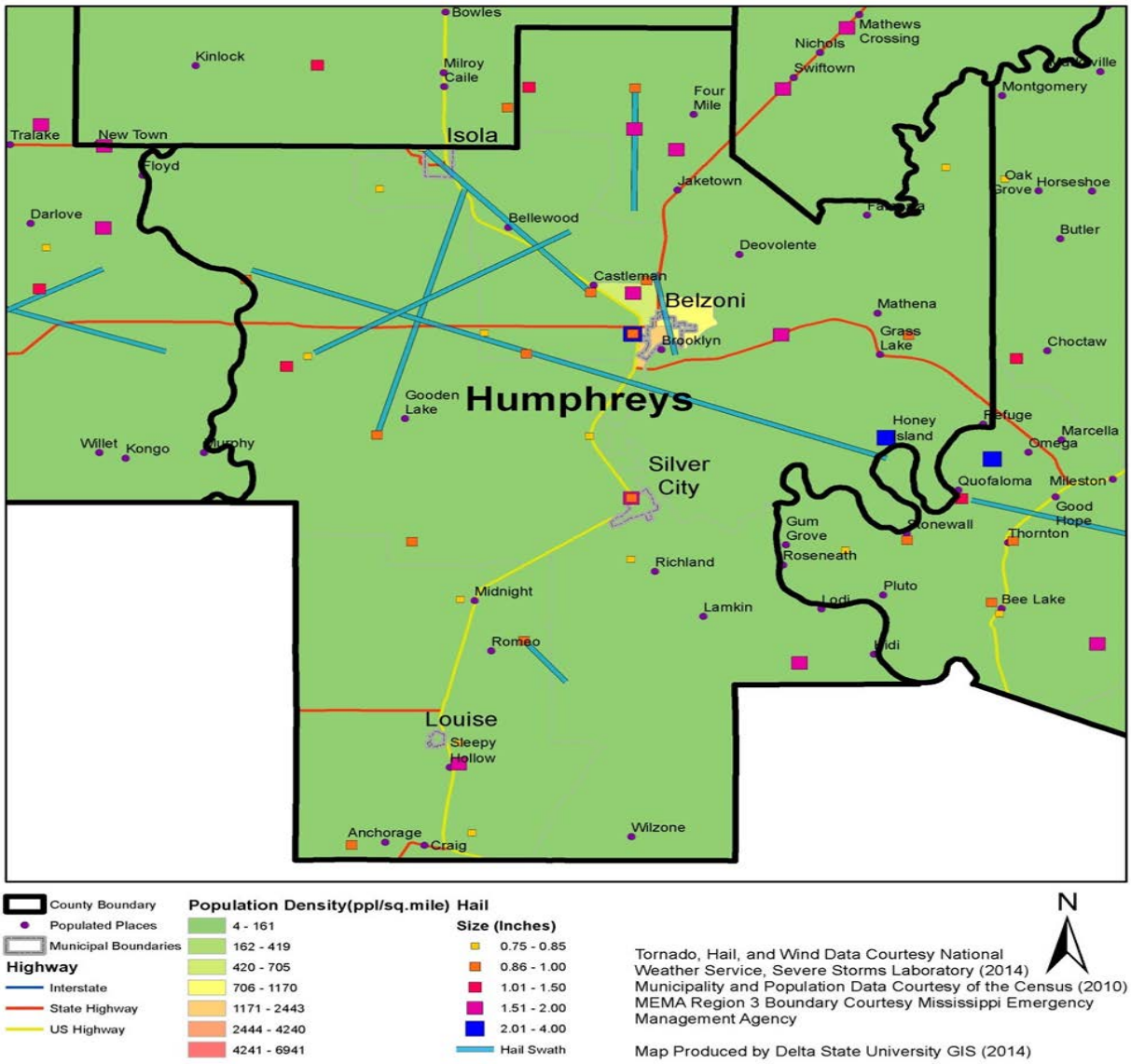
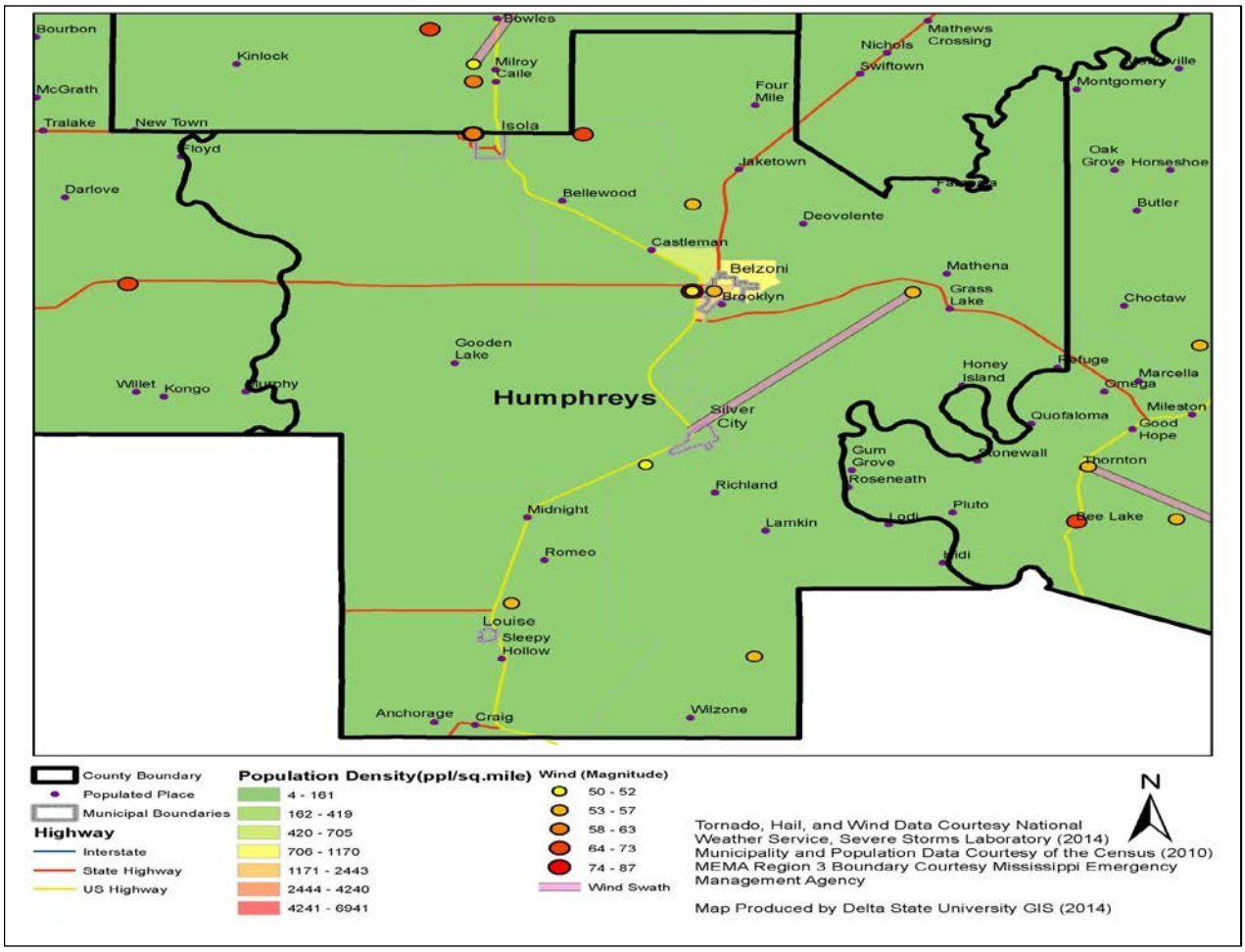


Figure E.10 – Sample of Historic Severe Wind Events- Humphreys County



Severe Winter Weather

Location and Extent

All of Humphreys County is susceptible to severe winter storm events. As such, they generally are not confined to one geographic area but may, in fact, extend regionally and across multiple states. The extent of impacts can include prolonged power outages and possible energy shortages. Severe weather may affect businesses operations, causing them to lose income. The same is true for workers, who may be unable to navigate roadways to travel to work, or if workplace is closed due to loss of power. Ice buildup on roads and bridges creates dangerous driving conditions. When ice accumulates on power lines and trees, either or both could be downed from the weight of the ice. All Heavy snow has been known to cause roof cave ins. The elderly and disabled residents in Humphreys County who may have limited mobility should be considered very vulnerable. Measures should be taken to ensure that they are safe and warm.

Previous Occurrences

Table E.30 shows that there have been 12 severe winter storm events recorded in Humphreys County between the years 2000 and 2019. These events include hazards such as cold/wind chill, heavy snow, and ice storm.

Table E.30 – Severe Winter Weather Events 2000 to 2019 I Source: NCEI

Date	Type	Death	Injury	Property Damage	Crop Damage
2/25/15	Heavy Snow	-	-	-	-
2/11/14	Ice Storm	-	-	-	-
1/15/2013	Ice Storm	-	-	15,000	-
2/9/2011	Heavy Snow	-	-	300,000	-
2/3/2011	Ice Storm	-	-	200,000	-
1/9/2011	Ice Storm	-	-	25,000	-
2/11/2010	Heavy Snow	-	-	5,000	-
1/1/2010	Cold/wind Chill	-	-	250,000	-
3/7/2008	Heavy Snow	-	-	-	-
1/25/2008	Ice Storm	-	-	100,000	-
12/31/2000	Heavy Snow	-	-	-	-
1/27/2000	Heavy Snow	-	-	15,000	-
Total	**-**		**-**	**$910,000**	**-**

The National Weather Service reported a sleet event occurred on March 5, 2015 which is typical of how severe winter events unfolded over the past two decades. The following is a shortened summary of the event, and the description shows the extent of multiple cascading effects that occur as a result of multiple weather elements, including rain, a freeze, and warming trends.

> *Sleet accumulated up to one inch at Duck Hill after a heavy snowfall that occurred the previous week. Fortunately, a warming trend helped alleviate a lot of road issues. Temperatures warmed quickly on March 4th into the mid-70s to low-80s, but this was followed by cold and strong high-pressure building stretching from Canada, through the Plains, and further south. Temperatures quickly plummeted to the 40-50-degree range. Moisture lingered behind the cold front and rain changed sleet late the night of March 4th into early morning hours of March 5th. As colder air in the lower parts of the atmosphere continued to filter in, moisture began to transition over to a wintry mix, mainly in the form of sleet, in the northwest Delta. This setup was very favorable for a transition from rain to freezing rain to sleet. Moisture further southeast near the Natchez Trace corridor and Jackson metro began to transition over in the early morning hours of March 5th, with some moderate sleet falling in central Mississippi. Sleet and some snow began to mix into the Delta while the majority of the area saw a significant accumulation of sleet. Some areas in south and east Mississippi also saw some sleet but a little to no accumulation. Precipitation moved out late morning of March 5th. Some areas saw between 1/2 inch to 1-2 inches in the far northern parts of the Delta and northern Mississippi. Because the roads were warm two days previously, bad road conditions were largely limited to areas that received significant heavy sleet accumulation (the Delta and northern Mississippi). Areas in the Jackson Metro region experienced slick roads but warm ground and road temperature from the previous few days alleviated some of the issues.*

Probability of Future Occurrence

The probability of severe winter weather events in Humphreys County is highly likely. There was severe winter event in ten of the 19 years studied, which suggest there is a 37% chance of an occurrence in a given year. The region may experience an event several years in a row, but then not experience one for several years.

Assessing Vulnerability

Community assets at risk from a winter storm include the electrical and telephone utility system and tree coverage and canopy. Vehicular accidents from icy conditions could cause injury, property damage, or death. Ice laden tree limbs can fall, causing property damage. A hard freeze may also result in decreased water pressure as frozen and damaged pipes thaw and leak. Winter storms impact the entire community. Among essential services, critical facilities and infrastructure likely to be affected are the public safety on roadways and electric, telephone and water services.

The Mississippi Economic Development Council produced figures in March 2020 showing that in Humphreys County there were 30 workers employed in the construction sector. There were not any figures provided for the number employed in agriculture, forestry, fishing and hunting and mining. Workers such as these, who spend a great deal of time outdoors, are most likely to be affected by severe winter weather.

Populations at Risk: Vulnerable persons during winter weather periods are the homeless, the elderly, young children, and persons with chronic health problems. Above freezing temperatures combined with strong wind can result in felt temperatures below freezing and cause hypothermia, illness, and death.

Property Damage: This hazard has caused roofs to cave in, trees to fall on houses, prolonged power outages. It can create dangerous driving conditions. NCEI data show three storms occurring between the years 2000 and 2019 caused damage ranging from $250,000 to over $300,000 during each event. Over $910,000 million in damages was incurred during the described 19-year period.

Critical Facilities and Essential Services: Essential services are not likely to be significantly impacted by a winter storm. For the most part, generators have been installed at critical and essential facilities within the county and participating jurisdictions to ensure that continuity of electricity for dispatch and emergency services.

Transportation Systems: Some major transportation services could be temporarily interrupted should icing occur. Those include bridges and overpasses. These include bridges crossing Highway 7, 12, 14,16, US 49 W and other roads countywide.

Lifeline Utility Systems: The most likely lifeline utility system that could be affected by a winter storm would be electric power, telephone and water line service. Power interruption could be anticipated by rural water systems without generators until power is restored.

Tornado

Location and Extent

Mississippi consistently ranks in the top 10 states with the most tornadoes in the nation. All areas of the state, including Humphreys County, are susceptible to impacts from EF0 to EF5 magnitude tornado that can cause millions of dollars in damage.

Tornado is a non-spatial hazard, meaning that all jurisdictions in the county are equally likely to experience an event. Of particular concern are persons who reside in a mobile/manufactured home, and the elderly and disabled. According to the 2010 Census, there are approximately 348 mobile/manufactured housing units -- structures at high risk to wind events of any type. These units represent 9.0% of the housing stock in Humphreys County.

Previous Occurrences

A total of 12 tornadoes were recorded in the NCEI database for Humphreys County between 2000 and 2019. They are summarized below in Table 3.31. The table is followed by a discussion of events mapped by the Jackson, MS office of the National Weather Service as having taken place in the year 2020.

As a result of tornado event occurring on September 24, 2005 in Humphreys County there was one reported death and two injuries reported in the Town of Isola and three injuries reported in the City of Belzoni. A tornado reported on November 24, 2001 that touched down in Town of Isola resulted in 5 injuries.

Table E.31 – Tornado Events 2000 to 2019 I Source: NCEI

Location	Date	Event	Mag	Death	Injury	Property Damage	Crop Damage
Louise	10/17/2012	Tornado	EF2	-	-	50,000	-
Louise	10/17/2012	Tornado	EF1	-	-	40,000	-
Lake City	10/17/2012	Tornado	EF1	-	-	50,000	-
Louise	12/9/2008	Tornado	EF0	-	-	-	-
Isola	4/7/2006	Tornado	F0	-	-	-	-
Silver City	9/24/2005	Tornado	F0	-	-	8,000	5,000
Belzoni	9/24/2005	Tornado	F1	-	-	150,000	150,000
Isola	9/24/2005	Tornado	F1	1	2	50,000	50,000
Belzoni	9/24/2005	Tornado	F2	-	3	2,000,000	500,000
Belzoni	4/6/2003	Tornado	F0	-	-	25,000	-
Isola	11/24/2001	Tornado	F3	-	5	4,000,000	-
Belzoni	2/24/2001	Tornado	F0	-	-	10,000	-
Totals			**12**	**1**	**10**	**$6,383,000**	**$705,000**

More recently, a series of tornadoes struck the Southeastern states, including those occurring over the weekend of April 10-12, 2020, referred to as the Easter Weekend Tornado. While the National Weather Service has not completed damage estimates, it appears as though no damage was recorded in Humphreys County, but there was property damage in adjacent District 3 counties of Carroll, Holmes and Montgomery.

The most recent tornado events occurring in Humphreys County are discussed below are illustrated in the maps and discussion that follows.

October 17, 2012-A vigorous, fast-moving early autumn storm system brought severe weather to portions of the ArkLaMiss region from the evening of Wednesday October 17th, 2012 into the early morning hours of Thursday October 18th. The combination of intense wind shear, very strong forcing, along with adequate moisture and instability levels across the region resulted in severe storms developing ahead of and along a strong cold front as it raced east across the forecast area during the overnight hours. Numerous reports of wind damage from intense supercell and bowing-type thunderstorms were received as they produced strong straight-line winds and tornadoes across the area from the Delta Region, southeast into Central Mississippi, and reaching into parts of East Central and Southeast Mississippi. There were sporadic reports of hail, but with such fierce wind shear over the region, straight line winds and tornadoes were the primary modes of severe weather during this event.

To put some historical perspective on this "rare" early Fall severe weather event, the EF-3 that occurred across Scott/Newton counties was only the 2nd F3 to occur in the month of October across MS in recorded history. The 3 strong tornadoes for this event is 2nd all-time to the Oct 17, 1980 event where 7 tornadoes occurred (6) of which were strong (F2). Additionally, there were 11 total tornadoes during this event which ties Oct 13, 2001 for the most tornadoes during any October event.

The maps below show the locations of surveyed tornado tracks as determined by the National Weather Service Office in Jackson.

Figure E.11: Sample of Historical Tornado Locations

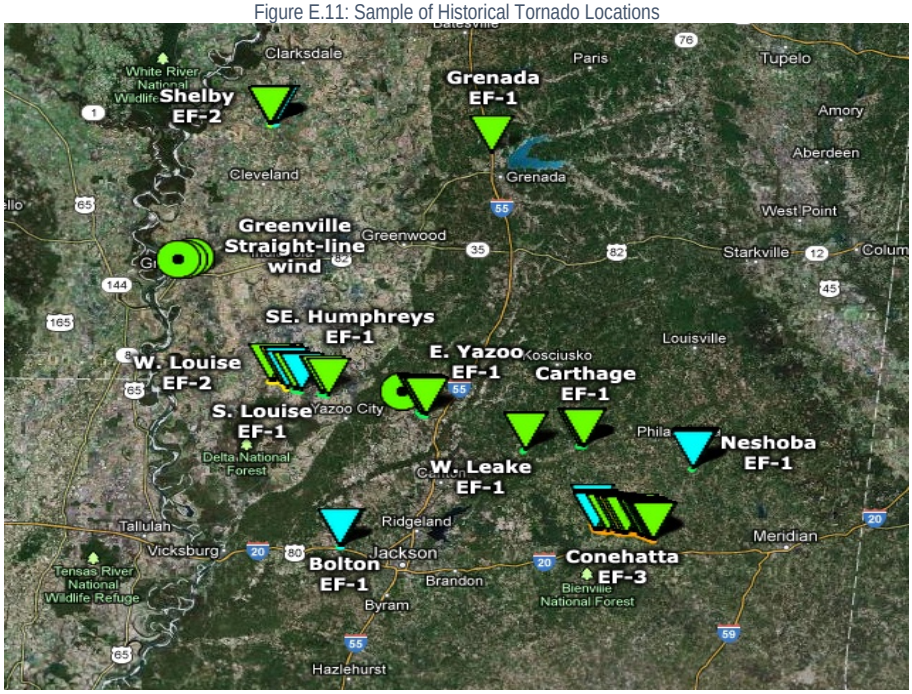
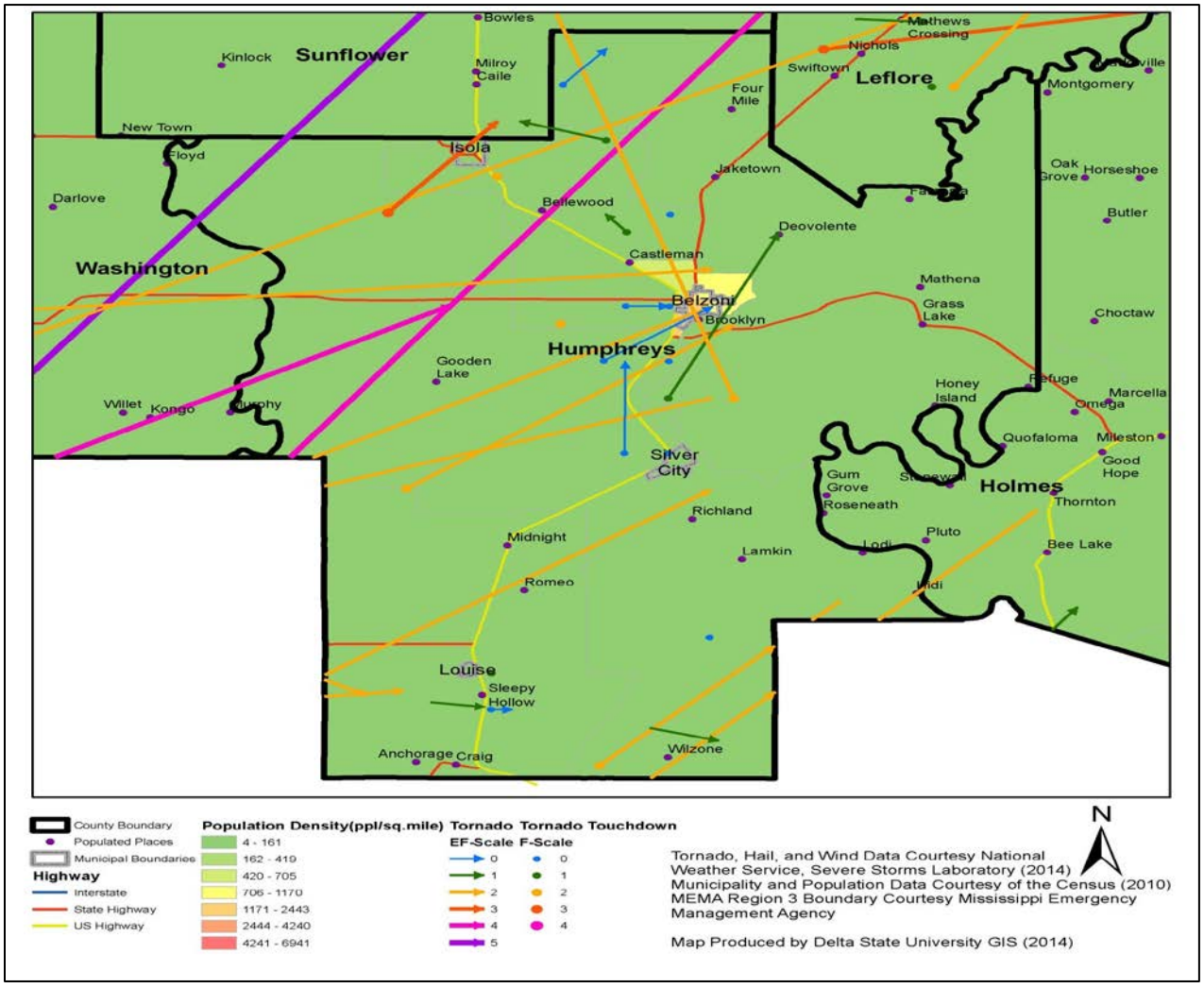


Figure E.12: Sample of Historic Tornado Events- Humphreys County



Probability of Future Occurrence

NCEI data presented shows that tornado events have occurred in 6 of the 19 years being studied as part of this mitigation planning process. This suggests that there is roughly a 31.5% chance that Humphreys County will be affected by a tornado in any given year. Equally likely is the possibility that more than one such event will occur within proximity to others – proximity in terms of time and geography.

Assessing Vulnerability

Although technology and warning system capabilities have improved significantly in recent years, tornadoes can still occur with little or no warning, and cause severe destruction, personal injury, and possible loss of life. The list of affected communities included in Table E.31 show that entire county is vulnerable to impacts from tornadoes. Particularly vulnerable are those living in mobile/manufactured housing units, as was discussed below.

Impacts to Life and Property: Perhaps most vulnerable to this hazard are those population segments consisting of (elderly, disabled, and poor) who may not have the ability to seek shelter in a timely manner. Older frame houses and mobile homes are particularly vulnerable to tornadoes. According to the 2018 American Community Survey, produced by the U.S. Census Bureau, there are roughly 348 mobile homes in the county. This figure represents 9.0% of the

total housing units. If other structures are not built to withstand high winds, roof damage or roof failure may occur, mobile homes are placed on an anchored foundation, the force of tornado winds will likely lift and overturn the structure. Severely damaged mobile homes may not be again habitable.

Impacts to Natural Resources: Tree canopy and decorative vegetation are all subject to tornado damage. The force of a tornado is powerful enough to uproot trees and vegetation and deposit the debris in standing water, which could result in pollution. Wildlife and farm animals are not likely to survive the force of tornado winds and may be carried to distant ground or deposited in a body of water which may result in pollution. Streams can become clogged with windblown debris and downed trees, causing flooding. If debris is not removed from vacant land it could become a threat to health and safety, create a fire hazard, or create a haven for unwanted vermin or pests.

Impacts to Critical Facilities: A tornado may affect any critical facility or critical infrastructure in Humphreys County. The County and its municipalities require that all new buildings and infrastructure, such as water tanks and towers, be built to high wind-resistant standards. All public and essential service buildings in Humphreys County are still at risk from a direct strike from a tornado; however, there is nothing to indicate that those buildings are more vulnerable than any other building in the County. Given the unpredictable nature of tornadoes and high potential , it is essential to have designated areas that are safer than other areas in all public and essential service buildings.

Tropical Storm / Hurricane

Location and Extent

While Humphreys County is situated over 200 miles from the Mississippi Gulf Coast, the area is vulnerable to the unavoidable effects of tropical storms/hurricanes as they reach land and continue to inland away from the coastal landing point. Storms moving inland have been known to produce violent winds, torrential rains, tornadoes, and flash flooding. Damage levels can be significant or low, depending on the hurricane path and whether it picks up strength before hitting landfall and moving more inland.

Previous Occurrences

Two recent storms documented by the National Weather Service are listed in Table E.32. They were included in the 2015 District 3 RHMP and records indicate that no subsequent events have affected the region. Hurricane Katrina caused substantial damage to all 82 Mississippi counties.

Table E.32 – Tropical Storm / Hurricane Events

Event Name	Date	Death	Injury	Property Damage	Crop Damage
Hurricane Rita	9/24/2005	-	-	30,000	200,000
Hurricane Katrina	8/29/2005	-	-	500,000	8,000,000
Total		**-**	**-**	**$530,000**	**$8,200,000**

Probability of Future Occurrence

Based on past events, the probability of tropical storm events is classified as low. Two events occurred in the past 20 years which, if averaged, would yield a 10.5% annual chance of occurrence. While climate change may increase the number and ferocity of hurricane events making landfall, there remains the fact remains that no other events are documented for the period since NCEI began keeping records in the year 1950.

Assessing Vulnerability

Hurricanes affecting the Gulf Coast usually lose strength as they make landfall and move northward, usually without hurricane force winds impacting the area. However, due to the speed, size, and magnitude of the storm, the County could still be affected by damaging winds. The entire population is at risk to tropical storms and hurricanes. Damage during these events may occur as a result from hurricane-spawned tornadoes and flooding from heavy rain.

Table E.33 includes the most recently available data secured from a HAZUS run for tropical storm/hurricane events to evaluate the potential economic losses for Humphreys County.

Table E.33 – Direct Economic Losses for Buildings Annualized Losses I Source: State of Mississippi Standard Hazard Mitigation Plan

Capital Stock Losses			Income Losses					
Cost Building Damage	Cost Contents Damage	Inventory Loss	Loss Ratio %	Relocation Loss	Capital Related Loss	Wages Loss	Rental Income Loss	Total Loss
$23,000	$5,000	0	.01	$3,000	0	0	$1,000	$32,000

The greatest threat to life and property in Humphreys County would occur in a Category 5 Hurricane directly striking the coastline of Harrison County, Hancock County, St. Bernard, or Plaquemine Parishes, Louisiana. A strike at these locations could place Humphreys County, being located approximately 200 miles north, directly in the path of the highest winds and heaviest rain bands produced by such a storm.

Impacts to People and Property: The very young, the elderly, and the disabled are particularly vulnerable to harm from tropical storms/hurricanes. Older frame homes and residences and businesses housed in manufactured structures are especially vulnerable to the effects of severe winds, rain, and tornadoes generated by hurricanes. Airborne missiles such as tree limbs and branches, signs and signposts, roofing, metal siding, and other pieces of buildings, including entire roofs can penetrate doors and windows. This penetration into the “envelope” of the building allows the force of the wind to act against interior walls and ceilings of the structure – causing structural failure.

Impact on Critical Facilities: Properties at risk may include hospitals, nursing homes and housing likely to contain occupants who may not be sufficiently mobile to avoid death and injury during a flood or other emergency. Public safety facilities such as fire stations, vehicle and equipment storage facilities and emergency operations centers could also be at risk if not properly mitigated.

Impacts of Natural Resources: The most significant risk to natural resources in tropical storms and hurricanes in Humphreys County is damage to forests canopy and timberlands. Inland rivers and lakes can become clogged with wind-blown debris and trees, slowing recovery from a hurricane. Obstructions, if not removed can become a cause of flooding. Trees toppled onto the forest floor quickly become a target for infestation from insects that may spread to healthy trees. Water quality may suffer due to unwanted debris and vegetation blown in a hurricane. Potential debris from fallen trees can create fuel for wildfires when the area dries sufficiently to allow for burning through lightning or intervention by mankind. The Mississippi State Forest Commission works continuously to ensure that, through proactive cutting and prescribed burns, fallen trees and debris will not become fuel for a wildfire. In areas where timber is a significant feature of the economy, hurricane winds wreak havoc with growing trees, causing damage that lessens the quality of the timber and increases the likelihood of insect infestation.

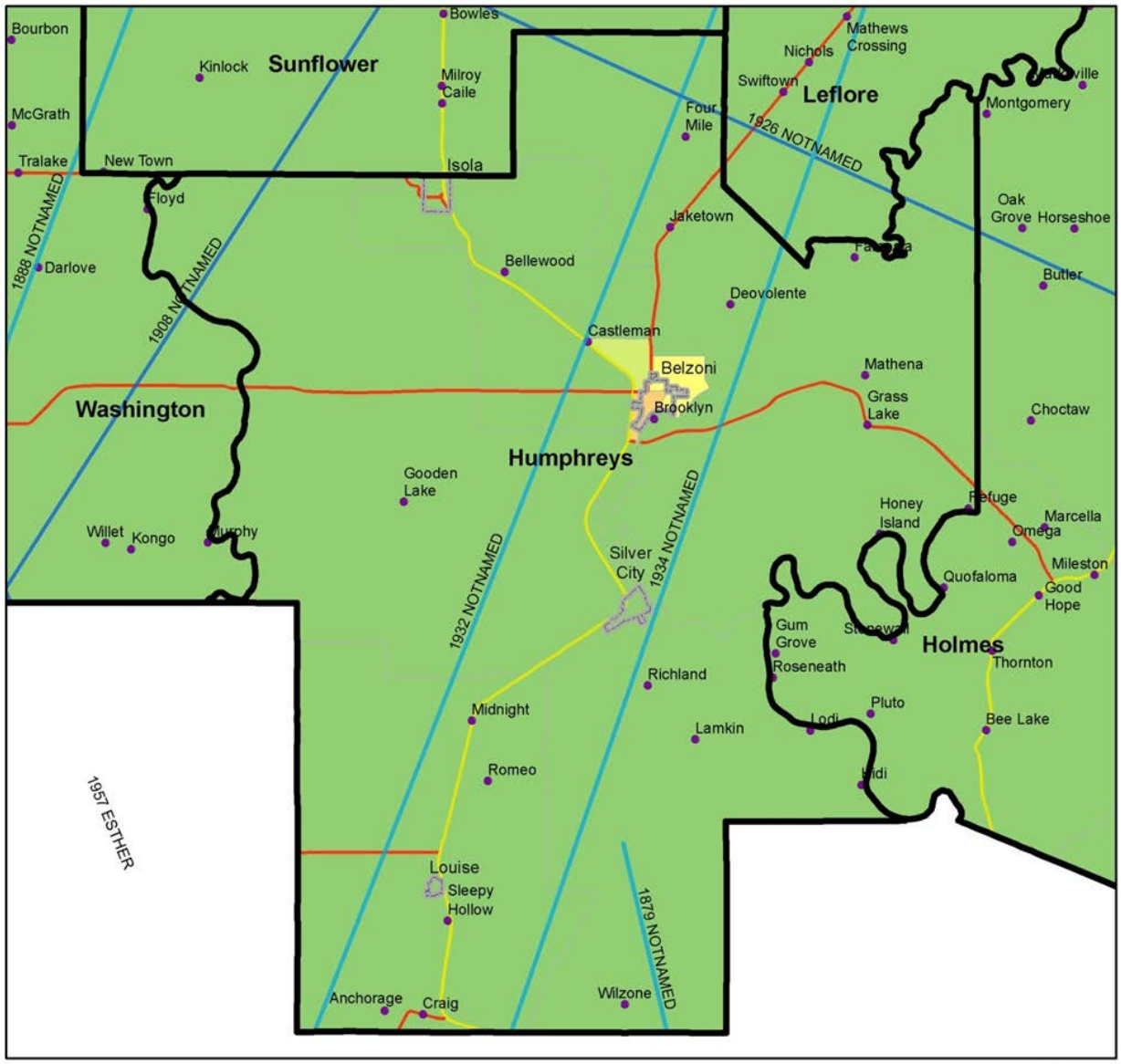
Impacts on Transportation Systems: Hurricane and/or high winds from tornadoes could result in power poles blown over or broken off onto roadways result in hazardous driving conditions until they can be cleared away. Overhead lines are often still energized until linemen are able to cut power to them. These conditions result in extremely hazardous driving conditions immediately following a hurricane or other windstorm. In heavily populated areas, lack of electricity also results in lack of signal lights at major intersections, creating driving hazards. Rail traffic could be interrupted by damage to railroad lines caused by flooding and damage to bridges and overpasses.

Impact on Lifeline Utility Systems: Overhead electric and telephone lines are damaged by trees and debris blown across them, or power poles and lines are blown over by hurricane force or tornado winds. In some instances, electric power may not be restored for many days or even weeks.

In the aftermath of Hurricane Katrina, the entire grid of Mississippi Power Company was affected down and, in some areas, land lines for telephones were down for weeks or months. This situation affected electrical cooperatives such as Central Electric Power Association (Carthage, Mississippi), which serves a portion of rural Humphreys County. The hurricane also damaged cell phone transmission towers and radio and television transmission towers, many of which were out of service due to electric power failure. Lack of electricity also left some water systems and sewage treatment plants unable to operate until generators could be brought in to restore partial power.

To further demonstrate how tropical storms have penetrated inland over a longer period of time (since the 1959s), the map below shows the tracks Humphreys County hurricane crossings for roughly the past 70 years, although only two events are documented by NCEI.

Figure E.13: Tropical Storm/Hurricane Historical Events-Humphreys County I Source: NCEI



Wildfire

Location and Extent

The Humphreys County land area includes approximately 30,268 acres of forestland is equal to 10.9% coverage as a percent of land. County forestland data was derived from the 2019 Forestland Inventory conducted by Mississippi Forestry Commission as shown in the table E.34.

Table E.34 – 2019 Forestland Statistics* I Source: www.mfc.ms.gov

		Forestland			
County	Total Land Area (Acres)	Acres	Coverage (%)	Pine	Hardwood
Attala	471,597	284,817	60.4	49.1	41.3
Bolivar	279,658	86,465	30.9	0.0	100.0
Carroll	405,982	263,067	64.7	22.5	68.5
Holmes	488,932	197,380	40.3	15.1	84.8
Humphreys	275,892	30,268	10.9	0.0	100.0
Leflore	387,967	57,537	14.8	0.0	100.0
Montgomery	260,948	161,110	61.7	36.1	54.2
Sunflower	452,541	23,174	0.05	0.0	100.0
Washington	487,198	74,984	15.3	0.0	100.0

The Wildfire discussion in the Base Plan mentioned that an analysis of the change in total forestland area from the previous plan shows that the total acreage and percent of coverage has continued on a declining trend in all District 3 counties, with Attala (-23.2%) and Holmes (-22.8%) Counties showing the greatest decline in forested land. The average loss of the other seven District 3 counties was 5.43 percent. Most forested land in the planning area is under private ownership.

Information provided by the Mississippi Forestry Commission indicates that wildfires may occur during any season but, since 2012, the worst fires (determined by the number of acres burned) have occurred in late Summer and early Fall. Data presented in above also shows the potential for county-level differences in the total number of fires and acreage burned from year to year based on the percentage of forestland in the county.

Past wildfires have threatened and destroyed property. The next table shows the number of residences, commercial buildings and outbuildings, broken down by county, that have been threatened or destroyed since 2015. Humphreys County has not seen any residences or businesses threatened or destroyed.

Table E.35-Humphreys County Structures Threatened and or Destroyed by Wildfire Since 2015 I Source: Mississippi Forestry Commission

County	Residences Threatened	Residences Destroyed	Commercial Building Threatened	Commercial Building Destroyed	Outbuilding Threatened	Outbuilding Destroyed
Attala	149	3	4	-	75	8
Bolivar	-	-	-	-	-	-
Carroll	113	-	45	-	33	1
Holmes	116	-	3	-	98	2
Humphreys	-	-	-	-	-	-
Leflore	2	-	-	-	6	-

Montgomery	33	-	4	-	43	4
Sunflower	-	-	-	-	-	-
Washington	1	-	-	-	1	-
TOTALS	**414**	**3**	**56**	**-**	**256**	**15**

Fortunately for all Humphreys County stakeholders, there is a strong fire protective services component between the local fire department and the presence of State forest rangers. These forces are strong and likely able to prevent most any fire from growing to catastrophic levels.

Previous Occurrences

A combination of local weather, drought conditions vegetative cover and topographic conditions may affect the development of wildfires. Documenting fire events is not consistent across the planning region with the local fire departments. The NOAA National Centers for Environmental Information (NCEI), Storm Events Database, shows no reported wildfires in the fifty-nine years between January 1, 1960 and December 1, 2019 for each of the District 3 counties. All available wildfire data is on a county level.

Table E.36 captures wildfire data for each District 3 county for the period 2014 to 2019. Humphreys County data is highlighted.

Table E.36 – Wildfire Data 2009 to 2011 I Source: www.mfc.ms.gov

County	2019		2018		2017		2016		2015		2014	
Humphreys	**Total Fires**	**Acres Burned**	**Total Fires**	**Acres Burned**	**Total Fires**	**Acres Burned**	**Total Fires**	**Acres Burned**	**Total Fires**	**Acres Burned**	**Total Fires**	**Acres Burned**
Attala	28	782	21	392	38	468	59	1,170	52	597	32	187
Bolivar	-	-	-	-	-	-	1	80	-	-	-	-
Carroll	5	18	4	32	13	172	24	387	24	268	16	83
Holmes	13	87	15	522	27	532	39	432	43	441	36	486
Humphreys	-	-	-	-	-	-	-	-	-	-	-	-
Leflore	-	-	-	-	-	-	1	22	6	150	-	-
Montgomery	4	34	-	-	1	7	14	139	12	154	8	135
Sunflower	-	-	-	-	-	-	1	-	-	-	-	-
Washington	1	5	-	-	1	32	-	-	1	8	1	40

Information provided by the Mississippi Forestry Commission indicates that wildfires may occur during any season but, however, since 2012, the worst fires (determined by the number of acres burned) have occurred in late Summer and early Fall. The data presented in the table above also indicates the differences in total fires and average burned from year to year and county to county. Within the planning area, there is no data available on structures threatened or destroyed. Humphreys County data is highlighted.

Probability of Future Occurrences

Table E.37 below shows the number of fires and acres burned each year between 2014 and 2019, along with mean and median averaged for each.

Table E.37 – Mean and Median Averages for Humphreys County, Number of Fires and Acres Burned I Source: Mississippi Forestry Commission

Total Fires	2019	2018	2017	2016	2015	2014	Total	Mean	Median
Total Fires	-	-	-	-	-	-	-	-	-
Acres Burned	-	-	-	-	-	-	-	-	-

It has been stated that it is difficult to develop probability of wildfire occurrence due to the range of elements that "set the stage" for a wildfire to occur. There is not any historical data for Humphreys County, however it can be stated that in any given year there is a potential for at least 1 fire to develop.

Assessing Vulnerability

Wildfires pose a low threat to all areas of Humphreys County, where just around 10.9 % of acreage is forestland. Current mitigation of the fire hazard includes regular thinning of vegetative fuel, but the County Emergency Management Department works closely with County and local fire departments to educate the public about issues such as backyard burning that can lead to wildfire. Figure E.14a through E.14e are screen shots from the web site of the Southern Wildfire Risk website (www.southernwildfirerisk.com) established by the Southern Group of State Foresters. These images show the overall risk of Humphreys County and its jurisdictions located in the Wildfire Urban Interface (WUI).

Figure E.14a: Jurisdictional Wildfire Vulnerability -Humphreys County

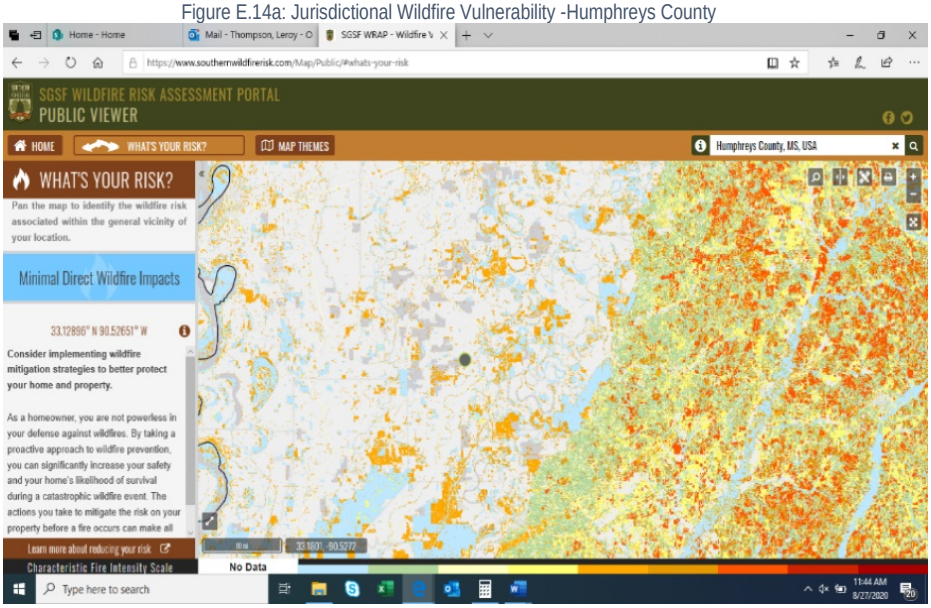


Figure E.14b –Jurisdictional Wildfire Vulnerability- City of Belzoni

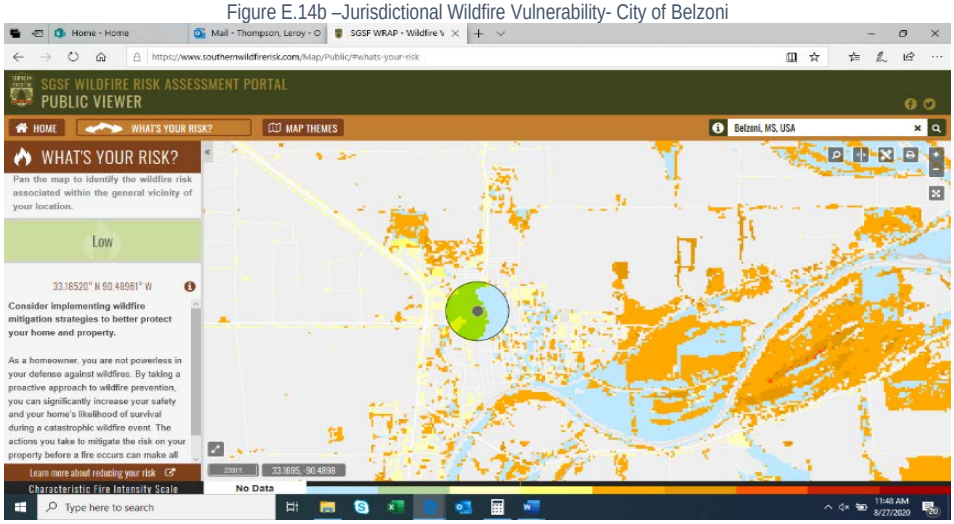


Figure E.14c –Jurisdictional Wildfire Vulnerability-Town of Isola

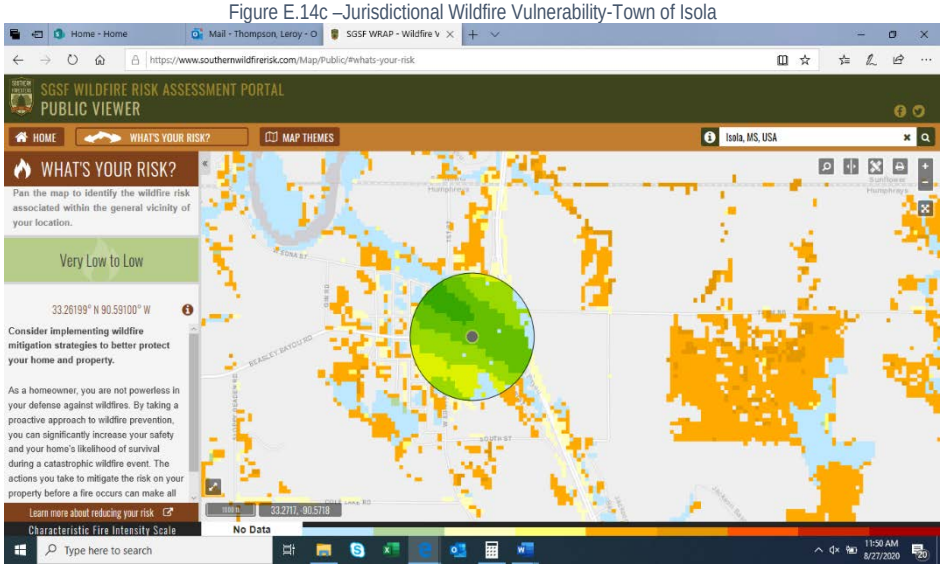


Figure E.14d –Jurisdictional Wildfire Vulnerability-Town of Louise

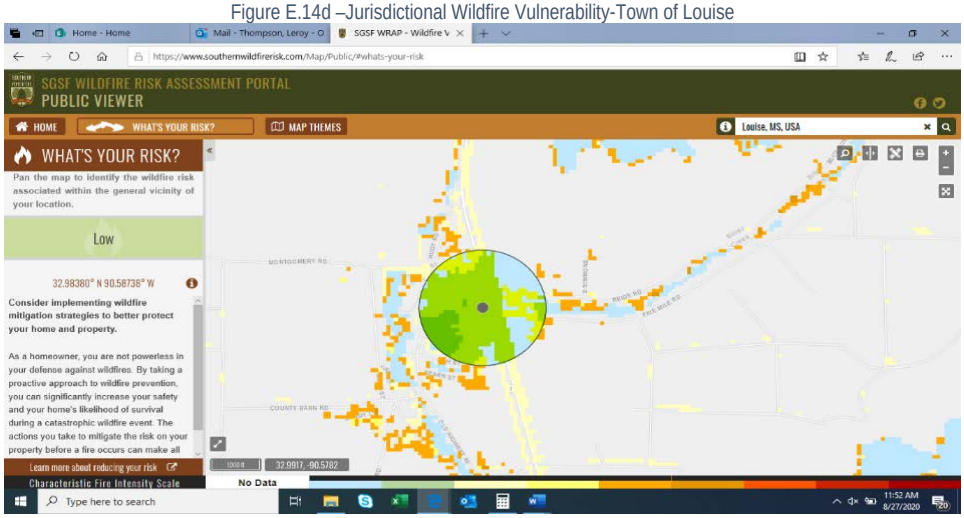
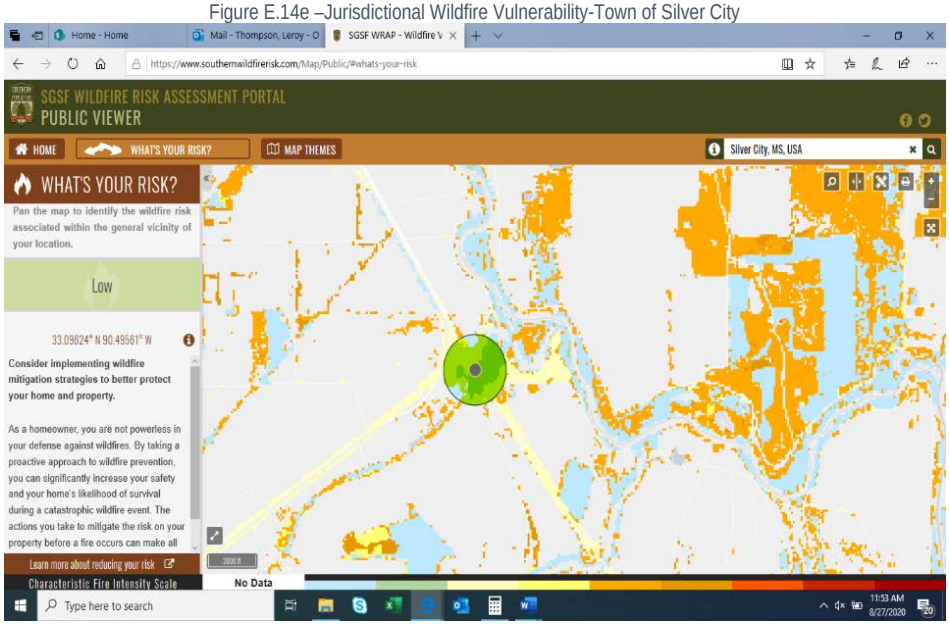


Figure E.14e –Jurisdictional Wildfire Vulnerability-Town of Silver City



The following table summarizes the risk of Humphreys County and each of its jurisdictions to wildfire SGSF portal.

Table E.38: Geographic Vulnerability to Wildfire by Jurisdiction I Source: MFC

Jurisdiction	Ranking
Unincorporated Humphreys County	Low-Very Low
City of Belzoni	Low
Town of Isola	Very Low
Town of Louise	Low
Town of Silver City	Low
Overall Humphreys County Vulnerability to Wildfire	Low

The hazard was rated as being low overall in the 2015 RHMP. The places most vulnerable to wildfires are forested areas in unincorporated areas of Humphreys County. Current mitigation of fire hazard includes regular thinning of trees and removal of dead limbs and underbrush of the 30,268 acres of forestland.

Impacts to Life and Property: Wildfire could impact the community by overextending personnel and financial resources of local emergency response crews and create a need to evacuate residences and businesses. The County's vulnerability to county-wide wildland fire hazard is mitigated somewhat by the presence of fire stations in most parts of the county, as well as the presence of a Sheriff's Office, which serves as an alternate EOC and personnel to augment those resources of fire stations.

Impacts to Critical Facilities: Electrical power could be impacted by wildfire and service could be temporarily interrupted by wildfire. It is doubtful that wildfire would have a lasting impact on water and sewer systems.

Impact on Future Development: The efforts of public and non-profit water associations ensure that there will always be water available for firefighting and structural protection, particularly in rural areas of the County. Several fire stations and districts in the county are not manned on a full-time basis but rely on volunteers, assisted by the Forestry Service, to fight wildfires. This could result in a negative impact on future development especially in the rural areas. Firefighting capacity may need to be enhanced should the community reach a point where future development includes significant numbers of residents or large industrial assets.

Hazardous Material Incidents

Location and Extent

Many hazardous and toxic materials are transported through areas of Humphreys County on 18-wheelers via U.S. Highways 49 W, and Mississippi State Highways 7, 12, 14 and 16.

The proximity of these transportation routes to areas of Humphreys County increase the risk to residents in a five-mile radius for hazards involving transportation accidents and hazardous materials spills. A secondary risk to a transportation accident involving hazardous materials is the hazard of explosions and fires.

Previous Occurrences

Table E.39 provides a summary of toxic release incidents reported in Humphreys County from 2014 through 2019. According to the U.S. Environmental Protection Agency (EPA) Toxic Release Inventory (TRI), the following industries within Humphreys County handle hazardous materials and have had reported releases.

Table E.39- EPA Toxic Release Inventory Summary for Humphreys County 2014-2018 I Source: U.S. Environmental Protection Agency, Toxic Release Inventory Program Database; https://www.epa.gov/toxics-release-inventory-tri-program

	2018		2017		2016		2015		2014	
County	No. Facilities	No. Reports	No. Facilities	No. Reports	No. Facilities	No. Reports	No. Facilities	No. Reports	No. Facilities	No. Reports
Humphreys	2	2	2	2	2	2	1	2	2	2

Probability of Future Occurrence

It is likely that an event of this type will occur in Humphreys County at some point in the future given the fact that a major interstate highway and other major state and local roadways pass through the county. Specific areas where such incidents may occur are discussed under Addressing Vulnerability.

Assessing Vulnerability

Location, magnitude, type of problem, wind velocity and direction, and weather conditions vary with each incident, thus making an assessment of vulnerability difficult at best. The possible impact of a hazardous materials incident could include evacuation from homes and businesses, possible deaths or injuries from exposure, long-term environmental damage, and property losses.

Summary of Risk Assessment

Table E.40, shown at the beginning of discussion of Humphreys County hazards, is presented here to as a summary of all hazards discussed.

Table E.40: Humphreys County Hazard Events and Damages I Source: NCEI

Hazard Type	No of Events	Death	Injury	Property Damage	Crop Damage
Dam/Levee Failure	-	-	-	-	-
Drought	10	-	-	$ 130,000	$ 6,991,000
Earthquake	-	-	-	-	-
Extreme Heat	5	-	-	-	-
Expansive Soil	-	-	-	-	-
Flood	16	-	-	$ 1,897,000	$ 1,100,000
Severe Storm	112	-	-	$ 821,500	$ 150,000
Severe Winter Weather	12	-	-	$ 910,000	-
Tornado	12	1	10	$ 6,383,000	$ 705,000
Tropical Storm / Hurricane	2	-	-	$ 530,000	$ 8,200,000
Wildfire	-	-	-	-	-
Totals	169	1	10	$ 10,671,000	$ 17,146,000

* Damage estimates not available

This data shows that, in terms of number and frequency, severe storms are the most regularly occurring, while drought has caused the most damage to both property and crops totaling over $130 thousand in property damage and $6.991 million in crop damage. Of the $27,817,000 in total damages from 112 event occurring between 2000 and 2019, crop damage represents roughly twice the dollar amount of damage as that to personal property. Figures show tornadoes and the rare hurricanes that affect Humphreys County were responsible for much of the damage.

The Mississippi Department of Revenue 2018 Annual Report showed that there was a 2017 total property assessment value of 2017 equaled $ 82,795,525. A severe hazard event causing damage to 10 percent of property would cause damage in the amount of $ 8,279,552. Assuming that crop damage associated with such an event might run twice this amount, it can be anticipated that crop damage would run approximately has been estimated and roughly one third of property damage, the crop damage associated with such an event would total approximately $ 16,559,104, and overall damage could run as high as $24,838,656. Figures could vary widely depending on event type, location, magnitude, and extent.

E.3 Capability Assessment

This section assesses Humphreys County's capability to implement hazard mitigation activities. More detailed information on the purpose and methodology used to conduct the capability assessment can be found in Section 5 - Capability Assessment.

Planning and Regulatory Capability

The findings of the Planning and Regulatory section of capability assessment are described below in Table E.41. This table provides a jurisdictional overview of the plans and programs in place, followed by summary statistics of the *Local Capability Assessment Surveys*. Each county and municipality were asked to self-assess their capabilities. The planning and regulatory capabilities in Humphreys County and it participating jurisdictions has not changed since the previous plan.

Table E.41 - Relevant Plans, Ordinances and Programs

Jurisdiction	Comprehensive / Master Plan	Capital Improvements Plan	Economic Development Plan	Emergency Operations Plan	Continuity of Operations Plan	Transportation Plan	Stormwater Management Plan	Community Wildfire Protection Plan	Historic Preservation Plan	Building Codes	Fire Department ISO Rating	Site Plan Review Requirements	Land Use Plan	Zoning Ordinance	Subdivision Regulation	Flood Damage Prevention Ordinance	Flood Insurance Studies	National Flood Insurance Program	Community Rating System (CRS)
Humphreys County	✓			✓	✓	✓	✓		✓	'12	10	✓				✓	✓	✓	
Belzoni	✓			✓		✓	✓			'03	7	✓	✓	✓	✓	✓	✓	✓	
Isola	✓			✓		✓				'12	8	✓				✓	✓	✓	
Louise	✓			✓		✓				'12	8						✓	✓	
Silver City				✓		✓				'12	10			✓	✓	✓	✓		

Emergency Management Capabilities

Hazard Mitigation Plan: A hazard mitigation plan represents a community's blueprint for how they intend to reduce the impact of natural and human-caused hazards on people and the built environment. Elements of a hazard mitigation plan include a risk assessment, capability assessment and mitigation strategy.

- The jurisdictions within Humphreys County participate in the development and implementation of a hazard mitigation plan.

Emergency Operations Plan: An emergency operations plan outlines responsibility and the means by which resources are deployed during and following an emergency or disaster.

- Survey results indicate that Humphreys County, the City of Belzoni and the towns of Isola, Louise and Silver City all had emergency operations plans.

Continuity of Operation Plan: A continuity of operations plan establishes a clear chain of command, line of succession, and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster.

- Survey results indicate that Humphreys County has continuity of operations plan.

General Planning Capabilities

The implementation of hazard mitigation activities often involves individuals beyond the emergency management profession. Stakeholders may include local planners, public works officials, economic development specialists and others. Similarly, hazard mitigation planning cuts across multiple disciplines. As a result, the questions asked in the Local Capability Assessment Survey regarding general planning capabilities were designed to measure the degree to which mitigation is integrated into other planning efforts.

Comprehensive Plan: A comprehensive plan establishes the overall vision for a community and helps to guide municipal decision-making.

- Survey results indicate that Humphreys County and the municipalities of Belzoni, Isola and Louise have comprehensive plans.

Economic Plan: An economic plan serves as a road map for economic development decision making, based on the collection of statistical data, historical perspective, and human potential.

- Survey results indicate that no jurisdictions have an economic plan.

Community Wildfire Protection Plan: The community wildfire protection plan is a strategic plan that identifies wild land fire issues facing the community and outlines prioritized mitigation actions.

- Survey results indicate that no jurisdictions have community wildfire protection plans.

Transportation Plan: A transportation plan identifies the means to gauge transportation demands and the options to meet those needs, while considering the social, economic and environmental characteristics of the area. The development of transportation networks can significantly impact the amount, type and location of future growth. As a result, transportation planning can have a dramatic impact on future hazard vulnerability.

- Survey results indicate that Humphreys County, the City of Belzoni and the Towns of Isola, Louise and Silver City all have transportation plans.

Capital Improvements Plan: A capital improvements plan guides the scheduling of spending on public improvements. A capital improvements plan can serve as an important mechanism to guide future development away from identified hazard areas. Limiting public spending in hazardous areas is one of the most effective long-term mitigation actions available to local governments.

- Survey results indicate that no jurisdictions have capital improvement plans.

Historic Preservation Plan: A historic preservation plan is intended to preserve historic structures or districts within a community. An often-overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards to include the identification of the most effective way to reduce future damages. This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of harm's way.

- Survey results indicate that Humphreys County has a historic preservation plan.

Zoning Ordinances: As part of a community's police power, zoning is used to protect the public health, safety and welfare. A zoning ordinance is the mechanism through which zoning is typically implemented. Since zoning regulations enable municipal governments to limit the type and density of development, it can serve as a powerful tool when applied in identified hazard areas.

- Survey results indicate that the municipalities of Belzoni and Silver City have zoning ordinances.

Subdivision Ordinances: A subdivision ordinance is intended to regulate the development of housing, commercial, industrial or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development.

- Survey results indicate that the municipalities of Belzoni and Silver City have subdivision ordinances.

Building Codes, Permitting and Inspections: Building codes regulate construction standards. Decisions regarding the adoption of building codes, the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community.

- Survey results indicate that Humphreys County, the City of Belzoni and the Towns of Isola, Louise and Silver City all have building codes, permitting and inspections.

Floodplain Management Capability: Flooding represents the greatest natural hazard facing the nation and the planning area. At the same time, the tools available to reduce the impacts associated with flooding are among the most developed when compared to other hazard-specific mitigation techniques. Information contained in this section has been gathered through surveys and the NFIP Status Book.

Storm Water Management Plan: A storm water management plan is designed to address flooding associated with storm water runoff. The storm water management plan is typically focused on design and construction measures that are intended to reduce the impact of more

frequently occurring minor urban flooding.

- Survey results indicate that Humphreys County and the City of Belzoni have storm water management plans.

Flood Damage Prevention Ordinance/NFIP participation: A local Flood Damage Prevention Ordinance is a tool used by counties and municipalities to regulate the type of construction that occurs in the floodplain. If a community is an NFIP participant, a Flood Ordinance or Court Order is in place.

- Survey results indicates that Humphreys County and the City of Belzoni and the Towns of Isola and Louise have flood damage prevention ordinances. Additionally, the Town of Silver City does not participate in the NFIP.

- Below is a summary from the NFIP database of the participating jurisdictions within Humphreys County.

Continued Compliance to NFIP

Given the flood hazards in the planning area, an emphasis will be placed on continued compliance with the NFIP. The following steps will be taken by each participating community in order to meet or exceed the following minimum requirements as set by the NFIP.

- Issuing or denying floodplain development/building permits
- Inspecting all development to ensure compliance with local ordinance
- Maintaining records of floodplain development
- Assisting in the preparation and revision of flood maps/updates
- Assist residents in obtaining information on flood hazards, floodplain map data, flood insurance and proper construction measures.

The Town of Silver City does not participate in the NFIP. A mitigation action has been included in their action plan in the event the officials move to participate in the program.

Table E.42: Humphreys County NFIP Communities I Source: NFIP Policy and Loss Statistics as of 3/31/2018, 2018 State Hazard Mitigation Plan

Jurisdictions	NFIP Date	NFIP Policies In Force	Insurance in Force	Closed Claims	Total Payments to Date ($)
Unincorporated Humphreys County	1/19/1983	126	25,563,000	218	$2,336,395
Belzoni	1/19/1983	28	6,622,000	86	$902,788
Isola	7/3/1978	3	655,000	-	-
Louise	5/1/1979	1	280,000	1	8,000
Silver City	Not Participating	-	-	-	-
Totals		158	33,120,000	215	$3,247,183

Administrative and Technical Capability

Table E.43 provides a summary of the capability assessment results for Humphreys County with regard to administrative and technical capabilities. The administrative and technical capabilities in Humphreys County and it participating jurisdictions has not changed since the previous plan.

Table E.43 - Administrative and Technical Capability

Jurisdiction	Planning Commission	Participation in Emergency Management Committee (LEPC or other)	Maintenance program to reduce risk (i.e., tree trimming, clearing drainage systems)	Mutual Aid Compacts	Building Inspection Department	Floodplain Manager	Emergency Manager	Community Planner	Civil Engineer	GIS Coordinator	Warning Systems / Services (i.e., reverse 911 / outdoor warning	Grant Writing Capabilities	Planning Commission
Humphreys County		✓	✓		✓	✓	✓	✓		✓		✓	✓
Belzoni		✓	✓		✓	✓	✓			✓		✓	✓
Isola		✓			✓	✓	✓			✓		✓	✓
Louise		✓			✓	✓	✓			✓		✓	✓
Silver City										✓		✓	

Fiscal Capability

Table E.44 provides a summary of the results of the local capability assessment for Humphreys County with regard to relevant fiscal resources. The fiscal capabilities in Humphreys County and it participating jurisdictions has not changed since the previous plan.

Table E.44 - Relevant Financial Resources

Jurisdiction	Capital Improvements Project Funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric services	Impact fees for new development	Stormwater utility fee	Incur debt through general obligation bonds or tax bonds	Incur debt through private activities	Community Development Block Grant (CDBG)	Other federal funding programs	State funding programs
Humphreys County	✓	✓				✓		✓	✓	✓
Belzoni	✓	✓	✓			✓		✓	✓	✓
Isola			✓			✓		✓	✓	✓
Louise			✓			✓		✓	✓	✓
Silver City			✓			✓		✓	✓	✓

Education and Outreach Capability

Table E.45 provides the results for the education and outreach capability for Humphreys County.

Table E.45 - Relevant Education Programs and Organizations

Jurisdiction	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Ongoing public education or information programs (e.g. responsible water use, fire safety, household preparedness, environmental education)	Natural disaster or safety-related school programs	*StormReady certification*	*Firewise Community Certification*	*Public / Private partnership initiatives addressing disaster- related issues*
Humphreys County		✓				✓
Belzoni			✓			✓
Isola						✓
Louise						✓
Silver City						✓

The lack of coordinated jurisdictional and countywide mitigation education and outreach resources was identified as a need by all jurisdictions. As such, communities and the County Emergency Management Department have agreed to approach the North Central Mississippi Planning and Development District to help develop a communications and information program using the County web site as its platform. A web page dedicated to this effort would include information on all natural and manmade hazards to which the region is prone. Each jurisdiction could include a hyperlink on its own web site that takes the user to information posted on the County site.

Mitigation action worksheet for this project are included at the end of this annex as a show of support for this countywide mitigation strategy. This approach to communications and outreach is reasonable in light of the Incident Command Structure used in the event of an emergency. Should a major hazard incident occur, the office of District 3 would contact the Emergency Management Director of each county who, in turn, provides status reports to jurisdictional elected officials. Because communities come together to plan for and respond to disasters, they will use this same approach to collectively develop relevant education and outreach programs that educate communities about how to mitigate against regional hazards of concern.

Conclusions on Local Capability

Table E.46 shows the results of the capability assessment using the scoring system that can be found in Section 5 of the base plan. The scoring for Humphreys County was based on information from the local capability survey and reviewing existing plans. According to the assessment, the average local capability score for the county and its communities is 36.4 which fall into Moderate capability. The overall local capabilities in Humphreys County and it participating jurisdictions has not changed since the previous plan.

Table E.46 – Capability Results Summary

Jurisdiction	Overall Capability Score	Overall Capability Rating
Humphreys County	44	Moderate
Belzoni	45	Moderate
Isola	35	Moderate
Louise	32	Moderate
Silver City	26	Limited

E.4 Mitigation Strategy

The participating jurisdictions reviewed the mitigation goals and priorities identified in the County's previous plan. Common elements of the previous mitigation goals were used to develop regional goals designed to achieve the implementation of mitigation actions. These refined goals were adopted by the participating jurisdictions. It was determined that the priorities for each of the participating jurisdictions had not changed, although the regionwide mitigation goals and objectives were streamlined as discussed in the base plan.

The Mitigation Strategy for Humphreys County includes several changes, including those based on the streamlined list of 2020 Goals and Objectives. The table of action items includes mitigation actions identified in the 2015 plan; the outcome of each; and how the strategy was updated for the 2020 plan; and newly developed mitigation actions, if any. The 2015 plan included two separate tables of mitigation actions: one table to provide a status update on actions mentioned in the previous plan; and a second table outlining the current mitigation strategy. These have been combined into one table in the current plan update.

Previous plans included a large number of mitigation actions considering the size and available resources of some jurisdictions, including those with only a few hundred residents. An example of this is the fact that most County Emergency Management (EM) Directors are the single departmental employee, or they perform their EM duties while functioning in one or more service roles in their community. The same is often true for leadership at the city or town level, where those in leadership "wear many hats."

Several changes were made to streamline the Mitigation Strategy given the following considerations.

- Actions identified as falling into the Preparedness Phase of the Emergency Management Cycle were removed and recommended for consideration under Preparedness Planning. Examples of this include disaster preparedness initiatives (such as providing weather radios to residents) and NIMS training, which represent actions a community normally does to prepare for a hazard event.

- The image at right, developed for a MEMA presentation, clearly delineates that EM agencies operationally function under four phases of emergency management, although sometimes the phases run concurrently. Professional emergency managers and their Emergency Support Functions (ESF), units called up during disaster response, develop specific plans and actions to as appropriate for each event phase.

- Actions identified as being required as part of the FEMA Hazard Mitigation Planning Process were removed because these are fully spelled out under the Plan Maintenance section of this RHMP Update. Examples of this include reviewing the mitigation plan and meeting to discuss needed plan updates after a disaster occurs in the community.

- It was recommended that actions that were similar activities be combined into one action. For example, there were previously separate action items for educating the public about natural hazards and for educating the public about manmade (technological, biological, health-related) hazards. A single outreach plan using multiple communications channels can incorporate education about all hazards to all audiences if the outreach plan is fully developed.

- In some instances, extensive description of previous actions was shortened for plan readability.
- Most action items were identified by all jurisdictions. In these cases, a countywide action was recommended developed that would be jointly implemented by all participating jurisdictions.

It is hoped that the streamlined mitigation strategy will be more manageable for the District 3 Counties and its jurisdictions to implement.

Progress Made on Mitigation Strategies and Updated Mitigation Strategy

Humphreys County jurisdictions have been proactive in implementing mitigation strategies identified in their previous plan. Actions included in Table A.30 have been sorted so deleted actions appear at the end of each jurisdictional listing. They are highlighted, and a reason for deletion is listed in the column labeled "2020 Status." This column includes use of the following designations to show action status:

Designation	Meaning	Description
D	Deleted	Action was deleted from the plan for the reason described under the Column 2020 Status Description
N	New	New action for the 2020 Plan Update
R	Retained	Action previously included in the 2015 plan, with a description of how it will be continued in the 2020 plan
IP	In Progress	Action previously included in the 2015 plan has been initiated, but not yet completed.

In the column labeled *Implementation Timeline*, initiatives listed as "Continuous Action" refers to an ongoing action that has initiated but not completed.

The participating jurisdictions reviewed the mitigation goals and priorities identified in the County's previous plan. Common elements of the previous mitigation goals were used to develop regional goals designed to achieve the implementation of mitigation actions. These refined goals were adopted by the participating jurisdictions. It was determined that the priorities for each of the participating jurisdictions has not changed.

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	EstimatedCost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
HUM-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Humphreys County	Mayor's office, Humphreys Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.1	M	HMGP, CDBG, general budget	2020
HUM-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Humphreys County	Mayor's office, Humphreys Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure.	2020-2025	1.2	M	HMGP, CDBG, general budget	2020
HUM-03	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Humphreys County	Humphreys Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.3	H	HMGP, general budget	2020
HUM-04	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Humphreys County	Humphreys County EMA, MEMA	Flood	Undetermined	R	Apply for HMGP funding to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood. Track RFC/SRL properties not yet and mitigation options with the property owners as funding becomes available.	Continuous Action	1.2	M	FMA	2020

HUM-05	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	Humphreys County	Public Works, Drainage Districts	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for drainage systems and culverts	2020-2025	1.2	H	HMGP, CDBG, CIAP funding or part of developer agreements	2020
HUM-06	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	Humphreys County	Public Works	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for storm water conveyance and detention structures	Continuous action	1.2	M	CDBG, CIAP, general budget	2020
HUM-07	Create defensible space around structures and infrastructures.	Defensible zones and buildings, power and gas lines and other infrastructure may be lacking throughout the county.	Humphreys County	Public Works, BOS		Undetermined	R	Develop Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.2	L	General Funds	2020
HUM-08	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Lighting strikes can create outages to essential county water and sewer services as well as invite unnecessary damage to county facilities. Consider program to establish lightning grounding systems on critical water and sewer system elements and other facilities prone to strikes to ensure that essential county service continue.	Humphreys County	Public Works,	Severe Weather	Undetermined	R	Identify and prioritize critical facilities requiring installation of lightning protection systtem, starting with water and sewer facilities	2020-2025	1.2	H	General funds	2020

HUM-09	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the city. Furthermore, we realize hazards have cascading affects which should also be further explored. Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives	Humphreys County	Humphreys Co. EMA, MEMA	Multi-hazard	N/A	R	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	2.2	H	General budget	2020
HUM-10	Develop critical infrastructure and Key Resources database (CIKR)	The State is lacking a comprehensive data base of critical facilities, infrastructure and other lifeline activities. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities for the County and its jurisdictions. The County EMA can serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.	Humphreys County	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Retain; Action will enhance database of CIKR assets within community.	2020-2025	2.1	H	General budget	2020
HUM-11	Develop Community Wildfire Protection Plan (CWPP)	The Healthy Forest Restoration Act provide communities with a tremendous opportunity to influence where and how federal agencies	Humphreys County	Fire Department, County EMA	Wildfire	Undetermined	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	2.1	H	MFC, general budget, State Fire Marshall	2020

		implement fuel reduction projects on federal lands. A CWPP is the most effective way to take advantage of this opportunity. Consider developing a CWPP and contact Mississippi Forest Commission to obtain guidance and potential funding sources.											
HUM-12	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The county has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Humphreys County	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	2.2	M	General Funds	2020
HUM-13	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Humphreys County	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	2.2	M	General budget	2020
HUM-14	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	Humphreys County participates in the NFIP, but the CRS program. Consider participating in the CRS program and implement.	Humphreys County	BOS, Floodplain Manager, Building Official, Co EMA, MEMA	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.3	H	General budget	2020
HUM-15	Become a Firewise community	The Firewise Program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in an effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity	Humphreys County	BOS, Fire Department, MFC	Multi-hazards	Undetermined	R	Review requirements to become a Firewise community and take first steps toward becoming certified.	Continuous Action	2.1	H	General budget	2020

		and access to funding. Obtain a wildfire risk assessment from the State Firewise Liaison, form a committee and create a action plan based on the assessment.											
HUM-16	Continue efforts on public information and awareness for natural hazards	The and county has several outreach initiatives to communicate hazard preparedness information to the general public and visitors in the area. Providing timely information and educational information related to preparedness, mitigation, response, and recovery to the public to foster their ability to become self-sufficient.	Humphreys County	Co EMA, applicable department, MEMA, NWS, FEMA	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2020
HUM-17	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the county that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the county's' web page.	Humphreys County	Co EMA, applicable department, MSDH,	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2020

HUM-18	Promote workshops for emergency preparedness/continuity of operations.	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans establishes a clear chain of command, line of succession, and procedures for backups and alternative emergency facilities in case of extreme emergency or disaster.	Humphreys County	BOS and Humphreys Co.	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2020
HUM-19	Encourage the development of training and emergency planning for private companies that handle hazard materials	Hazardous materials, if not handled correctly, can adversely impact people and property should spills or damaging effects be encountered.	Humphreys County	Humphreys Co. EMA, Police and Fire Officials	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	M	General budget	2020
HUM-20	Develop public/private partnerships that promote community hazard mitigation and assist in reach hazard mitigation goals	Local businesses is important to all jurisdictions as they provide goods and services to support the community. Identifying business that have interest in hazard mitigation due to their own interests or for the interest of the whole community as needed. The county will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives.	Humphreys County	Humphreys Co. applicable departments	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	M	General budget	2020

HUM-21	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including installation, testing and inspection	Humphreys County	Humphreys County EMA, MEMA	Severe Weather, Tornado	$35,000	D	Moved to Preparedness Planning. Not a mitigation action. Remove - routine maintenance is not considered to be mitigation	Continuous Action	1.1	H	HMGP, Local Funds	2015
HUM-22	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Humphreys County	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.2	M	NWS	2015
HUM-23	Develop weather radio program for vulnerable populations	Outdoor warning sirens, text messaging, television and other forms of communication have been implemented to alert the public; however, areas/population that may not receive notifications due to location and/or lack of communication devices: develop committee to explore benefit/ cost, vendors, funding options, etc. to provide weather radios to vulnerable populations.	Humphreys County	MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	Tornado, Severe Storm	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	2 yr	1.1	H	NWS, Private Funds	2015
HUM-24	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	Humphreys County	BOS	Human Infect. Disease	Undetermined	D		Continuous Action	1.2	H	General budget	2015
HUM-25	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after	Humphreys County	Road Department, Public Works,	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove from Mitigation Plan. Routine maintenance is not considered mitigation.	Continuous Action	1.2	H	General budget	2015

		severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris											
HUM-26	Update the Comprehensive Emergency Management Plan (CEMP)	A CEMP provides for the preparation for and the carrying out all emergency functions to mitigate, prepare for, respond to, recover from emergencies and disasters, and to aid victims suffering from injury or damage, resulting from disasters caused by all hazards, whether natural, technological, or human caused and to provide support for search and rescue operations for person and property in distress.	Humphreys County	EMA, Police and Fire Departments	Multi-hazard	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	2.1	H	Homeland Security, EMPG	2015
HUM-27	Develop a Commodity Flow Study	Hazardous materials are transported through and to various locations in the county. The routes include rail, air and roadway. This study will provide valuable data in the way of what chemicals are being transported to confirm that the county has appropriate response procedures and equipment needed. The county should consider assembling a committee to determine if a Commodity Flow Study would be beneficial.	Humphreys County	Fire Department, County EMA	Hazardous Material	$50,000-$75,000	D	Move to Preparedness Planning. Appoint a group to conduct Commodity Flow Study as part of County's overall preparedness and response efforts to hazard material incidents.	2018	2.1	L	HMEP	2015
HUM-28	Develop/update the Comprehensive Plan to include hazard mitigation strategy/goals	A comprehensive plan establishes the overall vision for a community and help to guide decision making and priorities for addressing growth and changes in land use.	Humphreys County	BOS	Multi-hazards	$50,000-$75,000	D	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	2015-2020	2.1	M	General funds	2015

HUM-29	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Humphreys County	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action	2.1	M	General budget	2015
HUM-30	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from an federal, state and local level.	Humphreys County	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action	2.1	M	General budget	2015
HUM-31	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Humphreys County	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020	2.2	H	HMGP, general budget	2015
HUM-32	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The county can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Humphreys County	Humphreys County EMA	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action	3.1	M	General budget	2015

HUM-33	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	Humphreys County	Humphreys County EMA, applicable departments	Multi-hazards	Undetermined	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings.	Continuous Action	2.2	M	General budget	2015
HUM-34	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	Humphreys County	Humphreys County EMA, applicable departments	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action	3.1	M	General budget	2015
HUM-35	Promote/Build storm water detention ponds when appropriate.	Detention ponds could be a solution for addressing flood impacts.	Humphreys County	Public Works	Flooding	Undetermined		Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.3	L	CDBG, developers	2020

City of Belzoni

BEL-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	City of Belzoni	Mayor's office, Humphreys Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMGP, CDBG, general budget	2020
BEL-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	City of Belzoni	Mayor's office, Humphreys Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure.	2020-2025	1.1	M	HMGP, CDBG, general budget	2020
BEL-03	Promote/Build storm water detention ponds when appropriate.	Detention ponds could be a solution for addressing flood impacts.	City of Belzoni	Public Works	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.1	L	CDBG, developers	2020
BEL-04	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	City of Belzoni	Humphreys Co. EMA, MEMA	Multi-hazard	300000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.2	H	HMGP, general budget	2020
BEL-05	Continue efforts on mitigating Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	City of Belzoni	Humphreys County EMA, MEMA	Flood	Undetermined	R	Apply for HMGP funding to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood. Track RFC/SRL properties not yet and mitigation options with the property owners as funding becomes available.	Continuous Action	1.2	M	FMA	2020
BEL-06	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the city are frequently impacted by	City of Belzoni	Public Works, Drainage Districts	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component	2020-2025	1.1	H	HMGP, CDBG, CIAP funding or	2020

		flash flood and severe weather events.						for drainage systems and culverts				part of developer agreements	
BEL-07	Create defensible space around structures and infrastructures.	Defensible zones and buildings, power and gas lines and other infrastructure may be lacking throughout the city.	City of Belzoni	Public Works, BOS		Undetermined	R	Develop Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.2	L	General Funds	2020
BEL-08	Develop critical infrastructure and Key Resources database (CIKR)	The State is lacking a comprehensive data base of critical facilities, infrastructure and other lifeline activities. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities for the County and its jurisdictions. The County EMA can serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.	City of Belzoni	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Retain; Action will enhance database of CIKR assets within community.	2020-2025	2.2	H	General budget	2020
BEL-09	Develop/update the Comprehensive Plan to include hazard mitigation strategy/goals	A comprehensive plan establishes the overall vision for a community and help to guide decision making and priorities for addressing growth and changes in land use.	City of Belzoni	BOS	Multi-hazards	$50,000-$75,000	R	Continuous Action - Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	2020-2025	2.1	M	General funds	2020
BEL-10	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The city has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	City of Belzoni	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Continuous Action revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review. Provide copy of Updated RHMP as guidance.	Continuous Action	3.1	M	General Funds	2020

BEL-11	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	City of Belzoni	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Continuous Action, review all planning-related ordinances and initiatives, Provide copy of Updated RHMP as guidance.	Continuous Action	3.1	M	General budget	2020
BEL-12	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	The City of Belzoni participates in the NFIP, but the CRS program. Consider participating in the CRS program and implement.	City of Belzoni	BOS, Floodplain Manager, Building Official, Co EMA, MEMA	Multi-hazards	Undetermined	R	Retain and revise for City to take actions necessary to become a member of the CRS	Continuous Action	2.3	H	General budget	2020
BEL-13	Continue efforts on public information and awareness for natural hazards	The city and county has several outreach initiatives to communicate hazard preparedness information to the general public and visitors in the area. Providing timely information and educational information related to preparedness, mitigation, response, and recovery to the public to foster their ability to become self-sufficient.	City of Belzoni	Co EMA, applicable department, MEMA, NWS, FEMA	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	M	General budget	2020
BEL-14	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the county that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the county's' web page.	City of Belzoni	Co EMA, applicable department, MSDH,	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2020

BEL-15	Develop public/private partnerships that promote community hazard mitigation and assist in reach hazard mitigation goals	Local businesses is important to all jurisdictions as they provide goods and services to support the community. Identifying business that have interest in hazard mitigation due to their own interests or for the interest of the whole community as needed. The county will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives.	City of Belzoni	Humphreys Co. applicable departments	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	M	General budget	2020
BEL-16	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including installation, testing and inspection	City of Belzoni	Humphreys County EMA, MEMA	Severe Weather, Tornado	35000	D	Moved to Preparedness Planning. Not a mitigation action. Remove - routine maintenance is not considered to be mitigation	Continuous Action	1.1	H	HMGP, Local Funds	2015
BEL-17	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	City of Belzoni	Public Works	Flood	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for storm water conveyance and detention structures	Continuous action	1.2	M	CDBG, CIAP, general budget	2020
BEL-18	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and roadways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	City of Belzoni	Road Department, Public Works,	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove from Mitigation Plan. Routine maintenance is not considered mitigation.	Continuous Action	3.1	H	General budget	2015

BEL-19	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the city. Furthermore, we realize hazards have cascading affects which should also be further explored. Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives	City of Belzoni	Humphreys Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	2.1	H	General budget	2015
BEL-20	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	City of Belzoni	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Moved to Preparedness Planning.	Continuous Action	2.1	M	General budget	2015
BEL-21	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from an federal, state and local level.	City of Belzoni	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Moved to Preparedness Planning.	Continuous Action	3.1	M	General budget	2015
BEL-22	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	City of Belzoni	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	Removed as an action item, included in RHMP Plan Maintenance	2020	2.1	H	HMGP, general budget	2015

BEL-23	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The city can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	City of Belzoni	Humphreys County EMA	Multi-hazards	Undetermined	D	Removed as an action item, included in RHMP Plan Maintenance	Continuous Action	2.1	M	General budget	2015
BEL-24	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	City of Belzoni	Humphreys County EMA, applicable departments	Multi-hazards	Undetermined	D	Removed as an action item, included in RHMP Plan Maintenance	Continuous Action	2.3	M	General budget	2015
BEL-25	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and	City of Belzoni	Humphreys County EMA, applicable departments	Multi-hazards	Undetermined	D	Removed as an action item, included in RHMP Plan Maintenance	Continuous Action	3.1	M	General budget	2015

		conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.											
Town of Isola													
ISO-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Isola	Mayor's office, Humphreys Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMGP, CDBG, general budget	2020
ISO-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and town property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Town of Isola	Mayor's office, Humphreys Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure.	2020-2025	1.1	M	HMGP, CDBG, general budget	2020
ISO-03	Promote/Build storm water detention ponds when appropriate.	Detention ponds could be a solution for addressing flood impacts.	Town of Isola	Public Works	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.1	L	CDBG, developers	2020
ISO-04	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Isola	Mayor's office, Humphreys Co. EMA, MEMA	Multi-hazard	300000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.2	H	HMGP, general budget	2020
ISO-05	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the town are frequently	Town of Isola	Public Works, Drainage Districts	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component	2020-2025	1.2	H	HMGP, CDBG, CIAP funding or	2020

		impacted by flash flood and severe weather events.						for drainage systems and culverts				part of developer agreements	
ISO-06	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	Town of Isola	Public Works	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for storm water conveyance and detention structures	Continuous action	1.1	M	CDBG, CIAP, general budget	2020
ISO-07	Develop critical infrastructure and Key Resources database (CIKR)	The State is lacking a comprehensive data base of critical facilities, infrastructure and other lifeline activities. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities for the County and its jurisdictions. The County EMA can serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.	Town of Isola	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Retain; Action will enhance database of CIKR assets within community.	2020-2025	3.1	H	General budget	2020
ISO-08	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The town has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Town of Isola	Mayor's office, County EMA, applicable departments	Multi-hazards	Undetermined	R	Continuous Action revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review. Provide copy of Updated RHMP as guidance.	Continuous Action	2.1	M	General Funds	2020

ISO-09	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Town of Isola	Mayor's office, County EMA, applicable departments	Multi-hazards	Undetermined	R	Continuous Action, review all planning-related ordinances and initiatives, Provide copy of Updated RHMP as guidance.	Continuous Action	2.2	M	General budget	2020
ISO-10	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	The Town of Isola participates in the NFIP, but the CRS program. Consider participating in the CRS program and implement.	Town of Isola	Mayor's office, Floodplain Manager, Building Official, Co EMA, MEMA	Multi-hazards	Undetermined	R	Retain and revise for Town to take actions necessary to become a member of the CRS	Continuous Action	2.1	H	General budget	2020
ISO-11	Continue efforts on public information and awareness for natural hazards	The town and county have several outreach initiatives to communicate hazard preparedness information to the general public and visitors in the area. Providing timely information and educational information related to preparedness, mitigation, response, and recovery to the public to foster their ability to become self-sufficient.	Town of Isola	Mayor's office, Co EMA, applicable department, MEMA, NWS, FEMA	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	2.3	M	General budget	2020
ISO-12	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the county that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the county's' web page.	Town of Isola	Mayor's office, Co EMA, applicable department, MSDH,	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2020

ISO-13	Develop public/private partnerships that promote community hazard mitigation and assist in reach hazard mitigation goals	Local businesses is important to all jurisdictions as they provide goods and services to support the community. Identifying business that have interest in hazard mitigation due to their own interests or for the interest of the whole community as needed. The county will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives.	Town of Isola	Mayor's office, applicable departments	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2020
ISO-14	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including installation, testing and inspection	Town of Isola	Mayor's office, Humphreys County EMA, MEMA	Severe Weather, Tornado	35000	D	Moved to Preparedness Planning. Not a mitigation action. Remove - routine maintenance is not considered to be mitigation	Continuous Action	1.1	H	HMGP, Local Funds	2015
ISO-15	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	Town of Isola	Mayor's office, Road Department, Public Works,	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove from Mitigation Plan. Routine maintenance is not considered mitigation.	Continuous Action	1.2	H	General budget	2015
ISO-16	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the city. Furthermore, we realize hazards have cascading affects which should also be further explored. Identify opportunities to join committees and	Town of Isola	Mayor's office, Humphreys Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning.	Continuous Action	1.2	H	General budget	2015

		planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives											
ISO-17	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Town of Isola	Mayor's office, County EMA, Fire and Police	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action. Access available free online training through FEMA web site.	Continuous Action	2.1	M	General budget	2015
ISO-18	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from an federal, state and local level.	Town of Isola	Mayor's office, County EMA, Fire and Police	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action. Access available free online training through FEMA web site.	Continuous Action	3.1	M	General budget	2015
ISO-19	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Town of Isola	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020	3.1	H	HMGP, general budget	2015
ISO-20	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The town can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Town of Isola	Mayor's office, Humphreys County EMA	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	2.1	M	General budget	2015

ISO-21	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	Town of Isola	Mayor's office, Humphreys County EMA, applicable departments	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	2.1	M	General budget	2015
Town of Louise													
LOU-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Louise	Mayor's office, Humphreys Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update county and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMGP, CDBG, general budget	2020

LOU-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Town of Louise	Mayor's office, Humphreys Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure.	2020-2025	1.1	M	HMGP, CDBG, general budget	2020
LOU-03	Promote/Build storm water detention ponds when appropriate.	Detention ponds could be a solution for addressing flood impacts.	Town of Louise	Public Works	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.1	H	HMGP, general budget	2020
LOU-04	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Louise	Humphreys County EMA, MEMA	Flood	Undetermined	R	Develop priority list for generator acquisition as funding becomes available	Continuous Action	1.2	M	FMA	2020
LOU-05	Upgrade drainage systems and culverts	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	Town of Louise	Public Works	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for drainage systems and culverts	Continuous action	1.2	M	CDBG, CIAP, general budget	2020
LOU-06	Create defensible space around structures and infrastructures.	Defensible zones and buildings, power and gas lines and other infrastructure may be lacking throughout the county.	Town of Louise	Public Works, BOS		Undetermined	R	Develop Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.2	L	General Funds	2020

LOU-07	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the city. Furthermore, we realize hazards have cascading affects which should also be further explored. Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives	Town of Louise	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	2020-2025	3.1	H	General budget	2020
LOU-08	Develop critical infrastruc2020-2025ture and Key Resources database (CIKR)	The State is lacking a comprehensive data base of critical facilities, infrastructure and other lifeline activities. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities for the County and its jurisdictions. The County EMA can serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.	Town of Louise	EMA, Police and Fire Departments	Multi-hazard	Undetermined	R	Retain; Action will enhance database of CIKR assets within community.	2020-2025	2.1	H	Homeland Security, EMPG	2020
LOU-09	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The town has ordinances and regulations in place as required to address all hazards prone to the county and include	Town of Louise	Mayor's office, County EMA, applicable departments	Multi-hazards	Undetermined	R	Continuous Action revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review. Provide copy of	Continuous Action	2.2	M	General budget	2020

		any changes in future development areas.						Updated RHMP as guidance.					
LOU-10	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision reviews process, land suitability analysis, etc.	Town of Louise	Mayor's office, County EMA, Fire and Police	Multi-hazards	Undetermined	R	Continuous Action, review all planning-related ordinances and initiatives, Provide copy of Updated RHMP as guidance.	Continuous Action	2.1	M	General budget	2020
LOU-11	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	The Town of Louise participates in the NFIP, but the CRS program. Consider participating in the CRS program and implement.	Town of Louise	Mayor's office, Fire Department, MFC	Multi-hazards	Undetermined	R	Retain and revise for Town to take actions necessary to become a member of the CRS	Continuous Action	2.3	H	General budget	2020
LOU-12	Continue efforts on public information and awareness for natural hazards	The town and county have several outreach initiatives to communicate hazard preparedness information to the general public and visitors in the area. Providing timely information and educational information related to preparedness, mitigation, response, and recovery to the public to foster their ability to become self-sufficient.	Town of Louise	Mayor's office, Co EMA, applicable department, MSDH,	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2020
LOU-13	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the county that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the county's' web page.	Town of Louise	Mayor's office, and Humphreys Co.	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2020

LOU-14	Develop public/private partnerships that promote community hazard mitigation and assist in reach hazard mitigation goals	Local businesses is important to all jurisdictions as they provide goods and services to support the community. Identifying business that have interest in hazard mitigation due to their own interests or for the interest of the whole community as needed. The county will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives.	Town of Louise	Mayor's office, Humphreys Co. applicable departments	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	M	General budget	2020
LOU-15	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including installation, testing and inspection	Town of Louise	Mayor's office, Humphreys County EMA, MEMA	Severe Weather, Tornado	35000	D	Moved to Preparedness Planning. Not a mitigation action.Remove - routine maintenance is not considered to be mitigation	Continuous Action	1.1	H	HMGP, Local Funds	2015
LOU-16	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	Town of Louise	Public Works	Flood	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for storm water conveyance and detention structures	Continuous action	1.2	M	CDBG, CIAP, general budget	2020
LOU-17	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	Town of Louise	Mayor's office, Humphreys Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.2	H	General budget	2015

LOU-18	Conduct annual first responder training for all hazards	National Incident Management System (NIMS) is essential and required for coordinating efforts from an federal, state and local level.	Town of Louise	Mayor's office, County EMA, Fire and Police	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action	3.1	M	General budget	2015
LOU-19	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from an federal, state and local level.	City of Belzoni	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Moved to Preparedness Planning.	Continuous Action	3.1	M	General budget	2015
LOU-20	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Town of Isola	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020	3.1	H	HMGP, general budget	2015
LOU-21	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	Town of Louise	Mayor's office, Humphreys County EMA, applicable departments	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	3.1	M	General budget	2015

LOU-22	Conduct annual reviews of the MEMA District 3 RHMP	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	Town of Louise	Mayor's office, Humphreys County EMA, applicable departments	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action	2.1	M	General budget	2015
LOU-23	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that	Town of Louise	Mayor's office, Floodplain Manager, Building Official, Co EMA, MEMA	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	2.1	H	General budget	2015

		would be useful for the town to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.											
Town of Silver City													
SIL-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Silver City	Mayor's office, Humphreys Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMGP, CDBG, general budget	2020
SIL-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Town of Silver City	Mayor's office, Humphreys Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure.	2020-2025	1.2	M	HMGP, CDBG, general budget	2020
SIL-03	Promote/Build storm water detention ponds when appropriate.	Detention ponds could be a solution for addressing flood impacts.	Town of Silver City	Public Works	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.1	L	CDBG, developers	2020

SIL-04	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Silver City	Humphreys County EMA, MEMA	Flood	Undetermined	R	Develop priority list for generator acquisition as funding becomes available	Continuous Action	1.2	M	FMA	2020
SIL-05	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the town are frequently impacted by flash flood and severe weather events.	Town of Silver City	Public Works, Drainage Districts	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for drainage systems and culverts	2020-2025	1.2	H	HMGP, CDBG, CIAP funding or part of developer agreements	2020
SIL-06	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	Town of Silver City	Public Works Department	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for storm water conveyance and detention structures	2020-2025	1.1	L	General Funds	2020
SIL-07	Develop critical infrastructure and Key Resources database (CIKR)	The State is lacking a comprehensive data base of critical facilities, infrastructure and other lifeline activities. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities for the County and its jurisdictions. The County EMA can serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.	Town of Silver City	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Retain; Action will enhance database of CIKR assets within community.	2020-2025	3.1	H	Homeland Security, EMPG, General Budget	2020
SIL-08	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The Town Silver City has ordinances and regulations in place as required to address all hazards prone to the county and include	Town of Silver City	Fire and Police Department, Humphreys County EMA	Multi-hazards	Undetermined	R	Continuous Action revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review. Provide copy of	Continuous Action	2.1	M	General budget	2020

		any changes in future development areas.						Updated RHMP as guidance.					
SIL-09	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision reviews process, land suitability analysis, etc..	Town of Silver City	Mayor's Office, applicable departments	Multi-hazards	Undetermined	R	Continuous Action, Review all planning-related ordinances and initiatives, Provide copy of Updated RHMP as guidance.	Continuous Action	2.2	M	General budget	2020
SIL-10	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	The Town of Silver City does not participate in National Flood Insurance Program.	Town of Silver City	Floodplain Managers, Building Officials, Humphreys EMA, MEMA	Multi-hazards	Undetermined	R	Encourage and assist the Town's staff with developing and submitting an application to participate in the NFIP.	Continuous Action	2.1	H	General budget	2020
SIL-11	Continue efforts on public information and awareness for natural hazards	The town and county has several outreach initiatives to communicate hazard preparedness information to the general public and visitors in the area. Providing timely information and educational information related to preparedness, mitigation, response, and recovery to the public to foster their ability to become self-sufficient.	Town of Silver City	Mayor's Office, Humphreys Co. EMA, MEMA, NWS, FEMA	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	2.3	H	General budget	2020
SIL-12	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the county that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the county's' web page.	Town of Silver City	Mayor's Office, Humphreys Co. EMA, MSDA	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2020

SIL-13	Develop public/private partnerships that promote community hazard mitigation and assist in reach hazard mitigation goals	Local businesses is important to all jurisdictions as they provide goods and services to support the community. Identifying business that have interest in hazard mitigation due to their own interests or for the interest of the whole community as needed. The city will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives.	Town of Silver City	Mayor's Office, Humphreys Co. EMA	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2020
SIL-14	Install/maintain severe weather warning system	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Silver City	Mayor's office, Humphreys Co. EMA, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning.	2015-2020	1.1	M	NWS	2015
SIL-15	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	Town of Silver City	Road Department, Public Works, Mayor's Office	Multi-hazard	N/A	D	Moved to Preparedness Planning. Ongoing maintenance does not qualify as mitigation.	Continuous Action	1.2	H	General budget	2015
SIL-16	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the town.	Town of Silver City	Mayor's Office, applicable departments	Multi-hazard	Undetermined	D	Continuous action, moved to preparedness Planning initiative.	2019	1.2	H	General budget	2015

SIL-17	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Town of Silver City	Fire and Police Department, Humphreys County EMA	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action. Access available free online training through FEMA web site.	Continuous Action	2.1	M	General budget	2015
SIL-18	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from an federal, state and local level.	Town of Silver City	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Moved to Preparedness Planning.	Continuous Action	3.1	M	General budget	2015
SIL-19	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Town of Silver City	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020	3.1	H	HMGP, general budget	2015
SIL-20	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	Town of Silver City	Mayor's Office, Humphreys County EMA	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	2.1	M	General budget	2015

SIL-21	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	Town of Silver City	Humphreys County EMA, applicable departments	Multi-hazards	Undetermined	D	Removed as an action item, included in RHMP Plan Maintenance	Continuous Action	2.3	M	General budget	2015
SIL-22	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	Town of Silver City	Mayor's Office, Humphreys County EMA	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	2.1	H	General budget	2015

Mitigation Action Worksheets

Humphreys County elected to more fully describe two mitigation actions on a Mitigation Action Worksheet. The two worksheets address the following initiatives:

1. Retrofitting of critical infrastructure to provide protection from floods and high wind events.

2. Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others.

It was decided that all jurisdictions within the county will work on these two actions, so a separate action worksheet for each jurisdiction working on both each is included in the Actions Worksheets section. The Action Worksheets for Humphreys County are included first, and then jurisdictional worksheets follow.

Mitigation Action Worksheet		
1. Name of Jurisdiction:	Humphreys County, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the county severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Humphreys County-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Humphreys County Emergency Management Plan	
Progress Report		

13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Humphreys County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Humphreys County Mitigation Action Worksheet-2

Disaster communications originates with the Humphreys County Emergency Management Department. As such, it is appropriate to work with EM staff and the North Central Mississippi Planning and Development District to develop an education and outreach campaign that uses County communications as a touchstone for information about all hazards shared at the local level, included unincorporated and hard-to-reach communities.

Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	Humphreys County, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Humphreys County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, thus leaving stakeholders vulnerable to hazards.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Humphreys -2 Work with the North Central MS Planning and Development Council to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Humphreys Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Board of Supervisors, Mayors, City/Board of Aldermen, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	

11. Potential Fund Sources:	County and local budgets, PDD
12. Local Planning Mechanisms to be Used in Implementation, if any:	Humphreys County Emergency Management Plan, Town/City Communications Plans
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Jurisdictional Action Worksheets
Demonstrating Cooperative efforts with Humphreys on Mitigation Action Humphreys -2

Community Need

Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.

Solution:

Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Humphreys County Annex of the MEMA District 3 RHMP.

Mitigation Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Belzoni, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Belaoni-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	

11. Potential Fund Sources:	Local and County Budget, FEMA HMGP funding
12. Local Planning Mechanisms to be Used in Implementation, if any:	Humphreys County Emergency Management Plan
Progress Report	
13. Date of Status Report: **Report of Progress:** **Evaluation of Effectiveness:**	Project first discussed during a conference in which the Humphreys County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Belzoni, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Humphreys County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Belzoni-2 Work with the County and Regional Planning and Development Council to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Supporting efforts led by the Humphreys Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommended plan to the Board of Supervisors and local legislative bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	

11. Potential Fund Sources:	County and local budgets, PDD
12. Local Planning Mechanisms to be Used in Implementation, if any:	City of Belzoni Operations Plan, Humphreys County Emergency Management Plan,
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Mitigation Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Isola, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Isola-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	Local and County Budget, FEMA HMGP funding	

12. Local Planning Mechanisms to be Used in Implementation, if any:	Humphreys County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Humphreys County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Isola, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Humphreys County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Isola-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Supporting efforts led by the Humphreys Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommended plan to the Board of Supervisors and local legislative bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	

10. Useful Life:	Five years – revisit as local needs require
11. Potential Fund Sources:	County and local budgets, PDD
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town Communications Plan, City Emergency Management Plan, Humphreys County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Mitigation Action Worksheet		
1. Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Town of Louise, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Louise-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	Local and County Budget, FEMA HMGP funding	

12. Local Planning Mechanisms to be Used in Implementation, if any:	Humphreys County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Humphreys County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Louise, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Humphreys County annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Louise-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Humphreys Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	

11. Potential Fund Sources:	County and local budgets, PDD
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of Louise Operations Plan, Humphreys County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Mitigation Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Silver City, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Silver City-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	Local and County Budget, FEMA HMGP funding	

12. Local Planning Mechanisms to be Used in Implementation, if any:	Humphreys County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Humphreys County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Silver City, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Humphreys County annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Silver City-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Humphreys Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	

11. Potential Fund Sources:	County and local budgets, PDD
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of Silver City Operations Plan, Humphreys County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

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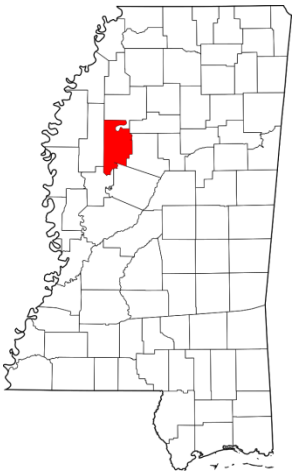
LEFLORE COUNTY



F.1 Community Profile

Geography

Located in north-central Mississippi, Leflore County is adjacent to Tallahatchie County to the north, Grenada County to the northeast, Carroll County to the east, Holmes and Humphreys Counties to the south and Sunflower County to the west. Leflore County is 108 miles north of Jackson, Mississippi and 140 miles south of Memphis, Tennessee. It includes the following communities (Figure F.1):

Cities	Towns	Unincorporated		
Greenwood	Morgan City	Berclair	Money Rising	Sunnyside
Itta Bena	Schlater	Browning	Quito	Swiftown
	Sidon	McNutt	Sun Ruby	Wildwood
		Minter City	Shellmound	

The total area of the county is 606.35 square miles which includes 14.42 square miles of water. Leflore County is in the Delta region of Mississippi. The Delta soil is characterized as mildly acidic to mildly alkaline. The geography of Leflore County is characterized by the relief typical of the Lower Mississippi Valley alluvial valley, with meandering ridges and swales, oxbow lakes, back-swamp areas, and low relief. Elevations range from 145 feet in the northern portion to 85 feet above sea level along the Yazoo River, where it enters Humphreys County to the south. The Yazoo and Yalobusha Rivers cross through Leflore just north of Greenwood and flow south through the eastern side of the county.

Greenwood is the county seat for Leflore County. It is located along Highways 82 and 49, and is 100 miles north of Jackson, Mississippi; 135 miles south of Memphis, Tennessee; and 50 miles east of the Mississippi River. With an approximate land area of 13 square miles, of which 12.4 square miles is land and 0.06 square miles is water, Greenwood's elevation ranges from 115 to 140 feet above sea level. The Tallahatchie River and the Yalobusha River meet at Greenwood to form the Yazoo River.

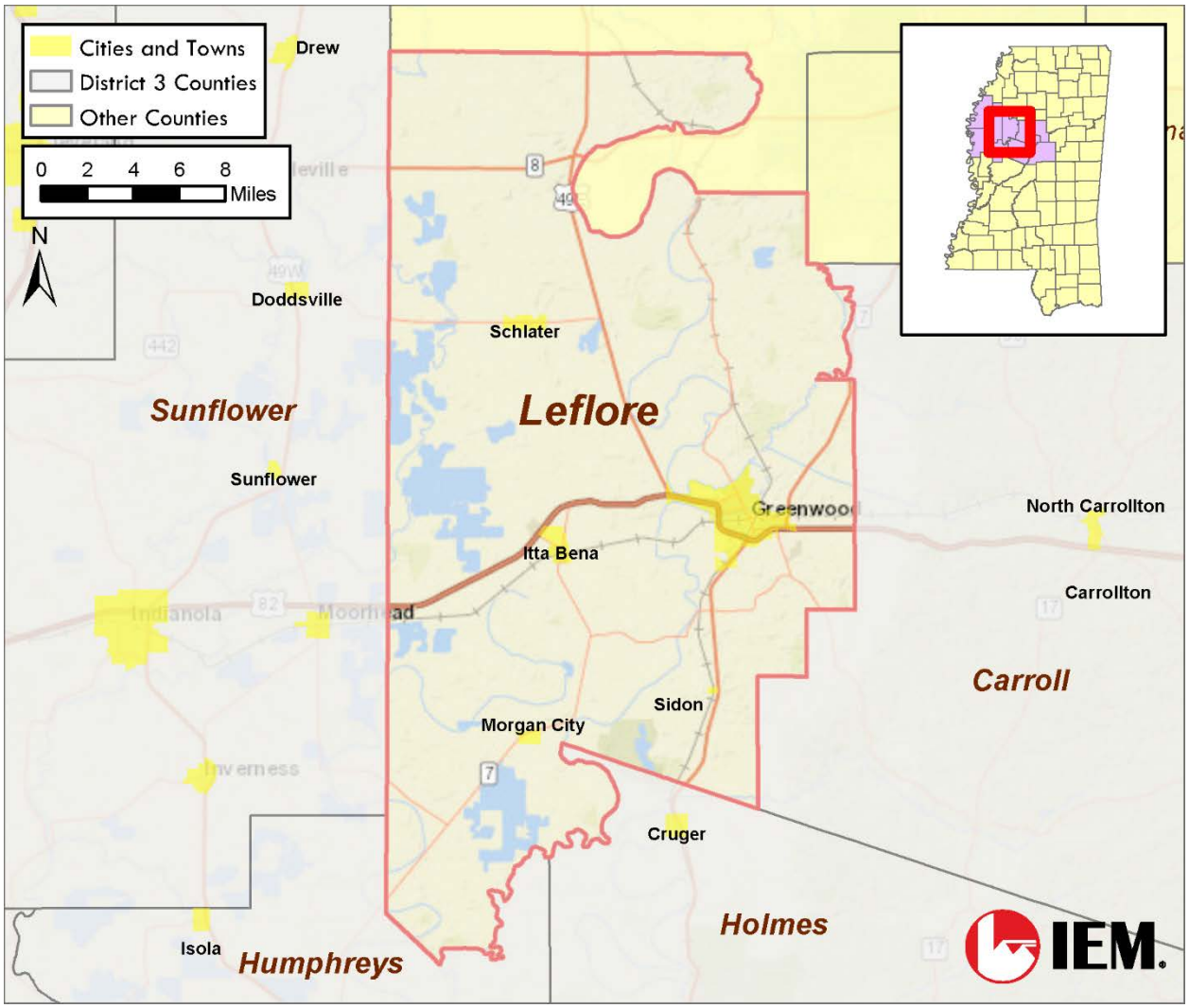
The City of Itta Bena is located just south of Highway 82 on Highway 7 in the central region of Leflore County. With an approximate land area of 1.5 square miles, of which 1.4 square miles is land and 0.04 square miles is water, Itta Bena's elevation is about 131 feet above sea level.

The Town of Morgan City is located in the southern region of Leflore County on Highway 7, south of the City of Itta Bena. With an approximate land area of 0.06 square miles, Morgan City's elevation is about 118 feet above sea level.

The Town of Schlater is located on Highway 442 in the northern region of Leflore County. With an approximate land area of 1.2 square miles, Schlater's elevation is about 128 feet above sea level.

The Town of Sidon is located in the southeast region of Leflore County, just west of Highway 49. With an approximate land area of 0.01 square miles, Sidon's elevation is about 125 feet above sea level.

Figure F.1 – Leflore County Orientation Map



Population and Demographics

As shown in Table F.1, every jurisdiction in Leflore County has experienced a decline in population between the 2010 U.S. Census report and 2018 Census estimates. The largest decline in population occurred in Itta Bena with almost 14 percent of its population relocating outside of the community. To further demonstrate the changes in population, Table F.1 shows population trends for each jurisdiction.

Table F.1 – Jurisdiction Population and Demographics, 2010 – 2018
Source: US Census Bureau 2010 and 2014-2018 American Community Survey 5-Year Estimates

	Population				Demographics					
Jurisdiction	2010 Census	2018 (Estimate)	Net Change	Percent Change	White	Black	Hispanic	Asian	Native American	2 + Races
Leflore County	32,317	28,183	-4,134	-.13%	23.5%	75.0%	2.8%	.7%	.0	.8%
Greenwood	15,205	13,790	1,415	-9%	26.6%	71.4%	1.1%	.6%	.0%	.7%
Itta Bena	2,049	1,845	204	-10%	8.1%	91.7%	.5%	.0	.0	.1%
Morgan City	255	231	24	-9.4%	6.5%	93.5%	1.6%	.0	.0	.0
Schlater	310	285	25	-8%	19.3%	77.8%	1.3%	.0	.0	2.9%
Sidon	509	464	45	-8.8%	0%	100%	.0%	.0%	.0	.0%

Special Populations (elderly, disabled, and low income): Poverty and other social factors were also considered in assessing the vulnerability of Leflore County and its municipalities. Within the unincorporated areas of Leflore County, there are some areas of extreme poverty, where individual resources for dealing with hazards are extremely limited. These are neighborhoods in which residents would be most dependent on public resources after a disaster and could therefore be considered as good investment areas for hazard mitigation activities. By focusing on these areas, Leflore County can not only help to reduce the vulnerability of individuals but can also help reduce the future impacts on public services. A summary of the percent of population falling into the special population's category are listed in Table F.2.

Other social factors, such as single mother households living below the poverty level, and children living with elderly grandparents may indicate areas where special childcare considerations may be necessary. Many communities within Leflore County have at least 30 percent of the total number of grandparents responsible for the basic needs of their grandchildren. Persons with disabilities and the elderly may not be able to evacuate or seek other preventive measures during a disaster. These individuals may be most vulnerable to severe storms, tornadoes and severe winter storms/freezes.

Table F.2 – Special Populations
Source: US Census Bureau 2010 and 2014-2018 American Community Survey 5-Year Estimates

Jurisdiction	Below Poverty	Elderly (65 and older)	Disabled (non institutionalized)
Leflore County	39.2	11.9	10.4
Greenwood	37.7	13.4	9.4
Itta Bena	41.1	11.1	17.5
Morgan City	59.6	8.2	4.5
Schlater	24.4	10.6	13.6
Sidon	54.5	3.5	7.1

Figure F.2a - CDC's Social Vulnerability Index 2016

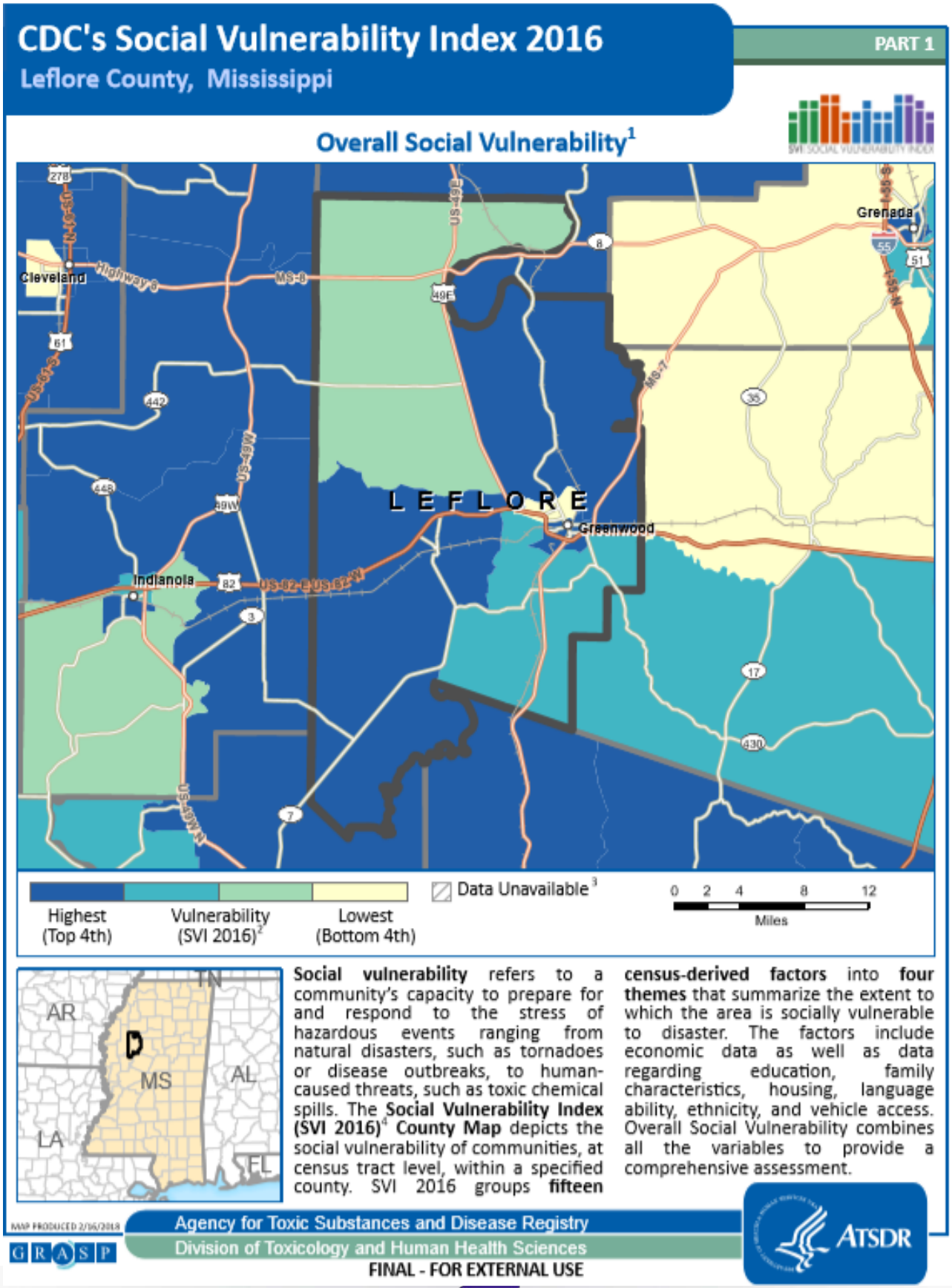
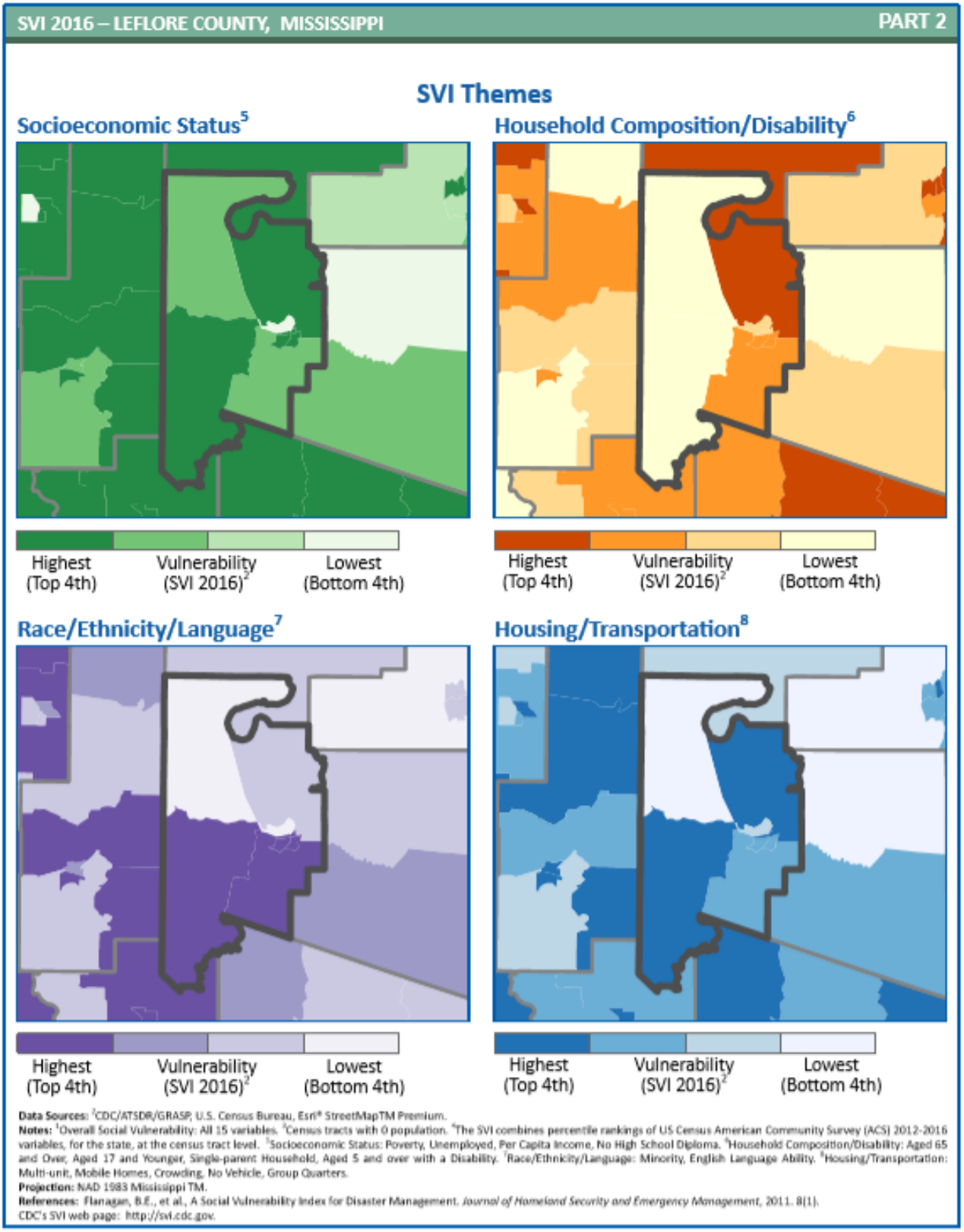


Figure F.2b - SoVI Themes



Housing, Growth Trends, and Land Use

Housing: Housing data was obtained from the 2018 Population estimates from the 2010 Census and presented below in Table F.3. In summary, between 2014 and 2018 there were 13,152 housing units, with 10, 224 households in Leflore County and an average household size of 2.77 people. In addition, 82.5 percent of housing is occupied, 8.8 percent of housing is mobile home/manufactured housing, and the majority of the homes were constructed prior to 1970. The percentage of unoccupied housing units rose from 17.5 percent in 2010 to 22.3 percent in 2018.

Table F.3 – Housing Statistics, Leflore County
Source: US Census Bureau 2010 and 2014-2018 American Community Survey 5-Year Estimates

Housing Statistics	Estimate	Percent
HOUSING OCCUPANCY		
Total housing units	13,086	100%
Occupied housing units	6,543	50%
Vacant housing units	2,928	22.3%
UNITS IN STRUCTURE		
1-unit, detached	9,497	71.6%
1-unit, attached	155	1.2%
2 units	566	4.3%
3 or 4 units	741	5.6%
5 to 9 units	859	6.5%
10 to 19 units	196	1.5%
20 or more units	89	0.7%
Mobile home	1,168	8.8%
Boat, RV, van, etc.	0	0.0%
YEAR STRUCTURE BUILT		
Built 2010 or later	83	0.6%
Built 2000 to 2009	1,060	8.0%
Built 1990 to 1999	1,079	8.1%
Built 1980 to 1989	2,659	20.0%
Built 1970 to 1979	3,263	24.6%
Built 1960 to 1969	1,840	13.9%
Built 1950 to 1959	1,320	9.9%
Built 1940 to 1949	1,067	8.0%
Built 1939 or earlier	900	6.8%
HOUSING TENURE		
Occupied housing units	10,224	100%
Owner-occupied	5,541	50.6%
Renter-occupied	5,401	49.4%
HOUSE HEATING FUEL		
Occupied housing units	10,224	100%
Utility gas	7,790	71.2%
Bottled, tank, or LP gas	904	8.3%
Electricity	2,147	19.6%
Fuel oil, kerosene, etc.	15	0.1%
Other fuel	15	0.1%
No fuel used	71	0.6%

Table F.4: Median Home Value, by Jurisdiction, 2019 | Source: U.S. Census, American Quick Facts

Jurisdiction	Median Home Value
Leflore County	$79,700
Greenwood	$89,100
Itta Bena	$63,400
Morgan City	$50,700
Schlater	$68,600
Sidon	$56,100

Growth Trends: There have been no significant changes in development since the previous plan. This trend is exemplified by Leflore County, which had a total of nine (9) building permits issued during 2019. New construction and redevelopment have been minimal and there are no known changes in conditions that may affect the risks or vulnerabilities for the participating jurisdictions. The communities within Leflore County have all experienced a decline in population since the 2015 plan. According to the City of Greenwood Comprehensive Plan 2010-2040, dated October 19, 2010, the community's growth depends upon the ability to adapt to changing economic realities. Population projections for the county, including all of its municipalities, indicate a 2.13 percent drop in population between 2015 and 2030 unless strategies are put in place and actively pursued. The City of Greenwood, which makes up 44 percent of the county's population, indicates a projected 4.37 percent drop in population during the same time period.

Land Use: The City of Greenwood enforces earthquake building standards for all commercial and public buildings. All new buildings (residential and commercial) are governed by building codes and a flood damage prevention ordinance. The City of Itta Bena also enforces building codes and a flood damage prevention ordinance. Leflore County and its other municipalities are covered by a flood damage prevention ordinance. Leflore County is governed by a land use/zoning ordinance, building codes (although little enforcement is currently available in the county), and a fire and life safety code.

It is difficult to determine the exact percentage of land which is in the flood zone. This is because streams in delta lands tend to meander, and also that existing structures and roadways divide the natural flow of water. Undeveloped land in the south and the north-central areas of Leflore County may be good targets for future preventive policies and programs. Examples of future programs could include policy changes to minimize development or requiring additional structural mitigation; or establishing a buffer zone around low lying and floodplain properties.

The City of Greenwood has experienced the greatest dollar loss in flood events since 2000 ($835,000, as reported in the NCEI Storm Events Database). The large industrial/commercial area just southwest of Greenwood and a portion of Highway 82 was annexed into the City of Greenwood. Most new development within Greenwood is commercial and is occurring along the annexed portion of Highways 82 and 7. This area of Highway 7 is in the floodplain, but all new construction requires mitigation measures such as raising the elevation. Undeveloped land in the south and the north-eastern areas of Greenwood may be good targets for future preventive policies and programs.

In Morgan City, future programs could include land use zoning to minimize development or requiring additional structural mitigation; or establishing a buffer zone around low lying and floodplain properties. Other areas that may benefit from buffer zones are those properties adjacent to the town's catfish industries (intense development in these areas could eventually lead to environmental problems). There are some local hazards in Morgan City such as abandoned buildings and other unsafe conditions that may require further study.

Employment and Industry

Leflore County's top 10 employers are presented below. Leflore County also offers a rich tourism experience to residents and visitors from all over the world.

- Greenwood Leflore Hospital
- Viking Range Corporation
- Mississippi Valley State University
- Greenwood Public School District
- Leflore County School District
- Heartland Catfish
- Milwaukee Electric Tool
- America's Catch
- City of Greenwood
- John Richard Company

The Mississippi Department of Employment Securities (MDES) assists individuals in obtaining employment. Through their network of WIN Job Centers, MDES matches qualified, prospective employees with employers. Tables F.5 and F.6 provide a summary of employment statistics for Leflore County. The largest area of job growth between 2015 and 2020 was in the Health Care & Social Assistance (350 jobs) field. The largest area of job loss in that same time period was in the Agriculture, Forestry, Fishing and Hunting (660 jobs); and Government (120 jobs) fields.

Table F.5 - Mississippi Department of Employment Security Annual Labor Force Report | Source: Mississippi Economic Development Council

Residence Based Amounts						
County	Average Civilian Labor Force	Average No. Unemployed	Average No. Employed	Average Annual Wage	Per Capita Income	Percent Below Poverty
Leflore (2020)	9,740	1,000	8,740	$26,052	$16,860	35.1%
Mississippi (2018)				$43,567	$23,434	19.7%

Table F.6 - Mississippi Department of Employment Security Annual Labor Force Report
Source: Mississippi Economic Development Council

*Establishment Based Amounts (2020)				
Manufacturing Total				2,650
Non-Manufacturing Total				11,350
Agriculture, Forestry, Fishing & Hunting	0		Professional & Business Service	250
Mining	0		Management of Companies & Enter	80
Utilities	70		Admin Support & Waste Management	160
Construction	650		Educational Services	180
Wholesale Trade	620		Health Care & Social Assistance	1,770
Retail Trade	1,530		Arts, Entertain & Recreation	80
Transportation & Warehousing	340		Accommodation & Food Service	1,090
Information	140		Other Service (except public admin)	180
Finance & Insurance	310		Government	3,790
Real Estate, Rental & Leasing	110		Education	1,540
*Note: *Establishment based amounts are estimates and do not include self-employed individuals, religious entities or non-profit institutions. Amounts include a pro-rata share of unclassified employment.*				

Critical Assets and Infrastructure

Lifeline Sectors, Critical Assets and Infrastructure

Lifeline sectors provide the framework from which individual critical assets and infrastructure are identified. A lifeline is a sector that provides an indispensable service which enables the continuous operation of critical business and government functions and is critical to human health and safety or economic security. Infrastructure associated with lifelines is a mix of public and private ownership and has many interdependencies. As an example, maintaining the function of a hospital during an event that results in a power failure is dependent on communication infrastructure and access to temporary power to prevent interruption of services. Assessing these sectors helps to identify root causes of impacts and consequences from previous hazard events and prioritizes the highest issue areas and interdependencies in order to create effective mitigation solutions.

This section provides a listing of those assets and facilities that are considered as critical in nature to the planning area. These facilities are identified in tables and figures based on best available data. Shelters and outdoor warning sirens are also considered as essential and their locations are provided as a figure in the Mitigation Strategy section of this Annex.

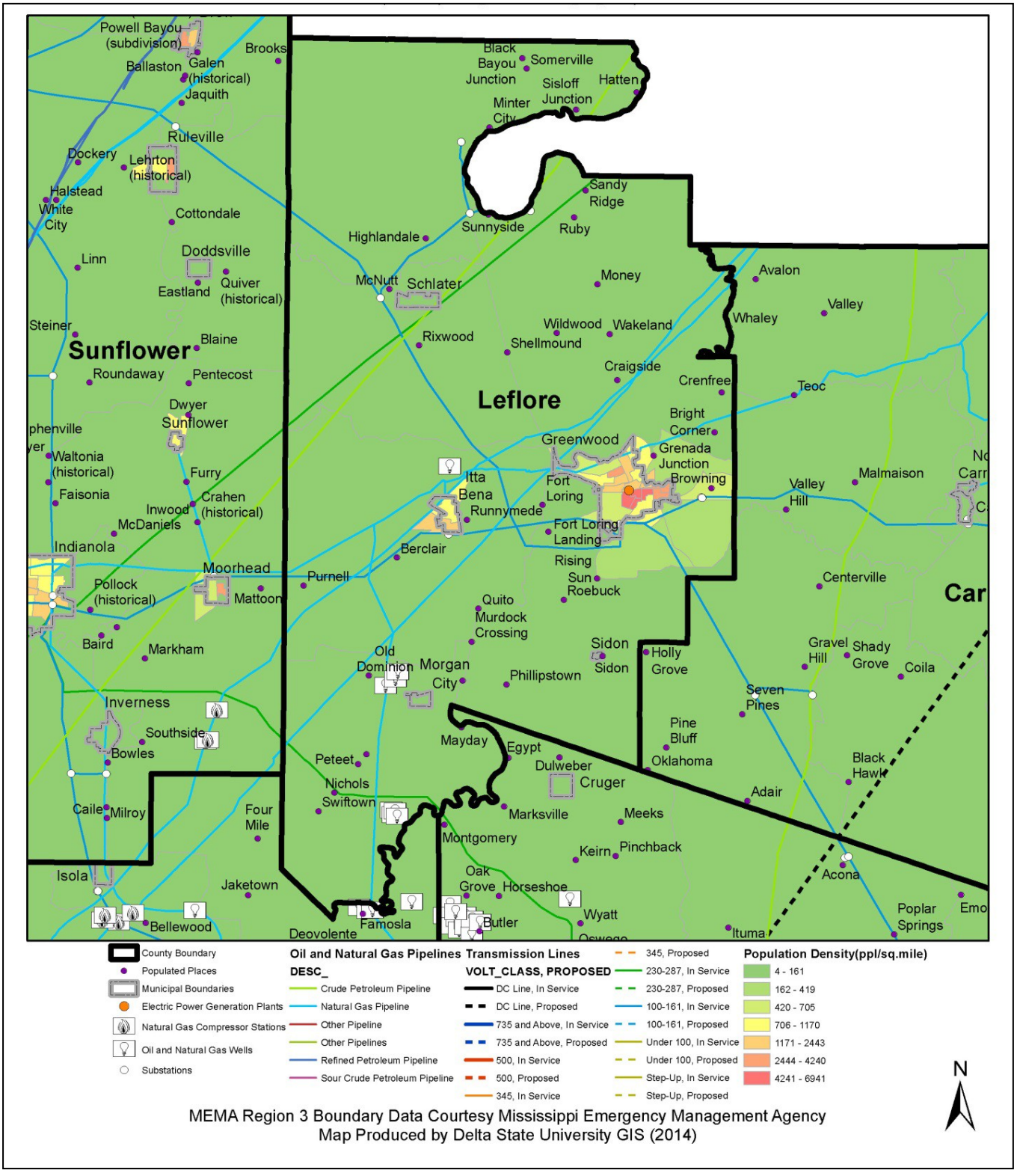
Transportation: As shown in Table F.7, Leflore County has many major thoroughfares, rail lines and airport access.

Table F.7 – Leflore County Transportation Routes

Roadway	Rail	Aviation
U.S. Route 49 U.S. Route 82 Mississippi Highway 7 Mississippi Highway 8	Class I Major - Canadian National / Illinois Central (CN/ICRR)	Greenwood-Leflore County Airport

Energy Assets: Oil, natural gas pipelines and electric transmission lines transverse through Leflore County. Figure F.3 on the subsequent page provides the locations of these systems. This information is unchanged since the 2015 plan.

Figure F.3– Leflore County Energy Assets



MEMA Region 3 Boundary Data Courtesy Mississippi Emergency Management Agency
Map Produced by Delta State University GIS (2014)

***Critical Assets and Facilities*:** Table F.8 provides a listing of the critical assets identified for Leflore County. A mitigation action was included in the 2015 RHMP to expand the Critical Infrastructure Key Resource (CIKR) database and send to the Remote Sensing Council for inclusion in the statewide CIKR database. There is no evidence that the Remote Sensing Council has integrated District 3 CIKR data during the 2015 planning cycle, so this action is carried forward for the 2020 RHMP update.

Table F.8 –Critical Assets and Facilities

Leflore County (unincorporated) Facilities		Use
Leflore County Courthouse		Government Facilities
Gilliam Head start Center Pillow Academy Maranatha Christian Academy Brown Elementary	Leflore County Elementary Leflore County High School T.Y. Fleming School (K-6)	Educational Facilities
Minter City Clinic	Leflore County Restitution Center	Health Care Facilities
Greenwood Facilities		**Use**
Greenwood City Hall		Government Facilities
Amanda Elzy Schools Leflore County Vo-Tech Center Bankston Elementary Davis Elementary Schools East Elementary M.C. Williams Elementary	Threadgill Elementary Greenwood Middle School Greenwood High School Vocational Complex Greenwood Alternative School Mississippi Delta Community College St. Francis School	Educational Facilities
Greenwood-Leflore Hospital	Golden Age, Inc.	Health Care Facilities
Greenwood- Leflore EOC Greenwood Police Dept. Greenwood Fire Stations (4)	Police Training Facility National Guard Armory	Public Safety
Itta Bena Facilities		**Use**
Itta Bena City Hall		Government Facilities
Leflore County High School Leflore County Elementary	Mississippi Valley State University Itta Bena Head Start Center	Educational Facilities
Itta Bena Clinic		Health Care Facilities
Itta Bena Fire Dept.	Itta Bena Police Dept.	Public Safety
Morgan City Facilities		**Use**
Morgan City Town Hall	Morgan City Police Dept.	Government Facilities
Morgan City Water Association		Public Utility
Morgan City Fire Dept.		Public Safety
Schlater Facilities		**Use**
Schlater Town Hall		Government Facilities
Schlater Police Dept.	Schlater Fire Dept.	Public Safety
Sidon Facilities		**Use**
Sidon Town Hall		Government Facilities
Sidon Fire Dept.	Sidon Police Dept.	Public Safety

As a complement to the previous table, researchers consulted the Mississippi Public Service Commission web site to review the list of utilities shown. The following Leflore County utilities companies are included on the web site. Some of these are the same as the ones listed above, and others are not thus included. It was decided that both tables should be incorporated into the District 3 Base Plan and in each of the county annexes for the sake of thorough documentation.

Table F.9: Mississippi Public Service Commission – County Utilities Listings | Source: Mississippi Public Service Commission – Leflore County Utilities

Gas Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
GC-123-0081-00	Atmos Energy Corporation	Mr. Mathew B. Davidson V-Pres.	790 Liberty Road Flowood, MS 39232-9321	601.420.5020	601.420.5020

Electric Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
EM-003-0024-00	City of Greenwood	Mr. Dudley McBee Mgr.	P.O. Box 866 Greenwood, MS 38935-0866		662.453.7234
EA-103-0048-00	Delta EPA	Mr. David O'Bryan Gen. Mgr.	P.O. Box 9399 Greenwood, MS 38930		662.453.6352
EC-123-0082-00	Entergy Mississippi Inc.	Mr. Martin McGee Customer Service Support	P.O. Box 1640 Jackson, MS 39215-1640		601.969.2336
EA-100-0042-00	Twin County EPA	Mr. Tim Perkins Manager	P.O. Box 158 Hollandale, MS 38748		662.827.2262

Sewer Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
SD-003-0669-01	East Leflore Co. Water & Sewer District	Mr. Dock Gabbert	P.O. Box 8166 Greenwood, MS 38930	662.897.1721	662.453.8860
SA-003-0612-01	Miles Homes Inc.	Mr. I. W. Steele Pres.	Rt. 2 Box 341 B Minter City, MS 38944		662.658.4404
SD-103-1213-01	Minter City Water and Sewer District	Mr. Hugh M. Arant Commissioner	P. O. Box 73 Minter City, MS 38944	662.624.2398	662.756.2034
SA-003-0473-01	Morgan City Water & Sewer Assoc. Inc.	Mr. James Johnson Pres.	P.O. Box 238 Morgan City, MS 38946		662.254.7162

Water Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
WA-003-1083-00	Blue Lake Water Association Inc.	Mr. Ollie Seals	P.O. Box 834 Itta Bena, MS 38941		662.299.8424

WM-003-0024-01	City of Greenwood	Mr. Dudley McBee Mgr.	P. O. Box 866 Greenwood, MS 38935-0866		662.453.7234
WM-003-0204-00	City of Schlater	Mr. Jason Colquett Mayor	P. O. Box 186 Schlater, MS 38952		662.299.9696
WD-003-0669-00	East Leflore Co. Water & Sewer District	Mr. Dock Gabbert	P. O. Box 8166 Greenwood, MS 38930	662.897.1721	662.453.8860
WA-100-0748-00	Humphreys County Water Assn. Inc.	Mr. Sterling Long Manager	454 Parsonage Road Belzoni, MS 39038		662.247.4145
WD-103-1213-00	Minter City Water and Sewer District	Mr. Hugh M. Arant Commission	P. O. Box 73 Minter City, MS 38944	662.624.2398	662.756.2034
WA-003-0473-00	Morgan City Water & Sewer Assn. Inc.	Mr. James Johnson President	P.O. Box 238 Morgan City, MS 38946		662.254.7162
WA-003-0766-00	Philipp Water Assn. Inc.	Mr. Mike Garett Manager	P.O. Box 145 Philipp, MS 38950	662.658.1257	662.299.0141
WA-103-0779-00	Phillipstown Water Assn. Inc.	Mr. J. D. Patridge Pres.	16934 CR 511 Sidon, MS 38954	662.453.2586	662.453.2586

Telecommunications Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
TC-123-0001-00	BellSouth Telecommunications, LLC	Mr. C. D. Smith Regulatory	2310 7th Street Meridian, MS 39301	601.592.6510	601.917.8787

F.2 Hazard Identification and Risk Assessment

Section 4 of the Base Plan contains detailed information regarding hazards that are applicable to all jurisdictions within this plan. This annex includes a brief summary of hazards to which Leflore County is prone and includes information related to the location and extent, historical events, and probability of future occurrence that may differ from the information in Section 4. Vulnerability assessments are provided only for those hazards with quantitative data. The health-related hazards of Pandemic Influenza and West Nile were included as low ranked hazards in the 2015 plan, but due to the world-wide coronavirus outbreak occurring at the time of this 2020 plan update, this hazard has been redefined as Human Infectious Disease/Pandemic and elevated as a hazard of concern in Section 4 of the Base Plan, and additional data related to this hazard is included within this Annex. That section also includes the most recently available information about Coronavirus Disease of 2019 (COVID-19) at the time of this plan's publication.

Hazard Ranking

As discussed in Section 4 of the Base Plan - Hazard Identification and Risk Assessment, each county evaluated the number of events and damage claims from impacts over the 20-year period between 2000 and 2020 to determine their hazard risk ranking.

Leflore County determined their probability of future occurrence based on reported data and local knowledge of previous events. Definitions for the classifications are provided below:

- Highly Likely – more than 8 occurrences over last 10 years
- Likely – 5 - 7 occurrences over last 10 years
- Low – 1 - 4 occurrences over last 10 years
- Susceptible – conditions are favorable or there are historic events (greater than 50 years) or local knowledge of unreported events.

Table F.10 provides a summary of the hazard events for Leflore County followed by the results of their risk ranking exercise (Table F.11).

Table F.10 – Leflore County Summary of Hazard Events 2004 – 2013 | Source: NCEI, MDEQ, USGS

Hazard Type	No of Events	Property Damage	Crop Damage	Death	Injury
Dam/Levee Failure	-	-	-	-	-
Drought	11	$80,000	$4,931,000	-	-
Earthquake	-	-	-	-	-
Extreme Heat / Heat	6	-	-	-	-
Expansive Soil	0	-	-	-	-
Flood	35	$2,167,000	-	-	-
Severe Storm	229	$7,169,000	$1,350,000	1	-
Severe Winter Weather	16	$1,620,000	-	-	-
Tornado	17	$4,575,000	$1,115,000	-	-
Tropical Storm / Hurricane	3	$1,081,043	$12,100,000	-	-
Wildfire	-	-	-	-	-

Table F.11 – Leflore County Risk Ranking Results

Hazard Type	Area Impacted	Health/Safety	Property Damage	Environmental Damage	Economic Disruption	Total	Future Occurrence	Risk	Risk Level
Dam/Levee Failure	3	0	3	3	3	12	2	24	Low
Drought	2	0	2	2	2	8	3	24	Low
Earthquake	1	0	1	0	1	3	2	6	Low
Expansive Soils	1	0	0	1	1	3	2	6	Low
Extreme Heat	0	0	0	0	0	0	3	0	Low
Flood	3	0	2	3	3	11	5	55	Medium
Severe Storm (thunderstorm, lightning, hail and high wind)	3	0	2	2	3	10	5	50	Medium
Severe Winter Weather	2	0	2	2	1	7	5	35	Medium
Tornado	2	0	2	2	2	8	5	40	Medium
Tropical Storm / Hurricane	1	0	1	2	1	5	2	10	Low
Wildfire	1	0	1	1	2	5	1	5	Low

The level of hazard risk within each jurisdiction in Leflore County is described in Table F.12. The hazard risk/vulnerability assessment concludes all jurisdictions within Leflore County could be equally impacted by each hazard.

Table F.12 – Summary of Hazard Ranking, All Jurisdictions in Leflore County

Hazard Type	*Leflore County*	*Greenwood*	*Itta Bena*	*Morgan City*	*Schlater*	*Sidon*
Dam/Levee Failure	Low	Low	Low	Low	Low	Low
Drought	Medium	Medium	Medium	Medium	Medium	Medium
Earthquake	Low	Low	Low	Low	Low	Low
Extreme Heat/Heat	Low	Low	Low	Low	Low	Low
Expansive Soils	Low	Low	Low	Low	Low	Low
Flood	Medium	High	Medium	Medium	Medium	Medium
Hazardous Materials	Low	Low	Low	Low	Low	Low
Human Infectious Disease	Medium	Medium	Medium	Medium	Medium	Medium
Severe Storm	Medium	Medium	Medium	Medium	Medium	Medium
Severe Winter Weather	Medium	Medium	Medium	Medium	Medium	Medium
Tornado	Medium	Medium	Medium	Medium	Medium	Medium
Tropical Storm/Hurricane	Low	Low	Low	Low	Low	Low
Wildfire	Low	Low	Low	Low	Low	Low

Mitigation planning researchers are fortunate to have access to the Data Visualization Tool included on the FEMA website. This site provides county-level data on the breakdown of flood events and hazards included in federal emergency and disaster declarations, as well as for flood events recorded by FEMA. The information is updated through June 2020 and shows the disaster name, event type, number of events, and occurrence date. The data includes information from the time FEMA first recording disaster events in the format currently used. While this time frame is longer than that included in this RHMP Update, the following page provides a one-page snapshot of Leflore County disasters that have been documented by FEMA.

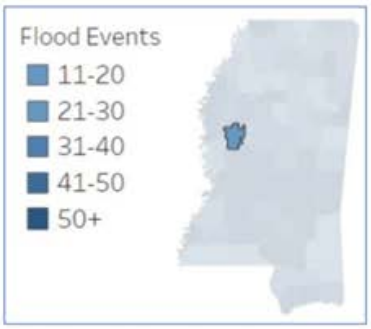
Figure F.4 –FEMA Declaration Statistics- Leflore County

FEMA Declarations: Leflore County Statistics: 1953 - 2020 ***Source:*** FEMA Data Visualization Web Site

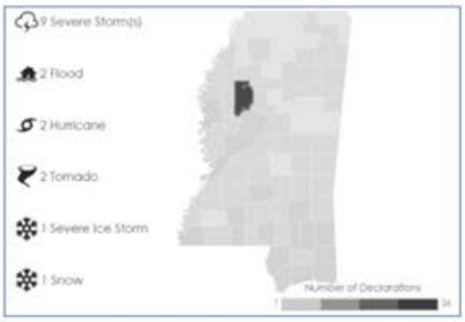
Not Included in data sourced 3/31/2020

- Mississippi COVID EM-3474 (Declared 3/13/2020)

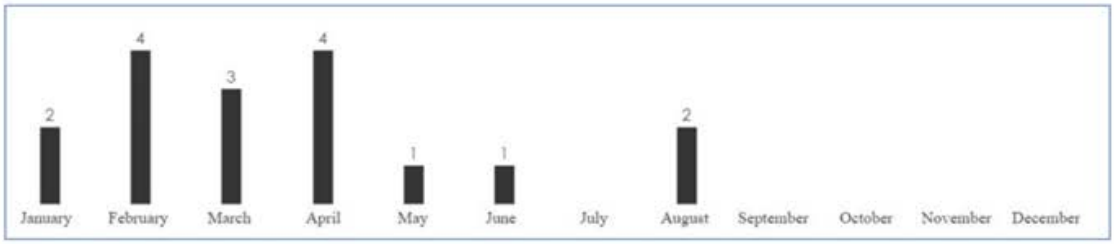
51 Flood Events

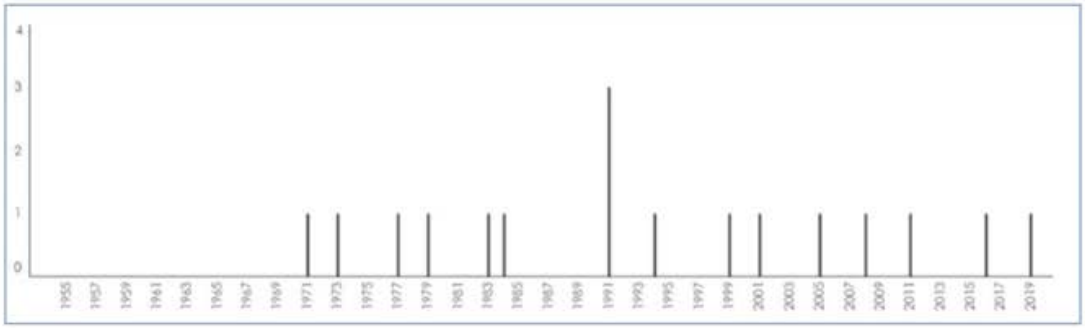


17 Declared Events



The charts below show the months and years in which disasters have occurred in Leflore County





FEMA Declarations for Leflore County (17)

Year	Declaration Name	Disaster Number	Year	Declaration Name	Disaster Number
1971	Storms & Tornadoes	302	1994	Severe Winter Storms, Freezing Rain & Sleet	1009
1973	Heavy Rains, Tornadoes & Flooding	368	1999	Severe Winter Storms, Ice & Freezing Rain	1265
1977	Drought & Freezing	3032	2001	Severe Storms & Tornadoes	1360
1979	Storms, Tornadoes, Floods	577	2005	Hurricane Katrina	1604
1983	Severe Storms, Tornadoes & Flooding	683	2008	Hurricane Gustav	3291
1984	Tornadoes	703	2011	Severe Storms, Tornadoes, Straight-line Winds, Flooding	1972
1991	Severe Storms & Flooding	895	2016	Severe Storms & Flooding	4268
1991	Severe Storms, Tornadoes & Flooding	888	2019	Severe Storms, Straight-line Winds, Tornadoes, and Flooding	4429
1991	Severe Storms, Tornadoes & Flooding	906			

Dam/Levee Failure

Location and Extent

The 2018 SHMP included a Region 3 Dam Inventory by County, breaking the numbers down for low, high, and significant hazard dams. The numbers of dams for all nine counties in the District are included for the purpose of comparing Leflore County's level of risk to that of surrounding counties. The table shows that Leflore District 3 does not have any significant, high or low hazard dams.

Table F.13 - Region 3 Dam Inventory by County
Source: 2018 Mississippi State Hazard Mitigation Plan

County	Significant	High	Low	Total
MEMA Region 3				
Attalla	1	2	44	47
Bolivar	-	-	14	14
Carroll	4	23	86	113
Holmes	1	5	39	45
Humphreys	-	-	4	4
Leflore	-	-	-	-
Montgomery	-	2	22	24
Sunflower	-	-	12	12
Washington	-	-	3	3

Until recently, Leflore County had 10 dams that were considered to be of low hazard risk, but they were reclassified and removed from the list of hazard dams. Figure F.5 provides the location of levees managed by the U.S. Army Corp of Engineers Vicksburg District.

Figure F.5– Mississippi Levee System

Previous Occurrences

Table F.14 provides a summary of three dam failures recorded by the MDEQ Dam Safety Division for Leflore County.

Table F.14 - Dam Failures 1982 – 2013 | Source: MDEQ Dam Safety Division

Date	County	Structure Name	Cause of Failure
June 1989	Leflore	Abiaca Creek	Breached
April 1983	Leflore	Pelucia Bayou	Breached
December 1982	Leflore	Pelucia Bayou	Overtopped

Probability of Future Occurrence

Dam failure is not considered to be among the highest hazards of concern in the county but, since the reclassification there is increased awareness among officials about monitoring such structures. The probability of future occurrence of dam breach is classified as low. It is not possible to develop a statistical probability when there is no recent historical data.

Assessing Vulnerability

Dam failure is not considered to be among the highest hazards of concern in the county but, since the reclassification there are no significant, high or low hazard dams located in the County. Therefore, dam failure is rated as low risk to Leflore County overall.

Drought

Location and Extent

Drought covers a large area and is not geographically confined. As such, all of Leflore County could be exposed to drought conditions. The extent of damage from drought typically does not pose a threat to property but can impact agricultural assets within the county.

Previous Occurrences

Table F.15 provides a summary of six events that were reported from 2000 to 2019. According to the NCEI, 11 drought events have taken place since the year 2000. It is important to note that the lack of data during that time frame does not accurately reflect what has taken place in the way of drought conditions. Drought events are recorded on a county level. The figures show that most drought-related damage is related to agricultural losses.

Table F.14: Drought Occurrences 2000 to 2019 | Source: NCEI

Date	Death	Injury	Property Damage	Crop Damage
12/1/2016	-	-	-	50,000
11/15/2016	-	-	-	50,000
8/1/2016	-	-	-	30,000
7/26/2016	-	-	30,000	-
10/1/2015	-	-	-	1,200
9/1/2015	-	-	-	400,000
10/1/2010	-	-	-	500,000
7/1/2007	-	-	50,000	-
6/1/2007	-	-	-	400,000
5/1/2007	-	-	-	500,000
10/1/2006	-	-	-	3,000,000
Total	-	-	$80,000	$4,931,000

Probability of Future Occurrence

Historical data listed in Table F.14 suggest that drought is likely. It may occur one or more times in a given year or may experience a drought-free period of several years. It is also likely that drought may occur as a result of climate change throughout the United States, which would affect the region's significant agriculture holdings. Of the nineteen years included in NCEI research, a drought has occurred in five years. A probability developed by dividing the number of drought years by the total number of years results in a 26.3% probability that a drought will occur in any given year.

Assessing Vulnerability

Drought occurs with advance warning because those in farm communities are able to tell when patterns of water availability are changing. Drought is also monitored by the National Weather Service and the Mississippi State University Extension Service, which has offices in each county. Two tools are available for Extension staff and others who monitor drought: the Keetch-Bynum Drought Index and the Palmer Drought Severity Index, which are discussed in Section 4 of the Base Plan as tools for drought monitoring. Drought is not known to cost human lives, but it affects lifestyles and the economic effects may be felt countywide. The NCEI database indicates there have been no known deaths or injuries from drought in the planning area.

All NCEI events are listed as occurring in the Leflore Zone, so it can be deduced that the entire county is equally at risk to the hazard. However, because the unincorporated areas, which include agricultural assets, are more affected by drought than municipalities, this area ranks the hazard as medium for unincorporated areas. Other areas of the county are determined to be at low vulnerability to drought, so the County overall is listed as having low vulnerability.

Table H.16- Leflore County Overall Vulnerability to Drought

Jurisdiction	Ranking
Unincorporated Leflore County	Medium
City of Greenwood	Low
City of Itta Bena	Low
Town of Morgan City	Low
Town of Schlater	Low
Town of Sidon	Low
Overall Leflore County Vulnerability to Drought	Low

Earthquake

Location and Extent

Leflore County, like most of northwestern Mississippi, is located within the Modified Mercalli Zone VI. Should an event occur that has a 5.9 to 6.0 magnitude on the Richter Scale, some or all of the following may occur:

- The event would be felt by all or nearly everyone
- People may be awakened from sleep if the event occurs at night
- Widespread frightened population
- Some dishes and windows would be broken.
- Unstable objects would be overturned.
- Pendulum clocks may stop.
- Heavy furniture moved
- Instances of fallen plaster
- Slight damage

Previous Occurrences

No earthquakes have been reported as having taken place in or affected Leflore County.

Probability of Future Occurrence

In 2002, a study by the Center for Earthquake Research and Information (CERI) at the University of Memphis reported that, in any given 50-year interval, there is a seven to ten percent probability of the region experiencing an event at the level of the devastating 1811-1812 sequence of earthquakes in the New Madrid Zone. The study also estimated that there is an estimated 25 to 40 percent probability that a 6.0 magnitude event occurring in a 50-year time period. The probability of future earthquake occurrence is, therefore, classified as susceptible.

Assessing Vulnerability

The level of vulnerability is the same for all areas of the county given that there is no substantive geographic variation in distance from one end of the county to the City of New Madrid, MO, the epicenter of the New Madrid Seismic Zone. The distance between the New Madrid and the Town of Schlater, in the northwest corner of the county, is an estimated 225.4 miles, and the distance to Town of Morgan City an estimated additional 36 miles further south. There is not enough a distance in proximity to New Madrid to say that one community is more vulnerable than the other.

There are recorded deaths, injuries, or property damage from earthquakes in Leflore County. There is little likelihood of any detrimental effect on the County's economy, residents' lifestyle, or physical structures. However, the effects on life and property in the area and low hazard dams could be significant if a large earthquake were to occur given the nature of the built environment. In estimates derived from a report by the U.S. Geological Survey (USGS) "New Madrid Earthquake Project," the relative risk for Leflore County and other sectors of District 3 for a potential seismic event with a magnitude of between 3 and 4 on the Richter scale.

Based on research completed by the USGS Earthquake Hazard Program suggests that buildings constructed using load-bearing masonry walls are vulnerable to damage by earthquakes, while steel and wood-frame buildings have a lower seismic vulnerability. Low-rise reinforced concrete buildings are also in this lower seismic risk category. Damage expected in such an event within the unincorporated areas of Leflore County could include buildings, not secured to a solid foundation being shaken off their supports, and chimneys falling away from houses. Multi-story structures built with un-reinforced masonry buildings could be substantially damaged.

In reviewing earthquake effects on dams, the SHMP overlaid significant high hazard dams with historic seismic recordings and developed a dam inventory for earthquake prone counties. Dam/levee systems are also vulnerable to earthquake events as shown by the table below, which was presented earlier as Table F.17.

Table F.17: Dam Inventory in Relation to Earthquake Prone Counties by Dam Type
Source: 2018 Mississippi State Hazard Mitigation Plan

MEMA DISTRICT 3				
County	Significant	Hight	Medium	Low
Attala	1	2	44	47
Bolivar	-	-	14	14
Carroll	4	2	86	113
Holmes	1	5	39	45
Humphreys	-	-	4	4
Leflore	-	-	-	-
Montgomery	2	2	24	2
Sunflower	-	-	12	12
Washington	-	-	3	3

The County does not have any significant, high or low hazard dams; however, other none classified dams within the county could be impacted from seismic activity.

Extreme Heat / Heat

Location and Extent

Heat waves cover a large area and cannot be confined within geographic boundaries. Therefore, all of Leflore County and its municipalities could be exposed to extreme heat conditions. The extent of damage from heat events typically does not pose a threat to property or crops but can impact people with heat-related injuries or fatalities. The elderly, infants and disabled are most vulnerable to excessive heat conditions.

Previous Occurrences

As shown in Table F.18, there have been six recorded heat events from 2000 to 2020, with no damages or fatalities; however, one fatality was contributed to extreme heat temperatures in 2000.

Table F.18: Extreme Heat Occurrences 2000 to 2020 | Source: NCEI

Date	Event	Death	Injury	Property Damage ($)	Crop Damage
8/1/2010	Excessive Heat	0	0	0	0
8/5/2007	Heat	0	0	0	0
7/15/2006	Heat	0	0	0	0
8/17/2005	Heat	0	0	0	0
7/23/2005	Heat	0	0	0	0
6/19/2000	Heat	1	0	0	0

National Weather Service event narrative for the most recent occurrence (8/1/2010) is typical of how extent is described for the other events.

> "A four day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS Jackson, MS forecast area, 19 record highs were set between August 1st and 4th. On August 2nd, the 2nd warmest average temperature was recorded. The low was 78 and the high 105, this resulted in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in 3 fatalities across the forecast area."

The deaths mentioned in this description occurred elsewhere in the region served by the Jackson, MS weather station, so they are a reminder that extreme heat affects the entire county and all populations. It is not feasible to discuss vulnerability broke down by jurisdiction because NCEI data for this hazard is all reported countywide.

Probability of Future Occurrence

While six events are listed in the table of historic events, two of these appear to be from an extended event that occurred over a two-month period. As such, for the purpose of determining probability, it is accurate to say that four events took place over a 19-year period, so there is a 21% percent chance of occurrence in any given year.

Assessing Vulnerability

Extreme heat can affect certain populations but generally causes no property damage. During periods of extreme heat, there is little physical destruction, although roads can buckle, and livestock die. Extreme heat conditions can pose problems for those not accustomed to the climate or who are outside for prolonged periods of time. Extreme heat can create a threat even to individuals and communities that are accustomed to high temperatures. Excessive heat can also cause utility outages due to an increased demand for electricity.

All of the following populations are prone to heat-related conditions: the elderly; young children; those who are immobile; persons who live alone especially without air conditioning; people without transportation; and people suffering from serious illnesses.

Expansive Soil

Location and Extent

Expansive soils are present throughout Mississippi and have been known to cause considerable damage to housing and infrastructure. Less than 50 percent of soils in Leflore County consist of clay having high swelling potential. No communities within the county are at higher risk than others for impact from this hazard.

Previous Occurrences

There has been no record of expansive soil issues in Leflore County.

Probability of Future Occurrence

The probability of expansive soils is classified as low.

Assessing Vulnerability

Expansive soils could cause damage to infrastructure and both business and residential structures within Leflore County and its municipalities.

Flood

Location and Extent

The entire geographic region of Leflore County is at risk to riverine, flash flooding, and flooding caused by undersized, overburdened stormwater management systems. All of the flood events cited from recent NCEI data below are documented as flash floods. Flood data shown below indicates that all locations in the county are susceptible to flooding, and the extent of some events is listed as countywide.

Flash floods often occur when rain falls on the built environment where impervious surfaces, gutters, and storm sewers hasten the flow of run-off. Flowing waters can become raging torrents of water that course through streambeds and streets, sweeping away everything in their path.

Previous Occurrences

Table F.19 provides a summary of flood events recorded in Leflore County from 2000 to 2019. While inadequate stormwater management capability likely contributes to flash flooding in all areas, it is noted where local creeks, rivers and their tributaries are located nearby and may be potential sources of overflow.

Table F.19: Flood Events 2000 to 2020 | Source: NCEI

Location	Date	Time	Type	Death	injury	Property Damage ($)	Crop Damage
Crenfree	5/9/2019	6:30	Flash Flood	-	-	10,000	-
Greenwood	2/22/2019	6:00	Flash Flood	-	-	500,000	-
Quito	2/20/2019	2:45	Flash Flood	-	-	15,000	-
Greenwood	9/6/2018	7:00	Flash Flood	-	-	30,000	-

Location	Date	Time	Type	Death	injury	Property Damage ($)	Crop Damage
Itta Bena	2/22/2018	9:35	Flash Flood	-	-	20,000	-
Morgan City	6/16/2017	7:52	Flash Flood	-	-	100,000	-
Greenwood	3/31/2016	6:30	Flash Flood	-	-	15,000	-
Greenwood	3/31/2016	5:00	Flash Flood	-	-	85,000	-
Itta Bena	3/31/2016	4:50	Flash Flood	-	-	150,000	-
Grenada Jct.	7/23/2014	6:10	Flash Flood	-	-	600,000	-
Greenwood	6/9/2014	6:00	Flash Flood	-	-	30,000	-
Greenwood	1/13/2013	13:30	Flash Flood	-	-	15,000	-
Browning	1/12/2013	9:00	Flash Flood	-	-	120,000	-
Craigside	9/30/2012	21:45	Flash Flood	-	-	75,000	-
Ft Loring	7/25/2011	18:30	Flash Flood	-	-	5,000	-
Greenwood	5/2/2010	9:16	Flash Flood	-	-	12,000	-

Location	Date	Time	Type	Death	injury	Property Damage	Crop Damager
Greenwood	1/21/2010	2:30	Flash Flood	-	-	4,000	-
Itta Bena	9/15/2009	15:25	Flash Flood	-	-	100,000	-
Ft Loring	9/14/2008	7:45	Flash Flood	-	-	5,000	-
Greenwood	4/11/2005	11:07	Flash Flood	-	-	10,000	-
Greenwood	12/7/2004	2:10	Flash Flood	-	-	50,000	-
Greenwood	11/23/2004	21:45	Flash Flood	-	-	50,000	-
Greenwood	3/5/2004	17:30	Flash Flood	-	-	2,000	-
Greenwood	6/11/2003	20:35	Flash Flood	-	-	10,000	-
Greenwood	4/6/2003	18:00	Flash Flood	-	-	20,000	-
Countywide	9/26/2002	13:00	Flash Flood	-	-	1,050	-
Greenwood	7/23/2002	21:50	Flash Flood	-	-	1,000	-
Greenwood	3/31/2002	3:00	Flash Flood	-	-	1,000	-
Countywide	1/24/2002	7:30	Flash Flood	-	-	1,000	-
Countywide	12/13/2001	16:30	Flash Flood	-	-	-	-
Countywide	12/13/2001	16:30	Flash Flood	-	-	-	-
Countywide	11/29/2001	10:00	Flash Flood	-	-	-	-
Countywide	11/29/2001	1:30	Flash Flood	-	-	-	-
Countywide	4/3/2000	10:45	Flash Flood	-	-	30,000	-
Countywide	4/1/2000	23:30	Flash Flood	-	-	100,000	-
Totals				-	-	$2,167,000	-

Table F.20: Leflore County Flood Events 20001 to 2019 – Sorted by Location | Source: FEMA FIS Leflore County 2018

Location	# Events	Major Water Bodies
Unincorporated Leflore	15	Yazoo and Tallahatchie Rivers, Palusha Bayou, Walker Lake, Craig Canals, and Canal No. 1
Greenwood	16	Yazoo and Tallahatchie Rivers, Palusha Bayou, Walker Lake, Craig Canals, and Canal No. 1
Itta Bena	3	Bear Creek
Morgan City	1	-
Schlater	-	McNutt Lake
Sidon	-	-

Information from the same table can be further sorted to assess vulnerability for the jurisdictions and unincorporated areas of the Leflore County. All unincorporated communities, reference to part of the County, will be counted toward incidents not within an identified municipality.

While there is a section devoted to flood vulnerability further in this annex, vulnerability will also be addressed here, in proximity to the previous information.

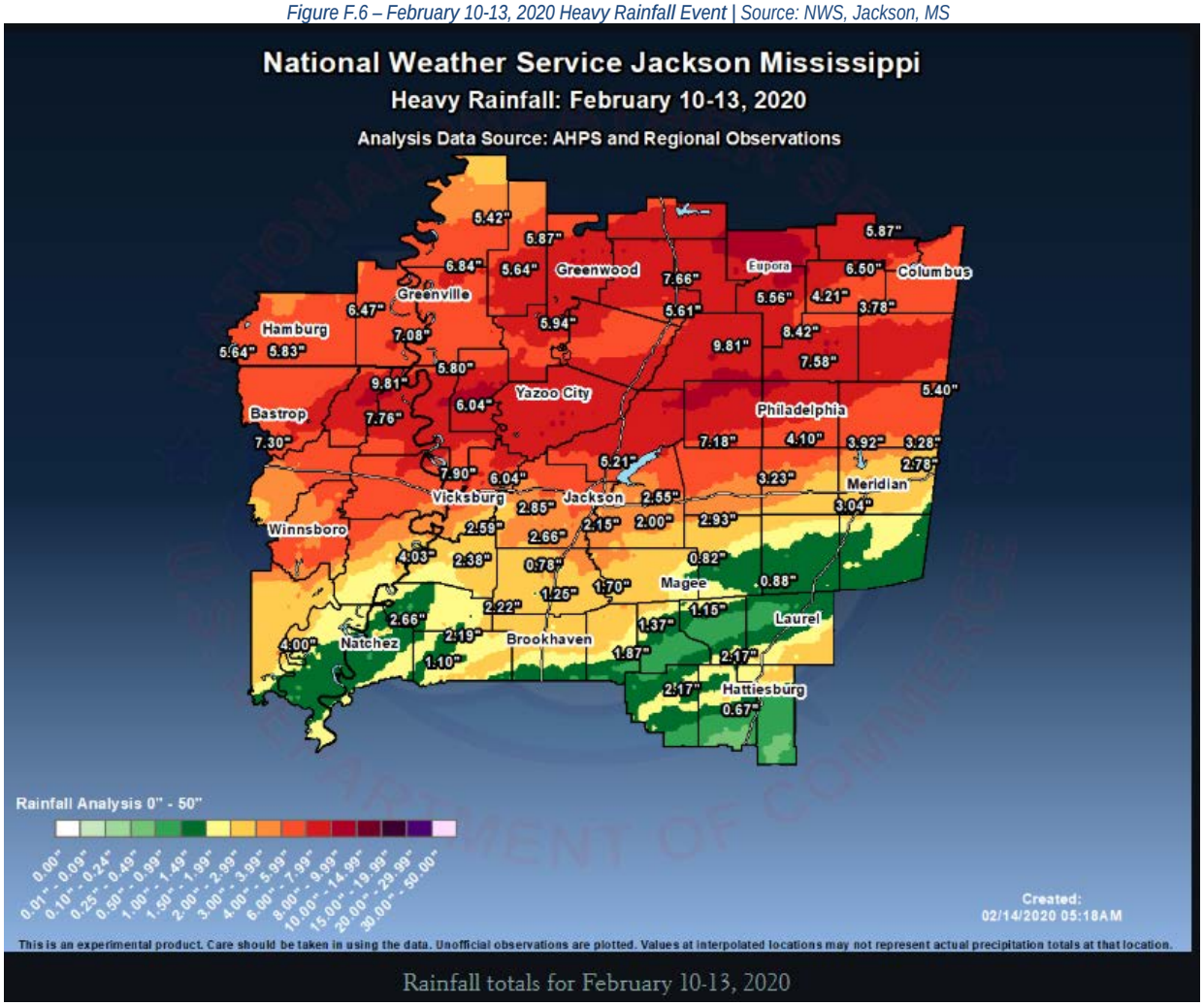
Table F.21: Geographic Vulnerability to Flood by Jurisdiction |Source: NCEI

Location	# Events	Vulnerability Level	Critical Points
Countywide Central Portion, East Portion		Medium	Presence of major rivers and tributaries covering most of the county
City of Greenwood		Low	Location near major river and tributaries
City of Itta Bena		Low	Location of minor canals throughout the city
Town of Morgan City		Low	Location of minor lowline areas throughout the town
Town of Schlater		Medium	Location of low line areas running through town
Town of Sidon		Low	Location of minor lowline areas throughout the town
Overall vulnerability of Leflore County		Medium	Number events, that do not affect structures, input from the Office of Emergency Management

The planning region overall rated the community as moderately vulnerable to flooding based on the fact most of vulnerable land does not include at-risk structures. Also, the total dollar value of damages is relative given the length of time studied.

In addition to the events documented as occurring through 2019, District 3 experienced significant rainfall in early 2020 that had not yet been fully documented by NCEI at the time of plan development. The visual included on the next page as Figure F.8 shows that during the period of February 10-13, 2020, communities districtwide received between three to 14 inches of rain, and rain continued to fall – at times heavily – throughout the rest of the month. The Leflore County Emergency Management Director reported that rainfall affected roadways and highlighted the need for road improvements in certain areas to mitigate against future flooding.

Figure F.6 – February 10-13, 2020 Heavy Rainfall Event | Source: NWS, Jackson, MS



Leflore County and all of its municipalities participate in the National Flood Insurance Program (NFIP).

Based on data obtained through the 2013 State of Mississippi Standard Hazard Mitigation Plan, Leflore County could experience the following losses (Table F.22).

Table F.22 – Leflore County HAZUS Flood Results | Source: HAZUS (2013 State of Mississippi Standard Hazard Mitigation Plan)

Structural Damage	Contents Damage	Inventory Loss	Total Building Loss	Income loss	Total Building and Income Loss	Bldg. Loss Ratio
$25,260,000	$28,410,000	$1,000,000	$54,670,000	$650,000	$55,320,000	18.3%

Residential at Risk	Other at Risk	Total Bldgs. Risk	No. of Bldgs. Substantially Damaged	No. of house-holds	No. of people needing shelter	Countywide Building Exposure
309	2	311	75	757	1,599	$1,443,286,000

The next two tables were also taken from the 2018 SHMP and, respectively, show the number of RL/SRL properties for Leflore County and the eight other counties included in District 3 as well as the number of NFIP participating communities and number of properties mitigated for each county.

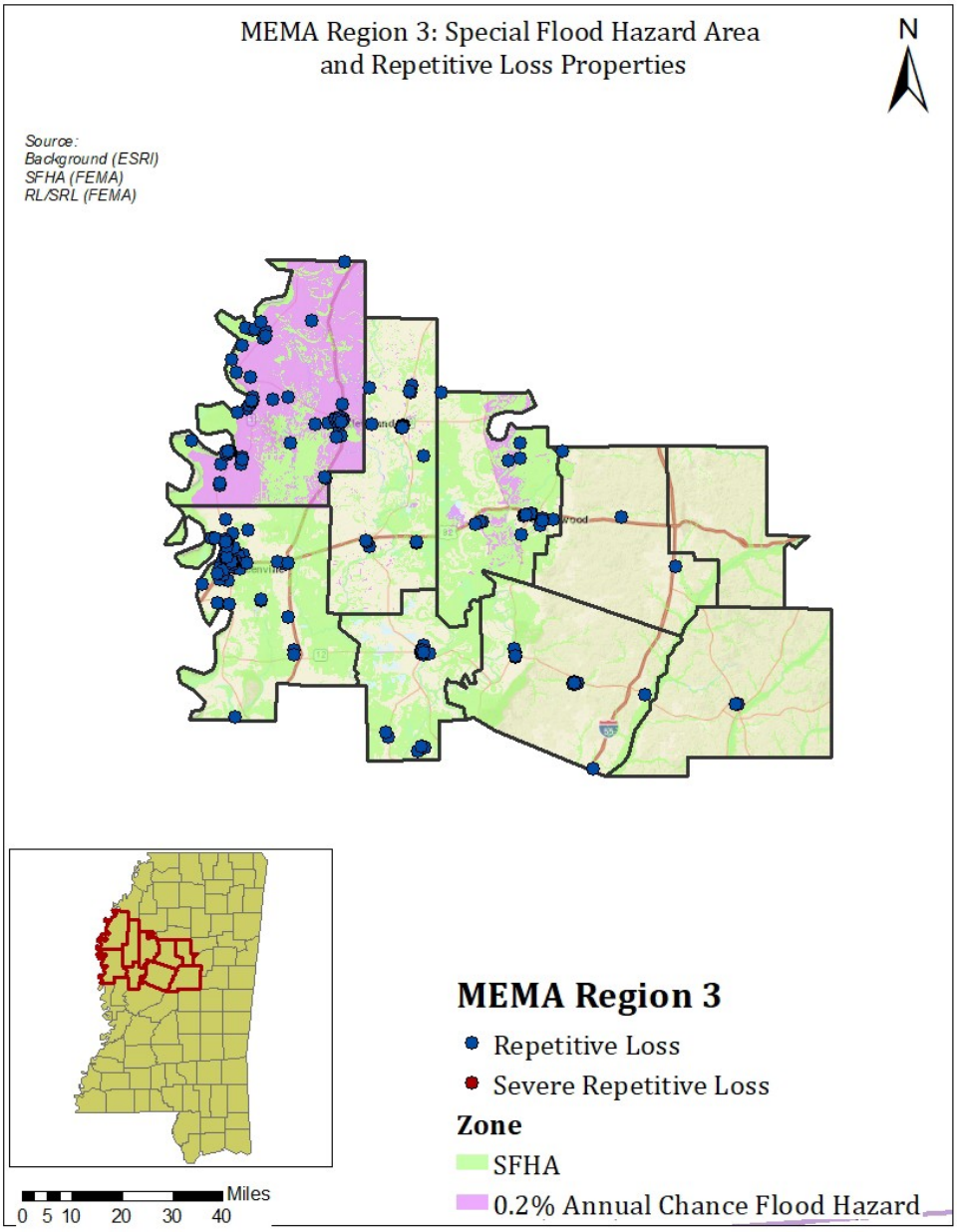
Table F.23 - District 3 Repetitive Loss and Severe Repetitive Loss Properties by County, 2009-2016
Source: 2018 Mississippi State Hazard Mitigation Plan

County	Repetitive Loss				Severe Repetitive Loss			
	No. of Properties 2009	No. of Properties 2011	No. of Properties 2016	No. of Flood Claims	No. of Properties 2009	No. of Properties 2011	No. of Properties 2016	No. of Flood Claims
Attala	0	0	1	2	0	0	0	0
Bolivar	155	108	210	631	2	48	2	228
Carroll	4	4	4	8	0	0	0	0
Holmes	11	12	12	27	0	0	0	0
Humphreys	40	31	46	161	2	10	1	61
Leflore	29	27	27	71	0	2	0	8
Montgomery	0	0	0	0	0	0	0	0
Sunflower	19	16	20	72	1	4	0	21
Washington	152	115	191	631	14	48	8	250
Totals	410	313	511	1,603	19	112	11	568

Table F.24 - District 3 Participating Communities and Number of Mitigated Properties by County
Source: 2018 Mississippi State Hazard Mitigation Plan

County	No. of NFIP Communities	No. of Mitigated Properties
Attala	5	0
Bolivar	16	20
Carroll	4	0
Holmes	8	0
Humphreys	5	1
Leflore	6	1
Montgomery	4	0
Sunflower	8	4
Washington	6	26
Totals	61	52

Figure F.7 - District 3 Special Flood Hazard Area (SHFA) and Repetitive Loss Structures
Source: 2018 Mississippi SHMP



The Capabilities Assessment of this Annex identifies NFIP participation and also the fact that a Flood insurance Study was conducted when FEMA developed local Flood Insurance Rate Maps (FIRMs). There are 20 repetitive loss properties in the county. The map below, also from the 2018 SHMP shows the location of Special Flood Hazard Areas (SFHAs) and RL structures for each county in Region 3 (including the ones in Leflore County).

Based on based available data, as shown in Table F.25, there are 29 properties listed on the state's repetitive loss property database, of which none have been mitigated. These properties probably have not been mitigated due to the fact that providing replacement housing and relocation assistance for the low-income residents in this area is an issue. Additional information regarding these properties is provided in the mitigation strategy chapter of this plan.

Residents of Leflore County participating in the National Flood Insurance Program (NFIP) have received over $2,624,230 in flood loss payments. Details regarding the NFIP program by community are provided in the capability's assessment section of this annex

Table F.25: Summary of Repetitive and Severe Repetitive Flood Properties | Source: MEMA RL Listing 2016

Repetitive Flood								
Jurisdiction	Community ID	No. of properties	No. Mitigated	No. Insured	Total Losses	Total Bldg. Payments	Total Contents	Total Paid
Leflore County	280101	23	1	0	59	434,120.47	90,517.63	524,638.10
Greenwood	280102	2	0	0	4	8,074.09	6,716.00	14,790.09
Itta Bena	280103	2	0	0	4	37,880.23	260.80	38,141.03
Total Repetitive Flood		27	1	0	67	480,074.79	97,494.43	577,569.22
Severe Repetitive Loss								
Jurisdiction	Community ID	No. of properties	No. Mitigated	No. Insured	Total Losses	Total Bldg. Payments	Total Contents	Total Paid
Leflore County	280101	2	0	0	8	21,038.93	111,063.47	132,102.40
Total Severe Repetitive Loss		2	0	0	8	21,038.93	111,063.47	132,102.40
Total			29	1	0	75	501,113.72	208,557.90

Probability of Future Occurrence

Flooding events continue to be a threat in Leflore County and the probability of future occurrences will remain as highly likely given the history of flood events; the presence of an overtaxed drainage system; and location in the region of the Yazoo River and its many tributaries. NCEI data shows that one or more portions of the County reported flooding in 17 of the 19 years of data being studied. This suggests that there is a 89% chance of flooding in any given year. As such, it is highly likely that the community will see flooding roughly once every 18 to 24 months.

Assessing Vulnerability

In Greenwood, poor drainage in and around the city is a result of the low elevations in the area. Low-lying areas around Greenwood are subject to flooding from the Yazoo and Tallahatchie Rivers, Palusha Bayou, Walker Lake, Craig Canals, and Canal No. 1. The most severe flooding usually occurs in the winter and early spring as a result of heavy rainfall. During major floods which pose a threat to Greenwood, a series of pumps along the levee are used. The City of Greenwood received a grant to replace some of these pumps which should help the City more reliably mitigate the effects of some flash flooding.

Greenwood has a large flood zone and maintains participation in the National Flood Insurance Program. The U.S. Army Corps of Engineers has enlarged the channel on the Yazoo River as far as the Money Community. This improvement has lowered the flow line by about three feet in places around Greenwood thereby decreasing the flood hazard significantly.

The City of Itta Bena has a drainage problem, with flash flooding impacts streets and some houses during heavy or prolonged rains. Over the years, Bear Creek has been so silted that drainage cannot flow properly. Dredging of the Creek would greatly assist in solving the city's drainage problems. As of the updating of this plan these areas with drainage problems have still not been addressed.

Morgan City has a flood zone on the east and south areas of the town and maintains participation in the National Flood Insurance Program. There are no repetitive loss properties in Morgan City.

Schlater's flood zone extends on both sides of McNutt Lake that runs east to west through town, and also on the east side of town (one single family home is located in the flood hazard zone). Schlater maintains participation in the National Flood Insurance Program and has no repetitive loss properties in Schlater.

Although Sidon currently has no repetitive loss properties, 25 structures are in the flood hazard area, and that community is not protected by a levee system against the Yazoo River. The Rising Sun Subdivision, the Browning Community, and a mobile home park located near Sidon are also priority vulnerable areas (street flooding is common during heavy or prolonged rain). Sidon participates in the National Flood Insurance Program.

Acres of river frontage have eroded over the years, which results in the loss of property and additional accumulation of silt, which exacerbates flooding and necessitates frequent re-dredging. Loss of property worth up to a million dollars is possible, and structural integrity of critical facilities, such as the Greenwood-Leflore Hospital could be threatened. The U.S. Army Corps of Engineers performs regular bank stabilization only when structures such as the levee, a public structure, or a road are threatened by erosion.

Impact on Transportation Systems: Leflore County includes several state-owned bridges located on US Route 49 and 82 and Mississippi Highways 7 and 8. These serve as vital transportation and evacuation routes for the county and surrounding areas. These bridges cross portions of delineated floodplains and are susceptible to flood damage.

In addition to bridges, roadways are subject to inundation and overtopping by periods of heavy rain, which appear likely to occur more frequently given climate change observations. Storm events generally projected to occur as 100-year flood events are occurring more frequently. The potential loss could include up to the full replacement value of the bridge structure if flooding results in bridge collapse. In severe cases, roadways could also be undermined, causing complete or partial washout of roadbed and collapse of the road surface. Bridges and roadways with a history of flood impact could benefit from mitigation projects.

Impact on Lifeline Utility Systems: Lifeline utility systems such as electric power, gas, utility and water distribution and telephone service are generally not significantly affected by flood events, although flooded lift stations could result in storm water infiltration into treatment facilities. A facility's power source could be interrupted during ***Impact*** a flood and result in expensive repairs unless the supply is elevated.

Severe Storm (Lightning, Hail, and Severe Wind)

Location and Extent

All of Leflore County is susceptible to lightning, hail, and severe wind occurrences and all jurisdictions could be equally impacted by the hazard.

Review of all 112 severe storm events reported for 200 to 2020 in the NCEI Storm Events Database for high wind indicates a range reported from 46 to 98 miles per hour. During the same time period, there were 59 hail events with the dimension of the hail ranging from 0.75 to 2.50 inches. Only two lightning events were documented for this time frame, causing an estimated $53,000 in property damage. A lightning strike in Greenwood on August 23, 2005 struck several light poles and knocked

out some transformers. Lightning started a brush fire along Highway 49 during a severe storm on August 6, 2012.

Previous Occurrences

Tables F.26 to F.29 illustrate that numerous severe storm events have occurred countywide. To further demonstrate these historical events, Figures F.8 and F.9 are also provided to illustrate the impacts of hail and strong wind events.

Table F.26 – Total of All Severe Weather Events | Source: NCEI Storm Events Database

Total – All Severe Weather Events					
Hazard Event	No of Events	Property Damage	Crop Damage	Deaths	Injuries
Lightning	2	$53,000	-	-	-
Hail	59	$2,504,000	$1,300,000	-	-
Severe Wind	55	$4,612,000	$50,000	-	-
Totals	229	$7,169,000	$1,350,000	-	-

Table F.27 – Lightning Events 2000 to 2019 | Source: NCEI

Location	Date	Time	Death	Injury	Property Damage	Crop Damage
Greenwood	8/23/2005	18:20	-	-	50,000	-
Craigside	8/6/2012	17:00	-	-	-	-
Totals			-	-	53,000	-

Between the years 2000 and 2020, 59 hail Leflore County events were recorded by the National Weather Service. Captured in the table below, the data shows that all incorporated and unincorporated areas of the county were affected, and the recorded hail magnitude ranged from .75" to 2.50" and total recorded property damage was $2,504,000 and crop damage was $1,300,000.

Table F.28 – Hail Events 2000 to 2019 | Source: NCEI

Location	Date	Time	Mag	Death	Injury	Property	Crop Damage
Highlandaleee	5/30/2018	12:25	1.00 in.	-	-	-	-
Greenwood	3/13/2016	23:43	0.75 in.	-	-	-	-
Greenwood	4/19/2015	21:30	1.00 in.	-	-	-	-
Money	4/28/2014	11:51	1.00 in.	-	-	-	-
Money	4/27/2013	22:10	1.00 in.	-	-	-	-
Greenwood	3/23/2013	17:51	0.75 in.	-	-	-	-
Shellmound	3/23/2013	17:40	1.00 in.	-	-	-	-
Money	12/8/2012	19:41	1.00 in.	-	-	-	-
Itta Bena	6/11/2012	17:58	1.00 in.	-	-	-	-
Runnymede	5/21/2012	14:00	1.00 in.	-	-	-	-
Phillipstown	3/2/2012	17:01	1.00 in.	-	-	-	-
Tinter City	2/1/2012	17:30	0.75 in.	-	-	-	-
Phillipstown	4/20/2011	18:11	1.00 in.	-	-	-	-
Money	4/20/2011	11:55	1.00 in.	-	-	-	-
Greenwood	3/29/2011	20:23	1.00 in.	-	-	20,000	-
Greenwood	5/28/2010	23:55	1.00 in.	-	-	-	-

Location	Date	Time	Mag	Death	Injury	Property	Crop Damage
Morgan City	4/23/2010	14:57	1.00 in.	-	-	-	-
Sandy Ridge	7/26/2009	8:22	0.75 in.	-	-	-	-
Runnymede	6/13/2009	18:32	0.75 in.	-	-	-	-
Berclair	6/13/2009	4:52	0.75 in.	-	-	-	-
Highlandale	2/27/2009	7:45	0.75 in.	-	-	-	-
Itta Bena	2/27/2009	6:49	0.88 in.	-	-	-	-
Greenwood	8/3/2008	15:04	1.00 in.	-	-	-	-
Itta Bena	8/3/2008	14:55	1.00 in.	-	-	-	-
Itta Bena	8/2/2008	21:48	1.00 in.	-	-	-	-
Tinter City	5/24/2008	14:15	0.75 in.	-	-	-	-
Money	5/2/2008	23:31	1.00 in.	-	-	-	-
Schlater	1/8/2008	15:57	0.75 in.	-	-	-	-
Schlater	11/14/2007	18:05	1.00 in.	-	-	-	-
Minter City	6/8/2007	17:01	1.00 in.	-	-	-	-
Schlater	5/15/2007	14:58	0.75 in.	-	-	-	-
Itta Bena	6/21/2006	16:43	1.00 in.	-	-	-	-
Greenwood	5/10/2006	2:58	0.75 in.	-	-	-	-
Greenwood	4/7/2006	21:20	1.50 in.	-	-	-	-
Schlater	4/7/2006	17:27	1.75 in.	-	-	200,000	-
Morgan City	4/7/2006	16:48	2.00 in.	-	-	2,000,000	1,000,000
Itta Bena	4/7/2006	16:33	1.00 in.	-	-	-	-
Morgan City	4/7/2006	15:29	1.75 in.	-	-	200,000	300,000
Schlater	3/31/2006	21:27	1.00 in.	-	-	-	-
Money	12/4/2005	1:00	1.00 in.	-	-	-	-
Sidon	6/8/2005	14:17	0.88 in.	-	-	-	-
Itta Bena	5/14/2005	17:25	1.00 in.	-	-	-	-
Greenwood	4/11/2005	9:55	0.75 in.	-	-	-	-
Itta Bena	4/6/2005	16:50	0.75 in.	-	-	-	-
Greenwood	4/6/2005	15:28	0.88 in.	-	-	-	-
Morgan City	4/6/2005	9:22	0.75 in.	-	-	-	-
Itta Bena	3/13/2005	19:15	1.75 in.	-	-	70,000	-
Greenwood	10/25/2003	16:43	1.75 in.	-	-	5,000	-
Morgan City	7/17/2003	15:30	0.75 in.	-	-	1,000	-
Greenwood	6/11/2003	20:05	0.75 in.	-	-	1,000	-
Minter City	6/2/2003	17:15	0.75 in.	-	-	1,000	-
Greenwood	5/5/2003	15:20	1.00 in.	-	-	1,000	-
Greenwood	5/5/2003	9:40	1.00 in.	-	-	1,000	-
Greenwood	5/5/2003	9:28	0.88 in.	-	-	1,000	-
Greenwood	5/5/2003	8:30	1.00 in.	-	-	1,000	-
Minter City	3/18/2003	20:20	0.75 in.	-	-	1,000	-
Greenwood	3/13/2003	9:15	0.75 in.	-	-	1,000	-
Sidon	5/27/2001	12:28	0.88 in.	-	-	-	-
Greenwood	2/24/2001	20:45	0.88 in.	-	-	-	-
Totals				-	-	$2,504,000	$1,300,000

Historical data for severe wind events shows that they occur with great frequency in all incorporated and unincorporated sections of the county. While agricultural damage was reported in one instance, events primarily create general property damage.

Table F.29 – Severe Wind Events 2000 to 2019 | Source: NCEI

Location	Date	Event Type	Mag	Death	Injury	Property Damage	Crop Damage
Money	12/16/2019	T-Storm Wind	53 kts. EG	-	-	5,000	-
Greenwood	6/19/2019	T-Storm Wind	58 kts. EG	-	-	20,000	-
Browning	7/21/2018	T-Storm Wind	50 kts. EG	-	-	3,000	-
Ftloring	7/21/2018	T-Storm Wind	50 kts. EG	-	-	5,000	-
Money	7/21/2018	T-Storm Wind	53,00 kts.	-	-	30,000	-
Itta Bena	4/3/2018	T-Storm Wind	53 kts. EG	-	-	30,000	-
Money	6/16/2017	T-Storm Wind	50 kts. EG	-	-	4,000	-
Sidon	6/16/2017	T-Storm Wind	50 kts. EG	-	-	5,000	-
Ft. Loring	4/6/2017	T-Storm Wind	51 kts. EG	-	-	3,000	-
Schlater	2/25/2017	T-Storm Wind	50 kts. EG	-	-	5,000	-
Money	11/29/2016	T-Storm Wind	50 kts. EG	-	-	8000	-
Crenfee	7/11/2016	T-Storm Wind	53 kts. EG	-	-	10,000	-
Runnymede	6/17/2016	T-Storm Wind	50 kts. EG	-	-	8,000	-
Schlater	6/17/2016	T-Storm Wind	50 kts. EG	-	-	7,000	-
Itta Bena	7/3/2015	T-Storm Wind	55 kts. EG	-	-	30,000	-
Schlater	5/24/2015	T-Storm Wind	43 kts. EG	-	-	2,000	-
Greenwood	5/24/2015	T-Storm Wind	43 kts. EG	-	-	2,000	-
Itta Bena	5/24/2015	T-Storm Wind	50 kts. EG	-	-	15,000	-
Greenwood	7/23/2014	T-Storm Wind	52 kts. EG	-	-	-	-
Shellmound	4/4/2014	T-Storm Wind	52 kts. EG	-	-	8,000	-
Quito-Kimbrough ARPT	2/20/2014	T-Storm Wind	65 kts. EG	-	-	20,000	-
Money	12/21/2013	T-Storm Wind	50 kts. EG	-	-	1,000	-
Wakeland	7/11/2013	T-Storm Wind	50 kts. EG	-	-	3,000	-
Shellmound	3/31/2013	T-Storm Wind	50 kts. EG	-	-	15,000	-
Itta Bena	1/30/2013	T-Storm Wind	50 kts. EG	-	-	10,000	-
Greenwood	12/20/2012	T-Storm Wind	50 kts. EG	-	-	5,000	-
Money	12/8/2012	T-Storm Wind	40 kts. EG	-	-	500	-
Leflore (Zone)	9/30/2012	Strong Wind	43 kts. EG	-	-	1,000	-
Schlater	8/13/2012	T-Storm Wind	50 kts. EG	-	-	7,000	-
Money	7/14/2012	T-Storm Wind	50 kts. EG	-	-	5,000	-
Ft Loring	6/11/2012	T-Storm Wind	53 kts. EG	-	-	3,000	-
Schlater	6/11/2012	T-Storm Wind	53 kts. EG	-	-	6,000	-
Greenwood	5/31/2012	T-Storm Wind	50 kts. EG	-	-	10,000	-
Schlater	5/17/2012	T-Storm Wind	50 kts. EG	-	-	1,000	-
Leflore (Zone)	2/23/2012	Strong Wind	43 kts. EG	-	-	30,000	-
Browning	2/1/2012	T-Storm Wind	50 kts. EG	-	-	1,000	-
Schlater	2/1/2012	T-Storm Wind	50 kts. EG	-	-	7,000	-
Greenwood	8/11/2011	T-Storm Wind	50 kts. EG	-	-	10,000	-
Greenwood	7/25/2011	T-Storm Wind	50 kts. EG	-	-	3,000	-
Ft Loring	5/25/2011	T-Storm Wind	50 kts. EG	-	-	20,000	-
Craigside	4/27/2011	T-Storm Wind	50 kts. EG	-	-	25,000	-
Greenwood	4/27/2011	T-Storm Wind	60 kts. EG	-	-	260,000	-
Greenwood	4/15/2011	T-Storm Wind	55 kts. EG	-	-	3,000	-
Sunnyside	4/15/2011	T-Storm Wind	65 kts. EG	-	-	90,000	-
Highlandale	4/15/2011	T-Storm Wind	70 kts. EG	-	-	50,000	-
Money	2/24/2011	T-Storm Wind	65 kts. EG	-	-	30,000	-
Itta Bena	2/24/2011	T-Storm Wind	67 kts. EG	-	-	700,000	-
Greenwood	5/28/2010	T-Storm Wind	52 kts. EG	-	-	50,000	-
Itta Bena	5/17/2010	T-Storm Wind	50 kts. EG	-	-	4,000	-
Greenwood	4/3/2010	T-Storm Wind	60 kts. EG	-	-	35,000	-
Money	4/3/2010	T-Storm Wind	62 kts. EG	-	-	30,000	-

Location	Date	Event Type	Mag	Death	Injury	Property Damage	Crop Damage
Schlater	4/3/2010	T-Storm Wind	78 kts. EG	-	-	100,000	-
Bright Corner	10/9/2009	T-Storm Wind	55 kts. EG	-	-	-	-
Money	10/9/2009	T-Storm Wind	60 kts. EG	-	-	7,000	-
Leflore (Zone)	9/15/2009	Strong Wind	43 kts. EG	-	-	2,000	-
Greenwood	9/15/2009	T-Storm Wind	58 kts. EG	-	-	8,000	-
Quito Kimbrough Arpt	7/30/2009	T-Storm Wind	68 kts. EG	-	-	33,000	-
Leflore Co.	5/12/2009	T-Storm Wind	57 kts. EG	-	-	11,000	-
Leflore (Zone)	4/18/2009	Strong Wind	46 kts. EG	-	-	2,000	-
Grenada Jct	4/10/2009	T-Storm	55 kts. EG	-	-	2,000	-
Leflore (Zone)	2/11/2009	Strong Wind	43 kts. EG	-	-	20,000	-
Greenwood	8/7/2008	T-Storm Wind	52 kts. EG	-	-	-	-
Runnymede	8/3/2008	T-Storm Wind	55 kts. EG	-	-	10,000	-
Ft Loring	8/2/2008	T-Storm Wind	53 kts. EG	-	-	-	-
Ft Loring	6/1/2008	T-Storm Wind	55 kts. EG	-	-	200,000	-
Schlater	6/1/2008	T-Storm Wind	65 kts. EG	-	-	25,000	-
Ruby	5/2/2008	T-Storm Wind	55 kts. EG	-	-	-	-
Schlater	5/2/2008	T-Storm Wind	60 kts. EG	-	-	25,000	-
Itta Bena	4/26/2008	T-Storm Wind	60 kts. EG	-	-	12,000	-
Schlater	1/8/2008	T-Storm Wind	55 kts. EG	-	-	40,000	-
Greenwood	10/18/2007	T-Storm Wind	50 kts. EG	-	-	60,000	-
Berclair	10/18/2007	T-Storm Wind	60 kts. EG	-	-	130,000	-
Crenfree	6/19/2007	T-Storm Wind	70 kts. EG	-	-	600,000	-
Greenwood	6/19/2007	T-Storm Wind	58 kts. EG	-	-	70,000	-
Schlater	5/15/2007	T-Storm Wind	55 kts. EG	-	-	-	50,000
Greenwood	4/25/2007	T-Storm Wind	60 kts. EG	-	-	100,000	-
Greenwood	2/24/2007	T-Storm Wind	70 kts. EG	-	-	150,000	-
Sidon	11/15/2006	T-Storm Wind	57 kts. EG	-	-	100,000	-
Itta Bena	4/7/2006	T-Storm Wind	60 kts. EG	-	-	500,000	-
Greenwood	3/9/2006	T-Storm Wind	55 kts. EG	-	-	5,000	-
Itta Bena	3/9/2006	T-Storm Wind	55 kts. EG	-	-	5,000	-
Sandy Ridge	3/9/2006	T-Storm Wind	65 kts. EG	-	-	50,000	-
Itta Bena	5/14/2005	T-Storm Wind	67 kts. EG	-	-	80,000	-
Schlater	4/29/2005	T-Storm Wind	72 kts. EG	-	-	200,000	-
Schlater	4/29/2005	T-Storm Wind	60 kts. MG	-	-	-	-
Schlater	4/6/2005	T-Storm Wind	66 kts. EG	-	-	30,000	-
Itta Bena	4/6/2005	T-Storm Wind	57 kts. EG	-	-	40,000	-
Itta Bena	12/7/2004	T-Storm Wind	63 kts. EG	-	-	10,000	-
Morgan City	12/7/2004	T-Storm Wind	55 kts. EG	-	-	1,000	-
Minter City	5/31/2004	T-Storm Wind	50 kts. EG	-	-	-	-
Money	8/2/2003	T-Storm Wind	50 kts. ES	-	-	5,000	-
Money	7/13/2003	T-Storm Wind	50 kts. ES	-	-	2,000	-
Greenwood	6/11/2003	T-Storm Wind	53 kts. ES	-	-	10,000	-
Morgan City	6/2/2003	T-Storm Wind	50 kts. ES	-	-	5,000	-
Countywide	6/2/2003	T-Storm Wind	55 kts. ES	-	-	20,000	-
Greenwood	5/6/2003	T-Storm Wind	50 kts. ES	-	-	10,000	-
Greenwood	5/5/2003	T-Storm Wind	50 kts. ES	-	-	20,000	-
Greenwood	5/5/2003	T-Storm Wind	50 kts. ES	-	-	10,000	-
Sidon	5/3/2003	T-Storm Wind	50 kts. ES	-	-	15,000	-
Greenwood Arpt	7/22/2002	T-Storm Wind	85 kts. M	-	-	175,000	-
Greenwood	7/12/2002	T-Storm Wind	60 kts. M		-	-	-
						$4,612,000	$50,000

Probability of Future Occurrence

Based on historical NCEI data, the future probability of hailstorms, severe winds and lightning events occurring in Leflore County is highly likely. There is a 15% chance that a lighting event, a 60% chance of a hail event and an 85% chance of a severe wind event will occur in a given year. However, property damage and impact to life in the County from these events is considered minimal compared to the potential damage from other hazards, such as tornado.

Assessing Vulnerability

Impact on Life and Property: severe storms (high wind, hail, and lightning) do not have particular impacts in any one geographical section of the County. However, hail and heavy rain would have the greatest impact on the agricultural community. The economic impacts of this hazard cannot be evaluated geographically. Critical county infrastructure is unlikely to be affected by this hazard.

While Leflore County's entire population is considered at risk to severe weather, rural areas and special populations such as those living in mobile homes, the elderly and disabled, may be most vulnerable. It is strongly recommended that all manufactured housing be fastened to the ground. The National Association of Certified Home Inspectors (NACHI) describes housing tie downs as a system of "heavy-duty straps and anchors designed to stabilize manufactured homes (also known as mobile homes) during high winds." The organization points out that failure to properly install and maintain tie-downs results in reduced capacity to resist sliding and overturning.

There are approximately 921 mobile homes in Leflore County, 7 percent of the housing units, with the highest number of those mobile homes located in the south central (Itta Bena, Airport, and Sidon communities) and the northeast (Money community) portions of the county. One mobile home park near Sidon has approximately 100 mobile homes, and is in an open area, unprotected from the wind. Also vulnerable are the large tracts of farmland across the county. Farmers often lack adequate warning of impending weather events to take protective action.

Severe Winter Weather

Location and Extent

All of Leflore County is susceptible to severe winter storm events. The extent of impacts can include prolonged power outages and possible energy shortages. Severe weather may affect business operations, causing them to lose income. The same is true for workers, who may be unable to navigate roadways to travel to work, or if a workplace is closed due to loss of power. Ice buildup on roads and bridges creates dangerous driving conditions. When ice accumulates on power lines and trees, either or both could be downed from the weight of the ice. Heavy snow has been known to cause roof cave ins. The elderly and disabled residents in Leflore County who may have limited mobility should be considered very vulnerable. Measures should be taken to ensure that they are safe and warm.

Previous Occurrences

Table F.30 shows that there have been 14 severe winter storm events recorded in Leflore County between the years 2000 and 2020. These events include hazards such as cold/wind chill, heavy snow, ice storm, winter storm and winter weather.

Table F.30 – Severe Winter Weather Events 2000 to 2019 | Source: NCEI

Date	Time	Type	Death	Injury	Property Damage	Crop Damage
1/16/2018	4:30	Heavy Snow	-	-	10,000	-
2/25/2015	12:00	Heavy Snow	-	-	-	-
1/15/2013	8:00	Ice Storm	-	-	20,000	-
1/14/2013	13:10	Ice Storm	-	-	20,000	-
2/9/2011	12:00	Heavy Snow	-	-	450,000	-
2/3/2011	20:30	Ice Storm	-	-	200,000	-
1/9/2011	13:45	Heavy Snow	-	-	20,000	-
1/1/2010	0:00	Cold/wind Chill	-	-	600,000	-
3/1/2009	0:13	Heavy Snow	-	-	-	-
3/1/2009	0:10	Winter Weather	-	-	-	-
3/7/2008	16:00	Heavy Snow	-	-	-	-
25/2008	9:00	Ice Storm	-	-	200,000	-
12/31/2000	16:30	Heavy Snow	-	-	-	-
1/27/2000	8:00	Heavy Snow	-	-	100,000	-
Total			-	-0	$1,620,000	-

The most recent severe winter storm event occurred on January 16, 2018, resulting in a heavy snowstorm. Accumulating snow impacted the Arkansas, Louisiana, and Mississippi Delta area (known as ArkLaMiss) on January 16, 2018 with accumulations ranging from ½ - 3 inches across much of the area. Atmospheric conditions on that date, brought an arctic cold front with temperatures plummeting well below freezing. This set the stage for moist southwest flow aloft to overrun the cold arctic air and produce a frontal band of snow overspread the area.
Snow began falling in the Delta around 4am and slowly spread south and east. This snowfall quickly accumulated on roads causing extremely dangerous driving conditions during the evening and overnight hours with numerous vehicle accidents reported. Another atypical aspect of this snow event was that the snow itself was very dry and powdery as it fell with temperatures well into the 20s. Most Deep South snows are typically heavy and wet with snow-to-liquid ratios of 10:1 or less. However, this event was unique in that the 0.8" of snow measured at the NWS Jackson office resulted in only 0.04" of liquid equivalent thus resulting in a relatively rare snow-to-liquid ratio of 20:1. In Leflore County, snowfall reached a range of 1.0-2.0 inches with 0.3 inches of sleet.

A previous severe winter storm event impacted Leflore County on February 9-11, 1994. The storm was primarily an ice storm that impacted the ArkLaMiss Delta (source NWS Jackson): The map presented blow shows the approximate area within the NWS Jackson forecast area impacted by the February 1994 ice storm. Areas shaded in light blue experienced at least some icing, mainly during the late- night hours of February 9 into the morning hours of February 10. Areas shaded in a darker blue experienced a more prolonged period of icing beginning on the evening of February 9 lasting into the morning of February 11.

This storm began with a sharp cold front with temperatures ranging from 70 degrees at midnight on February 9 to 28 degrees at 8 pm with light to moderate rain showers following the front. Ice began to accumulate causing tree branches to break and eventually entire trees thus causing power outages throughout the Delta.

Making matters worse, a new low-pressure system developed in the northwestern Gulf of Mexico along the front that had pushed through the area previously. This low tracked along the front toward the Mississippi coast on Thursday, spreading a new round of heavy precipitation northward across the state. Moderate freezing rain, which was already enough to cause significant issues, became heavy freezing rain with thunder. This caused a significant escalation of issues as ice accumulated quickly on trees, power and phone lines, and utility poles. It was extremely challenging for utility companies to keep up with falling lines, snapping poles, and snapping trees, resulting in an attempt to maintain utilities for hospitals, nursing homes, emergency responders, and other priority customers. The heavy precipitation also caused flooding, which was only made worse by storm drains clogged with tree debris. Several fields across the Delta were flooded as surrounding trees were full of ice.

Temperatures finally warmed to above freezing during the daytime hours of February 11, but only by a few degrees in the hardest-hit areas. The slow thaw continued over several days, as temperatures eventually reached the 40s.

Across northern Mississippi, approximately 3.7 million acres of commercial forestland was significant damaged, with the value of damaged timber estimated to be $1.3 billion. Damage to trees in urban areas was estimated to be another $27 million. Twenty-five percent of Mississippi's pecan crop was destroyed and impacted for years to come, at an estimated cost of $5.5 million per year. Nearly 750,000 customers were without power at some point across North Mississippi, with some outages lasting up to a month. Over 8,000 utility poles were pulled down by the weight of the ice, and over 4,700 miles of lines were downed. About 490 water systems were impacted, with as many as 741,000 customers without water at some point. System wide, Entergy had 250,000 to 300,000 customers without power in Mississippi, Louisiana, and Arkansas. Commercial flights would not resume until the following Wednesday, February 16.

By most accounts, this was the worst ice storm to impact the ArkLaMiss Delta since January of 1951.

Probability of Future Occurrence

Based on past events, the probability of severe winter weather event occurring across Leflore County is likely with a 35% chance of occurring in any given year.

Assessing Vulnerability

The community assets at risk from a winter storm include the electrical and telephone utility systems and tree coverage and canopy. Vehicular accidents from icy conditions could cause injury, property damage, or death. Ice laden tree limbs can fall, causing property damage. Additionally, hard freezes could result in decreased water pressure as frozen and damaged pipes thaw and leak. Winter storms impact the entire community. Among essential services, critical facilities and infrastructure likely to be affected are the public safety on roadways and electric, telephone and water services. Workers who spend a great deal of time outdoors, are most likely to be affected by severe winter weather.

Populations at Risk: Vulnerable persons during winter weather periods are the homeless, the elderly, young children, and persons with chronic health problems. Above freezing temperatures combined with strong wind can result in temperatures below freezing and cause hypothermia, illness, and death.

Property Damage: In the past, this hazard has caused roofs to cave in, trees to fall on houses, prolonged power outages, and dangerous driving conditions. Figures above show that twelve storms occurring between the years 2000 and 2020 caused damage ranging from $10,000 to over $600,000 during each event, and these were not the only incidents with associated damage costs. Over $1,620,000 million in damages was incurred during the described 20-year period.

Critical Facilities and Essential Services: Essential services are not likely to be significantly impacted by a winter storm. For the most part, generators have been installed at essential facilities within the county and participating jurisdictions to ensure continuity of electricity for dispatch and emergency services.

Transportation Systems: Some major transportation services could be temporarily interrupted should icing occur. Those include bridges and overpasses highways and other rural roads throughout the county.

Lifeline Utility Systems: The most likely lifeline utility system that could be affected by a winter storm would be electric power, telephone and water line service. It could be anticipated that interruption of those rural water systems that do not have access to generators, services would last long enough in Leflore County to cause a major problem.

Tornado

Location and Extent

The entire Leflore County planning area is susceptible to tornado events and could be equally impacted by the hazard. Tornadoes that have caused significant impacts in the county in the past have ranged from a magnitude of EF0 to [E]F3 on the Enhanced Fujita Scale. The one [E]F3 event occurred in Greenwood on February 24, 2001 and resulted in $2.2 million property damage. Another event in Quito on September 24, 2005 was [E]F2, and caused $1.5 million in property damage and $700,000 in crop damage.

Previous Occurrences

A total of 17 tornadoes were recorded in the NCEI database for Leflore County between 2000 and 2020, and there were no injuries or death reported during this time period. Details of the reported events are summarized below in Table F.31. The table is followed by a discussion of events mapped by the Jackson, MS office of the National Weather Service as having taken place in the year 2020.

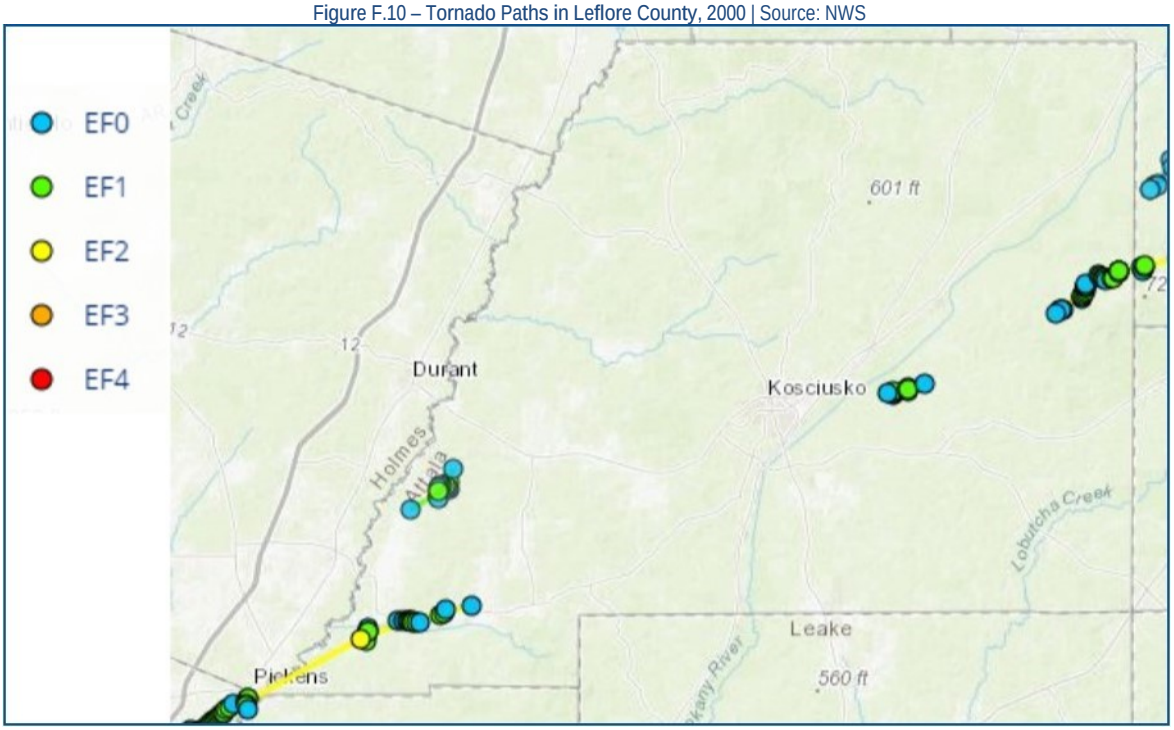
Table F.31 – Tornado Events 2000 to 2020 |Source: NCEI

Location	Date	Event	Magnitude	Death	Injury	Property Damage	Crop Damage
Sisloff Jct	4/27/2011	Tornado	EF1	-	-	-	30,000
Sidon	4/27/2011	Tornado	EF1	-	-	50,000	-
Nichols	4/23/2010	Tornado	EF1	-	-	50,000	-
Mayday	5/2/2008	Tornado	EF1	-	-	40,000	300,000
Schlater	2/24/2007	Tornado	EF0	-	-	80,000	-
Morgan City	4/7/2006	Tornado	F0	-	-	-	-
Morgan City	4/7/2006	Tornado	F0	-	-	-	-
Swiftown	9/24/2005	Tornado	F1	0	0	-	40,000

Location	Date	Event	Magnitude	Death	Injury	Property Damage	Crop Damage
Itta Bena	9/24/2005	Tornado	F0	0	0	-	15,000
Quito	9/24/2005	Tornado	F2	0	0	1,500,000	700,000
Itta Bena	9/24/2005	Tornado	F1	0	0	200,000	-
Greenwood	9/24/2005	Tornado	F0	0	0	-	30,000
Shellmound	4/29/2005	Tornado	F1	0	0	400,000	-
Money	12/7/2004	Tornado	F1	0	0	10,000	-
Schlater	5/29/2004	Tornado	F0	0	0	-	-
Greenwood	2/24/2001	Tornado	F3			2,200,000	-0
Schlater	1/3/2000	Tornado	F1			45,000	-
TOTALS				0	0	**$4,575,000**	**$1,115,000**

In addition to the events listed above, the NWS includes on its web site a map that shows the path of tornadoes that took place in the year 2000.

Figure F.10 – Tornado Paths in Leflore County, 2000 | Source: NWS



More recently, a series of tornadoes struck the Southeastern states, including those occurring over the weekend of April 10-12, 2020, referred to as the Easter Weekend Tornado. While the National Weather Service has not completed damage estimates, it appears as though no damage was recorded in Leflore County, but there was property damage in adjacent District 3 counties of Carroll, Holmes and Montgomery.

Probability of Future Occurrence

A review of previous events indicates that the tornado events occurring in Leflore County as being likely with a 15 percent chance of occurring throughout the county in a given year. Equally likely is the possibility that more than one such event will occur within proximity to others – proximity in terms of time and geography. Assuming that tornado listings for the same day indicate that the same event affected multiple communities, a review of data in Table F.19 shows that Leflore County has experienced nine tornadoes during the period between 2000 and 2019.

Assessing Vulnerability

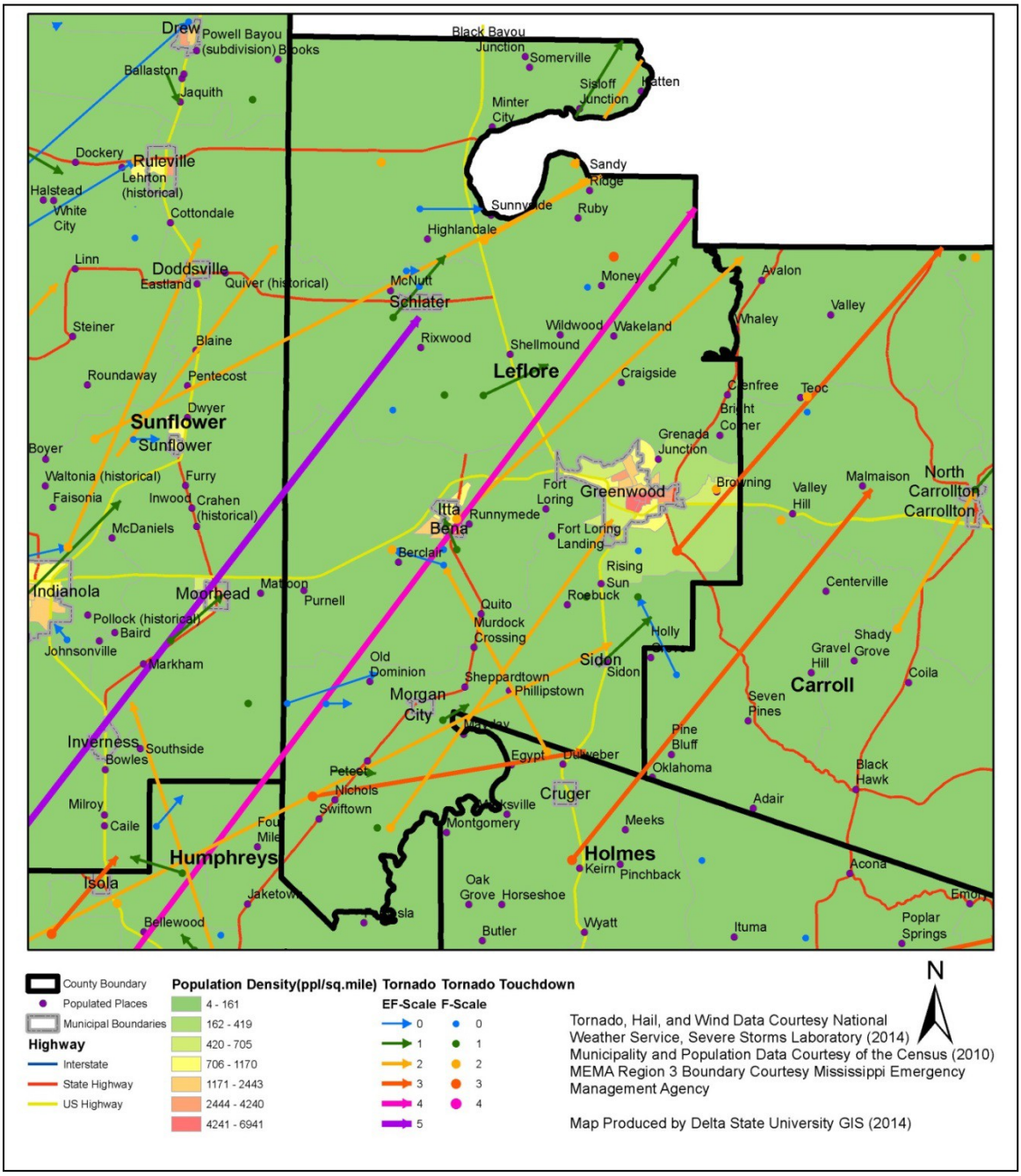
Impacts to Life and Property: Perhaps most vulnerable to this hazard are those population segments consisting of elderly, disabled, and poor who may not have the ability to seek shelter in a timely manner. Older frame houses and mobile homes are particularly vulnerable to tornadoes. According to the 2018 American Community Survey, produced by the U.S. Census Bureau, there are roughly 921 mobile homes in the county. This figure represents 7.0% of the total housing units. If other structures are not built to withstand high winds, roof damage or roof failure may occur. Mobile homes placed on an anchored foundation will likely be lifted and overturn with the force of tornado winds. Severely damaged mobile homes may not be habitable.

Tornado safe rooms can provide safer sheltering during an event and will be a focus for mitigation actions for this plan update.

Impacts to Natural Resources: Tree canopy and decorative vegetation are all subject to tornado damage. The force of a tornado is powerful enough to uproot trees and vegetation and deposit the debris in standing water, which could result in pollution. Wildlife and farm animals are not likely to survive the force of tornado winds and may be carried to distant ground or deposited in a body of water which may result in pollution. Streams can become clogged with windblown debris and downed trees, causing flooding. If debris is not removed from vacant land it could become a threat to health and safety, create a fire hazard, or create a haven for unwanted vermin or pests.

Impacts to Critical Facilities: A tornado may affect any critical facility or critical infrastructure in Leflore County. The County and its municipalities require that all new buildings and infrastructure, such as water tanks and towers, be built to high wind-resistant standards. All public and essential services buildings in Leflore County are still at risk from a direct strike from a tornado; however, there is nothing to indicate that those buildings are more vulnerable than any other building in the county. With the unpredictable nature of tornadoes and the possibility of tornado damage, it is essential to have designated areas that are safer than other areas in all public and essential service buildings.

Figure F.11: Sample of Historic Tornado Events



Tropical Storm / Hurricane

Location and Extent

While Leflore County is situated over 200 miles from the Mississippi Gulf Coast, the area is vulnerable to the unavoidable effects of tropical storms/hurricanes as they reach land and continue to move inland away from the coastal point of landfall. Storms moving inland have been known to produce violent winds, torrential rains, tornadoes, and flash floods. The extent of damages can have a significant impact on the communities within the county. All jurisdictions within the county could be equally impacted by the hazard.

Previous Occurrences

Three recent storms documented by the National Weather Service are listed in Table F.32. They were included in the 2015 District 3 RHMP and records indicate that no subsequent events have affected the region. Hurricane Katrina caused substantial damage to all 82 Mississippi counties. To further demonstrate how tropical storms have penetrated inland over a longer period of time (since the 1950s), Figure F.9 shows Leflore County hurricane crossings since for roughly the past 70 years, although only the three events below are documented by NCEI.

Table F.32 – Tropical Storm / Hurricane Events 2000 to 2020 | Source: NCEI

Event Name	Date	Death	Injury	Property Damage	Crop Damage
Hurricane Rita	9/24/2005	-	-	10,000	100,000
Hurricane Katrina	8/29/2005	-	-	1,000,000	12,000,000
Hurricane Lily	10/3/2002	-	-	71,043	-
Total		-	-	$1,081,043	$12,100,000

Probability of Future Occurrence

Based on past events, the probability of tropical storm events is classified as low. Three events occurred in the past 20 years which, if averaged, would yield a 15% annual chance of occurrence.

Assessing Vulnerability

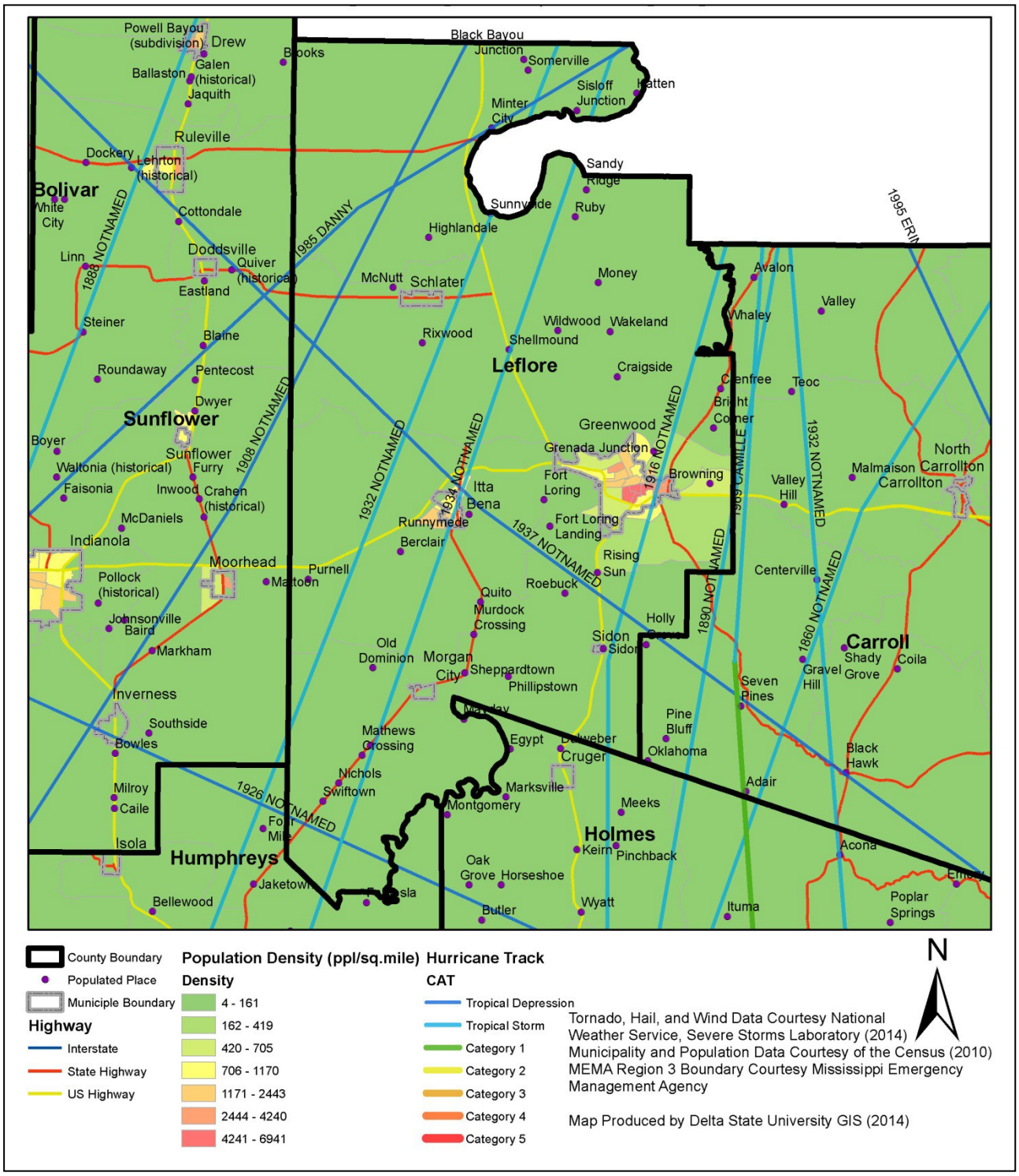
Leflore County is located inland of the Mississippi coastline. Hurricanes affecting the Gulf Coast usually lose strength as they make landfall and move northward, usually without hurricane force winds impacting the area. However, due to the speed, size, and magnitude of the storm, the County could still be affected by damaging winds. The entire population is at risk to tropical storms and hurricanes. Damage during these events may result from spawned tornadoes and flooding from heavy rain.

Table F.33 presents data obtained from HAZUS for tropical storm/hurricane events to evaluate the potential economic losses for the County.

Table F.33 – Direct Economic Losses for Buildings Annualized Losses | *Source: 2018 State of Mississippi SHMP*

Capital Stock Losses						Income Losses		
Cost Building Damage	Cost Contents Damage	Inventory Loss	Loss Ratio %	Relocation Loss	Capital Related Loss	Wages Loss	Rental Income Loss	Total Loss
$55,000	$13,000	0	0.00	$6,000	$1,000	$1,000	$2,000	$78,000

Figure F.12– Tropical Storm/Historical Events



The greatest threat to life and property in Leflore County would occur in a Category 5 Hurricane directly striking the coastline of Harrison or Hancock Counties in Mississippi, or St. Bernard or Plaquemine Parishes, Louisiana. A strike at these locations could place Leflore County, being located approximately 200 miles north, directly in the path of the highest winds and heaviest rain bands such a storm would produce.

Impacts to People and Property: The very young, the elderly, and the disabled are particularly vulnerable to harm from tropical storms/hurricanes. Older frame homes and residences and businesses housed in manufactured structures are especially vulnerable to the effects of severe winds, rain, and tornadoes generated by hurricanes. Airborne missiles such as tree limbs and branches, signs and signposts, roofing, metal siding, and other pieces of buildings, including entire roofs can penetrate doors and windows. This penetration into the "envelope" of the building allows the force of the wind to act against interior walls and ceilings of the structure – causing structural failure.

Impact on Critical Facilities: Properties at risk may include hospitals, nursing homes and housing likely to contain occupants who may not be sufficiently mobile to avoid death and injury during a flood or other emergency. Public safety facilities such as fire stations, vehicle and equipment storage facilities and emergency operations centers could also be at risk.

Impacts of Natural Resources: The most significant risk to natural resources in tropical storms and hurricanes in Leflore County is damage to forests' tree canopies and timberlands. Inland rivers and lakes can become clogged with wind-blown debris and trees, slowing recovery from a hurricane. Obstructions, if not removed can become a cause of flooding. Trees toppled onto the forest floor quickly become a target for infestation from insects that may spread to healthy trees. Water quality may suffer due to unwanted debris and vegetation blown in a hurricane. Potential debris from fallen trees can create fuel for wildfires when the area dries sufficiently to allow for burning through lightning or intervention by mankind. The Mississippi State Forest Commission works continuously to ensure that, through proactive cutting and prescribed burns, fallen trees and debris will not become fuel for a wildfire. In areas where timber is a significant feature of the economy, hurricane winds wreak havoc with growing trees, causing damage that lessens the quality of the timber and increases the likelihood of insect infestation of standing trees.

Impacts on Transportation Systems: Hurricane and/or high winds from tornadoes could result in power poles blown over or broken off onto roadways resulting in hazardous driving conditions until they can be cleared away. Overhead lines are often still energized until linemen are able to cut power to them. These conditions result in extremely hazardous driving conditions immediately following a hurricane or other windstorm. In heavily populated areas, lack of electricity also results in lack of signal lights at major intersections, creating driving hazards. Rail traffic could be interrupted by damage to railroad lines caused by flooding and damage to bridges and overpasses.

Impact on Lifeline Utility Systems: Overhead electric and telephone lines are damaged by trees and debris blown across them, or power poles and lines are blown over by hurricane force or tornado winds. In some instances, electric power may not be restored for many days or even weeks. In the aftermath of Hurricane Katrina, the entire grid of Mississippi Power Company was affected and, in some areas, land lines for telephones were down for weeks or months. This situation affected electrical cooperatives such as Central Electric Power Association (Carthage, Mississippi), which serves a portion of rural Leflore County. The hurricane also damaged cell phone transmission towers and radio and television transmission towers, many of which were out of service due to electric power failure. Lack of electricity also left some water systems and sewage treatment plants unable to operate until generators could be brought in to restore partial power.

Wildfire

Location and Extent

The Leflore County land area includes approximately 57,537 acres of forestland is equal to 14.8% coverage as a percent of land. County forestland data was derived from the 2019 Forestland Inventory conducted by Mississippi Forestry Commission as shown in the table below.

Table F.34 – 2016-2017 Forestland Statistics | Source: www.mfc.ms.gov

		Forestland			
County	Total Land Area (Acres)	Acres	Coverage (%)	Pine	Hardwood
Attala	471,597	284,817	60.4	49.1	41.3
Bolivar	279,658	86,465	30.9	0.0	100.0
Carroll	405,982	263,067	64.7	22.5	68.5
Holmes	488,932	197,380	40.3	15.1	84.8
Humphreys	275,892	30,268	10.9	0.0	100.0
Leflore	387,967	57,537	14.8	0.0	100.0
Montgomery	260,948	161,110	61.7	36.1	54.2
Sunflower	452,541	23,174	0.05	0.0	100.0
Washington	487,198	74,984	15.3	0.0	100.0

The Wildfire discussion in the Base Plan referenced an analysis of the change in total forestland area from the previous plan which shows that the total acreage and percent of coverage has continued on a declining trend in all District 3 counties, with Attala (-23.2%) and Holmes (-22.8%) Counties showing the greatest decline in forested land. The average loss of the other seven District 3 counties was 5.43 percent. Most forested land in the planning area is under private ownership.

Information provided by the Mississippi Forestry Commission indicates that wildfires may occur during any season but, since 2012, the worst fires (determined by the number of acres burned) have occurred in late Summer and early Fall. Data presented in Table 4.46 in the Base Plan indicates the county-level differences in the total number of fires and acreage burned from year to year.

Past wildfires have threatened and destroyed property. Table F.35 presents a statistical analysis of residences, commercial buildings and outbuildings, by county, that have been threatened or destroyed since 2015. Within the planning area, Leflore County has had two residences and six outbuildings threatened, but no structures destroyed by wildfire.

Table F.35 - Leflore County Residence and Structures Threatened and/or Destroyed by Wildfire Since 2015 | *Source: Mississippi Forestry Commission*

County	Residences Threatened	Residences Destroyed	Commercial Building Threatened	Commercial Building Destroyed	Outbuilding Threatened	Outbuilding Destroyed
Attala	149	3	4	-	75	8
Bolivar	-	-	-	-	-	-
Carroll	113	-	45	-	33	1
Holmes	116	-	3	-	98	2
Humphreys	-	-	-	-	0	-
Leflore	2	-	-	-	6	-
Montgomery	33	-	4	-	43	4
Sunflower	-	-	-	-	0	-
Washington	1	-	-	-	1	-
TOTALS	**414**	**3**	**56**	**-**	**256**	**15**

Fortunately for all Leflore County stakeholders, there is a strong fire protective services component between the local fire department and the presence of State forest rangers. These forces are strong and likely able to prevent most any fire from growing to catastrophic levels.

Previous Occurrences

A combination of local weather, drought conditions vegetative cover and topographic conditions may affect the development of wildfires. Documenting fire events is not consistent across the planning region with the local fire departments. The NOAA National Centers for Environmental Information (NCEI), Storm Events Database, shows no reported wildfires in the fifty-nine years between January 1, 1960 and December 1, 2019 for each of the District 3 counties. All available wildfire data is on a county level.

Table F.36 captures wildfire data for each District 3 county for the period 2014 to 2019. Leflore County data is highlighted.

Table F.36 – Wildfire Data 2014 to 2019 | Source: Mississippi Forestry Commission

County	2019		2018		2017		2016		2015		2014	
	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned
Attala	28	782	21	392	38	468	59	1,170	52	597	32	187
Bolivar	-	-	-	-	-	-	1	80	-	-	-	-
Carroll	5	18	4	32	13	172	24	387	24	268	16	83
Holmes	13	87	15	522	27	532	39	432	43	441	36	486
Humphreys	-	-	-	-	-	-	-	-	-	-	-	-
Leflore	-	-	-	-	-	-	1	22	6	150	-	-
Montgomery	4	34	-	-	1	7	14	139	12	154	8	135
Sunflower	-	-	-	-	-	-	1	-	-	-	-	-
Washington	1	5	-	-	1	32	-	-	1	8	1	40

Information provided by the Mississippi Forestry Commission indicates that wildfires may occur during any season; however, since 2012 the worst fires (determined by acres burned) have occurred in late Summer and early Fall. The data presented in table above also indicates the differences in total fires and acreage burned from year to year and county to county.

Probability of Future Occurrence

Table F.37 below shows the number of fires and acres burned each year between 2014 and 2019, along with mean and median averaged for each.

Table F.37 – Mean and Median Averages for Leflore County, Number of Fires and Acres Burned
Source: Mississippi Forestry Commission

Total Fires	2019	2018	2017	2016	2015	2014	Total	Mean	Median
Total Fires	-	-	-	1	6	-	-	-	-
Acres Burned	-	-	-	22	150	-	-	-	-

It has been stated that it is difficult to develop probability of wildfire occurrence due to the range of elements that "set the stage" for a wildfire to occur. There is not any historical data for Leflore County, however it can be stated that in any given year there is a potential for at least 1 fire to develop.

Assessing Vulnerability

Wildfires pose a low threat to all areas of Leflore County, where just around 14.8 % of acreage is forestland. Current mitigation of the fire hazard includes regular thinning of vegetative fuel, but the County Emergency Management Department works closely with County and local fire departments to educate the public about issues such as backyard burning that can lead to wildfire. Figures F.13a through F.13f are screen shots from the web site of the Southern Wildfire Risk website (www.southernwildfirerisk.com) established by the Southern Group of State Foresters. These images show the overall risk of Leflore County and its jurisdictions located in the Wildfire Urban Interface (WUI).

Figure F.13a –Jurisdictional Wildfire Vulnerability-Leflore County

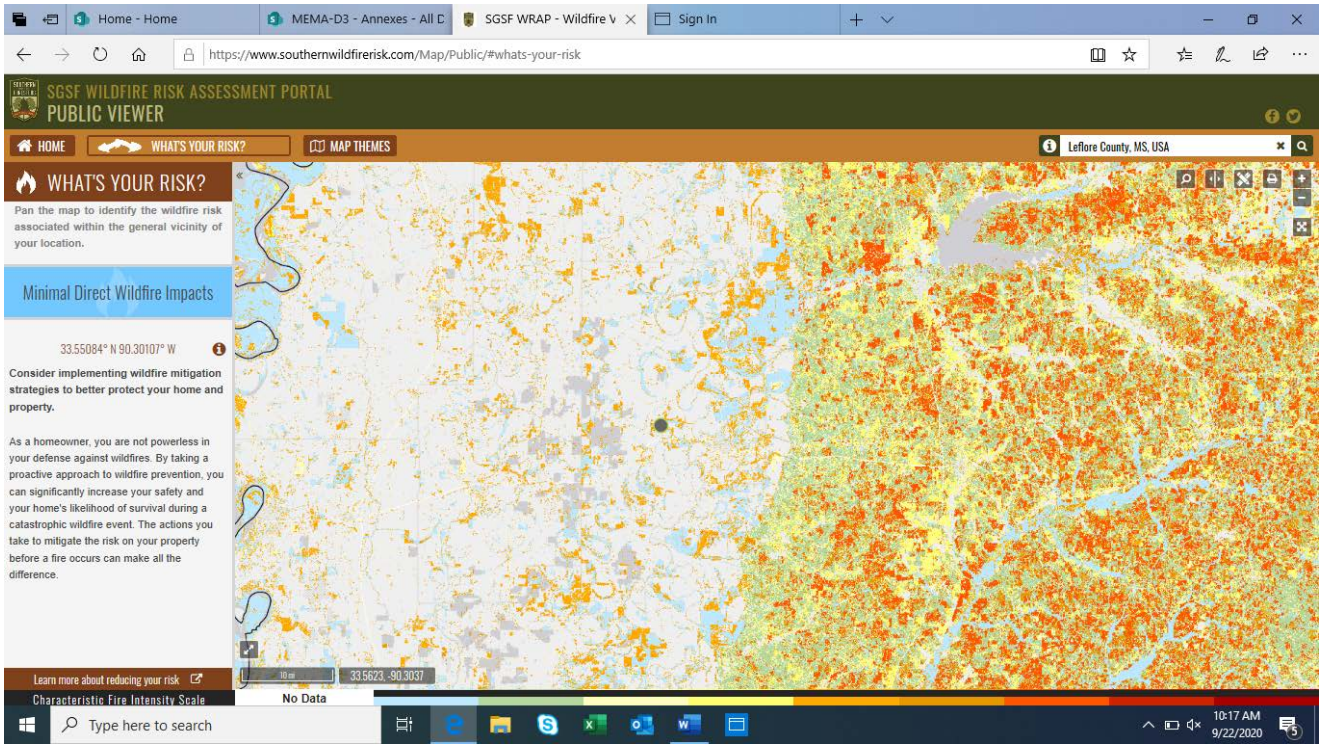


Figure F.13b –Jurisdictional Wildfire Vulnerability-City of Greenwood

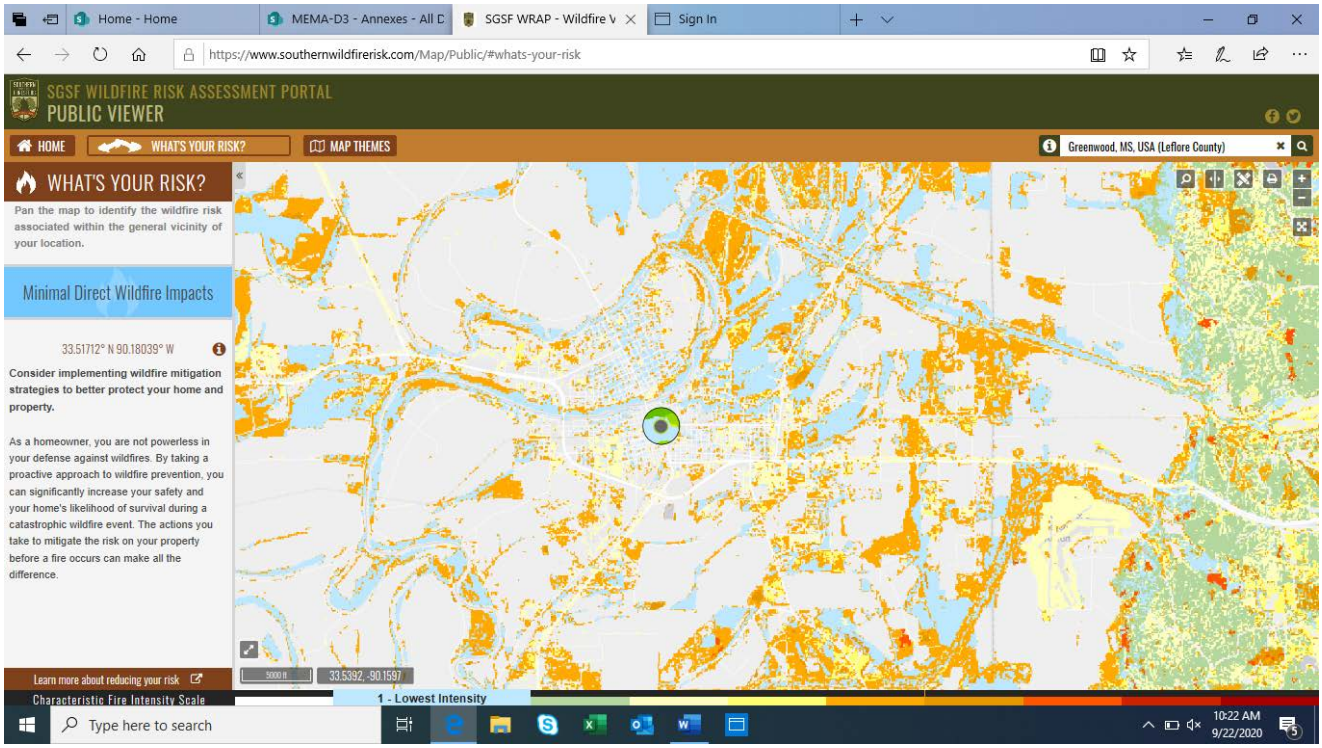


Figure F.13c –Jurisdictional Wildfire Vulnerability-City of Itta Bena

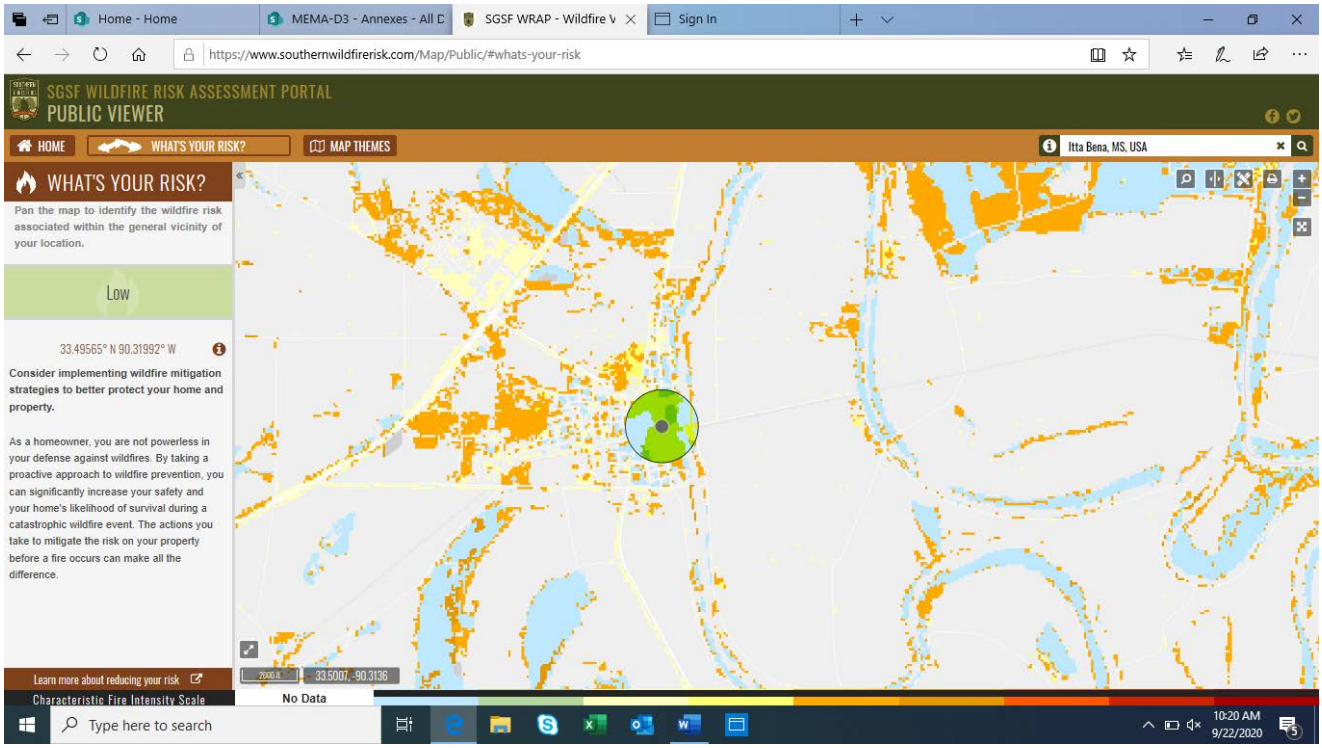


Figure F.13d –Jurisdictional Wildfire Vulnerability-Town of Morgan City

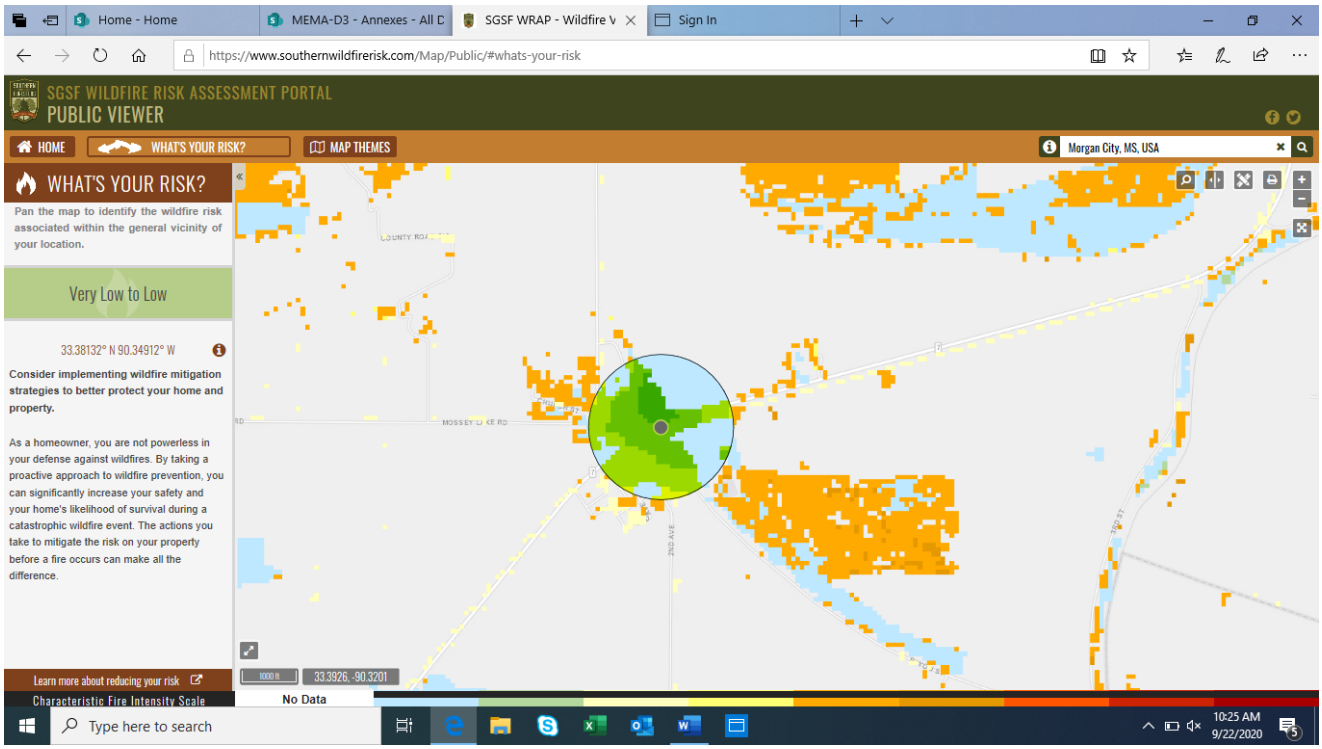
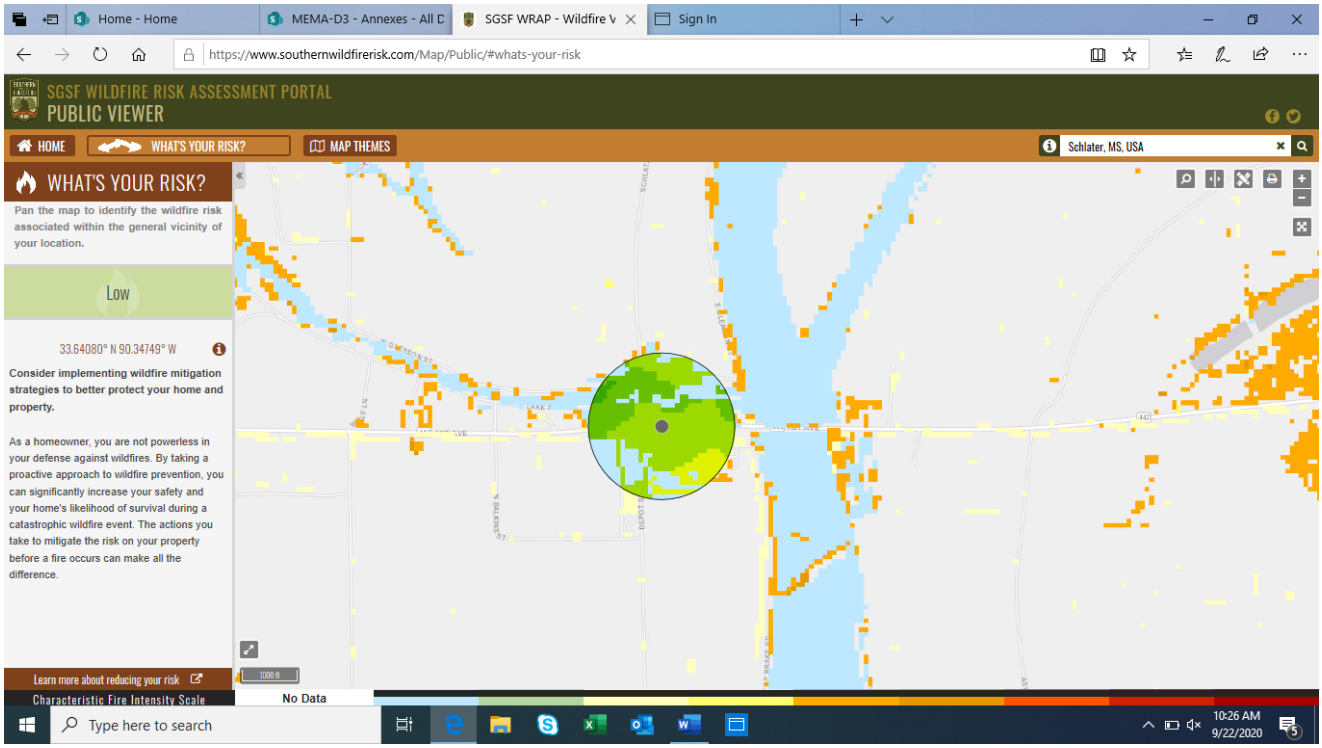
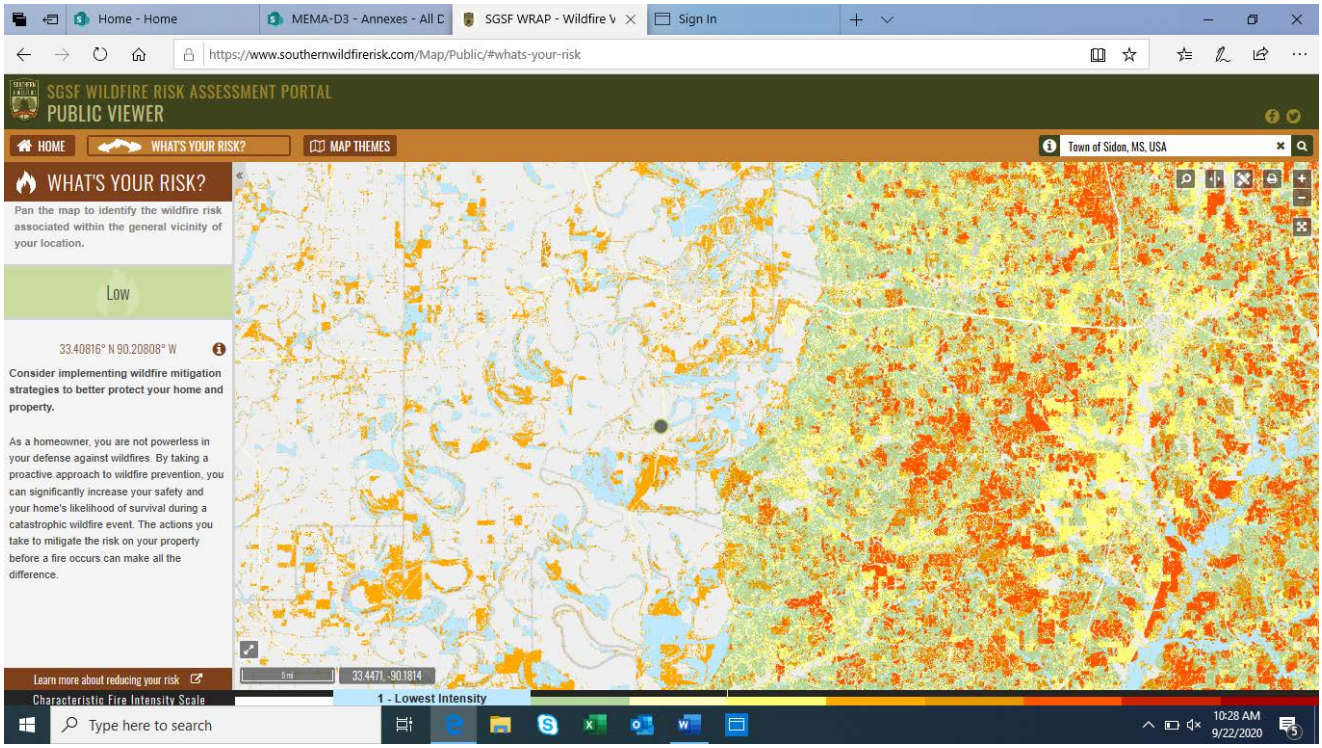


Figure F.13e –Jurisdictional Wildfire Vulnerability-Town of Schlater



FigureFE.13f –Jurisdictional Wildfire Vulnerability-Sidon



The following table summarizes the risk of Leflore County and each of its jurisdictions to wildfire SGSF portal.

Table E.38: Geographic Vulnerability to Wildfire by Jurisdiction | Source: MFC

Jurisdiction	Ranking
Unincorporated Leflore County	Minimal Direct Wildfire Impact
City of Greenwood	Minimal Direct Wildfire Impact
City of Itta Bena	Low
Town of Morgan City	Very Low to Low
Town of Schlater	Low
Town of Sidon	Low
Overall Leflore County Vulnerability to Wildfire	Low

The hazard was rated as being low overall in the 2015 RHMP. The places most vulnerable to wildfires are forested areas in unincorporated areas of Leflore County. Current mitigation of fire hazard includes regular thinning of trees and removal of dead limbs and underbrush of the 57,537 acres of forestland.

Impacts to Life and Property: Wildfire could impact the community by overextending personnel and financial resources of local emergency response crews and create a need to evacuate residences and businesses. The County's vulnerability to county-wide wildland fire hazard is mitigated somewhat by the presence of fire stations in most parts of the county, as well as the presence of a Sheriff's Office, which serves as an alternate EOC and personnel to augment those resources of fire stations.

Impacts to Critical Facilities: Electrical power could be impacted by wildfire and service could be temporarily interrupted by wildfire. It is doubtful that wildfire would have a lasting impact on water and sewer systems.

Impact on Future Development: The efforts of public and non-profit water associations ensure that there will always be water available for firefighting and structural protection, particularly in rural areas of the County. Several fire stations and districts in the county are not manned on a full-time basis but rely on volunteers, assisted by the Forestry Service, to fight wildfires. This could result in a negative impact on future development especially in the rural areas.

Hazardous Material Incidents

Location and Extent

Many hazardous and toxic materials are transported through areas of Leflore County on 18- wheelers via U.S. Highways 82, 8 and 49, and Mississippi State Highway 7. In addition, some industrial facilities store, use or transport hazardous materials through Leflore County and its municipalities.

Previous Occurrences

Table F.39 provides a summary of toxic release incidents reported in Leflore County from 2014 through 2018. According to the U.S. Environmental Protection Agency (EPA) Toxic Release Inventory (TRI), the following releases have been reported in Leflore County.

Table F.39 - EPA Toxic Release Inventory Summary for Leflore County 2014-2018
Source: U.S. Environmental Protection Agency, Toxic Release Inventory Program Database;
https://www.epa.gov/toxics-release-inventory-tri-program

	2018		2017		2016		2015		2014	
County	No. Facilities	No. Reports	No. Facilities	No. Reports	No. Facilities	No. Reports	No. Facilities	No. Reports	No. Facilities	No. Reports
Leflore	7	22	7	23	7	23	5	24	6	24

Probability of Future Occurrence

Based on past disaster events in other communities this type of incident is highly likely in Leflore County.

Assessing Vulnerability

Leflore County is vulnerable to hazardous materials incidents primarily involving limited releases at fixed facilities or transportation accidents on U.S. Highways 8, 49, and 82, and Mississippi Highway 7. The proximity of these transportation routes to Leflore County communities increases the risk to residents in a five-mile radius for hazards involving transportation accidents and hazardous materials spills.

On any given day, transportation routes throughout Leflore County, especially Highway 82 that crosses through many of the communities within the county, carry cargoes of hazardous materials and radioactivity. Accidents with hazardous materials must be dealt with quickly and resourcefully to ensure the safety of the public. Hazardous materials releases caused by the accidents could also affect the general population in the vicinity of the accident.

Based on past disaster events in other communities, a hazardous materials incident is highly likely in Leflore County. The possible impact of a hazardous materials incident could include evacuation from homes and businesses, possible deaths or injuries from exposure, long-term environmental damage, and property losses of up to $4.2 million.

Greenwood is vulnerable to hazardous materials incidents involving transportation accidents on U.S. Highways 49, and 82, and Mississippi Highway 7. The proximity of these transportation routes to populated areas of Greenwood increase the risk to residents in a five-mile radius for hazards involving transportation accidents and hazardous materials spills. A secondary risk to a transportation accident involving hazardous materials is the hazard of explosions and fires.

Itta Bena is vulnerable to hazardous materials incidents involving transportation accidents on U.S. Highway 82, and Mississippi Highway 7. (The Columbus-Greenville Railroad also runs through Itta Bena). The proximity of these transportation routes to populated areas of Itta Bena increase the risk to residents in a five-mile radius for hazards involving transportation accidents and hazardous materials spills. A secondary risk to a transportation accident involving hazardous materials is the hazard of explosions and fires.

Portions of Mississippi Highway 7 around Itta Bena are used frequently by slow-moving farm equipment, which may increase the hazard of transportation accidents with hazardous materials.

Based on past disaster events in other communities, a hazardous materials incident is highly likely in Itta Bena. The possible impact of a hazardous materials incident could include evacuation from homes and businesses, possible deaths or injuries from exposure, long-term environmental damage, and property losses of up to $1.2 million.

Morgan City is vulnerable to hazardous materials incidents involving transportation accidents on Mississippi Highway 7. The proximity of this major transportation route to populated areas of Morgan City increases the risk to residents in a five-mile radius for hazards involving transportation accidents and hazardous materials spills. A secondary risk to a transportation accident involving hazardous materials is explosions and fires. The town's wastewater treatment plant is the only facility required to report hazardous materials storage or releases, thus reducing the potential in Morgan City for hazardous spills or discharges.

Schlater is vulnerable to hazardous materials incidents involving transportation accidents on Mississippi Highway 442. The proximity of this transportation route to populated areas of Schlater increases the risk to residents in a five-mile radius for hazards involving transportation accidents and hazardous materials spills. A secondary risk to a transportation accident involving hazardous materials is the hazard of explosions and fires.

The Mid-Valley Pipeline crosses Highway 49 along the northern region of the county from west to east. The Town of Schlater and the unincorporated areas in the northern region of the county could be vulnerable to a disturbance of this line. Farther south, a natural gas line runs parallel to Highway 7, staying to the north of Morgan City, the Airport community and Greenwood. This line is approximately eight miles south of Itta Bena. Although the county has never experienced a disaster connected with this hazard, the presence of these pipelines increases the risk for residents in the vulnerable areas to explosions, fires, and release of poisonous gases in the event the pipeline is disturbed.

It is estimated that a major disaster involving a pipeline could result in 24 deaths and dozens of injuries and could cost between $17 and $900 million dollars in property damage. Indirect consequences of such a disaster could include the loss of primary transportation routes to the Greenwood-Leflore Hospital and major employers (in the case of a disturbance of the natural gas pipeline).

In addition to the presence of major transportation routes and railways, Leflore County, Greenwood and Itta Bena have a number of fixed facilities in which hazardous and/or toxic materials are stored. This creates a potential for hazardous spills or discharges. Fixed facilities that store, use or transport hazardous materials have strict controls that lower the risk of an accidental release. In addition, fixed facility sites are closely coordinated and monitored with Local Emergency Preparedness Committees, of which County response agency officials are members.

Summary of Risk Assessment

Table F.40 (also shown at the beginning of discussion of Leflore County hazards as Table F.10), is presented here as a summary of all hazard risks discussed in this plan for the period 2000 - 2020.

Table F.40: Total of Leflore County Hazard Events and Damages | Source: NCEI, MDOH

Hazard Type	No of Events	Property Damage	Crop Damage	Death	Injury
Dam/Levee Failure	-	-	-	-	-
Drought	11	$80,000	$4,931,000	-	-
Earthquake	-	-	-	-	-
Excessive Heat / Heat	6	-	-	-	-
Expansive Soil	0	-	-	-	-
Flood	35	$2,167,000	-	-	-
Hazardous Materials	22	Unknown	N/A	-	-
Human Infectious Disease (as of August 21, 2020)	N/A	N/A	N/A	70	1,186 cases
Severe Storm	229	$7,169,000	$1,350,000	1	-
Severe Winter Weather	16	$1,620,000	-	-	-
Tornado	17	$4,575,000	$1,115,000	-	-
Tropical Storm / Hurricane	3	$1,081,043	$12,100,000	-	-
Wildfire	-	-	-	-	-

This data shows that, in terms of number and frequency, severe storms are the most regularly occurring, while drought has caused the most damage to both property and crops totaling over $130 thousand in property damage and $6.991 million in crop damage. Tornadoes have caused over $6,383 million in property damage and $705 thousand in crop damage. This is followed by floods that have caused over $1.897 million in property damage and $1.100 million in crop damage. The total damages from all event between 2000 and June 2020 is estimated at $27,817,000 million, of which property damage accounts for 38% and crop damages 62% of all losses. Hurricanes have a low probability of occurring in the county but can cause significant amounts of damage to both property and crops. For example, in 2005 Hurricane Katrina caused over $530 thousand in property damage and $8.2 million in crop damage throughout the county.

The Mississippi Department of Revenue 2018 Annual Report showed that the 2017 total property assessment value equaled $ 272,544,965. This value includes both real and personal property. Table F.42 provides an estimate of potential property losses based on an event that would impact 10% of properties values as provided by NCEI data.

Table F.41-Estimated Property Damage Assessment
Source: Mississippi Department of Revenue 2018 Annual Report, NCEI

Event	*Property Damage (NCEI Data)*	*Impact*	*Total*
Total Value of Property (2018 Tax Commission)			**$ 272,544,965**
Drought	*$130,000*	*-10%*	*-$13,000*
Flood	$1,897,000	*10 %*	*$189,700*
Severe Storm	$821,500	*10 %*	*$82,150*
Severe Winter Storm	$910,000	*10 %*	*$91,000*
Tornado	$6,383,000	*10 %*	*$638,300*
Tropical Storm	$ 530,000	*10 %*	*$53,000*

F.3 Capability Assessment

This section assesses Leflore County's capability to implement hazard mitigation activities. More detailed information on the purpose and methodology used to conduct the capability assessment can be found in Section 5 – Capability Assessment.

Planning and Regulatory Capability

The findings of the Planning and Regulatory section of the capability assessment are described below in Table F.42. This table provides a jurisdictional overview of the plans and programs in place, followed by summary statistics of the *Local Capability Assessment Surveys*. Each county and municipality were asked to self-assess their capabilities.

Table F.42- Relevant Plans, Ordinances and Programs

Jurisdiction	Comprehensive / Master Plan	Capital Improvements Plan	Economic Development Plan	Emergency Operations Plan	Continuity of Operations Plan	Transportation Plan	Stormwater Management Plan	Community Wildfire Protection Plan	Historic Preservation Plan	Building Codes	Fire Department ISO Rating	Site Plan Review Requirements	Land Use Plan	Zoning Ordinance	Subdivision Regulation	Stormwater Management Plan	Flood Damage Prevention Ordinance	Flood Insurance Studies	National Flood Insurance Program	Community Rating System Rating
Leflore County	✓	✓	✓	✓		✓				'14	9			✓	✓		✓	✓	✓	
Greenwood	✓		✓	✓			✓		✓	'12	4	✓	✓	✓	✓	✓	✓	✓	✓	
Itta Bena	✓										7			✓	✓		✓	✓	✓	
Morgan City											9						✓		✓	
Schlater				✓							9						✓		✓	
Sidon											9						✓		✓	

Emergency Management Capabilities

Hazard Mitigation Plan: A hazard mitigation plan represents a community's blueprint for how they intend to reduce the impact of natural and human-caused hazards on people, the built environment, the natural environment and the economy. Elements of a hazard mitigation plan include a risk assessment, capability assessment and mitigation strategy.

- The jurisdictions within Leflore County participated in the development and implementation of a hazard mitigation plan.

Emergency Operations Plan: An emergency operations plan outlines the responsibilities for preparedness, response, recovery and mitigation, and the means by which resources are allocated and deployed during and following an emergency or disaster.

- Survey results indicate that Leflore County and the municipalities of Greenwood and Schlater have emergency operations plans.

Continuity of Operation Plan: A continuity of operations plan establishes a clear chain of command, line of succession, and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster.

- Survey results indicate that no jurisdictions have continuity of operations plans.

General Planning Capabilities

The implementation of hazard mitigation activities often involves individuals beyond the emergency management profession. Stakeholders may include local planners, public works officials, economic development specialists and others. Similarly, hazard mitigation planning cuts across multiple disciplines. As a result, the questions asked in the Local Capability Assessment Survey regarding general planning capabilities were designed to measure the degree to which mitigation is integrated into other planning efforts.

Comprehensive Plan: A comprehensive plan establishes the overall vision for a community and helps to guide municipal decision-making.

- Survey results indicate that Leflore County and the Cities of Greenwood and Itta Bena have comprehensive plans.

Economic Plan: An economic plan serves as a road map for economic development decision making, based on the collection of statistical data, historical perspective, and human potential.

- Survey results indicate that Leflore County and the City of Greenwood have economic plans.

Community Wildfire Protection Plan: The community wildfire protection plan is a strategic plan that identifies wild land fire issues facing the community and outlines prioritized mitigation actions.

- Survey results indicate that no jurisdictions have Community Wildfire Protection Plans. Nor do any jurisdictions participate in the Firewise program.

Transportation Plan: A transportation plan identifies the means to gauge transportation demands and the options to meet those needs, while considering the social, economic and environmental characteristics of the area. The development of transportation networks can significantly impact the amount, type and location of future growth. As a result, transportation planning can have a dramatic impact on future hazard vulnerability.

- Survey results indicate that Leflore County has a transportation plan.

Capital Improvements Plan: A capital improvements plan guides the scheduling of spending on public improvements. A capital improvements plan can serve as an important mechanism to guide future development away from identified hazard areas. Limiting public spending in hazardous areas is one of the most effective long-term mitigation actions available to local governments.

- Survey results indicate that Leflore County has a capital improvement plan.

Historic Preservation Plan: A historic preservation plan is intended to preserve historic structures or districts within a community. An often-overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards to include the

identification of the most effective way to reduce future damages. This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of harm's way.

- Survey results indicate the City of Greenwood has a historic preservation plan.

Zoning Ordinances, Site Plan Review Requirements: As part of a community's police power, zoning is used to protect the public health, safety and welfare. A zoning ordinance is the mechanism through which zoning is typically implemented. Since zoning regulations enable municipal governments to limit the type and density of development, it can serve as a powerful tool when applied in identified hazard areas.

- Survey results indicate that Leflore County and the Cities of Greenwood and Itta Bena have zoning ordinances.
- Survey results indicate that the City of Greenwood has requirements for Site Plan Review.

Subdivision Ordinances: A subdivision ordinance is intended to regulate the development of housing, commercial, industrial or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development.

- Survey results indicate that Leflore County and the Cities of Greenwood and Itta Bena have subdivision ordinances.

Building Codes, Permitting and Inspections: Building codes regulate construction standards. Decisions regarding the adoption of building codes, the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community.

- Survey results indicate that Leflore County and the City of Greenwood have building codes, permitting and inspections.

Fire ISO Rating: The fire insurance industry sets a fire score or Public Protection Classification (PPC) score between 1 to 10 as an indication of how well-protected each community is by the fire department. A Class 1 rating represents an exemplary fire suppression programs, while a Class 10 indicates that the communities fire suppression program does not meet minimum criteria. The scale plays a key role in the underwriting process used by insurance companies.

- The City of Greenwood currently has the lowest rating (4), indicating significant capabilities to suppress fires.

Floodplain Management Capability

Flooding represents the greatest natural hazard facing the nation and the planning area. At the same time, the tools available to reduce the impacts associated with flooding are among the most developed when compared to other hazard-specific mitigation techniques. Information contained in this section has been gathered through surveys and the NFIP Status Book.

Storm Water Management Plan: A storm water management plan is designed to address flooding associated with storm water runoff. The storm water management plan is typically focused on design and construction measures that are intended to reduce the impact of more frequently occurring minor urban flooding.

- Survey results indicate the City of Greenwood has a storm water management plan.

Flood Damage Prevention Ordinance/NFIP participation: A local Flood Damage Prevention Ordinance is a tool used by counties and municipalities to regulate the type of construction that occurs in the floodplain. If a community is an NFIP participant, a Flood Ordinance or Court Order is in place.

- Survey results indicate that Leflore County and all municipalities within its boundaries have a local Flood Damage Prevention Ordinance.

Continued Compliance with NFIP

Given the flood hazards in the planning area, an emphasis will be placed on continued compliance with the NFIP. The following steps will be taken by each participating community in order to meet or exceed the following minimum requirements as set by the NFIP.

- Issuing or denying floodplain development/building permits
- Inspecting all development to ensure compliance with local ordinance
- Maintaining records of floodplain development
- Assisting in the preparation and revision of flood maps/updates
- Assist residents in obtaining information on flood hazards, floodplain map data, flood insurance and proper construction measures.

Table F-43 presents a summary from the NFIP database of the participating jurisdictions within Leflore County.

Table F.43 - Leflore County NFIP Communities
Source: NFIP Policy and Loss Statistics (3-31-14) and Community Status Report (4-4-14)

Jurisdiction	NFIP Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date ($)
Leflore County	11/1/1979	521	64,484,500	266	$1,908,094.03
Greenwood	3/18/1980	289	58,867,500	43	$338,019.86
Itta Bena	4/3/1978	10	1,737,100	13	$50,241.20
Morgan City	4/3/1978	1	13,000	3	$1,859.08
Schlater	9/27/1985	0	0	0	0
Sidon	3/15/1978	19	1,047,800	1	$50,445.46
Totals		840	126,149,900	326	$2,348,660

Administrative and Technical Capability

Table F.44 provides a summary of the capability assessment results with Leflore County for administrative and Technical Capability.

Table F.44 – Administrative and Technical Capability

Jurisdiction	Planning Commission	Participation in Emergency Management Committee	Maintenance Program to reduce risk (i.e., tree trimming,	Mutual Aid Compacts	Building Inspection Department	Floodplain Manager	Emergency Manager	Community Planner	Civil Engineer	GIS Coordinator	Warning Systems/Services (I.e., reverse 911/outdoor	Grant Writing Capabilities
Leflore County		✓		✓	✓		✓		✓		✓	
Greenwood		✓		✓	✓	✓	✓	✓	✓		✓	
Itta Bena		✓		✓			✓				✓	
Morgan City		✓		✓			✓				✓	
Schlater		✓		✓			✓				✓	
Sidon		✓		✓			✓				✓	✓

Fiscal Capability

Table F.45 provides a summary of the results of the local capability assessment for Leflore County related to relevant fiscal resources.

Table F.45 – Administrative and Technical Capability

Jurisdiction	Capital Improvements Project Funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric services	Impact fees for new development	Stormwater utility fee	Incur debt through general obligation bonds or tax	Incur debt through private activities	Community Development Block Grant (CDBG)	Other federal funding programs	State funding programs
Leflore County										
Greenwood		✓	✓			✓		✓	✓	✓
Itta Bena										
Morgan City										
Schlater										
Sidon			✓							

Education and Outreach Capability

Table F.46 provides the results for the education and outreach capability for Leflore County.

Table F.46: Relevant Education Programs and Organizations

Jurisdiction	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Ongoing public education or information programs (e.g. responsible water use, fire safety, household preparedness, environmental education)	Natural disaster or safety-related school programs	StormReady certification	Firewise Community Certification	Public / Private partnership initiatives addressing disaster- related issues
Leflore County	✓	✓		✓		✓
Greenwood	✓	✓	✓			✓
Itta Bena		✓				
Morgan City		✓				
Schlater		✓				
Sidon		✓				

Conclusions on Local Capability

Table F.47 shows the results of the capability assessment using the scoring system that can be found in Section 5 of the base plan. The scoring for Leflore County was based on information from the local capability survey and review of existing plans. According to the assessment, the average local capability score for the county and its communities is 24.83 which falls into the moderate capability rating.

Table F.47– Capability Results Summary

Jurisdiction	Overall Capability Score	Overall Capability Rating
Leflore County	36	Moderate
Greenwood	48	High
Itta Bena	20	Limited
Morgan City	14	Limited
Schlater	16	Limited
Sidon	15	Limited

F.4 Mitigation Strategy

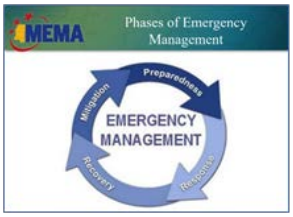
The participating jurisdictions reviewed the mitigation goals and priorities identified in the County's previous plan. Common elements of the previous mitigation goals were used to review and revise a broad streamlined list of regional goals designed to achieve the implementation of local mitigation actions. These refined goals were adopted by the participating jurisdictions. It was determined that the priorities for each of the participating jurisdictions had not changed, although the regionwide mitigation goals and objectives were streamlined as discussed in the base plan.

The Mitigation Strategy for Leflore County includes several changes, including those based on the revised list of 2020 Goals and Objectives. The table of action items includes mitigation actions identified in the 2015 plan; the status of each; newly developed mitigation actions, if any; and how the strategy was updated for the 2020 plan. The 2015 plan included two separate tables of mitigation actions: one table to provide a status update on actions mentioned in the previous plan; and a second table outlining the current mitigation strategy. These have been combined into one table in the current plan update.

Previous plans included a large number of mitigation actions, considering the size and available resources of some jurisdictions, including those with only a few hundred residents. An example of this is the fact that most County Emergency Management (EM) Directors are the single departmental employee, or they perform their EM duties while functioning in one or more service roles in their community. The same is often true for leadership at the city or town level, where those in leadership "wear many hats."

Several changes were made to streamline the Mitigation Strategy given the following considerations.

- Actions identified as falling into the Preparedness Phase of the Emergency Management Cycle were removed and recommended for consideration under Preparedness Planning. Examples of this include disaster preparedness initiatives (such as providing weather radios to residents) and National Incident Management System (NIMS) training, which represent actions a community carries out to prepare for a hazard event.
- The image at right, developed for a presentation, clearly delineates that EM agencies operationally function under four phases of emergency management, although sometimes the phases run concurrently. Professional emergency managers and their Emergency Support Functions (ESF), units called up during disaster response, develop specific plans and actions to as appropriate for each event phase.



- Actions identified as being required as part of the FEMA Hazard Mitigation Planning Process were removed because these are fully spelled out under the Plan Maintenance section of this RHMP Update. Examples of this include reviewing the mitigation plan and meeting to discuss needed plan updates after a disaster occurs in the community.
- It was recommended that actions that were similar activities be combined into one action. For example, there were previously separate action items for educating the public about natural hazards and for educating the public about manmade (technological, biological, health-related) hazards. A single outreach plan using multiple communications channels can incorporate education about all hazards to all audiences if the outreach plan is fully developed.
- In some instances, extensive description of previous actions was shortened for plan readability.

- Most action items were identified by all jurisdictions. In these cases, a countywide action was recommended that would be jointly implemented by all participating jurisdictions under the authorities of each entity.

It is hoped that the streamlined mitigation strategy will be more manageable for the District 3 Counties and its jurisdictions to implement in the next planning cycle.

Progress Made on Mitigation Strategies and Updated Mitigation Strategy

Leflore County jurisdictions have been proactive in implementing mitigation strategies identified in their previous plan. Actions included in Table F.48 have been sorted so that deleted actions appear at the end of each jurisdictional listing. They are highlighted, and a reason for deletion is listed in the column labeled "2020 Status." This column includes use of the following designations to show action status:

Designation	Meaning	Description
D	Deleted	Action was deleted from the plan for the reason described under the Column 2020 Status Description
N	New	New action for the 2020 Plan Update
R	Retained	Action previously included in the 2015 plan, with a description of how it will be continued in the 2020 plan
IP	In Progress	Action previously included in the 2015 plan has been initiated, but not yet completed.

Mitigation Action Plan: Leflore County and its Municipalities

Table F-48: 2020 Mitigation Action Plan

Project #	Action Title	Action Description	Jurisdiction (s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New; IP=In Progress)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (by Year)
Leflore County													
LC-1	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Maintain continuity of emergency services and governmental to protect staff and county property. Existing facilities may lack protective measures and adequate building standards.	Leflore County	BOS, County EMA, MEMA	All	Undetermined	R	Conduct a study of public critical structures and infrastructure to determine needs and cost; prioritize projects according to need, and consider options such as shatterproof glass, enhanced frames, roofing, and elevation.	2020-2025	1.1	H	HMGP, CGBG, General budget	2015
LC-2	Mitigate deficient/obsolete bridges	Bridges throughout MEMA District 3 are unable to withstand seismic activity and/or are classified by the national bridge inventory as structurally deficient or functionally obsolete. Work with applicable local, federal and state agencies to develop a priority	Leflore County	County EMA, Engineers, MDOT	All	Undetermined	R	Study area roadways to identify priority road and bridge improvements; prioritize based on community need.	2020-2025	1.1	M	MDOT, FHWA, State Aid	2015

		system for improvements.											
LC-3	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events. During the planning process, no specific areas were identified. The County will monitor their existing drainage systems and address systems in need of upgrades as funding becomes available.	Leflore County	CoBOS, Road Dept., Public Works, Drainage Districts	Flooding	Undetermined	R	Develop a stormwater management plan that includes improvements to all structures -- culverts, drainage, stormwater conveyance, detention ponds, and related installations.	2020-2025	1.1	H	HMGP, CDBG, CIAP funding or as part of a developer agreement	2015
LC-4	Create defensible space around structures and infrastructure	Implement defensible space programs to reduce risk to structures and infrastructure such as replacing flammable vegetation with less flammable species to create defensible zones around buildings, gas lines and other infrastructure.	Leflore County	Public Works, BOS	Wildfire	Undetermined	R	Develop Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.1	M	Public Works, BOS	2015

LC-5	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Lightning strikes can create outages to essential county water and sewer services as well as invite unnecessary damage to county facilities. The county should consider a program to establish lightning grounding systems on critical water and sewer system elements and other facilities prone to strikes to ensure that essential county services continue.	Leflore County	Public Works, BOS	Severe Storm	Undetermined	R	Identify and prioritize critical facilities requiring installation of lightning protection system, starting with water and sewer facilities and government buildings.	2020-2025	1.1	M	General budget	2015
LC-6	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	Leflore County	BOS, Public Works	Human Infectious Disease (WNV/ other vector-borne illnesses	Undetermined	R	Incorporate community education under overall mitigation public outreach	Continuous Action	1.1	H	General budget	2015

LC-7	Storm proof/retrofit new critical facilities and infrastructure	New public buildings/infrastructure should include advanced mitigation techniques when practical, such as roof and foundation supports, shutters, shatter-proof windows/doors, etc. .	Leflore County	BOS, County EMA, MEMA	All	Undetermined	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meet IBC standards to withstand all hazards.	2020-2025	1.2	H	HMGP, CDBG, General budget	2015
LC-8	Promote/build storm water detention ponds when appropriate	Implement when applicable	Leflore County	Public works	Flood	Undetermined	R	Detention ponds could be a solution for addressing flood impacts.	Continuous Action	1.3	M	CDBG, developers	2015
LC-9	Secure generators for existing and new critical facilities and infrastructure	Generators are essential for providing continual operations in the event of a disaster. As funding becomes available, the city will apply for grants to install generators to support existing or new facilities/infrastructure.	Leflore County	Mayor, Town Council, County EMA and BOS	All	Undetermined	R	Seek funding to install generators for municipal offices, safe rooms, and critical facilities.	2020-2025	1.3	H	HMGP, General Budget	2015
LC-10	Monitor water supply and establish conse3rvation regulations	The County should consider establishing water conservation ordinances and implement water conservation techniques by	Leflore County	Public Works, Building Official, BOS	Drought	Undetermined	R	Identify water conservation issues during drought and develop water monitoring ordinance and program.	2020-2025	1.5	L	General budget	2015

		regularly checking for leaks to minimize water supply loss.											
LC-11	Develop Critical Infrastructure and Key Resources database (CIKR)	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on c.ritical facilities and infrastructure for the County and its jurisdictions. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and	Leflore County	County EMA and Town Mayors	All	Undetermined	R	Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	2.1	L	General budget	2015

		accurately mapped.											
LC-12	Develop/update Stormwater Management Plan	Include six measures, including: Public Education and Outreach, Public Participation and Involvement, Managing Illicit Discharge Detection and Elimination, Controlling Construction Site Runoff Control, Controlling Post-Construction Runoff, and Pollution Prevention/Good Housekeeping.	Leflore County	Public Works	Flooding	Undetermined	R	Develop a countywide stormwater management plan that includes improvements to all structures -- culverts, drainage, stormwater conveyance, detention ponds, and related installations.	2020-2025	2.1	M	General budget	2015
LC-13	Develop a Commodity Flow Study	Hazardous materials are transported through and to various locations in the County. These routes include rail, air and roadway. This study will provide valuable data in the way of what chemicals are being transported to confirm that the county has appropriate response procedures and	Leflore County	Fire Department, Leflore County EMA	Hazardous Materials	Undetermined	R	Coordinate with the Local Emergency Preparedness Committee to determine if a Commodity Flow Study would benefit the County's overall preparedness and response efforts as it relates to hazardous material incidents.	2020-2025	2.1	L	HMEP	2015

		equipment needed.											
LC-14	Develop/Update the Comprehensive Plan to include hazard mitigation strategies/goals	County ordinances and regulations guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the County and includes any changes in future development areas.	Leflore County	BOS, Planning, EMA, Applicable Departments	All	Undetermined	R	Review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	2020-2025	2.1	M	General budget	2015
LC-15	Become a Firewise Community	The Firewise program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in the effort to protect people and property from wildfire risks. Obtain a wildfire risk assessment from the state Firewise liaison, form a committee and	Leflore County	Fire Department, BOS, MFC	Wildfire	Undetermined	R	Review requirements to become a Firewise community and encourage non-participating communities to join.	2020-2025	2.1	L	General budget	2015

		create an action plan based on assessment, conduct a Firewise day event, and submit an application to State Firewise liaison.											
LC-16	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies.	The County has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the County and includes any changes in future development areas.	Leflore County	Public Works	Flooding	Undetermined	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	Continuous Action	2.2	H	General budget	2015

LC-17	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analyses, etc. Provide a copy of the MEMA 3 Regional Hazard Mitigation Plan to county departments responsible for the enforcement or development of policies and planning initiatives.	Leflore County	County EMA	All	None	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	Continuous Action	2.2	M	General budget	2015
LC-18	Improve/maintain participation in the National Flood Insurance Program and the Community Rating System	Leflore County participates in NFIP but not the CRS.	Leflore County	County EMA, Flood-plain Manager, Building Official, MEMA	Flood	Undetermined	R	Consider reviewing actions necessary to join CRS.	Continuous Action	2.3	M	General budget	2015

LC-19	Become a certified StormReady community	StormReady helps arm America's communities with the communication and safety skills needed to save lives and property - before and during the event. StormReady helps community leaders and emergency managers strengthen local safety programs. StormReady communities are better prepared to save lives from the onslaught of severe weather though advanced planning, education and awareness.	Leflore County	County EMA, BOS	Multi-Hazard	Undetermined	R	Contact NWS before applying, complete application, schedule verification meeting and receive approval.	2020-2015	2.5	M	General budget	2015

LC-20	Develop Community Wildfire Protection Plan (CWPP)	The Healthy Forests Restoration Act (HFRA) provided communities with a tremendous opportunity to influence where and how federal agencies implement fuel reduction projects on federal lands. A CWPP is the most effective way to take advantage of this opportunity. Additionally, communities with CWPPs in place will be given priority for funding of hazardous fuels reduction projects carried out under the auspices of the HFRA.	Leflore County	Fire Department, Leflore County EMA	Wildfire	Undetermined		No action during 2015 planning cycle; carry project forward and coordinate with all jurisdictions.	2020-2025	3.1	L	MFC, General Budget, State Fire Marshall	2015
							R						

LC-21	Continue efforts on public information and awareness for natural hazards.	The County has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public the public's self-sufficiency. Continue to provide information on all hazards that may include but not be limited to educational information, evacuation routes/procedures, workshop/ training programs, alert systems, etc.	Leflore County	County EMA, Applicable Departments, MEMA, NWS, FEM, North Central MS PDD Council	All	Undetermined		Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015
							R						

LC-22	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non- natural hazards. Identify areas/groups within the County that are prone to technological, man-made and health- related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the County's web page.	Leflore County	County EMA, MSDH, Applicable Departments, North Central MS PDD Council	Infectious Diseases, West Nile, Pandemic, Hazardous Materials	Undetermined	R	Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015
LC-23	Promote workshops for emergency preparedness and continuity of operation plans	Foster family emergency preparedness to include how families reach a safe location, stay connected during disaster, and how to respond to various hazard. Continuity of operation plans establishes a clear chain of command, line of succession, and procedures for backup or alternate emergency facilities in case	Leflore County	County EMA, BOS	All hazards	N/A	R	Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	M	General budget	2015

		of extreme emergency or disaster.											
LC-24	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their own interests or for the interest of the whole community is needed.	Leflore County	County EMA, Applicable Departments	All hazards	N/A	R	Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	L	General budget	2015
LC-25	Install safe rooms in unserved areas of the county.	Work with the County EMA and Fire Department and the other towns to discuss project locations, logistics, funding, and timetable. Anticipated new structures to be erected in towns and in countywide fire stations.	City of Greenwood	County EMA, Town Mayors, and the County Fire Department	Tornado, Severe Storm	Undetermined	N	The County and local jurisdictions have for some time discussed the need to install safe rooms and priority locations.	2020-2025	1.2	H	HMGP, General budget	2020

LC-26	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District 3	Hazards have cascading affects which should also be further explored. Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Leflore County	County EMA, Planning Depart-ment, Building Officials	All	Undetermined	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action		M	General budget	2015
LC-27	Support the installation of a NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from the Doppler radar sites located in Little Rock, AR; Memphis, TN; and Jackson, MS.	Leflore County	County EMA, BOS, MEMA, NWS, DOD	Severe Storm, Tornado	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action		H	National Weather Service	2015
LC-28	Develop a weather radio program for vulnerable populations	Public Education and Awareness	Leflore County	County EMA, MEMA, Private Industry	All	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action		L	MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	2015

LC-29	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local agency level. Conduct training and verify new employees are integrated into the training programs as necessary	Leflore County	County EMA	All	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action. Access available free online training through FEMA web site.	Continuous Action		M	General budget	2015
LC-30	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local agency level. Conduct training and verify new employees are integrated into the training programs as necessary	Leflore County	County EMA	All	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action. Access available free online training through FEMA web site.	Continuous Action		M	General budget	2015

LC-31	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44 §206 – communities are required to update their hazard mitigation plan every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	Leflore County	County EMA , District 3 Communities, MEMA Mitigation Bureau	All	Undetermined	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action		H	HMGP, General budget	2015
LC-32	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Each disaster presents varying degrees of impacts - no two storms are alike. The county can gain valuable data and insight into impacts as they occur to assess and define appropriate actions in the way of implementing an existing mitigation action or identifying a new need. Convene as soon as appropriate after an event to	Leflore County	County EMA	All	N/A	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action		H	General budget	2015

		conduct an after-action report and document this in the appendix of the mitigation plan.											
LC-33	Conduct annual reviews of the MEMA District 3 Regional Hazard Mitigation Plan	As defined in the plan maintenance section of this plan, the chairman of the hazard mitigation committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted into the appendix of this plan once completed. Complete the worksheets provided and attend RHMC meetings as they are scheduled.	Leflore County	County EMA, Applicable Departments	All	N/A	D	Remove as a mitigation action. Required element of RHMP.	2020-2025		H	General budget	2015

LC-34	Pursue training and funding opportunities for mitigation actions	Funding options for actions identified in this plan should be explored and pursued. Coordination with public works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the city from obtaining grants through the HMA.	Leflore County	County EMA, Applicable departments	All	N/A	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action		H	HMGP, General budget	2015
Project #	**Action Title**	**Action Description**	**Jurisdiction(s)**	**Agency**	**Hazard**	**Estimated Cost**	**2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New; IP=In Progress)**	**2020 Status Description**	**Implementation Timeframe**	**Mitigation Goal/Objectives**	**Priority Ranking**	**Potential Funding Source(s)**	**Status (by Year)**
City of Greenwood													

Green-1	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical. Measures may include, but are not limited to roof and foundation supports, shutters, shatter-proof windows/doors, etc. During the planning process, no new facilities or infrastructure were identified.	City of Greenwood	Mayor, Town Council, County EMA	All	Undetermined	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.1	H	HMGP, CDBG, General Budget	2015
Green-2	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations needed to protect staff and city property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include shatterproof glass, frame enhancements,	City of Greenwood	Mayor, Town Council, County EMA and BOS	All	Undetermined	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need	2020-2025	1.1	H	HMGP, CDBG, general budget	2015

		strengthening roofs to withstand high winds, and elevating or flood proofing, etc. Potential hardening projects may include any municipal building and public infrastructure.											
Green-3	Promote/build storm water detention ponds when appropriate	Implement when applicable	City of Greenwood	Public works	Flood	Undetermined	R	Detention ponds could be a solution for addressing flood impacts.	Continuous Action	1.3	M	CDBG, developers	2015
Green-4	Secure generators for existing and new critical facilities and infrastructure	Generators are essential for providing continual operations in the event of a disaster. As funding becomes available, the city will apply for grants to install generators to support existing or new facilities/infrastructure. The Town is in need of a generator to support their water system.	City of Greenwood	Mayor, Town Council, County EMA and BOS	All	Undetermined	R	Seek funding to install generators for municipal offices, safe rooms, and critical facilities.	2020-2025	1.1	H	HMGP, General Budget	2015
Green-5	Continue efforts on mitigating Repetitive Flood Claim/Severe Repetitive Loss	Grant funding through the HMGP & FMA may be used to mitigate RFC and	City of Greenwood	Flood-plain manager, Leflore County	Flood	Undetermined	R	Reference list of RFC/SRL properties that have not been mitigated. The	Continuous Action	1.5	M	Flood Mitigation Assistance	2015

	(RFC/SRL) properties when feasible and practical	SRL properties that repeatedly flood.		EMA, Mayor's office, applicable departments, MEMA				City will explore mitigation options with property owners as funding and opportunity present.					
Green-6	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the Town are frequently impacted by flash flood and severe weather events. During the planning process, no specific areas were identified. The town will monitor their existing drainage systems and address systems in need of upgrades as funding becomes available.	City of Greenwood	Mayor, Town Council, Drainage Districts, County Public Works	Flooding	Undetermined	R	Develop a countywide stormwater management plan that includes improvements to all structures -- culverts, drainage, stormwater conveyance, detention ponds, and related installations.	2020-2025	1.1	H	HMGP, CDBG, CIAP funding or as part of a developer agreement	2015
Green-7	Create defensible space around structures and infrastructure	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Minimize extent	City of Greenwood	Road Department	Wildfire	Undetermined	R	Work with County to develop Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	Continuous Action	1.1	M	General budget	2015

		of unnecessary debris.											
Green-8	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	City of Greenwood	Public Works	Human Infectious Disease (WNV/ other vector-borne illnesses	Undetermined	R	Incorporate community education under overall mitigation public outreach	Continuous Action	1.5	M	General budget	2015
Green-9	Implement / maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris.	City of Greenwood	Mayor, Town Council, Public Works, County EMA	Severe Storms, Tornado, Winter Weather	Undetermined	D	Action is considered routine maintenance. Develop tree trimming plan and schedule for implementation.	Continuous Action	1.1	M	General budget	2015
Green-10	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District 3	Hazards have cascading affects which should also be further explored. Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future	City of Greenwood	Mayor, Town Council, Public Works, County EMA	All	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Ongoing	1.6	M	General budget	2015

		planning and regulatory initiatives.											
Green-11	Develop Critical Infrastructure and Key Resources database (CIKR)	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities and infrastructure for the County and its jurisdictions. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately	City of Greenwood	Mayor, Town Council, Public Works, County EMA	All	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.6	M	General budget	2015

		mapped by the Council.											
Green-12	Develop/Update the Comprehensive Plan to include hazard mitigation strategies/goals	County ordinances and regulations guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the County and includes any changes in future development areas.	City of Greenwood	Mayor, Applicable Departments	All	Undetermined	R	Review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	2020-2025	2.1	M	General budget	2015
Green-13	Continue to enforce / improve ordinances and regulations to promote hazard mitigation strategies	The City has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the City and includes any changes in future development areas.	City of Greenwood	Mayor, City Council, Public Works and Department Heads	All	Undetermined	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	2020-2025	2.2	H	General Budget	2015

Green-14	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analyses, etc. Provide a copy of the MEMA 3 Regional Hazard Mitigation Plan to city departments responsible for the enforcement or development of policies and planning initiatives.	City of Greenwood	Mayor, Town Council, Public Works and Department Heads	All	None	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	Continuous Action	2.2	M	General budget	2015
Green-15	Improve / maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) programs	The City of Greenwood participates in NFIP but not the CRS.	City of Greenwood	Mayor, Town Council, Floodplain Manager, County EMA	Flood	Undetermined	R	Revise for the City to continue to review actions necessary to join CRS.	Continuous Action	2.5	H	General budget	2015

Green-16	Continue efforts on public information and awareness for natural hazards	The Town has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Continue to work with the County to provide information on all hazards which may include but not be limited to educational information, evacuation routes/ procedures, workshop/ training programs, alert systems and the like.	City of Greenwood	Mayor, City Council, Department Heads, County HMA	All	N/A	R	Revise to include working with the County and PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2015
Green-17	Install safe rooms in unserved areas of the county.	Work with the County EMA and Fire Department and the other towns to discuss project locations, logistics, funding, and timetable. Anticipated new structures to be erected in towns and in countywide fire stations.	City of Greenwood	County EMA, Town Mayors, and the County Fire Department	Tornado, Severe Storm	Undetermined	N	The County and local jurisdictions have for some time discussed the need to install safe rooms and priority locations.	2020-2025	1.2	H	HMGP, General budget	2020

Green-17	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures	City of Greenwood	Town Police and Fire Departments, County EMA	All	Staff time	D	Moved to Preparedness Planning. Not a mitigation action. Access available free online training through FEMA web site.	Continuous Action	2.3	L	General budget	2015
Green-18	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local agency level. Conduct training and verify new employees are integrated into the training programs as necessary	City of Greenwood	All Departments	All	Staff time	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action	2.3	L	General budget	2015

Green-19	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44 §206 – communities are required to update their hazard mitigation plan every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	City of Greenwood	Mayor, Town Council, County EMA	All	None	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action	2.4	H	General budget	2015
Green-20	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Each disaster presents varying degrees of impacts - no two storms are alike. The city can gain valuable data and insight into impacts as they occur to assess and define appropriate actions in the way of implementing an existing mitigation action or identifying a new need. Convene as soon as appropriate after an event to	City of Greenwood	Mayor, Town Council, County EMA	All	None	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action	2.4	H	General budget	2015

		conduct an after-action report and document this in the appendix of the mitigation plan.											
Green-21	Conduct annual reviews of the MEMA District 3 Regional Hazard Mitigation Plan	As defined in the plan maintenance section of this plan, the chairman of the hazard mitigation committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted into the appendix of this plan once completed. Complete the worksheets provided and attend RHMC meetings as they are scheduled.	City of Greenwood	Mayor, Town Council, County EMA	All	None	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action	2.4	H	General budget	2015

Green-22	Pursue training and funding opportunities for mitigation actions	Funding options for actions identified in this plan should be explored and pursued. Coordination with public works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the city from obtaining grants through the HMA.	City of Greenwood	Mayor, Town Council, County EMA	All	N/A	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action	2.4	H	General budget	2015
Green-23	Promote workshops for emergency preparedness/continuity of operation plans	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations.	City of Greenwood	Mayor, Town Council, Department Heads, County EMA	All	N/A	D	Remove as a mitigation action-preparedness measure	Continuous Action	3.1	M	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New; IP=In Progress)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (by Year)
City of Itta Bena													
IB-2	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations needed to protect staff and city property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include shatterproof glass, frame enhancements, strengthening roofs to withstand high winds, and elevating or flood proofing, etc. Potential hardening projects may include any municipal	City of Itta Bena	Mayor, Town Council, County EMA and BOS	All	Undetermined	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need	2020-2025	1.1	H	HMGP, CDBG, general budget	2015

		building and public infrastructure.											
IB-3	Promote/build storm water detention ponds when appropriate	Implement when applicable	City of Itta Bena	Public works	Flood	Undetermined	R	Detention ponds could be a solution for addressing flood impacts.	Continuous Action	1.3	M	CDBG, developers	2015
IB-4	Secure generators for existing and new critical facilities and infrastructure	Generators are essential for providing continual operations in the event of a disaster. As funding becomes available, the city will apply for grants to install generators to support existing or new facilities/infrastructure. The Town is in need of a generator to support their water system.	City of Itta Bena	Mayor, Town Council, County EMA and BOS	All	Undetermined	R	Seek funding to install generators for municipal offices, safe rooms, and critical facilities.	2020-2025	1.1	H	HMGP, General Budget	2015
IB-5	Continue efforts on mitigating Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the HMGP & FMA may be used to mitigate RFC and SRL properties that repeatedly flood.	City of Itta Bena	Flood-plain manager, Leflore County EMA, Mayor's office, applicable departments, MEMA	Flood	Undetermined	R	Reference list of RFC/SRL properties that have not been mitigated. The City will explore mitigation options with property owners as funding and opportunity present.	Continuous Action	1.5	M	Flood Mitigation Assistance	2015

IB-6	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the Town are frequently impacted by flash flood and severe weather events. During the planning process, no specific areas were identified. The town will monitor their existing drainage systems and address systems in need of upgrades as funding becomes available.	City of Itta Bena	Mayor, Town Council, Drainage Districts, County Public Works	Flooding	Undetermined	R	Develop a countywide stormwater management plan that includes improvements to all structures -- culverts, drainage, stormwater conveyance, detention ponds, and related installations.	2020-2025	1.1	H	HMGP, CDBG, CIAP funding or as part of a developer agreement	2015
IB-7	Create defensible space around structures and infrastructure	Implement defensible space programs to reduce risk to structures and infrastructure such as replacing flammable vegetation with less flammable species to create defensible zones around buildings, gas lines and other infrastructure.	City of Itta Bena	Public Works, BOS	Wildfire	Undetermined	R	Develop Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.1	M	Public Works, BOS	2015

IB-8	Implement / maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris.	City of Itta Bena	Mayor, Town Council, Public Works, County EMA	Severe Storms, Tornado, Winter Weather	Undetermined		D	Action is considered routine maintenance. Develop tree trimming plan and schedule for implementation.	Continuous Action	1.1	M	General budget	2015
IB-9	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District 3	Hazards have cascading affects which should also be further explored. Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	City of Itta Bena	Mayor, Town Council, Public Works, County EMA	All	N/A		D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Ongoing	1.6	M	General budget	2015

IB-10	Develop Critical Infrastructure and Key Resources database (CIKR)	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities and infrastructure for the County and its jurisdictions. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.	City of Itta Bena	Mayor, Town Council, Public Works, County EMA	All	Undetermined		Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.6	M	General budget	2015
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IB-11	Continue to enforce / improve ordinances and regulations to promote hazard mitigation strategies	The City has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the City and includes any changes in future development areas.	City of Itta Bena	Mayor, City Council, Public Works and Departm ent Heads	All	Undetermined	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	2020-2025	2.2	H	General Budget	2015
IB-12	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analyses, etc. Provide a copy of the MEMA 3 Regional Hazard Mitigation Plan to city departments	City of Itta Bena	Mayor, Town Council, Public Works and Departm ent Heads	All	None	R	Review all codes and ordinances to ensure the highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	Contin uous Action	2.2	M	General budget	2015

		responsible for the enforcement or development of policies and planning initiatives.											
IB-13	Continue efforts on public information and awareness for natural hazards	The Town has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Continue to work with the County to provide information on all hazards which may include but not be limited to educational information, evacuation routes/ procedures, workshop/ training programs, alert systems and the like.	City of Itta Bena	Mayor, City Council, Department Heads, County HMA	All	N/A	R	Revise to include working with the County and PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2015
IB-14	Install safe rooms in unserved areas of the county.	Work with the County EMA and Fire Department and the other towns to discuss project locations, logistics, funding, and timetable. Anticipated new structures to be	City of Itta Bena	County EMA, Town Mayors, and the County Fire Department	Tornado, Severe Storm	Undetermined	N	The County and local jurisdictions have for some time discussed the need to install safe rooms and priority locations.	2020-2025	1.2	H	HMGP, General budget	2020

		erected in towns and in countywide fire stations.											
IB-15	Support the installation of a NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from the Doppler radar sites located in Little Rock, AR; Memphis, TN; and Jackson, MS.	City of Itta Bena	County EMA, BOS, MEMA, NWS, DOD	Severe Storm, Tornado	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action		H	National Weather Service	2015
IB-16	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures	City of Itta Bena	Town Police and Fire Departments, County EMA	All	Staff time	D	Moved to Preparedness Planning. Not a mitigation action. Access available free online training through FEMA web site.	Continuous Action	2.3	L	General budget	2015
IB-17	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local agency level. Conduct training and verify new	City of Itta Bena	All Departments	All	Staff time	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action	2.3	L	General budget	2015

		employees are integrated into the training programs as necessary											
IB-18	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44 §206 – communities are required to update their hazard mitigation plan every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	City of Itta Bena	Mayor, Town Council, County EMA	All	None	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action	2.4	H	General budget	2015
IB-19	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Each disaster presents varying degrees of impacts - no two storms are alike. The city can gain valuable data and insight into impacts as they occur to assess and define appropriate actions in the way of implementing an existing mitigation action	City of Itta Bena	Mayor, Town Council, County EMA	All	None	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action	2.4	H	General budget	2015

		or identifying a new need. Convene as soon as appropriate after an event to conduct an after-action report and document this in the appendix of the mitigation plan.											
IB-20	Conduct annual reviews of the MEMA District 3 Regional Hazard Mitigation Plan	As defined in the plan maintenance section of this plan, the chairman of the hazard mitigation committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted into the appendix of this plan once completed. Complete the worksheets provided and attend RHMC meetings as they are scheduled.	City of Itta Bena	Mayor, Town Council, County EMA	All	None	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action	2.4	H	General budget	2015

IB-21	Pursue training and funding opportunities for mitigation actions	Funding options for actions identified in this plan should be explored and pursued. Coordination with public works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the city from obtaining grants through the HMA.	City of O	Mayor, Town Council, County EMA	All	N/A	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action	2.4	H	General budget	2015
IB-22	Promote workshops for emergency preparedness/continuity of operation plans	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations.	City of Itta Bena	Mayor, Town Council, Department Heads, County EMA	All	N/A	D	Remove as a mitigation action-preparedness measure	Continuous Action	3.1	M	General budget	2015

IB-23	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their own interests or for the interest of the whole community is needed.	City of Itta Bena	Mayor's Office, Leflore County EMA	All	N/A	D	Remove as a mitigation action, intent of RHMP to pursue community coordination to attain mitigation goals.	Continuous Action	3.2	H	General budget	2015
Project #	**Action Title**	**Action Description**	**Jurisdiction (s)**	**Agency**	**Hazard**	**Estimated Cost**	**2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New; IP=In Progress)**	**2020 Status Description**	**Implementation Timeframe**	**Mitigation Goal/Objectives**	**Priority Ranking**	**Potential Funding Source(s)**	**Status (by Year)**
Town of Morgan City													
Morg-1	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical. Measures may include, but are not limited to roof and foundation supports, shutters, shatter-proof	Town of Morgan City	Mayor, Town Council, County EMA	All	Undetermined	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.1	H	HMGP, CDBG, General Budget	2015

		windows/doors, etc. During the planning process, no new facilities or infrastructure were identified.											
Morg-2	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations needed to protect staff and city property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include shatterproof glass, frame enhancements, strengthening roofs to withstand high winds, and elevating or flood proofing, etc. Potential hardening projects may include any municipal building and public infrastructure.	Town of Morgan City	Mayor, Town Council, County EMA and BOS	All	Undetermined	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need	2020-2025	1.1	H	HMGP, CDBG, general budget	2015

Morg-3	Promote/build storm water detention ponds when appropriate	Implement when applicable	Town of Morgan City	Public works	Flood	Undetermined	R	Detention ponds could be a solution for addressing flood impacts.	Continuous Action	1.3	M	CDBG, developers	2015
Morg-4	Secure generators for existing and new critical facilities and infrastructure	Generators are essential for providing continual operations in the event of a disaster. As funding becomes available, the city will apply for grants to install generators to support existing or new facilities/infrastructure. The Town is in need of a generator to support their water system.	Town of Morgan City	Mayor, Town Council, County EMA and BOS	All	Undetermined	R	Seek funding to install generators for municipal offices, safe rooms, and critical facilities.	2020-2025	1.1	H	HMGP, General Budget	2015
Morg-5	Continue efforts on mitigating Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the HMGP & FMA may be used to mitigate RFC and SRL properties that repeatedly flood.	Town of Morgan City	Flood-plain manager, Leflore County EMA, Mayor's office, applic-able depart-ments, MEMA	Flood	Undetermined	R	Reference list of RFC/SRL properties that have not been mitigated. The City will explore mitigation options with property owners as funding and opportunity present.	Continuous Action	1.5	M	Flood Mitigation Assistance	2015

Morg-6	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the Town are frequently impacted by flash flood and severe weather events. During the planning process, no specific areas were identified. The town will monitor their existing drainage systems and address systems in need of upgrades as funding becomes available.	Town of Morgan City	Mayor, Town Council, Drainage Districts, County Public Works	Flooding	Undetermined	R	Develop a countywide stormwater management plan that includes improvements to all structures -- culverts, drainage, stormwater conveyance, detention ponds, and related installations.	2020-2025	1.1	H	HMGP, CDBG, CIAP funding or as part of a developer agreement	2015
Morg-7	Create defensible space around structures and infrastructure	Implement defensible space programs to reduce risk to structures and infrastructure such as replacing flammable vegetation with less flammable species to create defensible zones around buildings, gas lines and other infrastructure.	Town of Morgan City	Public Works, BOS	Wildfire	Undetermined	R	Develop Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.1	M	Public Works, BOS	2015

Morg-8	Implement / maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris.	Town of Morgan City	Mayor, Town Council, Public Works, County EMA	Severe Storms, Tornado, Winter Weather	Undetermined	D	Action is considered routine maintenance. Develop tree trimming plan and schedule for implementation.	Continuous Action	1.1	M	General budget	2015
Morg-9	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District 3	Hazards have cascading affects which should also be further explored. Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Town of Morgan City	Mayor, Town Council, Public Works, County EMA	All	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Ongoing	1.6	M	General budget	2015

Morg-10	Develop Critical Infrastructure and Key Resources database (CIKR)	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities and infrastructure for the County and its jurisdictions. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.	Town of Morgan City	Mayor, Town Council, Public Works, County EMA	All	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.6	M	General budget	2015

Morg-11	Continue to enforce / improve ordinances and regulations to promote hazard mitigation strategies	The City has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the City and includes any changes in future development areas.	Town of Morgan City	Mayor, City Council, Public Works and Department Heads	All	Undetermined	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	2020-2025	2.2	H	General Budget	2015
Morg-12	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analyses, etc. Provide a copy of the MEMA 3 Regional Hazard Mitigation Plan to city departments	Town of Morgan City	Mayor, Town Council, Public Works and Department Heads	All	None	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	Continuous Action	2.2	M	General budget	2015

		responsible for the enforcement or development of policies and planning initiatives.											
Morg-13	Improve / maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) programs	The City of Greenwood participates in NFIP but not the CRS.	Town of Morgan City	Mayor, Town Council, Floodplain Manager, County EMA	Flood	Undetermined	R	Revise for the City to continue to review actions necessary to join CRS.	Continuous Action	2.5	H	General budget	2015
Morg-14	Continue efforts on public information and awareness for natural hazards	The Town has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Continue to work with the County to provide information on all hazards which may include but not be limited to educational information, evacuation routes/ procedures, workshop/ training programs, alert systems and the like.	City of Itta Bena	Mayor, City Council, Department Heads, County HMA	All	N/A	R	Revise to include working with the County and PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2015

Morg-15	Install safe rooms in underserved areas of the county.	Work with the County EMA and Fire Department and the other towns to discuss project locations, logistics, funding, and timetable. Anticipated new structures to be erected in towns and in countywide fire stations.	City of Itta Bena	County EMA, Town Mayors, and the County Fire Departme nt	Tornado , Severe Storm	Undetermined	N	The County and local jurisdictions have for some time discussed the need to install safe rooms and priority locations.	2020-2025	1.2	H	HMGP, General budget	2020
Morg-16	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures	Town of Morgan City	Town Police and Fire Departme nts, County EMA	All	Staff time	D	Moved to Preparedness Planning. Not a mitigation action. Access available free online training through FEMA web site.	Contin uous Action	2.3	L	General budget	2015
Morg-17	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local agency level. Conduct training and verify new employees are integrated into the training programs as necessary	Town of Morgan City	All Departme nts	All	Staff time	D	Remove as a mitigation action. Required element of RHMP.	Contin uous Action	2.3	L	General budget	2015

Morg-18	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44 §206 – communities are required to update their hazard mitigation plan every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	Town of Morgan City	Mayor, Town Council, County EMA	All	None	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action	2.4	H	General budget	2015
Morg-19	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Each disaster presents varying degrees of impacts - no two storms are alike. The city can gain valuable data and insight into impacts as they occur to assess and define appropriate actions in the way of implementing an existing mitigation action or identifying a new need. Convene as soon as appropriate after an event to conduct an after action report and document this in the appendix of the mitigation plan.	Town of Morgan City	Mayor, Town Council, County EMA	All	None	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action	2.4	H	General budget	2015

Morg-20	Conduct annual reviews of the MEMA District 3 Regional Hazard Mitigation Plan	As defined in the plan maintenance section of this plan, the chairman of the hazard mitigation committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted into the appendix of this plan once completed. Complete the worksheets provided and attend RHMC meetings as they are scheduled.	Town of Morgan City	Mayor, Town Council, County EMA	All	None	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action	2.4	H	General budget	2015
Morg-21	Pursue training and funding opportunities for mitigation actions	Funding options for actions identified in this plan should be explored and pursued. Coordination with public works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the city from obtaining	Town of Morgan City	Mayor, Town Council, County EMA	All	N/A	D	Remove as a mitigation action. Required element of RHMP.	Continuous Action	2.4	H	General budget	2015

		grants through the HMA.											
Morg-22	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their own interests or for the interest of the whole community is needed.	Town of Morgan City	Mayor's Office, Leflore County EMA	All	N/A	D	Remove as a mitigation action, intent of RHMP to pursue community coordination to attain mitigation goals.	Continuous Action	3.2	H	General budget	2015
Project #	**Action Title**	**Action Description**	**Jurisdiction(s)**	**Agency**	**Hazard**	**Estimated Cost**	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New; IP=In Progress)	2020 Status Description	**Implementation Timeframe**	**Mitigation Goal/Objectives**	**Priority Ranking**	**Potential Funding Source(s)**	**Status (by Year)**
Town of Schlater													
Sch-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Schlater	Mayor's office, Leflore Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Continue emphasis on storm proofing and retrofit of critical facilities	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

Sch-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc. Potential hardening projects may include any municipal building and public infrastructure. Specific buildings in need of upgrades include the fire department.	Town of Schlater	Mayor's office, Leflore Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Continue emphasis on storm proofing and retrofit of critical facilities	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

Sch-03	Promote/build storm water detention ponds when appropriate	Implement when applicable	Town of Schlater	Public works	Flood	Undetermined	R	Retain - focus on critical facilities and infrastructure	Continuous Action	1.3	M	CDBG, developers	2015
Sch-04	Secure generators for existing and new critical facilities and infrastructure	Generators are essential for providing continual operations in the event of a disaster.	Town of Schlater	Emergency Services	Multi-hazard	Unknown - dependent on facility type	R	As funding becomes available, apply for grants to install generators to support existing or new facilities.	2020-2025	1.3	H	HMGP, General Budget	2015
Sch-05	Continue efforts on mitigating Repetitive Flood Claim/Severe Repetitive Loss properties when feasible and practical.	Grant funding through HMGP may be used to mitigate RFC and SRL property that repeatedly flood.	Town of Schlater	Mayor's Office, Leflore County EMA, MEMA	Flood	Undetermined	R	RFC/SRL properties have been identified by the city and will explore options with property owners as funding and opportunities arise	Continuous Action	2.5	M	Flood Mitigation Assistance	2015
Sch-06	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the City are frequently impacted by flash flood and severe weather events - areas in need of improved systems include: areas in the town should be considered as needs and funding opportunities arise.	Town of Schlater	Mayor's office, Public Works, Drainage Districts	Flood	Undetermined	R	Retain - emphasis on critical facilities and infrastructure	2015-2040	1.5	H	HMGP, CDBG, CIAP funding or part of developer agreements	2015

Sch-07	Create defensible space around structures and infrastructure	Defensible zones around buildings, power and gas lines and other infrastructure may be lacking throughout the City.	Town of Schlater	Public Works, Mayor's Office	Wildfire	Undetermined	R	Implement defensible space programs to reduce risk to structures and infrastructure.	2020-2025	1.1, 1.2	L	General funds	2015
Sch-08	Develop Critical Infrastructure and Key Resources (CIKR) database	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities and infrastructure for the County and its jurisdictions. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing	Town of Schlater	Leflore County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Participate in state-level data gathering efforts	2021	1.6	H	General budget	2015

		and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.											
Sch-09	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	Update and/or develop ordinances and regulations as required to address all hazards prone to Schlater and include any changes in future development areas	Town of Schlater	Mayor's office	Multi-hazard	N/A	R	Move forward to this planning cycle	Continuous Action	2.2	M	General budget	2015
Sch-10	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	The town can gain valuable data and insight into impacts as they occur to assess and define appropriate actions in the way of implementing an existing mitigation action or identifying a new need. Convene as soon as appropriate after an event to conduct an after-action report and document this in the appendix of the mitigation plan.	Town of Schlater	Mayor's Office, Leflore County EMA	Multi-hazard	N/A	R	Move forward with focus on mitigation actions post-disaster	Continuous Action	2.4	H	General funds	2015

Sch-11	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	Continue to participate in the NFIP and seek opportunities to join/improve CRS rating through documentation of activities and projects	Town of Schlater	Mayor's office, Leflore Co. EMA, MEMA	Flood	N/A	R	Focus on CRS participation	Continuous Action	2.5	H	General budget	2015
Sch-12	Continue efforts on public information and awareness for natural hazards	The Town has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient. Continue to provide information on all hazards that may include but not be limited to educational information, evacuation routes/procedures,	Town of Schlater	Leflore County EMA, applicable departments, MEMA, NWS, FEMA	Multi-hazard	N/A	R	Focus on hazard mitigation measures	Continuous Action	3.1	H	General funds	2015

		workshop/training programs, alert systems and the like.											
Sch-13	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the town that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the city's web page	Town of Schlater	Leflore County EMA, MSDH, Mayor's Office	Human Infectious Disease, Hazardous Materials	N/A	R	Focus on mitigation measures	Continuous Action	3.1	H	MSD, EMPG, Homeland Security, general funds	2015
Sch-14	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals.	The county/town will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives	Town of Schlater	Leflore County EMA, Mayor's Office	Multi-hazard	N/A	R	Focus on mitigation measures	Continuous Action	3.2	M	General budget	2015

Sch-15	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including installation, testing and inspection	Town of Schlater	Leflore County EMA, Mayor's Office, MEMA	Severe Weather, Tornado	$35,000	D	Move to Preparedness Planning Initiative	Continuous Action	1.1	H	HMGP, Local Funds	2015
Sch-16	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Schlater	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Move to Preparedness Planning Initiative	2015-2020	1.1	M	NWS	2015
Sch-17	Implement maintenance program for storm water conveyance and detention structures	Continue to implement preventive maintenance to water conveyance systems	Town of Schlater	Public Works Dept.	Flood	Undetermined	D	Remove - routine maintenance is not a mitigation action	N/A	1.5	M	CDBG, CIAP, general budget	2015

Sch-18	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	Town of Schlater	Mayor's Office	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove. Routine maintenance is not considered mitigation.	N/A	1.5	H	General budget	2015
Sch-19	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives	Town of Schlater	Planning Department, Building Official, Leflore County EMA	Multi-hazard	N/A	D	Moved to Preparedness Planning	Continuous Action	1.6	H	General budget	2015
Sch-20	Integrate hazard mitigation into local planning	Provide a copy of the MEMA 3 RHMP to applicable departments responsible for the enforcement or development of policies and planning initiatives	Town of Schlater	Leflore Co. EMA, Mayor's Office, MEMA, applicable departments	Multi-hazard	N/A	D	Remove, requirement of the plan	Continuous Action	2.2	H	General budget	2015

Sch-21	Conduct annual NIMS training for first responders, officials and critical employees	Conduct training and verify new employees are integrated into training programs as necessary	Town of Schlater	Fire, Police, Leflore Co. EMA	Multi-hazard	N/A	D	Moved to Preparedness Planning	Continuous Action	2.3	H	General budget	2015
Sch-22	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	Town of Schlater	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazard	N/A	D	Remove, requirement of the plan	N/A	2.4	H	HMGP, General budget	2015
Sch-23	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	Town of Schlater	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazard	N/A	D	Remove, requirement of the plan	N/A	2.4	H	HMGP, General budget	2015
Sch-24	Conduct annual reviews of MEMA District 3 RHMP	Complete the worksheets provided and attend RHMC meetings as they are scheduled.	Town of Schlater	Leflore Co. EMA, Mayor's office	Multi-hazard	N/A	D	Remove, requirement of the plan	Continuous Action	2.4	H	General budget	2015

Sch-25	Pursue training and funding opportunities for mitigation actions	Continue to seek funding for eligible mitigation actions as they arise. Participate in training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques of completing an effective application and benefit cost analysis	Town of Schlater	Leflore Co. EMA, Mayor's office	Multi-hazard	N/A	D	Remove - component of HMP maintenance	Continuous Action	2.4	M	HMGP, general budget	2015
Sch-26	Promote workshops for emergency preparedness/continuity of operation plans	Provide applicable support to non-profit agencies, Chamber of Commerce, Planning and Development District and other organizations that assist families and business owners with the development of disaster plans.	Town of Schlater	Leflore County EMA, Mayor's Office	Multi-hazard	N/A	D	Moved to Preparedness Planning	N/A	3.2	H	Private funds	2015
Project #	**Action Title**	**Action Description**	**Jurisdiction(s)**	**Agency**	**Hazard**	**Estimated Cost**	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New; IP=In Progress)	2020 Status Description	**Implementation Timeframe**	**Mitigation Goal/Objectives**	**Priority Ranking**	**Potential Funding Source(s)**	**Status (by Year)**
Town of Sidon													

Sid-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Sidon	Mayor's office, Leflore Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Retain - emphasis on critical facilities and infrastructure	2015-2025	1.2	M	HMGP, CDBG, general budget	2015
Sid-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood	Town of Sidon	Mayor's office, Leflore Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Retain - emphasis on critical facilities and infrastructure	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

		proofing, etc. Potential hardening projects may include any municipal building and public infrastructure. Specific buildings in need of upgrades include the fire department.											
Sid-03	Promote/build storm water detention ponds when appropriate	Implement when applicable	Town of Sidon	Public works	Flood	Undetermined	R	Retain - focus on critical facilities and infrastructure	Continuous Action	1.3	M	CDBG, developers	2015
Sid-04	Secure generators for existing and new critical facilities and infrastructure	Generators are essential for providing continual operations in the event of a disaster.	Town of Sidon	Emergency Services	Multi-hazard	Unknown - dependent on facility type	R	As funding becomes available, apply for grants to install generators to support existing or new facilities.	2020-2025	1.3	H	HMGP, General Budget	2015
Sid-05	Continue efforts on mitigating Repetitive Flood Claim/Severe Repetitive Loss properties when feasible and practical.	Grant funding through HMGP may be used to mitigate RFC and SRL property that repeatedly flood.	Town of Sidon	Mayor's Office, Leflore County EMA, MEMA	Flood	Undetermined	R	RFC/SRL properties have been identified by the city and will explore options with property owners as funding and opportunities arise	Continuous Action	2.5	M	Flood Mitigation Assistance	2015

Sid-06	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the City are frequently impacted by flash flood and severe weather events - areas in need of improved systems include: areas in the town should be considered as needs and funding opportunities arise.	Town of Sidon	Mayor's office, Public Works, Drainage Districts	Flood	Undetermined	R	Retain - emphasis on critical facilities and infrastructure	2015-2040	1.5	H	HMGP, CDBG, CIAP funding or part of developer agreements	2015
Sid-07	Create defensible space around structures and infrastructure	Defensible zones around buildings, power and gas lines and other infrastructure may be lacking throughout the City.	Town of Sidon	Public Works, Mayor's Office	Wildfire	Undetermined	R	Implement defensible space programs to reduce risk to structures and infrastructure.	2020-2025	1.1, 1.2	L	General funds	2015

Sid-08	Develop Critical Infrastructure and Key Resources (CIKR) database	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities and infrastructure for the County and its jurisdictions. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.	Town of Sidon	Leflore County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Participate in state-level data gathering efforts	2021	1.6	H	General budget	2015

Sid-09	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	Update and/or develop ordinances and regulations as required to address all hazards prone to Sidon and include any changes in future development areas	Town of Sidon	Mayor's office	Multi-hazard	N/A	R	Move forward to this planning cycle	Continuous Action	2.2	M	General budget	2015
Sid-10	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	The town can gain valuable data and insight into impacts as they occur to assess and define appropriate actions in the way of implementing an existing mitigation action or identifying a new need. Convene as soon as appropriate after an event to conduct an after-action report and document this in the appendix of the mitigation plan.	Town of Sidon	Mayor's Office, Leflore County EMA	Multi-hazard	N/A	R	Move forward with focus on mitigation actions post-disaster	Continuous Action	2.4	H	General funds	2015
Sid-11	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	Continue to participate in the NFIP and seek opportunities to join/improve CRS rating through documentation of activities and projects	Town of Sidon	Mayor's office, Leflore Co. EMA, MEMA	Flood	N/A	R	Focus on CRS participation	Continuous Action	2.5	H	General budget	2015

Sid-12	Continue efforts on public information and awareness for natural hazards	The Town has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient. Continue to provide information on all hazards that may include but not be limited to educational information, evacuation routes/procedures, workshop/training programs, alert systems and the like.	Town of Sidon	Leflore County EMA, applicable departments, MEMA, NWS, FEMA	Multi-hazard	N/A	R	Focus on hazard mitigation measures	Continuous Action	3.1	H	General funds	2015

Sid-13	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the town that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the city's web page	Town of Sidon	Leflore County EMA, MSDH, Mayor's Office	Human Infectious Disease, Hazardous Materials	N/A	R	Focus on mitigation measures	Continuous Action	3.1	H	MSD, EMPG, Homeland Security, general funds	2015
Sid-14	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals.	The county/town will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives	Town of Sidon	Leflore County EMA, Mayor's Office	Multi-hazard	N/A	R	Focus on mitigation measures	Continuous Action	3.2	M	General budget	2015
Sid-15	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather	Town of Sidon	Leflore County EMA, Mayor's Office, MEMA	Severe Weather, Tornado	$35,000	D	Move to Preparedness Planning Initiative	Continuous Action	1.1	H	HMGP, Local Funds	2015

		Service: identify site locations and develop cost estimates, including installation, testing and inspection											
Sid-16	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Sidon	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Move to Preparedness Planning Initiative	2015-2020	1.1	M	NWS	2015
Sid-17	Implement maintenance program for storm water conveyance and detention structures	Continue to implement preventive maintenance to water conveyance systems	Town of Sidon	Public Works Dept.	Flood	Undetermined	D	Remove - routine maintenance is not a mitigation action	N/A	1.5	M	CDBG, CIAP, general budget	2015
Sid-18	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	Town of Sidon	Mayor's Office	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove. Routine maintenance is not considered mitigation.	N/A	1.5	H	General budget	2015

Sid-19	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives	Town of Sidon	Planning Department, Building Official, Leflore County EMA	Multi-hazard	N/A	D	Moved to Preparedness Planning	Continuous Action	1.6	H	General budget	2015
Sid-20	Integrate hazard mitigation into local planning	Provide a copy of the MEMA 3 RHMP to applicable departments responsible for the enforcement or development of policies and planning initiatives	Town of Sidon	Leflore Co. EMA, Mayor's Office, MEMA, applicable departments	Multi-hazard	N/A	D	Remove, requirement of the plan	Continuous Action	2.2	H	General budget	2015
Sid-21	Conduct annual NIMS training for first responders, officials and critical employees	Conduct training and verify new employees are integrated into training programs as necessary	Town of Sidon	Fire, Police, Leflore Co. EMA	Multi-hazard	N/A	D	Moved to Preparedness Planning	Continuous Action	2.3	H	General budget	2015
Sid-22	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	Town of Sidon	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazard	N/A	D	Remove, requirement of the plan	N/A	2.4	H	HMGP, General budget	2015

Sid-23	Conduct annual reviews of MEMA District 3 RHMP	Complete the worksheets provided and attend RHMC meetings as they are scheduled.	Town of Sidon	Leflore Co. EMA, Mayor's office	Multi-hazard	N/A	D	Remove, requirement of the plan	Continuous Action	2.4	H	General budget	2015
Sid-24	Pursue training and funding opportunities for mitigation actions	Continue to seek funding for eligible mitigation actions as they arise. Participate in training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques of completing an effective application and benefit cost analysis	Town of Sidon	Leflore Co. EMA, Mayor's office	Multi-hazard	N/A	D	Remove - component of HMP maintenance	Continuous Action	2.4	M	HMGP, general budget	2015
Sid-25	Promote workshops for emergency preparedness/continuity of operation plans	Provide applicable support to non-profit agencies, Chamber of Commerce, Planning and Development District and other organizations that assist families and business owners with the development of disaster plans.	Town of Sidon	Leflore County EMA, Mayor's Office	Multi-hazard	N/A	D	Moved to Preparedness Planning	N/A	3.2	H	Private funds	2015

Mitigation Action Worksheets

Leflore County elected to more fully describe two mitigation actions on a Mitigation Action Worksheet. The two worksheets address the following initiatives:

3. Retrofitting of critical infrastructure to provide protection from flood and high wind (severe thunderstorm and/or tornado) hazards.

4. Work with the Planning and Development Councils to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others.

It was decided that all jurisdictions within the county will work on these two actions, so a separate action worksheet for each jurisdiction working on each action is included in the Action Worksheets section. The Action Worksheets for Leflore County are included first and then worksheets for municipalities follow.

Leflore County Mitigation Action Worksheet-1

All residents of Leflore County and its municipalities are at risk to impacts of tornadoes. Vulnerable populations, including those who are elderly or disabled and those living in manufactured housing, are frequently at higher risk due to limitations in mobility and lack of substantial housing. Construction of safe rooms at selected location will provide an option for residents to seek safe locations within short distances outside of their homes.

Mitigation Action Worksheet		
2. Name of Jurisdiction: Name of Haz. Mitigation Plan:	Leflore County, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Protect vulnerable residents, many of whom are elderly and live in manufactured housing and must seek a safe location during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach a safe location. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home. See maps that follow showing the project locations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms. Alternative: Incorporate safe room space into current government structures. These spaces are not large or secure enough to serve in this function. Alternative: Situation remains as is, leaving residents exposed to severe weather.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Leflore-1 Construct safe rooms near several fire stations located throughout the county so that vulnerable populations could reach a structure after a short drive (or walk). Inspect current safe rooms to confirm security and resiliency.	
5. Action or Project Description:	The Emergency Management Director has identified locations where safe rooms would adequately serve the target population. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Confirming site locations. • Acquire property. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval. • Discuss to duration for which residents are expected to be housed: one or two hours versus a period of several days.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable residents from exposure to tornado, severe storms, & other hazards. Minimize need for residents to drive during dangerous conditions to reach safety.	COST Undetermined, depends on safe room size for new structures, and on level of improvements needed for existing safe rooms (if any)
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Leflore County Emergency Management Plan	

Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	06/2020 – Project first discussed during a conference in which the Leflore County Emergency Management Director participated during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Leflore County Mitigation Action Worksheet-2

Disaster communications originates with the Leflore County Emergency Management Department. As such, it is appropriate to work with EM staff and the North Central Mississippi Planning and Development District to develop an education and outreach campaign that uses County communications as a touchstone for information about all hazards shared at the local level, including unincorporated and hard-to-reach communities.

Jurisdictional Action Worksheets Demonstrating Cooperative efforts with Leflore on Mitigation Action Leflore-2

Community Need:

Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.

Solution:

Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Leflore County Annex of the District 3 RHMP.

Action Worksheet		
1.Name of Jurisdiction: Name of Haz. Mitigation Plan:	Leflore County, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Leflore County Annex of the District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, thus leaving stakeholders vulnerable to hazards.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Leflore -2 Work with the North Central MS Planning and Development Council to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Leflore Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Board of Supervisors, Mayors, City/Board of Aldermen, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	

9. Timeline for Completion:	Two years
10. Useful Life:	Five years – revisit as local needs require
11. Potential Fund Sources:	County and local budgets, PDD
12. Local Planning Mechanisms to be Used in Implementation, if any:	Leflore County Emergency Management Plan, Town/City Communications Plans
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Mitigation Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Greenwood, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Protect vulnerable residents, many of whom are elderly and live in manufactured housing and must seek a safe location during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach a safe location. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home. See maps that follow showing the project locations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms. Alternative: Incorporate safe room space into current government structures. These spaces are not large or secure enough to serve in this function. Alternative: Situation remains as is, leaving residents exposed to severe weather.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Greenwood-1 Construct safe rooms near several fire stations located throughout the county so that vulnerable populations could reach a structure after a short drive (or walk). Inspect current safe rooms to confirm security and resiliency.	
5. Action or Project Description:	*The Emergency Management Director has identified locations where safe rooms would adequately serve the target population. Funding is a limiting factor in proceeding with construction. Steps to complete the action include:* • *Confirming site locations.* • *Acquire property.* • *Develop a project budget.* • *Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.* • *Discuss to duration for which residents are expected to be housed: one or two hours versus a period of several days.*	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable residents from exposure to tornado, severe storms, & other hazards. Minimize need for residents to drive during dangerous conditions to reach safety.	COST Undetermined, depends on safe room size for new structures, and on level of improvements needed for existing safe rooms (if any)
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	City Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	

12. Local Planning Mechanisms to be Used in Implementation, if any:	City of Greenwood Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	06/2020 – Project first discussed during a conference in which the Leflore County Emergency Management Director participated during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
1. Name of Jurisdiction:	City of Greenwood, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Leflore County annex of the District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Greenwood-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Leflore Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Leflore County Operations Plan, Leflore County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Mitigation Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Itta Bena, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Protect vulnerable residents, many of whom are elderly and live in manufactured housing and must seek a safe location during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach a safe location. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home. See maps that follow showing the project locations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms. Alternative: Incorporate safe room space into current government structures. These spaces are not large or secure enough to serve in this function. Alternative: Situation remains as is, leaving residents exposed to severe weather.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Itta Bena-1 Construct safe rooms near several fire stations located throughout the county so that vulnerable populations could reach a structure after a short drive (or walk). Inspect current safe rooms to confirm security and resiliency.	
5. Action or Project Description:	The Emergency Management Director has identified locations where safe rooms would adequately serve the target population. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Confirming site locations. • Acquire property. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval. • Discuss to duration for which residents are expected to be housed: one or two hours versus a period of several days.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable residents from exposure to tornado, severe storms, & other hazards. Minimize need for residents to drive during dangerous conditions to reach safety.	COST Undetermined, depends on safe room size for new structures, and on level of improvements needed for existing safe rooms (if any)
Plan for Implementation		
7. Responsible Organization:	Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	City Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	

12. Local Planning Mechanisms to be Used in Implementation, if any:	City of Itta Bena land development regulations, Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	06/2020 – Project first discussed during a conference in which the Leflore County Emergency Management Director participated during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Itta Bena, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Leflore County Annex of the District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Itta Bena-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Supporting efforts led by the Leflore Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommended plan to the Board of Supervisors and local legislative bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	

10. Useful Life:	Five years – revisit as local needs require
11. Potential Fund Sources:	City budget, PDD
12. Local Planning Mechanisms to be Used in Implementation, if any:	City Communications Plan, City Emergency Management Plan, Leflore County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Mitigation Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Morgan City, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Protect vulnerable residents, many of whom are elderly and live in manufactured housing and must seek a safe location during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach a safe location. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home. See maps that follow showing the project locations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms. Alternative: Incorporate safe room space into current government structures. These spaces are not large or secure enough to serve in this function. Alternative: Situation remains as is, leaving residents exposed to severe weather.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Morgan City-1 Construct safe rooms near several fire stations located throughout the county so that vulnerable populations could reach a structure after a short drive (or walk). Inspect current safe rooms to confirm security and resiliency.	
5. Action or Project Description:	The County Emergency Management Director has identified locations where safe rooms would adequately serve the target population. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Confirming site locations. • Acquire property. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval. • Discuss to duration for which residents are expected to be housed: one or two hours versus a period of several days.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable residents from exposure to tornado, severe storms, & other hazards. Minimize need for residents to drive during dangerous conditions to reach safety.	COST Undetermined, depends on safe room size for new structures, and on level of improvements needed for existing safe rooms (if any)
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	City Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Leflore County Emergency Management Plan	

Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	06/2020 – Project first discussed during a conference in which the Leflore County Emergency Management Director participated during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Morgan City, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Leflore County Annex of the District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Morgan City-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital	
5. Action or Project Description:	Supporting efforts led by the Leflore Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommended plan to the Board of Supervisors and local legislative bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	

12. Local Planning Mechanisms to be Used in Implementation, if any:	Town Communications Plan, City Emergency Management Plan, Leflore County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Mitigation **Action Worksheet**		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Schlater, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Protect vulnerable residents, many of whom are elderly and live in manufactured housing and must seek a safe location during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach a safe location. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home. See maps that follow showing the project locations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms. Alternative: Incorporate safe room space into current government structures. These spaces are not large or secure enough to serve in this function. Alternative: Situation remains as is, leaving residents exposed to severe weather.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Schlater-1 Construct safe rooms near several fire stations located throughout the county so that vulnerable populations could reach a structure after a short drive (or walk). Inspect current safe rooms to confirm security and resiliency.	
5. Action or Project Description:	The County Emergency Management Director has identified locations where safe rooms would adequately serve the target population. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Confirming site locations. • Acquire property. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval. • Discuss to duration for which residents are expected to be housed: one or two hours versus a period of several days.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable residents from exposure to tornado, severe storms, & other hazards. Minimize need for residents to drive during dangerous conditions to reach safety.	COST Undetermined, depends on safe room size for new structures, and on level of improvements needed for existing safe rooms (if any)
Plan for Implementation		
7. Responsible Organization:	Mayor, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	City Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	

12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of Schlater land development/planning; Leflore County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	06/2020 – Project first discussed during a conference in which the Leflore County Emergency Management Director participated during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Schlater, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Leflore County Annex of the District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Schlater-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Supporting efforts led by the Leflore Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommended plan to the Board of Supervisors and local legislative bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	

12. Local Planning Mechanisms to be Used in Implementation, if any:	Town Communications Plan, City Emergency Management Plan, Leflore County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Mitigation Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Sidon, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Protect vulnerable residents, many of whom are elderly and live in manufactured housing and must seek a safe location during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach a safe location. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home. See maps that follow showing the project locations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms. Alternative: Incorporate safe room space into current government structures. These spaces are not large or secure enough to serve in this function. Alternative: Situation remains as is, leaving residents exposed to severe weather.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Sidon-1 Construct safe rooms near several fire stations located throughout the county so that vulnerable populations could reach a structure after a short drive (or walk). Inspect current safe rooms to confirm security and resiliency.	
5. Action or Project Description:	The Emergency Management Director has identified locations where safe rooms would adequately serve the target population. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Confirming site locations. • Acquire property. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval. • Discuss to duration for which residents are expected to be housed: one or two hours versus a period of several days.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable residents from exposure to tornado, severe storms, & other hazards. Minimize need for residents to drive during dangerous conditions to reach safety.	COST Undetermined, depends on safe room size for new structures, and on level of improvements needed for existing safe rooms (if any)
Plan for Implementation		
7. Responsible Organization:	Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County and local budgets, financial/in-kind support from local jurisdictions, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	City land development/planning, Leflore County Emergency Management Plan	

Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	06/2020 – Project first discussed during a conference in which the Leflore County Emergency Management Director participated during the planning phase of the MEA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Sidon, Mississippi MMA District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Leflore County Annex of the District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Sidon-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Supporting efforts led by the Leflore Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommended plan to the Board of Supervisors and local legislative bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	

12. Local Planning Mechanisms to be Used in Implementation, if any:	Town Communications Plan, City Emergency Management Plan, Leflore County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

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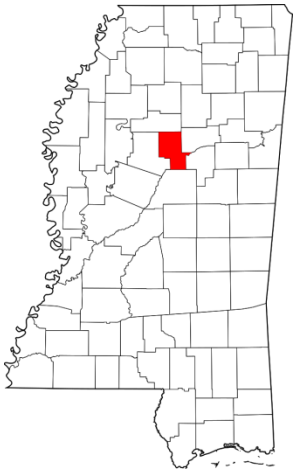
MONTGOMERY COUNTY

G.1 Community Profile

Geography

Located in north-central Mississippi, Montgomery County's neighboring counties include Grenada County to the north; Webster and Choctaw Counties to the east; Carroll County to the west; and Attala County to the South. Montgomery County is 101 miles north of Jackson, Mississippi and 131 miles south of Memphis, Tennessee. It includes the following communities (Figure G.1):



City	Towns	Unincorporated	
Winona	Duck Hill	Alva	Sibleyton
	Kilmichael	Lodi	Stewart
		Poplar Creek	Sweatman

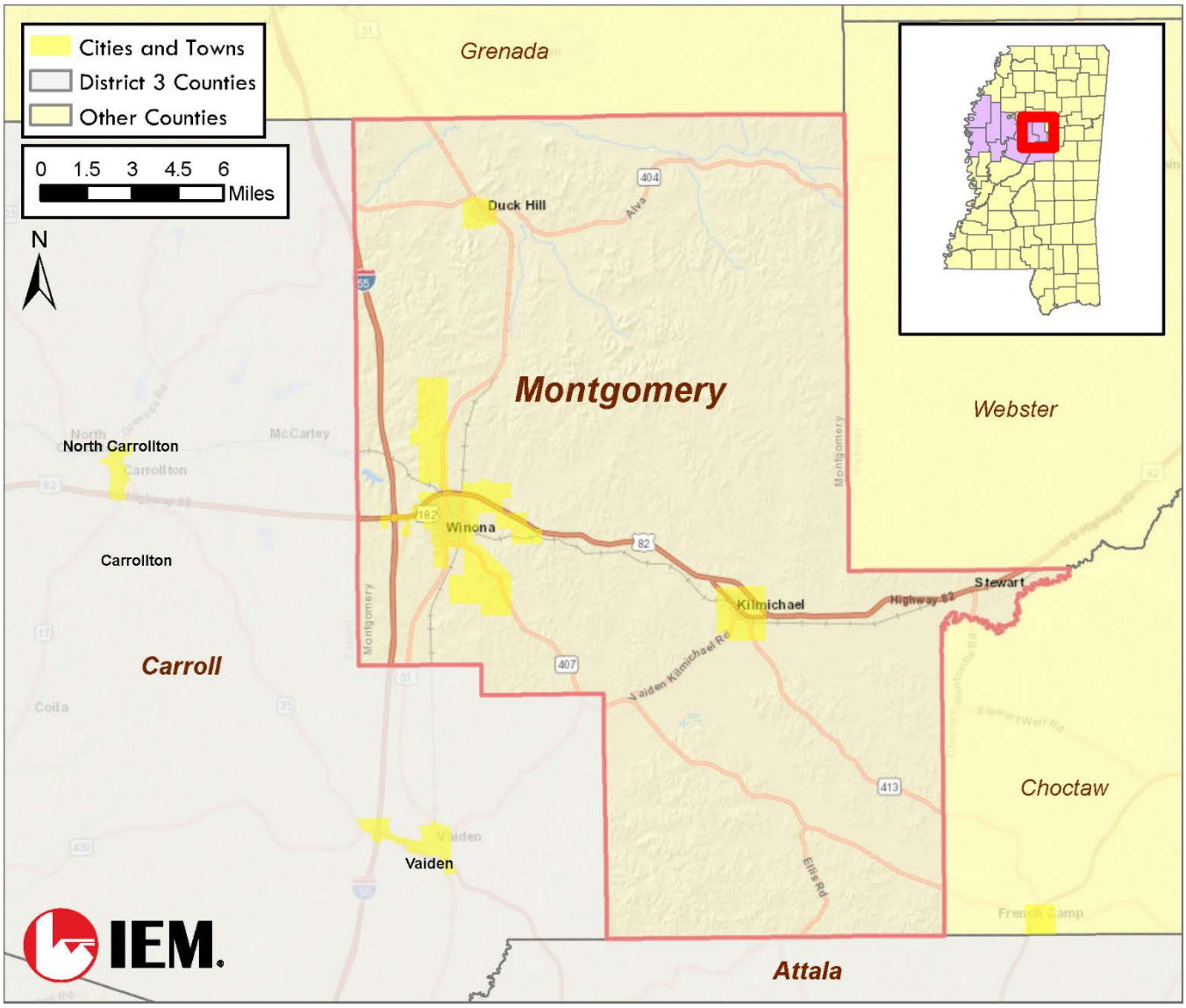
The total area of the county is 407.86 square miles, which includes 1.02 square miles of water. It is the fourth smallest county in land area in Mississippi. The North Central Hills in which it is located is a region where the soils are mostly acidic, and the topography is characterized by ridges and valleys. The Big Black River and its many tributaries cross much of the lower portion of the County, and the Yalobusha River and its tributaries stretch across the northern area.

The City of Winona is located at the intersection of U.S. Interstate 55 and U.S. Highways 51 and 82 and serves as the County seat of government. The City covers 33.9 square miles of land, including 0.1 square miles of water, and is located at elevation of 381 feet. The beautiful name of the city is derived from the Sioux word We-Noh-Nah, which means first-born daughter.

The Town of Duck Hill is located on U.S. Route 51, midway between the cities of Grenada and Winona. The Yalobusha River and its tributaries flows east and west of the town. Duck Hill covers 1.0 square miles of land and sits at an elevation of 253 feet. The town is known for holding the annual Lucie E. Campbell Gospel and Heritage Festival each July.

The Town of Kilmichael is located on U.S. Highway 82. Kilmichael has a total land area of 2.8 square miles and has an elevation of 361 feet. The Big Black River and its tributaries flow on outside both the eastern and western borders of the town. Its slogan is "The Town that Cares," and Kilmichael was the boyhood home of renown Blues singer B.B. King.

Figure G.1 – Montgomery County Orientation Map



Population and Demographics

Montgomery County has seen minor population decreases as shown in Table G.1.

Table G.1 - Jurisdiction Population and Demographics | Source: American Community Survey 2014-2018

	Population					Demographics				
Jurisdiction	2010 Census	2018 Census	Net Change	Percent Change	White	Black	Hispanic	Asian	Native American	2 + Races
Montgomery County	10,925	10,198	-727	-6.6	52.93%	43.42%	0.1%	0.3%	-	2.9%
Duck Hill	732	*732	N/A	N/A	30.54%	69.20%	1.24%	-	-	0.3%
Kilmichael	699	569	-130	-18.5%	42.37%	57.06%	-	-	-	0.6%
Winona	5,043	4,146	-897	-17.7%	42.78%	50.77%	-	0.78%	-	5.7%

Special Populations (elderly, disabled, and low income): Poverty and other social factors were also considered in assessing the vulnerability of Montgomery County and its municipalities. The Census web site reported the 2018 estimated population of the Town of Duck Hill was 1,133. A call was made to the Town of Duck Hill, and the Town Clerk confirmed the population has remained relatively stable, and the Town Clerk reported no major population increases. As such, figures from the 2010 Census are included for the year 2018 in the table above.

The Census Bureau reports the Town of Duck includes the highest percentage of those reported as living below poverty level, and Kilmichael includes the highest population of disabled persons. Jurisdictional special populations are summarized Table G.2.

Table G.2 – Special Populations | Source: American Community Survey 2014-2018

Jurisdiction	Below Poverty	Elderly (65 and older)	Disabled (non-institutionalized)
Montgomery County	27.3%	20.3%	24.2%
Duck Hill	36.8%	18.5%	16.3%
Kilmichael	31.2%	19.6%	29.4%
Winona	31.9%	19.6%	24.5%

Other social factors, such as the number of single mother households living below the poverty level, may indicate areas where special childcare considerations may be necessary. Persons with disabilities and the elderly may not be able to evacuate or seek other preventive measures during a disaster. These groups may be most vulnerable to severe storms, tornadoes and severe winter storms/freezes.

While population vulnerability within the assessment of each hazard identified as affecting Montgomery County, the Centers for Disease Control and Prevention (CDC) produces a county-based Social Vulnerability Index (SoVi, 2016) that discusses social vulnerability overall, as well as vulnerability according to “themes” that include socioeconomic status. Figure G.2a and Figure G.2b show the SOVI breakdown using these factors to measure vulnerability in Montgomery County.

Figure G.2a - CDC Social Vulnerability Index 2016

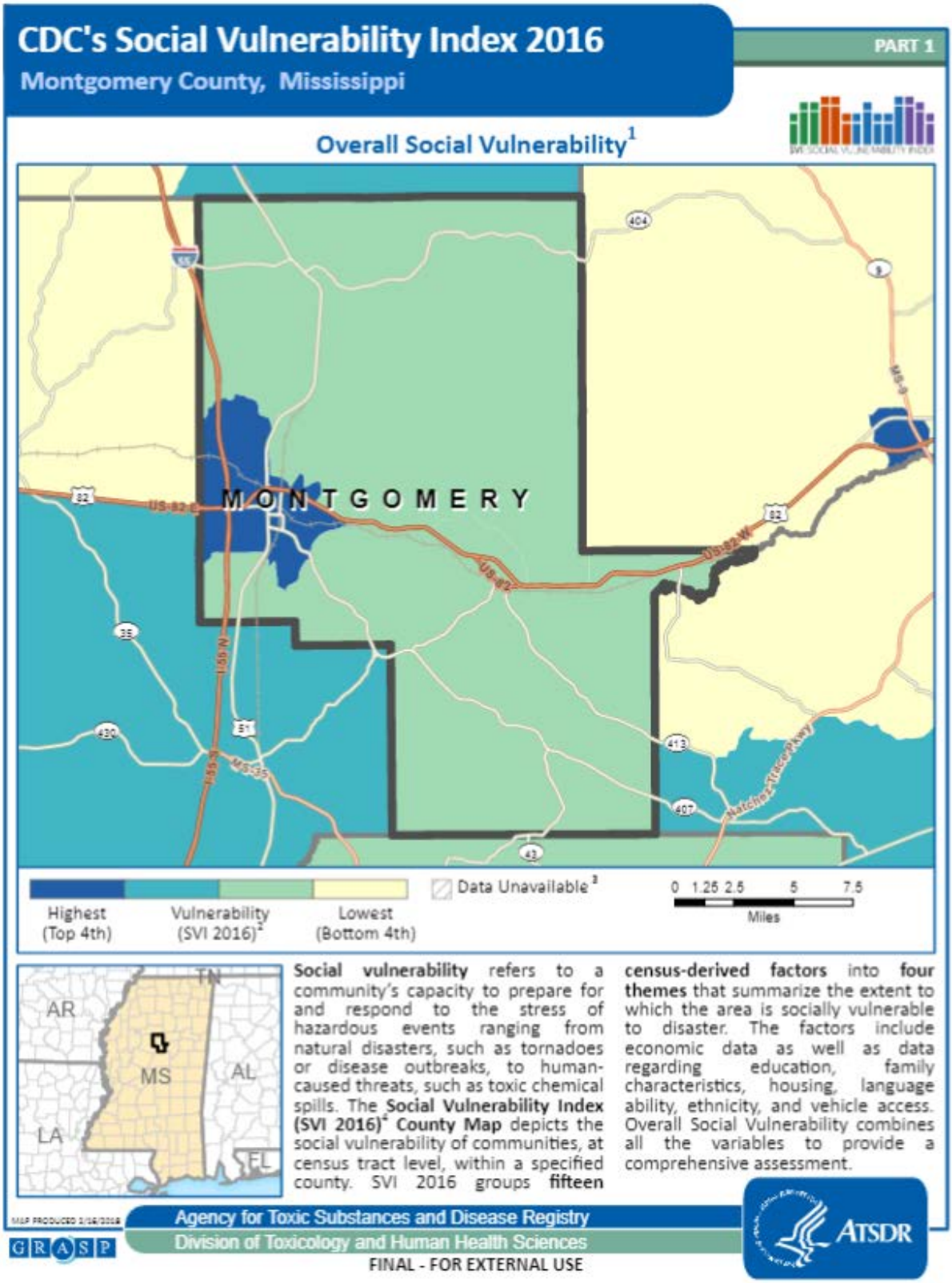
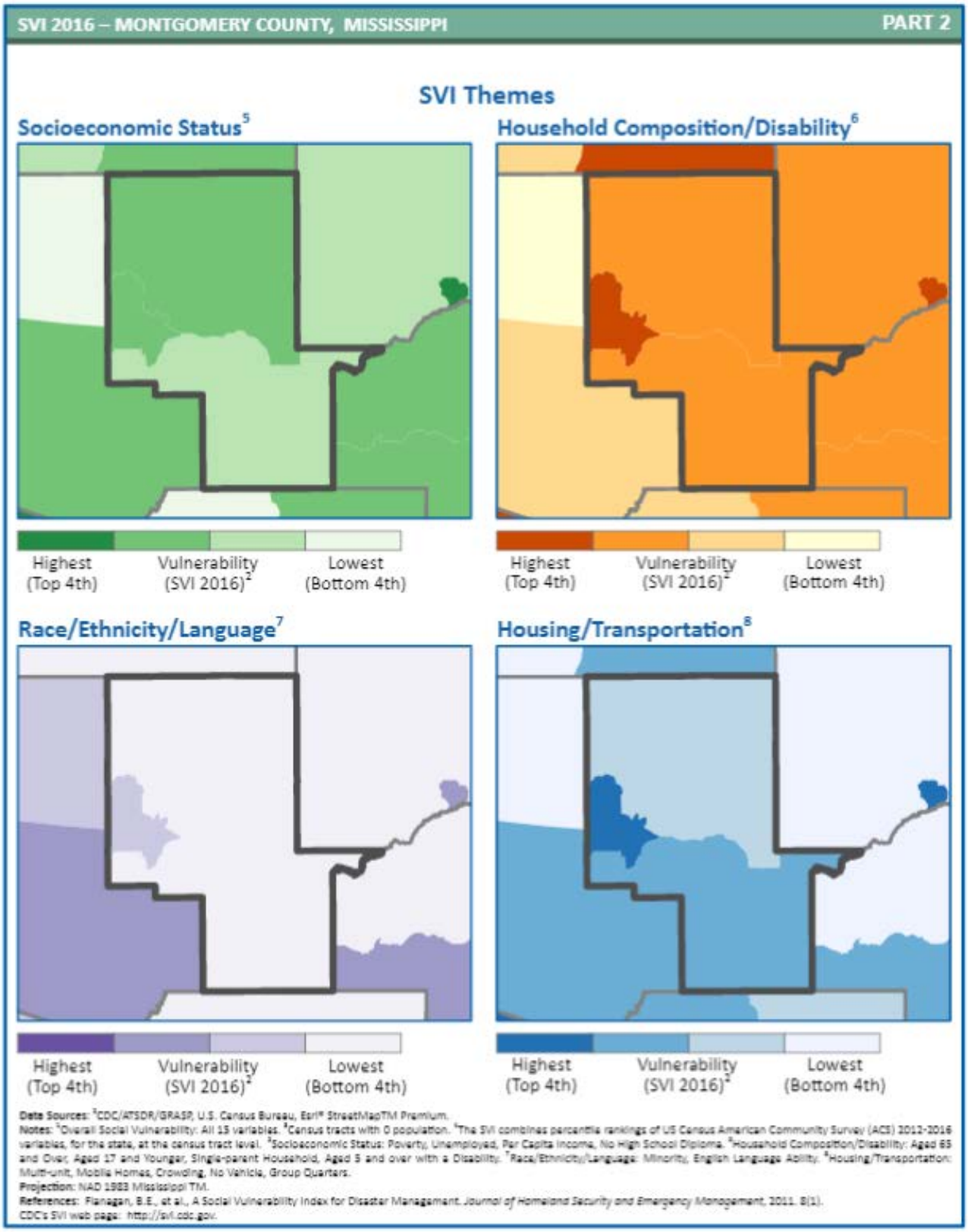


Figure G.2b CDC Social Vulnerability Index 2016 Themes



Housing, Growth Trends, and Land Use

Housing: Housing data was obtained from the 2018 Census estimates and is shown below in Table G.3. The figures show 82.4 percent of housing is occupied, 15.7 percent of housing is mobile home/manufactured housing, and most homes were constructed prior to 1980.

Table G.3 – Housing Statistics | Source: *US Census Bureau 2018 American Community Survey 5-Year Estimates*

Housing Statistics	Estimate	Percent
HOUSING OCCUPANCY		
Total housing units	5,606	100%
Occupied housing units	4,619	82.4%
Vacant housing units	987	17.6%
UNITS IN STRUCTURE		
1-unit, detached	4,326	77.2%
1-unit, attached	57	1.0%
2 units	142	2.5%
3 or 4 units	70	1.2%
5 to 9 units	59	1.1%
10 to 19 units	43	0.8%
20 or more units	10	0.2%
Mobile home	878	15.7%
Boat, RV, van, etc.	21	0.4%
YEAR STRUCTURE BUILT		
Built 2014 or later	50	0.9%
Built 2010 to 2013	92	1.6%
Built 2000 to 2009	550	9.8%
Built 1990 to 1999	821	14.6%
Built 1980 to 1989	790	14.1%
Built 1970 to 1979	1,343	24.0%
Built 1960 to 1969	905	16.1%
Built 1950 to 1959	337	6.0%
Built 1940 to 1949	182	3.2%
Built 1939 or earlier	536	9.6%
HOUSING TENURE		
Occupied housing units	4,619	100%
Owner-occupied	3,300	71.4%
Renter-occupied	1,319	28.6%
HOUSE HEATING FUEL		
Occupied housing units	4,619	100%
Utility gas	1,960	42.4%
Bottled, tank, or LP gas	1,379	29.9%
Electricity	1092	23.6%
Wood	140	3.0%

Growth Trends: There have been no significant changes in development since the previous plan. New construction and redevelopment have been minimal and there are no known changes in conditions that may affect the risks or vulnerabilities for the participating jurisdictions. At present, most growth can be expected in the County Seat, the City of Winona. New commercial growth has focused on areas near Highway 82 and Interstate 55. There are substantial parcels of undeveloped land throughout the county available for development that could be used for future mitigation efforts which might include establishing buffer zones around floodplain or flood-prone areas and around major transportation routes.

Land Use: Land use in Montgomery County is predominantly agricultural, with a few major industries located in the Winona area. Cotton, corn and soybeans are the major crops grown, and 61.7 percent of the acreage is timber land.

Employment and Industry

The Mississippi Department of Employment Security (MDES) assists individuals in obtaining employment. Through their network of WIN Job Centers, MDES matches qualified, prospective employees with employers. Table G.4 and Table G.5 summarize county employment statistics.

Table G.4 - Mississippi Department of Employment Security Annual Labor Force Report | Source: Mississippi Economic Development Council

County	Average Civilian Labor Force (2020)	Average No. Unemployed (2020)	Average No. Employed (2020)	Average Annual Wage (2020)	Per Capita Income (2020)	Percent Below Poverty (2020)
Montgomery	3,880	240	3,164	$29,492	$34,180	25.6%
Mississippi				$38,099	$37,834	21.5%

Table G.5 - Mississippi Department of Employment Security Annual Labor Force Report | Source: Mississippi Economic Development Council

*Establishment-Based Amounts 2020 Montgomery County			
Manufacturing			2,170
Non-Manufacturing (total):			80
Agriculture, Forestry, Fishing & Hunting	90	Professional & Business Service	40
Mining	0	Management of Companies & Entertainment	10
Utilities	20	Administrative Support & Waste Management	20
Construction	80	Educational Services	40
Wholesale Trade	70	Health Care & Social Assistance	370
Retail Trade	380	Arts, Entertainment & Recreation	10
Transportation & Warehousing	90	Accommodation & Food Service	240
Information	10	Other Service (except public administration)	40
Finance & Insurance	110	Government	540
Real Estate, Rental & Leasing	10	Education	210

*Note: *Establishment based amounts are estimates and do not include self-employed individuals, religious entities or nonprofit institutions. Amounts include a pro-rata share of unclassified employment.*

Critical Assets and Infrastructure

This section provides a listing of those assets and facilities considered as critical for the planning area. These facilities are identified in tables and figures based on best available data. Shelters and outdoor warning sirens are also considered as essential and their locations are provided as a figure in the Mitigation Strategy section of this Annex.

Transportation*:* As shown in Table G.6, Montgomery County includes many major thoroughfares, rail lines and airport access.

Table G.6 –Montgomery County Transportation Routes

Roadway	Rail	Aviation
Interstate 55 U.S. Route 51 U.S. Route 82	Canadian/Illinois Central Railroad	Winona-Montgomery County Airport

The area within a 120-mile radius of Winona-Montgomery County has been called “the Winner’s Circle” because it provides fast, easy access to the entire region: from Memphis, TN, to Jackson, MS; and from Mississippi’s Golden Triangle (formed by the cities of Columbus, Starkville, and West Point in eastern Mississippi), to the City of Oxford to the north and to the Delta region to the west. The Winner’s Circle refers not just to geography, but also to crossroads connections in a strategic convergence of interstate and U.S. highways, rail, and air, promising coast-to-coast, cost-effective reach from Mexico to Canada.

HIGHWAYS:
Winona-Montgomery County highway connections include:

I-55 – The north-south artery connecting the Gulf of Mexico with the Great Lakes, I-55 crosses six states, providing critical heartland market penetration and yielding easy access to Jackson, Mississippi; Memphis; and St. Louis. A dozen Interstate junctions, including I-10, I-20, I-40, and I-90, ensure coast-to-coast omni-directional highway coverage.

U.S. 51 – The historic and legendary highway route that goes far, extending 1200 miles from New Orleans to the Wisconsin-Michigan border, U.S. 51 also goes “way back,” memorialized by blues and rock singers for generations. Today, it’s one of the multiple reasons industry sings the praises of transportation assets in Winona-Montgomery County.

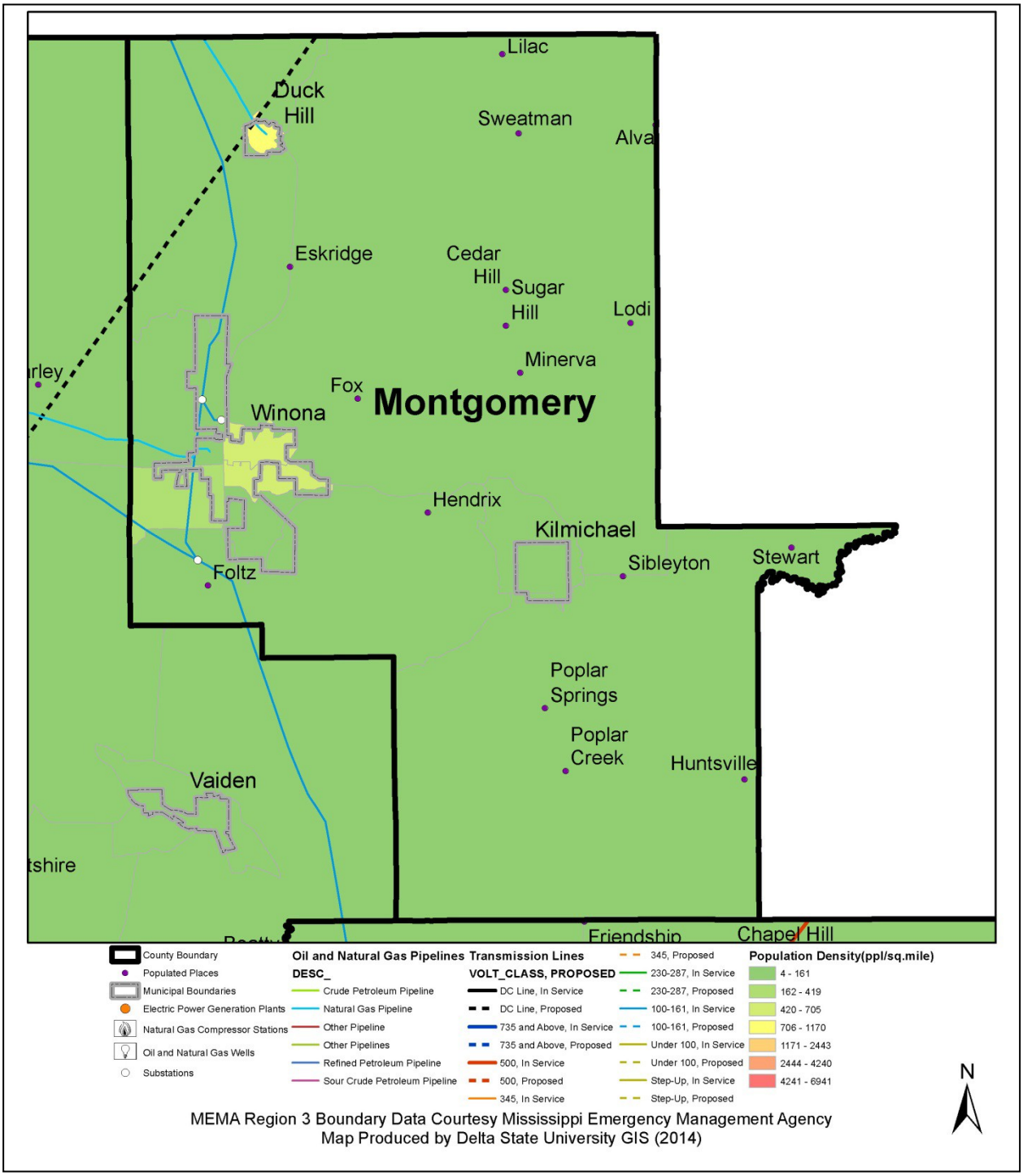
U.S. 82 – As an east-west route starting at White Sands, New Mexico, and terminating in Brunswick, GA, U.S. 82, the road provides access to the **Port of Brunswick**, the second busiest roll-on/roll-off (ro-ro) port in the nation, which also offers breakbulk and agri-bulk services.

RAIL:
Now owned and operated by RailUSA, the **Grenada Railroad** has a rich history that includes the legendary famed railroad engineer Casey Jones, and famed passenger trains such as the City of New Orleans and the Panama Limited. Today, the line connects industry to the superior Class I service of Illinois Central Railway, now owned by **Canadian Railway (CN),** which extends from Chicago through Memphis to New Orleans, where the **Port of New Orleans** provides deep-water service as the nation’s fourth largest port in cargo volume.

AIR:
The **Winona-Montgomery County Airport,** located just south of Winona's central business district, is a comfortable and convenient asset for corporate travel that includes a 4,000-foot runway, ground transportation, and in-flight catering. Corporate aircraft are maintained in peak condition through the extensive and expert services of Heath Aviation, the airport's FBO and an FAA Part 145 certified repair station specializing in avionics work, carrying the latest technology for a broad range of aircraft. Within an hour's drive are municipal airports located in Columbus and Greenville, the **Jackson-Evers International Airport**, in the State Capital of Jackson, is served by airlines such as Delta, American, United, and Southern Express Air.

Energy Assets: Oil, natural gas pipelines, and electric transmission lines transverse the County. Figure G.3 (next page) shows the location of these assets. The County Emergency Management Department confirmed that the map of assets, while produced for the 2015 RHMP, remains essentially accurate.

Figure G.3 - Energy Assets Map



Critical Assets and Facilities: Table G.7 lists assets identified as being critical for Montgomery County. The 2020 Hazard Mitigation Strategy includes an action to send the local Critical Infrastructure Key Resource (CIKR) database to the Remote Sensing Council for inclusion in the statewide database.

Table G.7 – Montgomery County Summary of Critical Assets and Facilities

Unincorporated Montgomery County Facilities		Use
Poplar Creek VFD	Stewart VFD	Public Safety
Water System		Public Utility
Duck Hill Facilities		**Use**
Duck Hill Wastewater Treat. Plant Water Facility	Duck Hill Natural Gas Facilities	Public Utility
Duck Hill Town Hall/Police Dept.		Government/Public Safety
Duck Hill Fire Department		Public Safety
Kilmichael Facilities		**Use**
Montgomery County Elementary	Montgomery County High	Educational Facilities
Kilmichael Hospital (Closed)	Kilmichael Group Home	Health Care Facilities
Kilmichael Wastewater Treat. Plant Water Towers (2)	Kilmichael Natural Gas Facilities	Public Utility
Kilmichael Town Hall/Police Dept.		Government /Public Safety
Kilmichael Fire Department		Public Safety
Winona Facilities		**Use**
Winona City Hall National Guard Armory	Montgomery County Courthouse Montgomery County EOC	Government Facilities
Winona Christian School	Winona Public Schools	Educational Facilities
Montgomery County Health Dept. Tyler Holmes Hospital MedStat Winona Manor	Winona Family Medical Clinic Winona Family Practice Fresenius Dialysis Kidney Dialysis	Health Care Facilities
Winona Wastewater Treat. Plant Water Tower (3)	Atmos Natural Gas Facility	Public Utility
Winona Police Dept.	Winona Fire Department	Public Safety

As a complement to information included in Table A.7, researchers consulted the Mississippi Public Service Commission (PSC) county-specific web pages to identify the PSC's list of county-based utilities. Utility companies listed on the PSC web site are shown in Table 8. This list includes some, but not all, of the assets shown in Table 7. As such, so it was decided that the information in both Table 7 and Table 8 would be included in this annex for the sake of thorough documentation.

Table G.8: Mississippi Public Service Commission – County Utilities Listings | Source: Mississippi Public Service Commission

Gas Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
GC-123-0081-00	Atmos Energy Corporation	Mr. Mathew B. Davidson V-Pres.	790 Liberty Road Flowood, MS 39232-9321	601.420.5020	601.420.5020
GM-003-0433-00	City of Duck Hill	Mr. Joey Cooley Mayor	P.O. Box 368 Duck Hill, MS 38925		662.565.7200
GM-003-0605-01	Town of Kilmichael	Ms. Pauline Hall City Clerk	P.O. Box 296 Kilmichael, MS 39747		662.262.4242

Electric Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
EA-103-0048-00	Delta EPA	Mr. David O'Bryan Gen. Mgr.	P.O. Box 9399 Greenwood, MS 38930		662.453.6352
EC-123-0082-00	Entergy Mississippi Inc.	Mr. Martin McGee Customer Service Support	P.O. Box 1640 Jackson, MS 39215-1640		601.969.2336

Sewer Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
SM-003-2176-00	City of Winona	Ms. June Williams City Clerk	P. O. Box 29 Winona, MS 38967		662.283.1232

Water Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
WA-003-0241-00	Eskridge-Rose Hill Water Assn. Inc.	Mr. John McCormick President	P.O. Box 220 Duck Hill, MS 38925	662.417.5771	662.565.2229
WA-003-0590-00	Fifty-one Fifty-five Water Assoc. Inc.	Mr. Maxie Ellis Pres.	71 Highway 51 Winona, MS 38967		662.283.4127
WA-003-0357-00	French Camp Water Assn. Inc.	Mr. Billy W. Thrailkill Pres.	P. O. Box 43 French Camp, MS 39745	662.547.6331	662.547.6331
WA-003-0627-00	Hayes Creek Water Assn. Inc.	Mr. James R. Bennett Pres.	703 Summit Street Winona, MS 38967	662.283.3506	662.283.3506
WA-003-0177-00	North District 1 Water Assn.	Ms. Alison McElroy Secretary	P.O. Box 507 Winona, MS 38967		662.283.3326
WA-003-0494-00	Poor House Water Assn.	Ms. Wilma Thompson	P.O. Box 700 Grenada, MS 389901		662.226.8636
WA-003-0295-00	Poplar Creek Water Assn. Inc.	Mr. Harvey Overstreet	2711 Highway 407 Kilmichael, MS 39747-9612		662.262.7142
WA-003-0400-00	South Winona Water Assn. Inc.	Ms. Jo Ann Dees Secretary	723 Enterprise Dr. Winona, MS 38967	662.283.2158	662.283.2158
WA-003-0179-00	Stewart Water Assn. Inc.	Mr. Larry Woods President	31 Stewart Lodi Road Stewart, MS 39767	662.614.1258	662.312.8226
WM-003-0605-00	Town of Kilmichael	Ms. Pauline Hall City Clerk	P. O. Box 296 Kilmichael, MS 39747		662.262.4242

Telecommunications Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
TC-123-0001-00	BellSouth Telecommunications, LLC	Mr. C. D. Smith Regulatory	2310 7th Street Meridian, MS 39301	601.592.6510	601.917.8787

G.2 Hazard Identification and Risk Assessment

This section addresses hazards to which Montgomery County is vulnerable, and includes the location and extent, historical events, and probability of future occurrence. Vulnerability assessments are included in this Annex only for hazards for which county-based data is available, although an effort has been made to identify jurisdictional vulnerability for spacial hazards. Section 4 of the Base Plan includes hazard descriptions for hazards applicable to all jurisdictions covered by the 2020 RHMP Update. Health-related hazards, such as Pandemic Influenza and West Nile virus, are of concern to the County, but there is no county-level data to add to the discussion of this hazard as it is addressed in Section 4 of the Base Plan. That section also includes the most recently available information about Coronavirus Disease of 2019 (COVID-19) at the time of this plan's publication.

Hazard Ranking

As discussed in Section 4 of the Base Plan (Hazard Identification and Risk Assessment) each county evaluated the number of events and damage claims from impacts for the 19-year period of 2000-2019 to determine their hazard risk ranking.

Montgomery County determined their probability of future occurrence based on reported data, local knowledge of previous events, and input from local officials and residents. Definitions for the classifications are provided below:

- Highly Likely – more than 8 occurrences over last 10 years
- Likely – 5 - 7 occurrences over last 10 years
- Low – 1 - 4 occurrences over last 10 years
- Susceptible – conditions are favorable or there are historic events (greater than 50 years) or local knowledge of unreported events.

Table G.9 provides a summary of the hazard events for Montgomery County followed by the results of their risk ranking exercise, included as Table G.10.

Table G.9 – Montgomery County Summary of Hazard Events 2000 – 2019 | Source: NCDC, MDEQ, USGS

Hazard Type	No of Events	Property Damage	Crop Damage	Death	Injury
Dam/Levee Failure	-	-	-	-	-
Drought	7	130,000	2,921,000	-	-
Earthquake	-	-	-	-	-
Excessive Heat / Heat	5	-	-	-	-
Expansive Soil-	-	-	-	-	-
Flood	20	1.006,000	-	-	1
Severe Storm	119	2,403,700	200,000	-	-
Severe Winter Weather	11	726,000	-	-	-
Tornado	12	6,390,100	2,100,000	-	-
Tropical Storm / Hurricane	2	10,020,000	50,050,000	-	-
Wildfire	-	-	-	-	-
Totals	177	$ 18,934,800	$ 55,271,000		

Table G.10 – Montgomery County Risk Ranking Results

Hazard Type	Area Impacted	Health/Safety	Property	Environmental Damage	Economic Disruptio	Total	Future Occurrence	Risk	Risk Level
Dam/Levee Failure	4	0	4	4	4	16	2	32	Low
Drought	3	0	2	2	2	9	3	27	Low
Earthquake	1	0	2	2	1	6	2	12	Low
Expansive Soils	1	0	2	2	1	6	2	12	Low
Extreme Heat	1	0	0	1	1	3	3	9	Low
Flood	1	2	1	1	1	6	5	30	Medium
Severe Storm (thunderstorm, lightning, hail and high wind)	3	0	3	2	1	9	5	45	Medium
Severe Winter Weather	2	0	1	1	2	6	3	18	Low
Tornado	3	0	4	3	2	12	4	48	High
Tropical Storm / Hurricane	4	0	2	2	2	10	2	20	Low
Wildfire	1	0	1	1	2	5	1	5	Low

Table G.11 table summarizes the vulnerability of each jurisdiction to each hazard. This information is based on community input, NCEI data, and available resources that discuss each hazard. An example of the latter would be the Mississippi DEQ web site Dam Safety Division, which provides maps illustrating the number and types of dams in each jurisdiction.

Table G.11 – Summary of Hazard Ranking, All Jurisdictions in Montgomery County

Hazard Type	Montgomery County	Town of Duck Hill	Town of Kilmichael	City of Winona
Dam/Levee Failure	*Low*	*Low*	*Low*	*Medium*
Drought	*Low*	*Low*	*Low*	*Low*
Earthquake	*Low*	*Low*	*Low*	*Low*
Excessive Heat/Heat	*Low*	*Low*	*Low*	*Low*
Expansive Soils	*Low*	*Low*	*Low*	*Low*
Flood	*Medium*	*High*	*Medium*	*High*
Severe Storm	*Medium*	*Medium*	*Medium*	*Medium*
Severe Winter Weather	*Low*	*Low*	*Low*	*Low*
Tornado	*High*	*High*	*High*	*High*
Tropical Storm/Hurricane	*Low*	*Low*	*Low*	*Low*
Wildfire	*Low*	*Low*	*Low*	*Low*

Mitigation planning researchers are fortunate to have access to the Data Visualization Tool included on the FEMA website. This site provides county-level data on the breakdown of flood events and hazards included in federal emergency and disaster declarations, as well as for flood events recorded by FEMA. The information is updated through June 2020 and shows the disaster name, event type, number of events, and occurrence date. The data includes information from the time FEMA first started recording disaster events in the format currently used. While this time frame is longer than that included in this RHMP Update, the following page provides a one-page snapshot of Montgomery County disasters documented by FEMA.

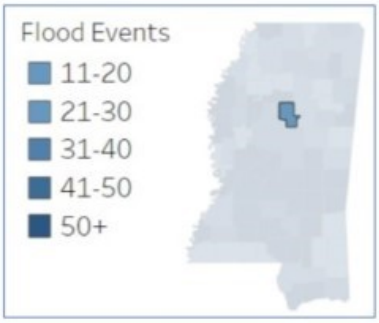
Figure G.4 Montgomery County FEMA Declarations Statistics

FEMA Declarations: Montgomery County Statistics: 1953 - 2020 ***Source:*** FEMA Data Visualization Web Site

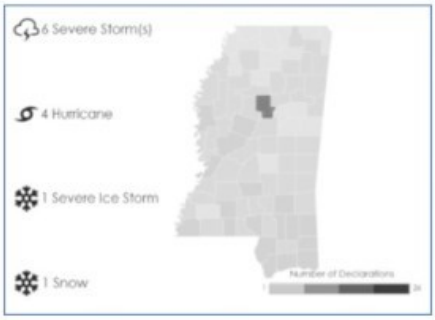
Not Included in data sourced 3/31/2020

- Mississippi COVID EM-3474 (Declared 3/13/2020)

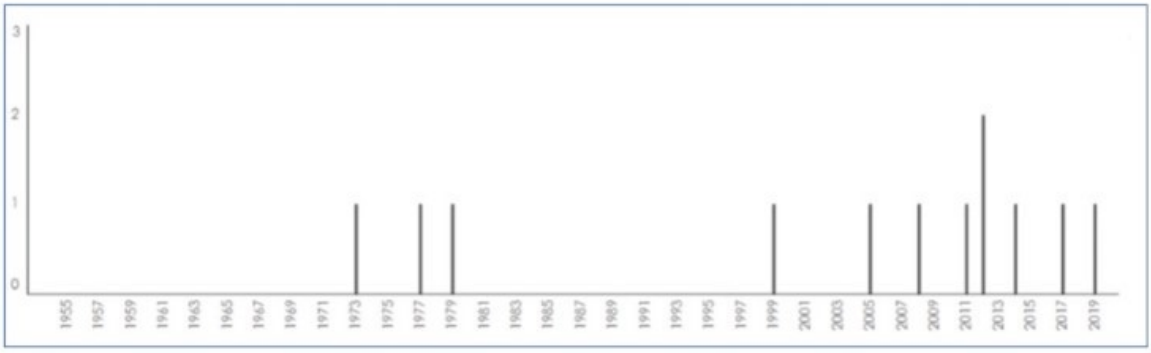
29 Flood Events



12 Declared Events



The charts below show the months and years in which disasters have occurred in Montgomery County



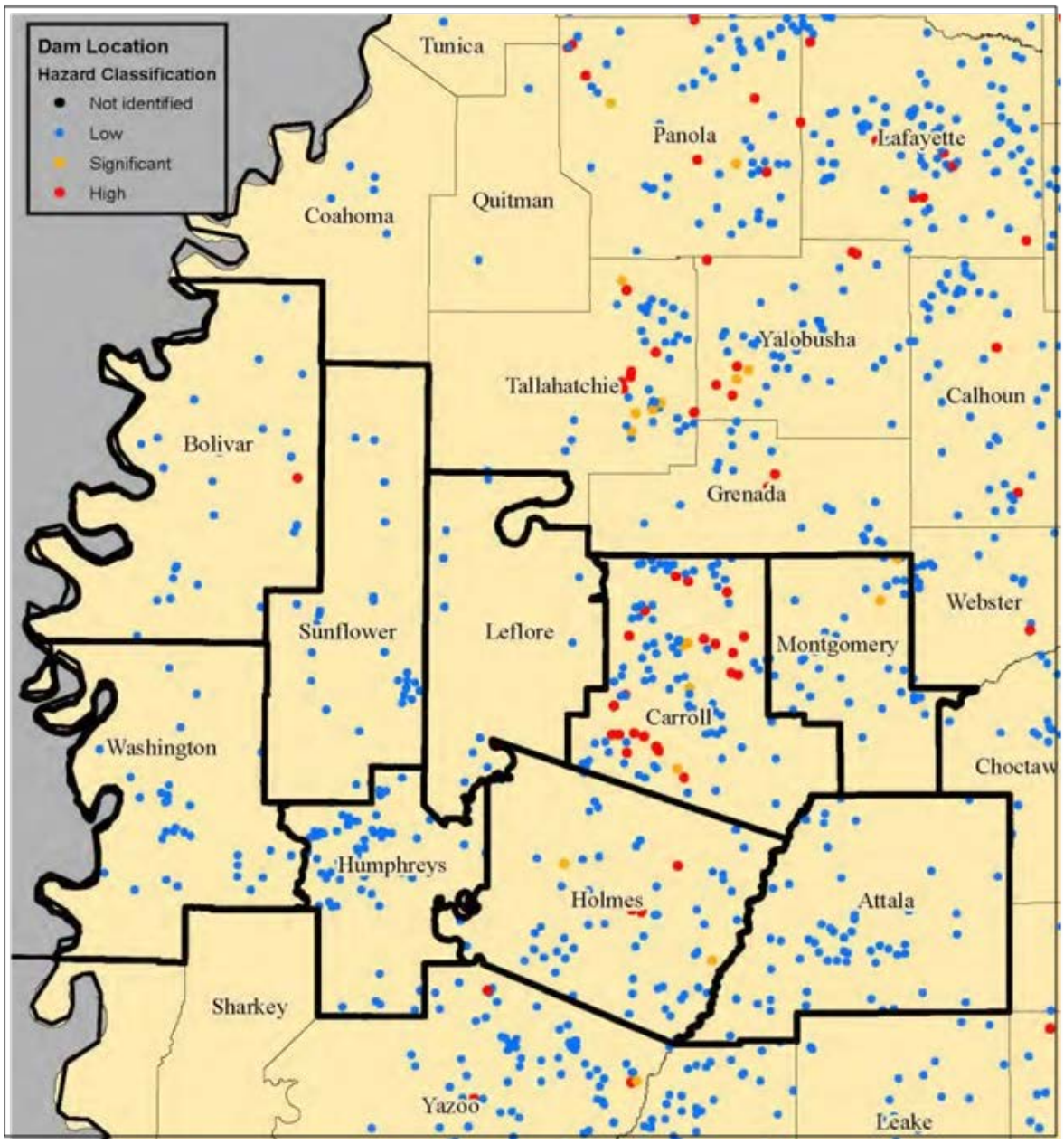
FEMA Declarations for Montgomery County (12)

Year	Declaration Name	Disaster Number	Year	Declaration Name	Disaster Number
1973	Heavy Rains, Tornadoes & Flooding	368	2001	Severe Storms, Tornadoes, Straight-line Winds, Flooding	1972
1977	Drought & Freezing	3032	2012	Hurricane Isaac	4081
1979	Storms, Tornadoes, Floods	577	2012	Tropical Storm Isaac	3348
1999	Severe Winter Storms, Ice, Freezing Rain	1265	2014	Severe Storms, Tornadoes & Flooding	4175
2005	Hurricane Katrina	1604	2017	Severe Storms, Tornadoes, Straight-line Winds, and Flooding	4314
2008	Hurricane Gustav	3291		Severe Storms, Straight-line Winds, Tornadoes, and Flooding	4429

Dam/Levee Failure

Figure G.5 below shows a list of dams mapped based on 2015 data secured from the Mississippi Department of Environmental Quality (MDEQ) and included in the 2015 District 3 RHMP.

Figure G.5: Dams Mapped by the State of Mississippi | Source: MDEQ, Delta State University



Location and Extent

The 2018 SHMP included a Region 3 Dam Inventory by County, breaking the numbers down for low, high, and significant hazard dams. The numbers of dams for all nine counties in the District are included for the purpose of comparing Montgomery County's level of risk to surrounding counties. The table shows there are fewer in Montgomery than in Carroll County or Holmes County, but more than in Bolivar, Humphreys, Sunflower, or Washington Counties.

Table G.12: Dams Located in Region 3 by County | Source: 2018 SHMP

County	Significant	High	Low	Total
Region 3				
Atalla	1	2	44	47
Bolivar	-	-	14	14
Carroll	4	23	86	113
Holmes	1	5	39	45
Humphreys	-	-	4	4
Leflore	-	-	-	-
Montgomery	-	2	37	39
Sunflower	-	-	12	12
Washington	-	-	3	3

However, in July 2020, the Mississippi Department of Environmental Quality provided a dam inventory to the research team most recent list of dams in Montgomery County. This list showed the county as having two high hazard dams and 34 low hazard dams, with three additional dams listed as not rated. Table G.13 and Table G.14 show dams in the high and low hazard categories.

Table G.13: Significant Hazard Dams | Source: Mississippi Department of Environmental Quality (MDEQ), July 2020

Dam Name	State ID	Latitude	Longitude	EAP Date
Bogue Ws Str Y-30-095 Dam	MS01659	33.608020174	-89.7384080067	
Winona Country Club Lake Dam	MS02160	33.446372399	-89.7043772941	12/18/2001

Table G.14: Low Hazard Dams | Source: Mississippi Department of Environmental Quality (MDEQ), July 2020

Dam Name	State ID	Latitude	Longitude
Winona Sewage Lagoon Dam	MS01655	33.4621371136	-89.7283137449
Kilmichael Lagoon Dam	MS01656	33.4284559392	-89.5650891935
Bogue Watershed Structure Y-30-058 Dam	MS01657	33.6696167001	-89.5270009063
Bogue Ws Str Y-30-057 Dam	MS01658	33.6615276147	-89.5087837509
Bogue Watershed Structure Y-30-051 Dam	MS01659	33.6356271474	-89.5358259511
Bogue Watershed Structure Y-30-038 Dam	MS01660	33.6210374867	-89.5968041326
Bogue Watershed Structure Y-30-043 Dam	MS01661	33.6244640378	-89.5534682257
Bogue Watershed Structure Y-30-089 Dam	MS01662	33.6051102325	-89.5703731066
Bogue Watershed Structure Y-30-052 Dam	MS01999	33.6167926448	-89.5191779538
Bogue Watershed Structure Y-30-034 Dam	MS02152	33.5735284427	-89.6339002765
Bogue Ws Str Y-30-031 Dam	MS02157	33.550722926	-89.6748137262
Bogue Watershed Structure Y-30-094 Dam	MS02158	33.5466173439	-89.652972513
Bogue Watershed Structure Y-30-084 Dam	MS02159	33.6690048526	-89.534521004
American Legion Montgomery County Lake Dam	MS02160	33.5092621139	-89.7819562601
H M Alexander Lake Dam	MS02161	33.4911444445	-89.5505005835
G H Curtis Lake Dam	MS02166	33.4800927478	-89.7748879196
W M Lott Pond Dam	MS02169	33.4526316944	-89.5265659993
Rodney Mortimer Lake Dam	MS02807	33.4904683969	-89.6871579643
Blaylock Pond Dam	MS02993	33.5211639231	-89.6936257623

Dam Name	State ID	Latitude	Longitude
G E Mason Catfish Pond Dam	MS02994	33.5053873758	-89.7181625218
G E Mason Catfish Pond Number 2 Dam	MS02997	33.5082490424	-89.7169965835
Mortimer Dam	MS03000	33.4909133972	-89.6860503784
MS06943 Lake Dam	MS03263	33.59287064	-89.76209183
MS06944 Lake Dam	MS03802	33.60715305	-89.74047112
MS06950 Lake Dam	MS06940	33.6732494	-89.7114904
MS06960 Lake Dam	MS06941	33.50410919	-89.77060963
MS06961 Lake Dam	MS06942	33.66383674	-89.59222331
MS06963 Lake Dam	MS06943	33.55949676	-89.64663369
MS06964 Lake Dam	MS06944	33.52342592	-89.64616152
MS06965 Lake Dam	MS06945	33.50560383	-89.59966762
MS06966 Lake Dam	MS06946	33.47737649	-89.6339451
MS06967 Lake Dam	MS06947	33.4257224	-89.64671007
MS06968 Lake Dam	MS06948	33.42592737	-89.72205491
MS06976 Lake Dam	MS06949	33.65866159	-89.52284681
MS07066 Lake Dam	MS06950	33.4296041	-89.55470918
MS07070 Lake Dam	MS06960	33.30943461	-89.52625609
MS07071 Lake Dam	MS06961	33.33383843	-89.54459225

Previous Occurrences

There is no record of a dam breach having occurred in Montgomery County.

Probability of Future Occurrence

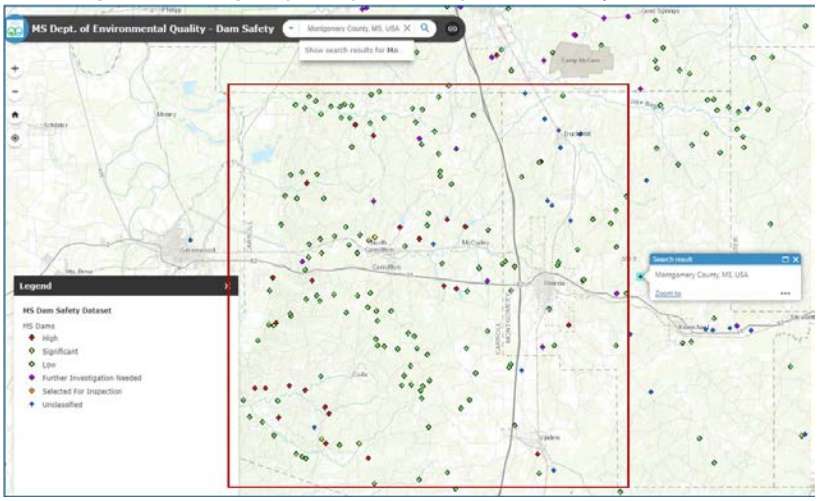
Dam failure is considered to be a low-ranking hazard for the county. It is not possible to develop a numerical probability of dam failure given there is no historical data, but photos shown below will describe the degree to which each jurisdiction may be vulnerable to the hazard.

Assessing Vulnerability

Hydrology studies indicate a break in nearby Grenada Dam or Enid Dam would likely cause water to flow into streams away from Montgomery County, so the area is not considered vulnerable in this regard. One of the two high hazard dams have an Emergency Action Plan (EAP) on file and the County Emergency Management Director is working with the other site to develop an EAP.
The maps below, taken from the MDEQ web site, show close up views of the location of dams in the County and each of its jurisdictions. In each screen shot, the name of the community is shown in the Search Box, and a legend is included to show the degree of hazard for each identified dam.

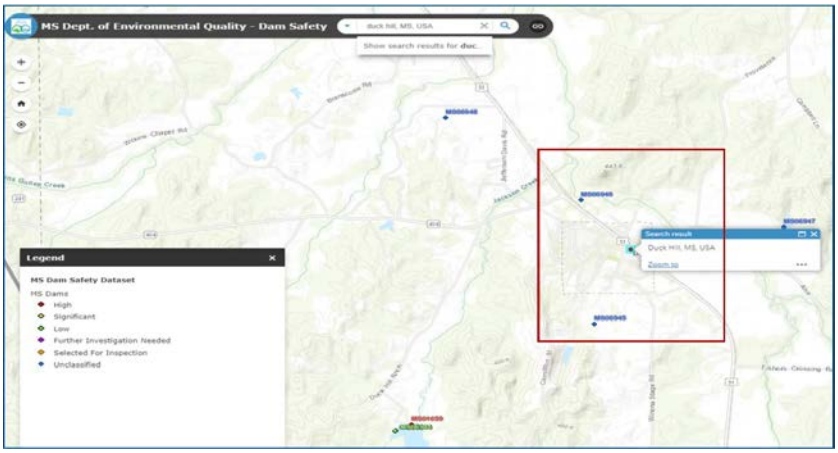
This map shows there are many unclassified dams for which more information Is needed, and that most dams in the unincorporated area are identified as low hazard dams.

Figure G.6a - Montgomery County Vulnerability to Dam Failure |Source: MDEQ



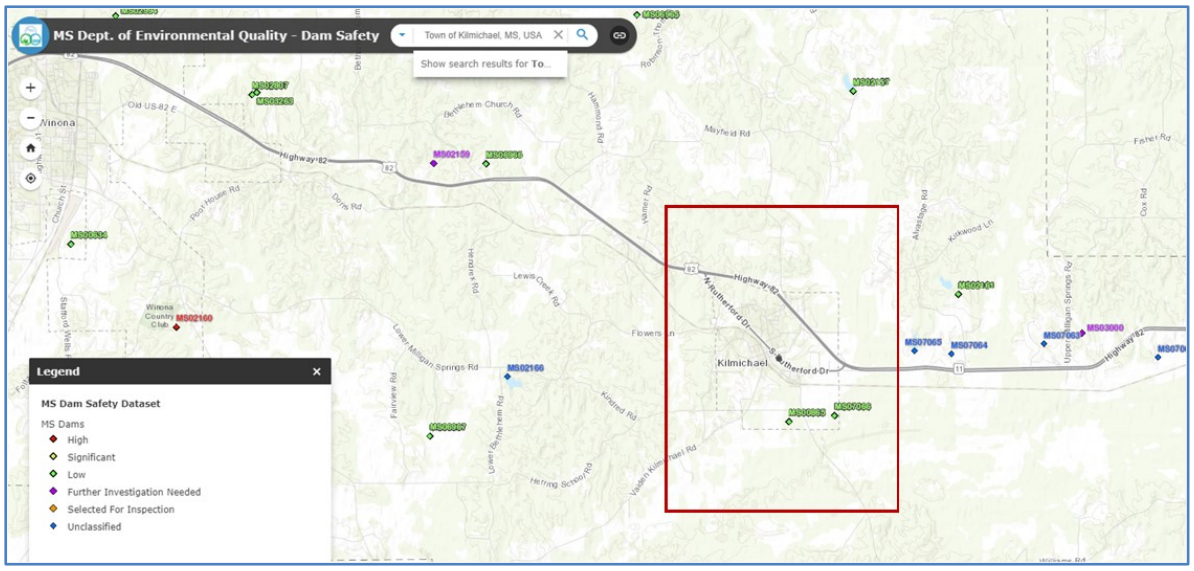
The dam vulnerability map for Duck Hill shows there are few dams located near the town and these are unclassified or low hazard dams.

Figure G.6b - Town of Duck Hill Vulnerability to Dam Failure | Source: MDEQ



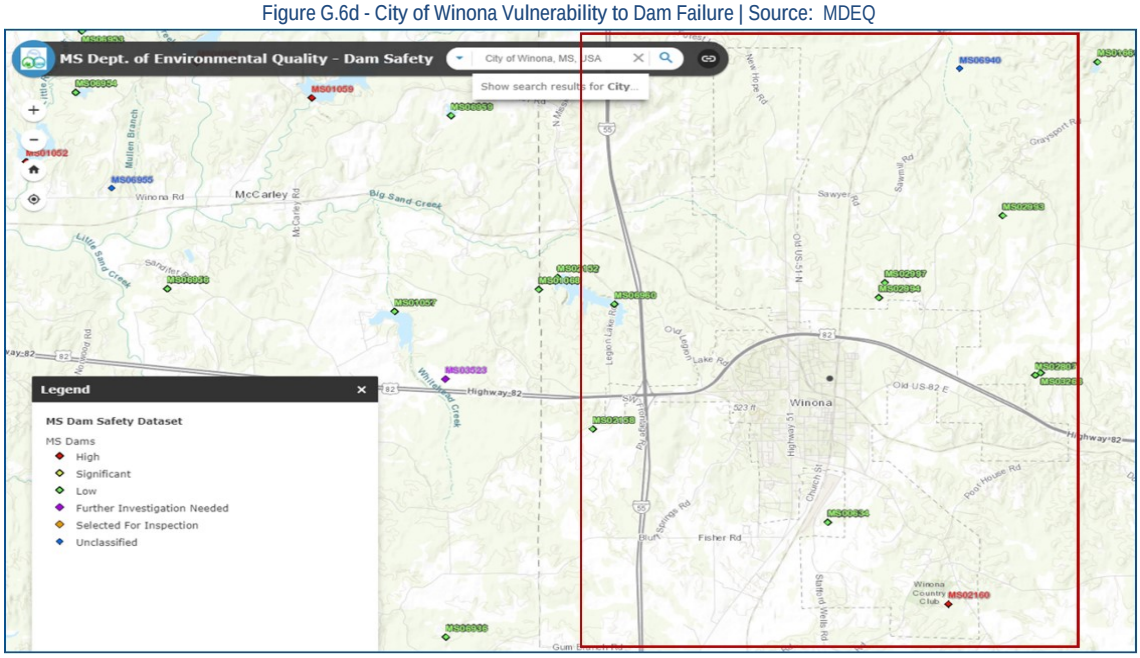
The map of the Town of Kilmichael shows two low hazard dams and several unclassified dams lay outside the town limits. As such, the town appears to have little exposure to dam risk.

Figure G.6c - Town of Kilmichael Vulnerability to Dam Failure | Source: MDEQ



The City of Winona is near one high hazard dam located at the Winona Country Club. The County Emergency Management Department has been in touch with the dam owner about maintaining its EAP. While all other areas of the county consider dam failure to be a low hazard, the City assigned it a medium hazard because of the presence of this structure.

Figure G.6d - City of Winona Vulnerability to Dam Failure | Source: MDEQ



Overall Vulnerability to Dam Failure

Table G.15 summarizes the vulnerability of each Montgomery County jurisdiction to dam failure.

Table G.15 – Vulnerability of Montgomery County Jurisdictions to Dam Failure

Jurisdiction	Ranking
Unincorporated Montgomery County	Low
Town of Duck Hill	Low
Town of Kilmichael	Low
City of Winona	Medium
Overall Montgomery County Vulnerability to dam failure	Low

Drought

Location and Extent

Drought is a spacial hazard, so it is not geographically confined. As such, all of Montgomery County could be exposed to drought conditions. The extent of damage from drought typically does not include property damage, but drought but can impact community agricultural assets.

Previous Occurrences

Table G.16 lists 14 events reported in the years of 2000 through 2019 as shown in the National Weather Service Storm Events Database managed by the National Center for Environmental Information (NCE. Note that a lack of data during a given time frame does not mean drought conditions did not exist – they may not have been recorded. NCEI reports drought on a countywide basis and not by jurisdiction.

Table G.16: Drought Occurrences 2000 to 2019 | Source: NCEI

Date	Death	Injury	Property Damage	Crop Damage
12/1/2016	0	0	0	50,000
11/1/2016	0	0	50,000	0
10/11/2016	0	0	0	40,000
8/1/2016	0	0	0	30,000
7/26/2016	0	0	30,000	0
10/1/2015	0	0	0	1,000
9/15/2015	0	0	0	400,000
10/1/2010	0	0	0	500,000
7/1/2007	0	0	50,000	0
6/1/2007	0	0	0	900,000
5/1/2007	0	0	0	300,000
4/25/2007	0	0	0	0
10/1/2006	0	0	0	700,000
Total	-	-	$130,000	$2,921,000

Probability of Future Occurrence

A closer look at the events shown in the previous table indicates drought sometimes is listed multiple times, but is in essence, one extended event reported more than one time. Looking at the data in this light, events have occurred in 2006, 2007, 2010, 2015 and 2016, suggesting roughly five significant events in a 19-year period. This suggests there is a 25% probability of drought in any given year, and the data shows these events primarily affect agricultural assets. Given the entire county includes agricultural assets, drought is expected to equally impact Montgomery County and its municipalities. It is considered a low-ranking hazard by the county and each municipality because of its infrequency, but it would be ranked as a medium hazard in unincorporated areas given the large number of agricultural assets.

Assessing Vulnerability

Drought occurs with advance warning because the those in farm communities are able to tell when patterns of water availability are changing. Drought is also monitored by the National Weather Service and the Mississippi State University Extension Service, which has offices in each county. Two tools are available for Extension staff and others who monitor drought: the Keetch-Bynum Drought Index and the Palmer Drought Severity Index, which are discussed in Section 4 of the Base Plan as tools for drought monitoring. Drought is not known to cost human lives, but it affects lifestyle and the economic effects may be felt countywide.

The NCEI database lists no record of death or injury from drought in the planning area. All events are listed as occurring in Montgomery (Zone), so it can be deduced the entire county is equally at risk to the hazard. However, because the unincorporated areas, which include agricultural assets, are more affected by drought than municipalities, this geographic segment ranks the hazard as medium.

Table G.17: Ranking of the Drought Hazard by Montgomery County Jurisdictions

Jurisdiction	Ranking
Unincorporated Montgomery County	Medium
Town of Duck Hill	Low
Town of Kilmichael	Low
City of Winona	Low
Overall Montgomery County Vulnerability to Drought	Low

Earthquake

Location and Extent

Montgomery County, like most of northwestern Mississippi, is located within the Modified Mercalli Zone VI. Should an event occur that has a 5.9 to 6.0 magnitude on the Richter Scale, some or all of the following may occur based on descriptions included in the Scale:

- The event would be felt by all or nearly everyone
- People may be awakened from sleep if the event occurs at night
- Widespread frightened population
- Some dishes and windows would be broken.
- Unstable objects would be overturned.
- Pendulum clocks may stop.
- Heavy furniture moved
- Instances of fallen plaster
- Slight property damage

Previous Occurrences

No earthquakes have been reported as having taken place in or affected Montgomery County.

Probability of Future Occurrence

In 2002, a study by the Center for Earthquake Research and Information (CERI) at the University of Memphis reported that, in any given 50-year interval, there is a seven to ten percent probability of the region experiencing an event at the level of the devastating 1811-1812 sequence of earthquakes in the New Madrid Zone. The study also estimated that there is an estimated 25 to 40 percent probability that a 6.0 magnitude event occurring a 50-year time period.

Assessing Vulnerability

The probably of an earthquake occurrence is the same for all areas of the county given there is no substantive geographic variation in distance from any place in the county to the city of New Madrid, MO, the epicenter of the New Madrid Seismic Zone. The distance between New Madrid and Duck Hill, in the northwest corner of the county, is 205 miles; and the distance to Poplar Creek, a hamlet in near the county's southern boundary, is 226 miles. There is too little distance from one end of the county to the other in terms of proximity to New Madrid to say that one community is more vulnerable than another.

There are no recorded deaths, injuries, or property damage from earthquakes in Montgomery County. There is little likelihood of any detrimental effect on the County's economy, residents' lifestyle, or physical structures. However, the effects on life and property in the area and low hazard dams could be significant if a large earthquake were to occur given the nature of the built environment. In estimates derived from a report by the U.S. Geological Survey (USGS) "New Madrid Earthquake Project," the relative potential for Montgomery County and other sectors of District 3 to experience a seismic event is that the region would be affected by one with a magnitude of between 3 and 4 on the Richter scale.

Based on research completed by the USGS Earthquake Hazard Program, buildings constructed using load-bearing masonry walls are vulnerable to damage by earthquakes, while steel and wood-frame buildings have a lower seismic vulnerability. Low-rise reinforced concrete buildings are also in this lower seismic risk category. In unincorporated areas of the County, buildings not secured to a solid foundation could be being shaken off their supports, and chimneys anywhere in the county could fall from rooftops. Multi-story structures built with un-reinforced masonry buildings are potentially vulnerable. The 2015 District 3 RHMP quoted USGS estimated losses from such an event as indicated in Table G.18.

Table G.18: Potential Montgomery County Earthquake Losses – Event Rated 3-4 on the Richter Scale | Source: USGS

Location	Injuries	Death	Displaced Persons	Property Damage
Montgomery County - Countywide	6	1	640	$2 Million

Dam/levee systems are also vulnerable to earthquake events. Montgomery County has a total of 39 dams, of which the location of the county's two significant hazard dams is presented in Figure 4.16 (Section 4) along with historical seismic recordings. The location of dams in unincorporated and incorporated areas of the county is discussed under the dam section. In reviewing earthquake effects on dams, the 2018 SHMP overlaid significant high hazard dams with historic seismic recordings and developed a dam inventory for earthquake prone counties. Dam/levee systems are also vulnerable to earthquake events as shown by the table below:

Table G.19: Dam Inventory in Relation to Earthquake Prone Counties by Dam Type | Source: 2018 Mississippi SHMP

DISTRICT 3				
County	Significant	High	Medium	Low
Attala	1	2	44	47
Bolivar	-	-	14	14
Carroll	4	23	86	113
Holmes	1	5	39	45
Humphreys	-	-	4	4
Leflore	-	-	-	-
Montgomery	2	22	24	2
Sunflower	-	-	12	12
Washington	-	-	3	3

This information differs slightly from that presented in Table G.12 because that table was developed based on information generated by MDEQ in July 2020. In July, MDEQ informed the research team dams that are continually being reclassified as new information about their hazard level comes to light.

Extreme Heat / Heat

Location and Extent

Waves of heat may cover all of District 3, or a larger area that includes one or more states. The hazard is not geographically confined. As such, all of Montgomery County could be affected by excessive heat. Regarding hazard extent, such events typically do not include property damage, but heat can affect the elderly, infants, and disabled persons, and cause death in persons who are overexposed. It can cause crop damage and affect the livelihood of those working in the agricultural industry. Additional discussion of extent is associated with one of the events listed in the table under Previous Occurrences.

Previous Occurrences

Table G.20 shows there were five recoded heat events from between the years 2000 and 2019. There were no damages or loss of life/injury documented from these events.

Table G.20 - Extreme Heat / Heat Occurrences 2000 to 2019 | Source: NCEI

Date	Event	Death	Injury	Property Damage	Crop Damage
8/1/2010	Excessive Heat	0	0	0	0
8/5/2007	Heat	0	0	0	0
7/15/2006	Heat	0	0	0	0
8/17/2005	Heat	0	0	0	0
7/23/2005	Heat	0	0	0	0

The National Weather Service event narrative for the most recent occurrence (8/1/2010) is typical of how extent is described in the other four events.

> A four-day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS Jackson, MS forecast area, 19 record highs were set between August 1st and 4th. On August 2nd, the 2nd warmest average temperature was recorded. The low was 78 and the high 105, resulting in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in three fatalities across the forecast area.

The deaths mentioned in this description occurred elsewhere in the region served by the Jackson, MS weather station, so they are a reminder extreme heat affects the entire county and a wider region. It is not feasible to discuss vulnerability broke down by jurisdiction because NCEI data for this hazard is reported countywide.

Assessing Vulnerability

Heat can affect certain populations, but generally causes no property damage. During periods of extreme heat, there is little physical destruction, although roads can buckle, and livestock may perish. Extreme heat conditions can pose problems for those not accustomed to the climate or who are outside for prolonged periods of time. Extreme heat can create a threat even to individuals and communities accustomed to high temperatures. Excessive heat can also cause utility outages due to an increased demand for electricity.

All of the following populations are prone to heat-related conditions: the elderly; young children; those who are immobile; persons who live alone especially without air conditioning; people without transportation; and people suffering from serious illnesses. Because NWS reports are county-based and events described are often regional occurrences, it is safe to say the entire population of all county locations are vulnerable.

Probability of Future Occurrence

While five events are listed in the table of historic events, two of these appear to be from an extended event that occurred over a two-month period. As such, for the purpose of determining probability, it is accurate to say four events took place over a 19-year period. It is worth noting a heat event has not been recorded for the most recent nine years of available data. Averaging the events out over the greater period is the most reasonable method for use in determining probability. The average recurrent interval for the 19-year period suggests there is a 21% percent chance of occurrents for any given year.

Expansive Soil

Location and Extent

Expansive soils are present throughout Mississippi and have been known to cause considerable damage to housing and infrastructure. Less than 50 percent of soils in Montgomery County consist of clay having high swelling potential.

Previous Occurrences

There has been no record of expansive soil events in Montgomery County.

Probability of Future Occurrence

The probability of expansive soils is classified as low. While it may be realistic to say there is a zero percent chance of occurrence, an estimated probability of 5-10% more accurately suggests there is cause for low-level concern and that the area is unlikely to experience future occurrence based on history of the hazard.

Assessing Vulnerability

Expansive soils could cause damage to infrastructure and to both business and residential structures within Montgomery County. Community leaders agreed this is a hazard of low-level concern but wanted to retain it in the 2020 RHMP update to document a discussion about the hazard took place.

Flood

Location and Extent

Flooding is an issue throughout Montgomery County, although a review of previous occurrences will allow us to discuss specific incidents that have occurred in municipalities and unincorporated hamlets. A single flash flood event could cause several thousands of dollars in property damage to existing structures and infrastructure, cause road closures and street flooding issues. Besides structural damage, erosion is a secondary hazard of flash flooding in Montgomery County.

Previous Occurrences

Table G.21 provides a summary of the 20 flood events recorded from 2000 to 2019, and Table G.22 shows the events sorted by location within the county. While inadequate stormwater management capability likely contributes to flash flooding in all areas, it is noted where local creeks, rivers and their tributaries are located nearby and may be potential sources of overflow.

Table G.21: Montgomery County Flood Events 20001 to 2019 | *Source: NCEI*

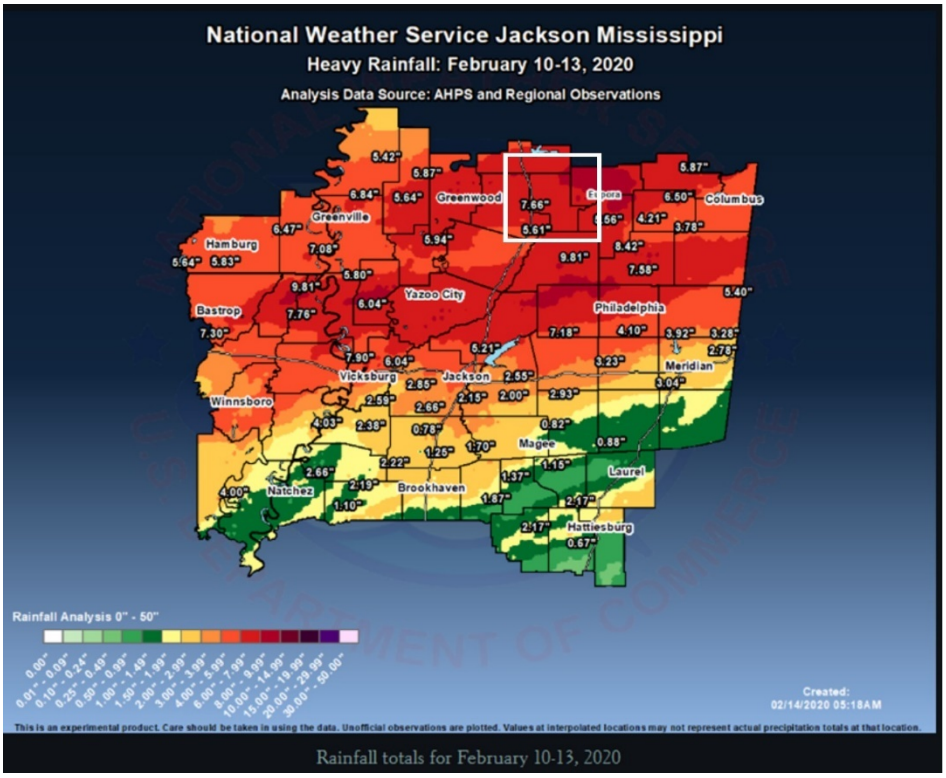
Location	Date	Event	Death	Injury	Property Damage	Crop Damage
Spring Hill	2/22/2019	Flash Flood	0	0	20,000	0
Winona	2/20/2019	Flash Flood	0	0	3,000	0
Duck Hill	9/6/2018	Flash Flood	0	0	2,000	0
Winona	3/31/2016	Flash Flood	0	0	100,000	0
Winona	3/31/2016	Flash Flood	0	0	100,000	0
Winona	9/24/2013	Flash Flood	0	0	-	0
Sweatman	7/24/2011	Flash Flood	0	0	3,000	0
Winona	7/23/2011	Flash Flood	0	0	3,000	0
Duck Hill	4/20/2011	Flash Flood	0	0	100,000	0
Sawyer	12/31/2010	Flash Flood	0	0	300,000	0
Duck Hill	6/28/2010	Flash Flood	0	0	10,000	0
Sibleyton	4/30/2010	Flash Flood	0	0	50,000	0
Winona	12/8/2009	Flash Flood	0	0	5,000	0
Duck Hill	9/23/2009	Flash Flood	0	0	2,000	0
Winona	5/7/2009	Flash Flood	0	0	40,000	0
Kilmichael	5/6/2009	Flash Flood	0	0	10,000	0
Duck Hill	2/27/2009	Flash Flood	0	0	100,000	0
Duck Hill	2/27/2009	Flash Flood	0	0	150,000	0
Duck Hill	9/14/2007	Flash Flood	0	1	8,000	0
Countywide	10/13/2001	Flash Flood	0	0	-	0
Total					$ 1,006,000	

Table G.22: Montgomery County Flood Events 20001 to 2019 – Sorted by Location | Source: NCEI

Location	# Events	Major Water Bodies
Spring Hill	1	Big Black River
Winona	7	Big Black River
Duck Hill	7	Yalobusha River
Sweatman	1	Yalobusha River
Sibleyton	1	Big Black River
Kilmichael	1	Big Black River
Countywide	1	Portions of the County are included in the basins of the Big Black River and the Yazoo River, the Yalobusha River being a tributary thereof

In addition to the events documented as occurring through 2019, District 3 experienced significant rainfall in early 2020 that had not yet been full documented by NCEI at the time of plan development. The visual identified below as Figure G.6 shows during the period of February 10-13, 2020, communities countywide received between three to 14 inches of rain, and rain continued to fall – at times heavily – through the rest of the month. The Montgomery County Emergency Management Director reported this event affected roadways countywide, and the map documenting rainfall totals regionally shows between 5.61" and 7.66" fell in Montgomery County during the period recorded. White text box shows county boundaries.

Figure G.7: Heavy Rainfall Event Recorded for February 10-13, 2020 | Source: National Weather Service



Probability of Future Occurrence

The NCEI list of flood events by year shows occurrences were recorded in ten of the 19 years between 2000 and 2019. Thus, the data suggests there is a 55% chance of flooding in any given year. Flood events recorded are more likely to occur in Duck Hill or Winona based on available NCEI data.

Repetitive and Severe Repetitive Loss Properties

The most recently available data, included in the 2015 District 3 RHMP, indicates there are no repetitive or severe repetitive loss properties in Montgomery County. The County, The Town of Duck Hill, and the City of Winona are NFIP participating communities.

Assessing Vulnerability

In addition to the previously mentioned municipalities of Duck Hill and Winona, both historical data and anecdotal reports suggest the unincorporated areas of Montgomery County considered vulnerable to flooding include Poplar Creek, Providence, Sweatman and Alva.

Should they become ill or need shelter from a severe storm, elderly and disabled residents in these areas may be stranded during periods of heavy or prolonged rain, as they would have to travel several miles of gravel roads to reach the hospital in Winona. As was previously mentioned, the major streams in Montgomery County are the Big Black River and the Yalobusha River, as well as their tributaries, including Big Bogue Creek, Little Bogue Creek, and Poplar Creek. During past flash flood events, heavy or prolonged rain has caused the creeks to overflow and cover roads in Montgomery County, with a few homes receiving flood damage.

In the City of Winona, the following flood-prone areas have been identified: roadways near Tyler-Holmes Hospital; Highway 407 at the intersection of Highway 51; and both sides of Highway 82 heading west before the intersection at Central Avenue. The major tributary streams affecting the City of Winona are Big Creek, Hays Creek, and Lewis Creek. During past flash flood events, heavy or prolonged rain has caused the creeks to overflow and stress the city's storm water runoff system in Winona, with a few homes receiving minor flood damage.

The following are flood-prone areas in Duck Hill: roadways near Eskridge Creek where it crosses Highway 51 South; and roadways near Jackson's Creek where it crosses North Street in two locations. Residents of East Church have reported high water during periods of heavy and prolonged rain.

Kilmichael does not have a floodplain; however, during periods of heavy and prolonged rain, as the ground becomes saturated, some areas have poor drainage. This situation could worsen as development continues with no codes or controls.

During the February 2020 period mentioned above, *The Winona Times* ran two articles about how flooding affected specific streets in each community. On February 19, the newspaper included a photo showing Mississippi Department of Transportation workers digging a drain on Highway 82 that overflowed and flooded Highway 82.[14]

[14]Drain Flooding on Highway 82, https://www.winonatimes.com/carrollton-news-carrollton-slideshow-front-page-slideshow-news/drain-flooding-highway-82, 02/19/2020, accessed 08/22/2020.

The previous day,[15] reporters summarized flood events countywide and mentioned the following locations as overwhelmed with water:

- Gordon Road
- Sawyer Road and New Hope Loop, just off of Highway 51 in Northern Montgomery County
- Intersection of Sweet Home Road and Scott Road was closed
- Stafford-Wells Road was closed to the bridge due to water on the road, but the road was passable
- Hendricks-Lewis Creek Road just off of Lower Milligan Springs Road
- North end of Will Eiland Loop in Kilmichael
- (In Winona), South Union Street, Republican Street, Sterling Avenue and College Street were all holding flood water
- There was a mud slide near an embankment of a road off Powell Street at the intersection of Barron Street. He said New Hope Road will be closed until next week.

The newspaper also reported the Big Black River rose steadily to a level of 15.39 feet, just short of its record level of 19 feet. This included a seven-foot rise from eight feet two day previous.

Based on HAZUS data extracted from the 2018 SHMP and shown in Table G.23, Montgomery County could experience hazard losses as shown on the table below in the event of a 100-year flood event. Information provided is at the county level and not broken down by jurisdiction.

Table G.23 – Montgomery County HAZUS Flood Results | Source: 2018 SHMP (HAZUS)

Structural Damage	Contents Damage	Inventory Loss	Total Building Loss	Income loss	Total Building and Income Loss	Bldg. Loss Ratio
$1,1399,000	$862,000	$5,000	$2,266,000	$6,000	$2,272,000	2.4%

Residential at Risk	Other at Risk	Total Bldgs. Risk	No. of Bldgs. Substantially Damaged	No. of households	No. of people needing shelter	Countywide Building Exposure
5	0	5	1	12	3	$480,710,000

Impact on Transportation Systems: Montgomery County includes federal, state, and locally owned bridges as shown on the listing below from the 2019 National Bridge Inventory (NBI). These are 2019 figures for structures rated on a scale from Good to Poor, with 15 Montgomery County structures falling into the Poor category. There are concerns bridge scouring could cause a structure to fail during a flood event.

Table G.24: Bridges in Carroll County | Source: 2019 National Bridge Inventory

County (Includes federal bridges)	Bridge Counts				Bridge Area (Square Meters)			
	All	Good	Fair	Poor	All	Good	Fair	Poor
Montgomery County	189	141	33	15	66,650	54,602	10,018	2,031

Figure G.8, from a Mississippi Department of Transportation (MDOT) map, shows structures identified as State-maintained deficient bridges. Red circles indicate the location of posted bridges and blue circles show the location of deficient bridges.

[15] LaKeadra Coffey, Widespread Flooding in County, https://www.winonatimes.com/front-page-slideshow-news/widespread-flooding-county, 2/18/2020, accessed 8/22/2020.

Figure G.8: State-Maintained Bridges Identified as Deficient |
Source: MDOT State Maintained Deficient Bridges

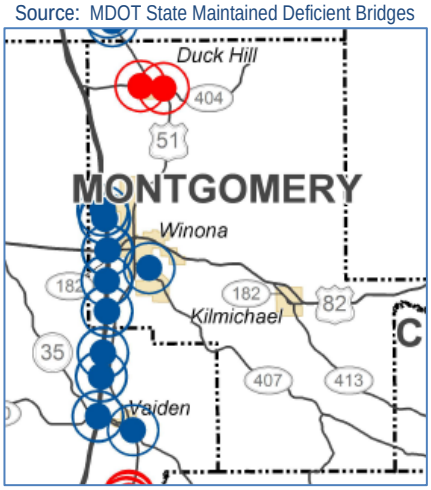


Table G.25 summarizes how the flood hazard is ranked for each community in Montgomery County. Rankings took into consideration information from the NCEI database, news reports, and input from the Montgomery County Emergency Management Director. The overall ranking is medium vulnerability to flood because of the low dollar value of damages ($1,006,000) during the 19-year period discussed in the risk assessment, and overall relative infrequency of events.

Table G.25 - Montgomery County Flood Hazard Ranking by Jurisdiction

Jurisdiction	Ranking
Montgomery County	Medium
Town of Duck Hill	High
Town of Kilmichael	Medium
City of Winona	High
Overall Montgomery County Vulnerability to Flood	Medium

Severe Storm (Lightning, Hail and Severe Wind)

Location and Extent

Severe storms include non-spacial elements and, therefore, can be described as equally affecting all areas of Montgomery County. All municipalities and unincorporated areas are susceptible to lightning, hail and severe wind events. Of particular concern are persons who reside in a mobile/manufactured home, as well as the elderly, and disabled because of their potential lack of mobility to respond to an unexpected hazard situation. It is strongly recommended all manufactured housing be fastened to the ground. The National Association of Certified Home Inspectors (NACHI) describes housing tie downs as a system of "heavy-duty straps and anchors designed to stabilize manufactured homes (also known as mobile homes) during high winds." The organization points out failure to properly install and maintain tie-downs results in reduced capacity to resist sliding and overturning.

Previous Occurrences

Severe storm data includes lightning, hail, and severe wind. As shown in Table G.26 to Table G.29, the entire county is susceptible to frequent impacts. To further demonstrate these historical events, Figure G.9 and Figure G.10 are also provided following the tables to show the historical impacts of previously document incidents of lightning, hail and severe wind events.

Table G.26 – Severe Storm Events in Montgomery County, Events 2000 to 2019 | Source: NCDC

Total – All Montgomery County Severe Storm Events					
Hazard Event	No of Events	Property Damage	Crop Damage	Deaths	Injuries
Lightning	1	20,0000	-	-	-
Hail	43	1,331,100	200,000		
Severe Wind	75	1,072,600	-	-	-
Totals	119	$ 2,403,700	$ 200,000	-	-

Table G.27 – Lightning Events 2000 to 2019 | Source: NCDC

Location	Date	Death	Injury	Property Damage	Crop Damage
Duck Hill	4/20/2011	0	0	$ 20,000	0

The one lightning event listed was included in the 2015 District 3 RHMP and no events have since been recorded. The tables show Montgomery County experienced 43 hail events and 75 severe wind or thunderstorm wind events between the years 2000 and 2019. Figure G.9 and Figure G.10 are also included after the tables to illustrate some of the locations of hail and severe wind events.

Table G.28 – Hail Events 2000 to 2019 | Source: NCEI

Location	Date	Event	Magnitude (Inches)	Death	Injury	Property Damage	Crop Damage
Poplar Creek	4/8/2019	Hail	2	0	0	20,000	-
Winona	3/5/2018	Hail	1	0	0	-	-
Kilmichael	11/29/2016	Hail	0.75	0	0	-	-
Sawyer	4/6/2016	Hail	1.25	0	0	100	-
Spring Hill	8/3/2014	Hail	0.75	0	0	-	-
Duck Hill	6/8/2014	Hail	1.75	0	0	-	-
Lilac	3/23/2013	Hail	1	0	0	-	-
Duck Hill	3/18/2013	Hail	1	0	0	-	-
Hendrix Siding	8/13/2012	Hail	1.5	0	0	5,000	-
Kilmichael	8/13/2012	Hail	1	0	0	-	-
Eskridge	5/8/2012	Hail	1.25	0	0	-	-
Winona	3/2/2012	Hail	1	0	0	-	-
Sweatman	9/11/2011	Hail	1.5	0	0	5,000	-
Duck Hill	4/20/2011	Hail	1.75	0	0	-	-
Eskridge	4/20/2011	Hail	1	0	0	-	-
Eskridge	4/20/2011	Hail	2.5	0	0	300,000	-
Polar Creek	4/20/2011	Hail	1.75	0	0	-	-
Sweatman	4/20/2011	Hail	1	0	0	-	-
Poplar Creek	4/15/2011	Hail	1	0	0	-	-
Sibleyton	4/30/2010	Hail	1	0	0	-	-
Kilmichael	4/23/2010	Hail	0.88	0	0	-	-
Kilmichael	4/23/2010	Hail	1	0	0	-	-
Winona	5/7/2009	Hail	0.75	0	0	-	-
Foltz	5/5/2009	Hail	0.88	0	0	-	-
Duck Hill	4/10/2009	Hail	0.75	0	0	-	-
Duck Hill	8/2/2008	Hail	0.88	0	0	-	-
Winona	8/2/2008	Hail	0.88	0	0	-	-
Poplar Creek	7/22/2008	Hail	0.75	0	0	-	-
Duck Hill	6/14/2008	Hail	0.75	0	0	-	-
Polar Creek	6/14/2008	Hail	0.75	0	0	-	-
Hendrix	4/11/2008	Hail	0.75	0	0	-	-
Sawyer	3/30/2008	Hail	1	0	0	-	-
Duck Hill	1/8/2008	Hail	0.75	0	0	-	-
Winona	6/30/2007	Hail	0.75	0	0	-	-
Kilmichael	6/15/2007	Hail	0.75	0	0	-	-
Kilmichael	6/21/2006	Hail	1	0	0	-	-
Duck Hill	4/7/2006	Hail	1.25	0	0	-	-
Duck Hill	4/7/2006	Hail	2.75	0	0	1,000,000	200,000
Poplar Creek	4/6/2005	Hail	0.75	0	0	-	-
Duck Hill	5/5/2003	Hail	0.75	0	0	1,000	-
Duck Hill	3/31/2002	Hail	0.75	0	0	-	-
Kilmichael	8/26/2000	Hail	0.75	0	0	-	-
Winona	3/10/2000	Hail	0.75	0	0	-	-
Totals						$ 1,331,100	$ 200,000

Table G.29 – Severe Wind/Thunderstorm Wind Events – 2000 to 2019 | Source: NCEI

Location	Date	Event Type	Magnitude	Death	Injury	Property Damage	Crop Damage
Winona	6/19/2019	Thunderstorm Wind	58	0	0	150,000	0
Polar Creek	1/19/2019	Thunderstorm Wind	50	0	0	3,000	0
Polar Creek	12/31/2018	Thunderstorm Wind	50	0	0	3,000	0
Winona	3/5/2018	Thunderstorm Wind	55	0	0	40,000	0
Sawyer	6/16/2017	Thunderstorm Wind	50	0	0	8,000	0
Foltz	4/30/2017	Thunderstorm Wind	55	0	0	25,000	0
Minerva	4/30/2017	Thunderstorm Wind	65	0	0	5,000	0
Poplar Creek	11/28/2016	Thunderstorm Wind	50	0	0	8,000	0
Fox	6/17/2016	Thunderstorm Wind	50	0	0	5,000	0
Spring Hill	6/17/2016	Thunderstorm Wind	53	0	0	8,000	0
Duck Hill	12/25/2015	Thunderstorm Wind	50	0	0	3,000	0
Duck Hill	4/19/2015	Thunderstorm Wind	50	0	0	3,000	0
Kilmichael	4/19/2015	Thunderstorm Wind	50	0	0	5,000	0
Duck Hill	6/8/2014	Thunderstorm Wind	52	0	0	-	0
Minerva	4/4/2014	Thunderstorm Wind	52	0	0	-	0
Winona	12/21/2013	Thunderstorm Wind	50	0	0	8,000	0
Kilmichael	5/21/2013	Thunderstorm Wind	50	0	0	3,000	0
Winona	5/21/2013	Thunderstorm Wind	50	0	0	3,000	0
Duck Hill	3/18/2013	Thunderstorm Wind	50	0	0	1,000	0
Winona	2/25/2013	Thunderstorm Wind	50	0	0	5,000	0
Kilmichael	12/10/2012	Thunderstorm Wind	50	0	0	10,000	0
Kilmichael	8/13/2012	Thunderstorm Wind	50	0	0	8,000	0
Minerva	8/13/2012	Thunderstorm Wind	50	0	0	10,000	0
Poplar Creek	8/13/2012	Thunderstorm Wind	50	0	0	5,000	0
Spring Hill	8/13/2012	Thunderstorm Wind	50	0	0	600	0
Winona	5/31/2012	Thunderstorm Wind	50	0	0	4,000	0
Polar Creek	3/2/2012	Thunderstorm Wind	61	0	0	-	0
Polar Creek	7/4/2011	Thunderstorm Wind	50	0	0	10,000	0
Sweatman	6/13/2011	Thunderstorm Wind	50	0	0	10,000	0
Duck Hill	4/20/2011	Thunderstorm Wind	55	0	0	1,000	0
Stewart	4/20/2011	Thunderstorm Wind	60	0	0	2,000	0
Winona	2/24/2011	Thunderstorm Wind	70	0	0	200,000	0
Kilmichael	12/31/2010	Thunderstorm Wind	50	0	0	2,000	0
Winona	12/31/2010	Thunderstorm Wind	50	0	0	2,000	0
Winona	7/16/2010	Thunderstorm Wind	53	0	0	20,000	0
Duck Hill	6/28/2010	Thunderstorm Wind	50	0	0	-	0
Duck Hill	4/3/2010	Thunderstorm Wind	50	0	0	-	0
Winona	4/3/2010	Thunderstorm Wind	60	0	0	35,000	0
Winona	12/8/2009	Thunderstorm Wind	60	0	0	3,000	0
Duck Hill	10/9/2009	Thunderstorm Wind	65	0	0	20,000	0
Winna	10/9/2009	Thunderstorm Wind	55	0	0	15,000	0
Foltz	7/30/2009	Thunderstorm Wind	68	0	0	200,000	0
Winona	6/23/2009	Thunderstorm Wind	52	0	0	20,000	0

Location	Date	Event Type	Magnitude	Death	Injury	Property Damage	Crop Damage
Sweatman	6/12/2009	Thunderstorm Wind	52	0	0	-	0
Winna	5/9/2009	Thunderstorm Wind	50	0	0	-	0
Hendrix Siding	5/6/2009	Thunderstorm Wind	50	0	0	4,000	0
	4/12/2009	Strong Wind	43	0	0	4,000	0
Duck Hill	4/10/2009	Thunderstorm Wind	70	0	0	20,000	0
Sawyer	12/27/2008	Thunderstorm Wind	50	0	0	-	0
Winona	8/2/2008	Thunderstorm Wind	52	0	0	-	0
Polar Creek	7/22/2008	Thunderstorm Wind	60	0	0	5,000	0
Stewart	4/11/2008	Thunderstorm Wind	50	0	0	-	0
Eskridge	11/14/2007	Thunderstorm Wind	50	0	0	-	0
Duck Hill	10/18/2007	Thunderstorm Wind	50	0	0	10,000	0
Kilmichael	6/19/2007	Thunderstorm Wind	55	0	0	5,000	0
Winona	6/18/2007	Thunderstorm Wind	58	0	0	12,000	0
Stewart	7/19/2006	Thunderstorm Wind	55	0	0	10,000	0
Duck Hill	3/9/2006	Thunderstorm Wind	58	0	0	10,000	0
Winona	4/6/2005	Thunderstorm Wind	53	0	0	-	0
Winona	4/6/2005	Thunderstorm Wind	53	0	0	-	0
Kilmichael	1/13/2005	Thunderstorm Wind	53	0	0	3,000	0
Countywide	7/16/2004	Thunderstorm Wind	55	0	0	8,000	0
Kilmichael	5/14/2004	Thunderstorm Wind	50	0	0	1,000	0
Winona	7/30/2003	Thunderstorm Wind	52	0	0	5,000	0
Central Portion	7/14/2003	Thunderstorm Wind	50	0	0	2,000	0
Winona	6/11/2003	Thunderstorm Wind	55	0	0	20,000	0
Winona	6/11/2003	Thunderstorm Wind	55	0	0	20,000	0
Countywide	6/2/2003	Thunderstorm Wind	55	0	0	15,000	0
Winona	7/23/2002	Thunderstorm Wind		0	0	20,000	0
Winona	7/22/2002	Thunderstorm Wind		0	0	1,000	0
Duck Hill	10/24/2001	Thunderstorm Wind		0	0	1,000	0
Countywide	6/5/2001	Thunderstorm Wind		0	0	16,000	0
Winona	6/4/2001	Thunderstorm Wind		0	0	12,000	0
Duck Hill	5/30/2001	Thunderstorm Wind		0	0	1,000	0
Winona	2/16/2001	Thunderstorm Wind		0	0	4,000	0
Totals						$ 1,072,600	0

Figure G.9 – Sample of Historic Hail Events

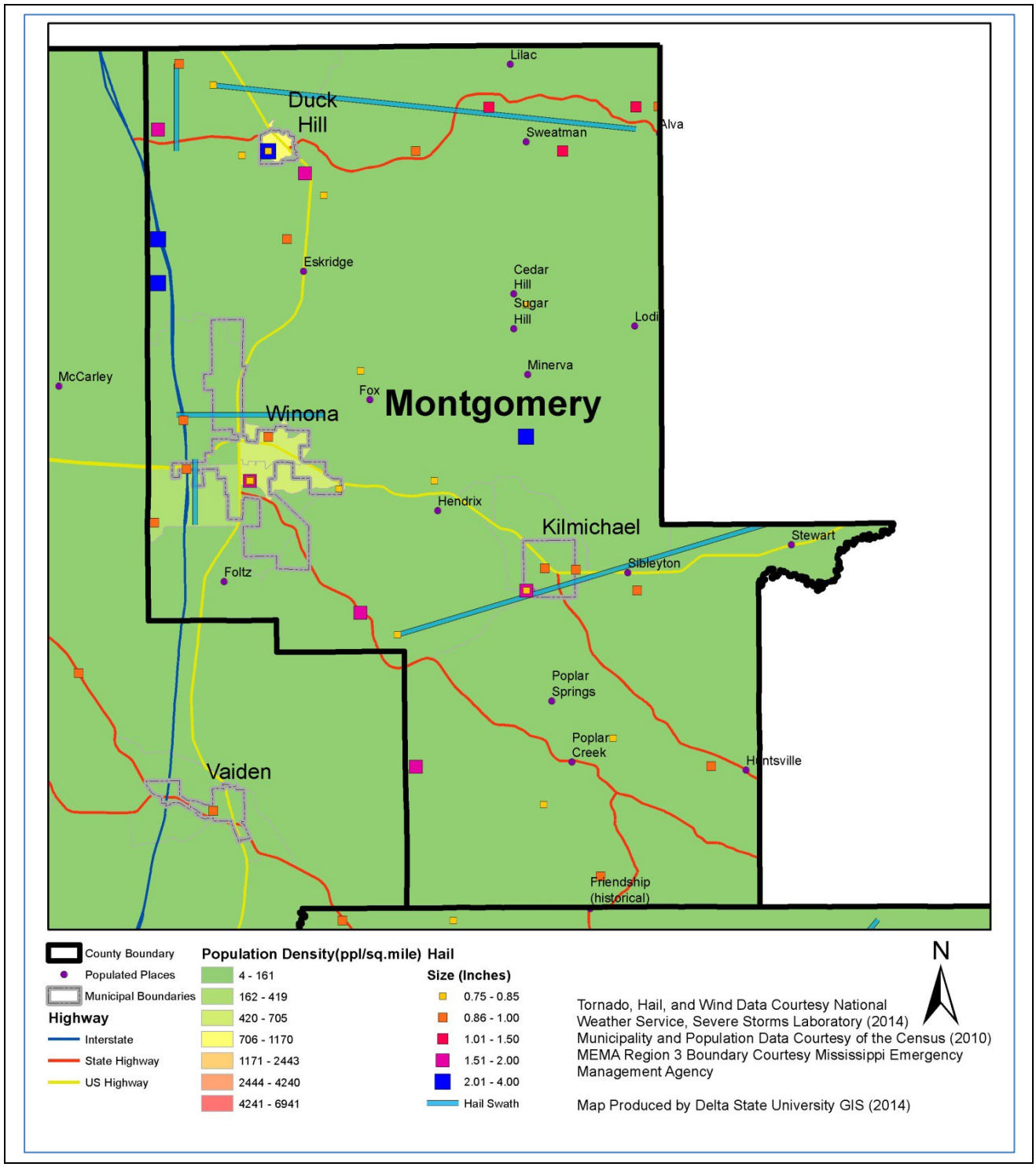
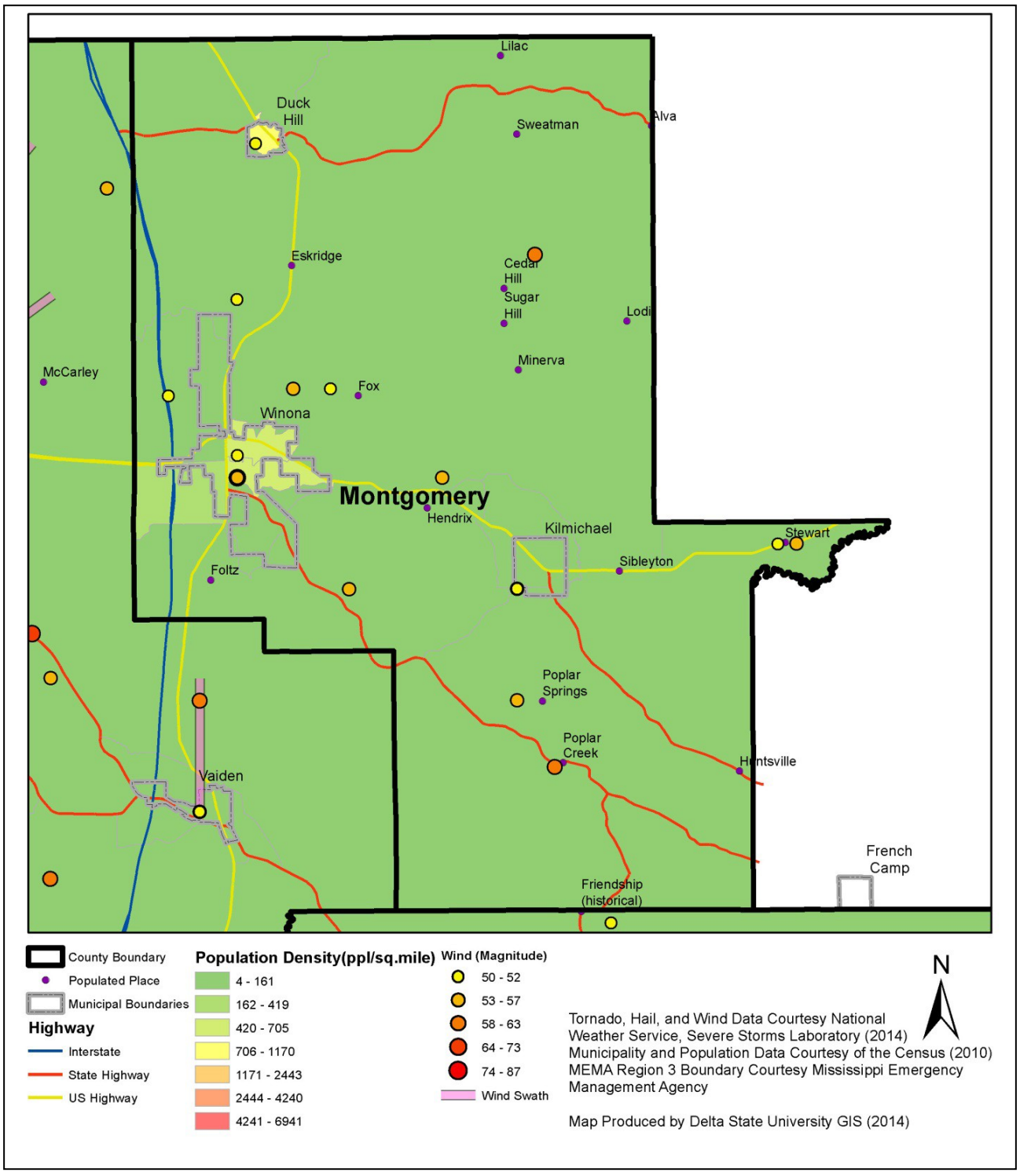


Figure G.10 – Sample of Historic Severe Wind Events



Probability of Future Occurrence

A review of NCEI data shows there is a 100% probability of several severe storms occurring each year. As was previously mentioned, severe storm components are non-spacial and, thus, capable of affecting the entire county.

Assessing Vulnerability

Severe storm events are also known to cross county boundaries and have regional impact. Their greatest impact since the year 2000 has been the $2,403,700 in property damage and the much smaller amount of crop damage ($200,000). Critical County infrastructure is unlikely to be affected by this hazard, but their frequent occurrence suggests the community and its first responders should be prepared to respond to such incidents should extreme events occur. The hazard is listed as a medium ranking in terms of risk because of the number of events and damage therefrom.

While Montgomery County's entire population is considered at risk to severe weather, rural areas and special populations, such as those living in mobile homes, the elderly and disabled, may be most vulnerable.

Severe Winter Weather

Location and Extent

The entire Montgomery County planning area is susceptible to severe winter storm events, which are non-spacial events. As such, they generally are not confined to one geographic area but may, in fact, extend regionally and across multiple states. Severe winter weather can result in prolonged power outages and possible energy shortages. They can affect businesses if employees are unable to travel to work, or when the workplace is closed due to loss of power. Dangerous driving conditions occur as ice builds up on roads and bridges. As ice accumulates on power lines and trees, several large trees could collapse and fall on homes, cars or pedestrians. Heavy snow accumulation has been known to cause roofs to cave in. Elderly and disabled residents and those with limited mobility should be considered vulnerable to the hazard.

Previous Occurrences

Table G.30 shows that 11 severe winter weather events occurred between the year 2000 ad 2019 and caused $726,000 in property damage. Not listed here is the most severe winter storm event to impact the county, which occurred in 1998. In that year, an ice storm crippled several counties and communities in Mississippi leaving many homes and businesses without power for weeks.

Table G.30 – Severe Winter Weather Events 2000 to 2019 | Source: NCEI

Date	Event Type	Death	Injury	Property Damage	Crop Damage
1/16/2018	Heavy Snow	0	0	10,000	0
3/5/2015	Sleet	0	0	0	0
2/25/2015	Heavy Snow	0	0	0	0
1/16/2013	Heavy Snow	0	0	0	0
1/14/2013	Ice Storm	0	0	10,000	0
2/9/2011	Heavy Snow	0	0	300,000	0
1/9/2011	Heavy Snow	0	0	30,000	0
1/1/2010	Cold/Wind Chill	0	0	300000	0
3/7/2008	Heavy Snow	0	0	0	0
12/21/2000	Ice Storm	0	0	1,000	0
1/27/2000	Heavy Snow	0	0	75,000	0
Totals				$ 726,000	

A National Weather Service description of the sleet event that occurred on March 5, 2015 is typical of how severe winter events unfolded over the past two decades. The following is a shortened summary of the event. The narrative shows the extent of multiple cascading effects that may occur as a result of multiple weather elements, including rain, a freeze, and warming trends.

> Sleet accumulated up to one inch at Duck Hill after a heavy snowfall that occurred the previous week. Fortunately, a warming trend helped alleviate the severity of road conditions. Temperatures warmed quickly on March 4th into the mid-70s to low-80s, but this was followed by cold and strong high pressure stretching from Canada, through the Plains, and further south. Temperatures quickly plummeted to the 40-50-degree range. Moisture lingered behind the cold front and rain changed to sleet late the night of March 4th into early morning hours of March 5th. As colder air in the lower

parts of the atmosphere continued to filter in, moisture began to transition to a wintry mix, mainly in the form of sleet, in the northwest Delta. This setup supported a transition from rain to freezing rain to sleet. Moisture further southeast near the Natchez Trace corridor and Jackson metro began to transition over in the early morning hours of March 5th, with some moderate sleet falling in central Mississippi. Sleet and some snow began to mix into the Delta while the majority of the area saw a significant accumulation of sleet. Some areas in south and east Mississippi also saw some sleet but a little to no accumulation. Precipitation moved out late morning of March 5th. Some areas saw between 1/2 inch to 1-2 inches in the far northern parts of the Delta and northern Mississippi. Because the roads were warm two days previously, bad road conditions were largely limited to areas that received significant heavy sleet accumulation (the Delta and northern Mississippi). Areas in the Jackson Metro region experienced slick roads, but warm ground and road temperature from the previous few days moderated hazardous conditions.

Probability of Future Occurrence

Severe winter weather has occurred in seven of the past 19 years covered during by this 2020 RHMP Update. Using the return interval as a basis for calculation (occurrences in seven of 19 years), there is a 33% probability of a severe winter storm occurring in the region in any given year. The hazard is ranked as low for its frequency and historic financial and human cost.

Assessing Vulnerability

Community assets at risk from a winter storm include the electrical and telephone utility system and tree coverage and canopy. Vehicular accidents resulting from icy conditions could cause injury, vehicular damage, or death. Falling ice-laden tree limbs may cause property damage. A hard freeze may also result in decreased water pressure as frozen and damaged pipes thaw and leak. Among essential services, critical facilities and infrastructure likely to be affected are roadways, where there is concern for public safety; and electric, telephone and water services.

The Mississippi Economic Development Council produced figures in March 2020 showing there were 90 Montgomery County workers employed in the agriculture, forestry, fishing and hunting sector; 80 in the construction sector; and 90 in the transportation and warehousing sector. Workers such as these, who spend a great deal of time outdoors, are likely to be adversely affected by severe winter weather.

Populations at Risk: Vulnerable persons during winter weather periods include the homeless, the elderly, young children, and persons with chronic health problems. Above freezing temperatures combined with strong wind can result in felt temperatures below freezing and cause hypothermia, illness, and death.

Property Damage: In the past, this hazard has caused roofs to cave in, trees to fall on houses, prolonged power outages, and dangerous driving conditions. Table above shows two separate events occurring between the years 2000 and 2019 each caused $300,000, and the 11 total events caused $726,000 in property damage. While these figures are not as large as damage costs from some other hazards, this amount is still significant for individual households, small businesses, and municipal governments operating on limited budgets.

Critical Facilities and Essential Services: Essential services are not likely to be significantly impacted by a winter storm. For the most part, generators have been installed at critical and essential facilities within the county and participating jurisdictions to ensure continuity of electricity for dispatch

and emergency services.

Transportation Systems: Transportation services could be temporarily interrupted should icing occur on major and arterial roadways.

Lifeline Utility Systems: The most vulnerable lifeline utility systems that could be affected by winter storm are electric power, telephone and water services. It could be anticipated for rural water systems that do not have access to back up generators, service outage could create problems in some areas of Montgomery County.

Tornado

Location and Extent

Mississippi consistently ranks in the top 10 states with the most tornadoes in the nation. All areas of the state, including Montgomery County, are susceptible to such events. Damages listed in Table G.31 show even an EF1 magnitude tornado can cause extensive damage.

Tornado is a non-spacial hazard, meaning all jurisdictions in the county are equally likely to experience an event. Of particular concern are persons who reside in a mobile/manufactured home, and the elderly and disabled. According to the Census Bureau 2014-2018 American Community Survey, there are approximately 878 mobile/manufactured housing units in the County, representing roughly 15.7% of total housing units. Most of these are located north of Highway 82 in the eastern portion of the county.

Previous Occurrences

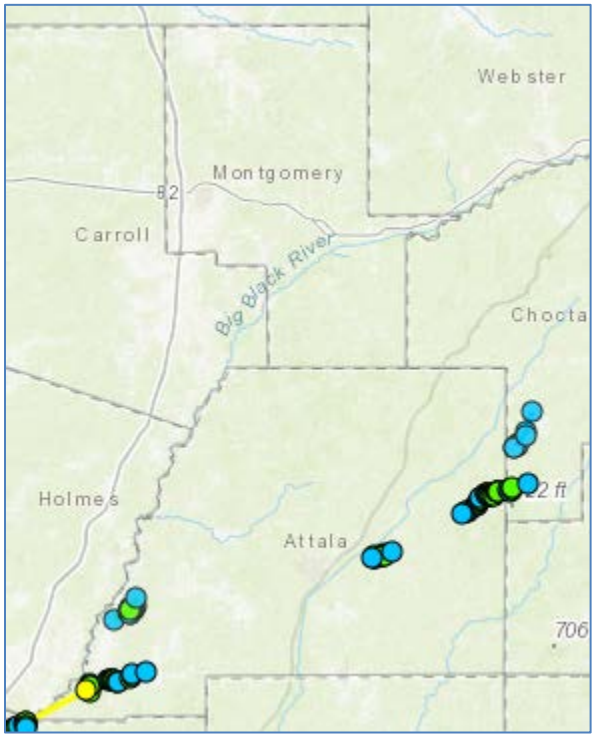
Table G.31 shows there were 12 recorded tornado events between 2000 and 2019. To include the most recent tornado coverage for the county, a map addressing more recent events – or the lack thereof -- follows this table and is included as Figure G.11.

Table G.31– Tornado Events 2000 to 2019 | *Source: NCDC*

Location	Date	Event Type	Magnitude	Death	Injury	Property Damage	Crop Damage
Poplar Creek	3/9/2019	Tornado	EF0	0	0	7,000	0
Polar Creek	9/5/2018	Tornado	EF0	0	0	100	0
Kilmichael	4/30/2017	Tornado	EF2	0	0	1,500,000	600,000
Kilmichael	4/30/2017	Tornado	EF1	0	0	4,000,000	500,000
Lodi	4/30/2017	Tornado	EF1	0	0	60,000	200,000
Minerva	4/30/2017	Tornado	EF1	0	0	40,000	0
Hendrix	4/28/2014	Tornado	EF1	0	0	70,000	0
Polar Creek	4/27/2011	Tornado	EF1	0	0	3,000	0
Polar Creek	4/27/2011	Tornado	EF2	0	0	350,000	800,000
Hendrix Siding	12/9/2008	Tornado	EF1	0	0	110,000	0
Winona	3/13/2006	Tornado	F0	0	0	0	0
Kilmichael	12/7/2004	Tornado	F1	0	0	250,000	0
Totals						$ 6,390,100	$ 2,100,000

The web site of the National Weather Service Jackson, MS, station includes a map showing the path of all tornados through mid-2020. Figure G.11 is a screen shot of this map, which includes both Montgomery County and its southern neighbor, Attala County. The map shows that no events have occurred in Montgomery County since January 2020, while several tornados have occurred in Attala County. However, Montgomery County considers tornado to be a high ranking hazard because of the high total cost of historical damage, and the fact that the occupants of the many mobile housing units there include occupants at risk of injury during an event should their residential structure be moved by tornadic forces.

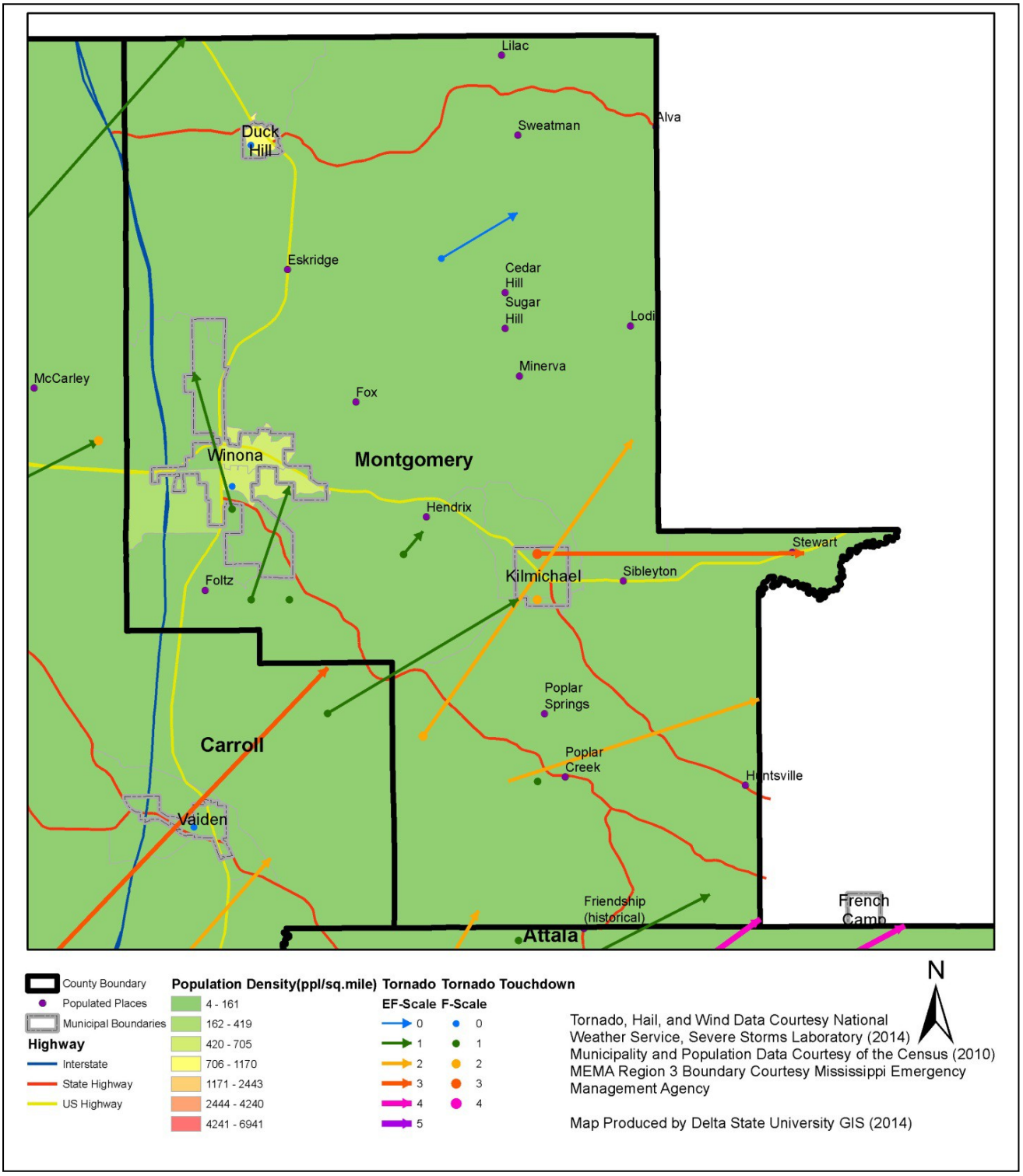
Figure G.11: 2020 Tornadic Events in Montgomery County | Source: National Weather Service



Probability of Future Occurrence

Probability was estimated considering tornadoes have occurred in eight of the nineteen years between 2000 and 2019. Dividing the number of years in which events occurred (eight) by the total number of years studied (19) results in 42% probability an event will occur in any given year. As such, tornadoes are considered a likely occurrence in Montgomery County.

Figure G.11 – Sample Historic Montgomery County Tornado Events



Assessing Vulnerability

Although technology and warning system capabilities have improved significantly in recent years, tornadoes can still occur with little or no warning and cause severe destruction, personal injury, and loss of life. The list of affected communities shown previously in Table G.31 indicates the entire county is vulnerable to tornado impacts. Particularly vulnerable are those living in mobile/manufactured housing units, as was previously discussed. The Montgomery County Emergency Management Department recognizes the degree to which its population is vulnerable to tornado and other severe weather events and has included a mitigation action worksheet in this Annex that discusses the need to build additional safe rooms. Tornado is a high-ranking hazard given the concern for vulnerable populations and the dollar amount of damage inflicted on the community.

Impacts to Life and Property: Perhaps most vulnerable to this hazard are those population segments consisting of (elderly, disabled, and poor) who may not have the ability to seek shelter in a timely manner. Older frame houses and the 878 mobile homes previously mentioned are particularly vulnerable to tornadoes. If structures are not built to withstand high winds, roof damage or roof failure may occur. Mobile homes are safest when anchored to a foundation lest the force of tornado winds lift and overturn the structure. Severely damaged mobile homes may not be later habitable.

Impacts to Natural Resources: Tree canopy and decorative vegetation are all subject to tornado damage. The force of a tornado is powerful enough to uproot trees and vegetation and deposit the debris in standing water, which could result in pollution. Wildlife and farm animals are not likely to survive the force of tornado winds and may be carried to distant ground or deposited in a body of water, which may result in pollution. Streams can become clogged with windblown debris and downed trees, causing flooding. Debris not removed from vacant land could become a threat to health and safety as a fire hazard, or it may create a haven for unwanted vermin or pests.

Impacts to Critical Facilities: A tornado may affect any critical facility or infrastructure. The County and its municipalities require all new buildings and infrastructure, such as water tanks and towers, be built to high wind-resistant standards. All public and essential service buildings in Montgomery County are still at risk from a direct tornado strike, but there is nothing to indicate such structures are more vulnerable than any other buildings in the County. Given the unpredictable nature of tornadoes and the possibility of event damage, it is important to designate areas as safe rooms in all public and essential service buildings.

Tropical Storm / Hurricane

Location and Extent

While Montgomery County is situated over 200 miles from the Mississippi Gulf Coast, the area is vulnerable to the unavoidable effects of tropical storms/hurricanes as these events reach land and continue inland away from the coast. Storms moving inland have been known to produce violent winds, torrential rains, tornadoes, and flash flooding. Damage levels may and be significant or low, depending on the hurricane path and whether it picks up strength before hitting landfall and turning inland.

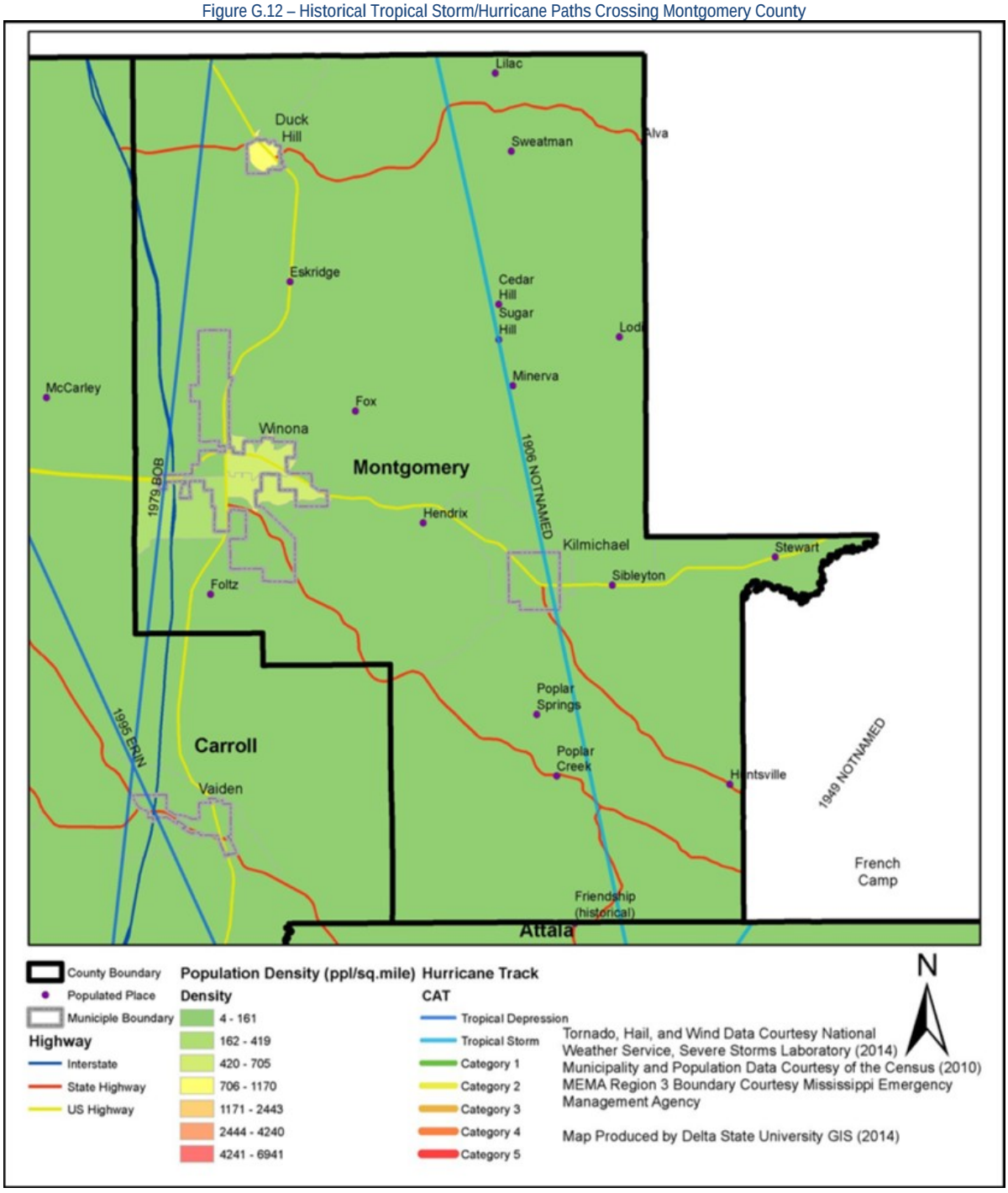
Previous Occurrences

Two recent storms documented by the National Weather Service are listed in Table G.32. They were included in the 2015 District 3 RHMP and records indicate no subsequent events have affected the region. Hurricane Katrina caused substantial damage to all 82 Mississippi counties. To further demonstrate how tropical storms have penetrated inland over a longer period of time (since the 1959s), Figure G.12 shows hurricane crossings for roughly the past 70 years, although only the two events below are listed in the NCEI Storm Events Database.

Table G.32 – Tropical Storm / Hurricane Events 2000 to 2019 | Source: NCDC

Event Name	Date	Death	Injury	Property Damage	Crop Damage
Hurricane Katrina	8/29/2005	-	1	10,000,000	50,000,000
Hurricane Dennis	7/10/2005	-	-	20,000	50,000
Total-				$10,000,000	$50,050,000

Figure G.12 – Historical Tropical Storm/Hurricane Paths Crossing Montgomery County



Probability of Future Occurrence

Because the two events listed are from the same year, the likelihood of a hurricane was estimated based on the occurrence of a single year's events divided by the 19 years considered for this RHMP update. This shows an estimated 5% probability of a hurricane occurring in any given year. Because hurricane is a non-special hazard, it is likely such an event would affect the entire county should it travel such a distance inland.

Assessing Vulnerability

Montgomery County is located inland of the Mississippi coastline. Hurricanes affecting the Gulf Coast usually lose strength as they make landfall and move northward, usually without hurricane force winds impacting the area. However, due to the speed, size, and magnitude of the storm, the County could still be affected by damaging winds. The entire population is at risk to tropical storms and hurricanes. Damage during these events may result from spawned tornadoes and flooding from heavy rain.

Table G.33 presents data obtained from HAZUS for tropical storm/hurricane events to evaluate the potential economic losses for the County. This represents the most recently available county-level Capital Stock and Income Losses data and was taken from the 2013 SHMP.

Table G.33 – Direct Economic Losses for Buildings Annualized Losses | Source: 2013 SHMP (HAZUS)

Capital Stock Losses				Income Losses				
Cost Building Damage	Cost Contents Damage	Inventory Loss	Loss Ratio	Relocation Loss	Capital Related Loss	Wages Loss	Rental Income Loss	Total Loss
$21,000	$6,000	0	0.00	$2,000	0	0	$1,000	$29,000

Reporting all losses in thousands of dollars, HAZUS calculations included in the 2018 SHMP Global Summary Report of a 100-year Hurricane event identified the State overall as having total Property Damage losses of $9,845,515.73 and Business Interruption Losses of $1,469,644.58, for a total of $11,318,160.30 statewide, but there is no loss breakdown by county. However, county data shown in Table G.34 includes residential/non-residential value, as well as total building value.

Table G.34 – Regional Population and Building Value Data | Source: 2018 SHMP (HAZUS)

		Building Value (thousands of dollars)		
County	Population	Residential	Non-residential	Total
Montgomery	10,925	$674,457	$239,254	$904,711

The greatest threat to life and property would occur in a Category 5 Hurricane directly striking the coastline of Harrison County, Hancock County, St. Bernard or Plaquemines Parishes in Louisiana. A strike at these locations could place Montgomery County directly in the path of the highest winds and heaviest rain bands produced by such a storm.

Impacts to People and Property: Healthy and frail populations are all vulnerable to the effects of a hurricane, when trees may fall on homes, businesses, crops, and people. In addition to concern about those living in mobile homes, those living in substandard housing are susceptible to the hazard if their structures are unable to withstand high winds. In the discussion of the Tornado hazard, it was mentioned Montgomery County would like to build additional safe rooms for residents who may wish to evacuate their homes in the event of a potentially deadly hazard event.
Impact on Critical Facilities: Properties at risk may include hospitals, nursing homes and housing

likely to contain occupants who may not be sufficiently mobile to avoid death and injury during a flood or other emergency. Public safety facilities such as fire stations, vehicle and equipment storage facilities and emergency operations centers could also be at risk.

Impacts of Natural Resources: Tropical storms and hurricanes may damage forest canopy and timberlands. Inland rivers and lakes can become clogged with wind-blown debris and trees, slowing recovery from a hurricane. Obstructions, if not removed can cause flooding. Trees toppled onto the forest floor quickly become a target for infestation from insects that may spread to healthy trees. Water quality may suffer due to unwanted debris and vegetation blown in a hurricane. Potential debris from fallen trees can create fuel for wildfires when the area dries sufficiently to allow for burning through lightning or intervention by mankind. The Mississippi State Forestry Commission works continuously to ensure that, through proactive cutting and prescribed burns, fallen trees and debris will not become fuel for a wildfire. In areas where timber is a significant feature of the economy, hurricane winds wreak havoc with growing trees, causing damage that lessens the quality of the timber and increases the likelihood of insect infestation of standing trees.

Impacts on Transportation Systems: Hurricane and/or high winds a tropical storm could result in downed power poles, which would be particularly hazardous if roadways were affected. In heavily populated areas, lack of electricity would cause a lack of traffic signal lights at major intersections, creating another driving hazard. Rail traffic could be interrupted by damage to railroad lines caused by flooding and damage to bridges and overpasses.

Impact on Lifeline Utility Systems: Overhead electric and telephone lines may be damaged by trees and debris blown across them, or power poles and lines are blown over by hurricane force or tornado winds. In some instances, electric power may not be restored for many days or even weeks. In the aftermath of Hurricane Katrina, the entire grid of Mississippi Power Company was affected and, in some areas, land lines for telephones were down for weeks or months. The hurricane also damaged cell phone transmission towers and radio and television transmission towers, many of which were out of service due to electric power failure. Lack of electricity also left some water systems and sewage treatment plants unable to operate until generators could be brought in to restore partial power.

Wildfire

Location and Extent

The potential for wildfires exists across Montgomery County, although they have the greatest potential to affect those parts of the County that are forested, or at the interface between forest and other land cover (known as the Wildlife Urban Interface, or WUI). County forestland data shown here was derived from the 2019 Forestland Inventory conducted by Mississippi Forestry Commission (MFC). It shows Montgomery County includes approximately 260,948 acres of forested land, or roughly 61.7 percent of the total land area. Information about the number of acres of forestland is presented in Table G.35, where Montgomery County data is highlighted. The county is second only to Carroll County in the percentage of acreage covered by forestland.

Table G.35 – 2019 Forestland Statistics | Source: Mississippi Forestry Commission

		Forestland			
County	Total Land Area (Acres)	Acres	Coverage (%)	Pine	Hardwood
Attala	471,597	284,817	60.4	49.1	41.3
Bolivar	279,658	86,465	30.9	0.0	100.0
Carroll	405,982	263,067	64.7	22.5	68.5
Holmes	488,932	197,380	40.3	15.1	84.8
Humphreys	275,892	30,268	10.9	0.0	100.0
Leflore	387,967	57,537	14.8	0.0	100.0
Montgomery	260,948	161,110	61.7	36.1	54.2
Sunflower	452,541	23,174	0.05	0.0	100.0
Washington	487,198	74,984	15.3	0.0	100.0

The Wildfire discussion in the Base Plan mentioned an analysis of the change in total forestland area from the previous plan shows the total acreage and percent of coverage has continued on a declining trend in all District 3 counties, with Attala (-23.2%) and Holmes (-22.8%) showing the greatest decline in forestland. The average loss of the other seven District 3 counties was 5.43 percent. Most forestland in the planning area is under private ownership.

Information provided by the Mississippi Forestry Commission indicates wildfires may occur during any season, but since 2012, the worst fires (determined by the number of acres burned) have occurred in late Summer and early Fall. Data presented in above also shows the potential for county-level differences in the total number of fires and acreage burned from year to year based on the percentage of forestland in the county.

Past wildfires have threatened and destroyed property. Table G.36 shows the number of residences, commercial buildings and outbuildings, broken down by county, which have been threatened or destroyed since 2015. Montgomery County has seen 33 residences and four businesses threatened but not destroyed; 43 outbuildings were threatened and four destroyed.

Table G.36 – Montgomery County Residence and Structures Threatened and or Destroyed by Wildfire Since 2015
Source: Mississippi Forestry Commission

County	Residences Threatened	Residences Destroyed	Commercial Building Threatened	Commercial Building Destroyed	Outbuilding Threatened	Outbuilding Destroyed
Attala	149	3	4	-	75	8
Bolivar	-	-	-	-	-	-
Carroll	113	-	45	-	33	1
Holmes	116	-	3	-	98	2
Humphreys	-	-	-	-	0	-
Leflore	2	-	-	-	6	-
Montgomery	33	-	4	-	43	4
Sunflower	-	-	-	-	0	-
Washington	1	-	-	-	1	-
TOTALS	**414**	**3**	**56**	**-**	**256**	**15**

Fortunately for all Montgomery County stakeholders, there is a strong fire protective services component between the local fire department and the presence of State forest rangers. These forces are strong and likely able to prevent most any fire from growing to catastrophic levels.

Previous Occurrences

Local weather, drought conditions vegetative cover and topographic conditions contribute to the potential forecast of future forecast of wildfires, which are difficult to predict due to the variables in how and when they start. Documenting fire events is not consistent across the planning region within local fire departments. The Mississippi Forestry Commission and State Fire Marshall were contacted for data sharing and they indicated they do not have any data to provide for this plan update. Table G.37 shows that between 2014 and 2019, there were 39 fires in which a total of 469 acres burned in Montgomery County. Encouragingly, the number of fires and acres burned have both dropped considerably in the last three years as a result of public education efforts.

Table G.37 – Wildfire Data 2014 to 2019 | Source: www.mfc.ms.gov

County	2019		2018		2017		2016		2015		2014	
	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned	Total Fires	Acres Burned
Attala	28	782	21	392	38	468	59	1,170	52	597	32	187
Bolivar	-	-	-	-	-	-	1	80	-	-	-	-
Carroll	5	18	4	32	13	172	24	387	24	268	16	83
Holmes	13	87	15	522	27	532	39	432	43	441	36	486
Humphreys	-	-	-	-	-	-	-	-	-	-	-	-
Leflore	-	-	-	-	-	-	1	22	6	150	-	-
Montgomery	4	34	-	-	1	7	14	139	12	154	8	135
Sunflower	-	-	-	-	-	-	1	-	-	-	-	-
Washington	1	5	-	-	1	32	-	-	1	8	1	40

Information provided by the MFC indicates wildfires may occur during any season but, since 2012, the worst fires (determined by the number of acres burned) have occurred in late Summer and early Fall. Data presented above also indicates county-level differences in the total number of fires and acreage burned from year to year.

Wildfires both threatens and destroys property. Table G.38 shows the number of residences, commercial buildings, and outbuildings broken down by county that have been threatened or destroyed since 2015. Montgomery county figures show that 33 residences and four commercial structures have been threatened but none destroyed. Forty-three outbuildings have been threatened by wildfire but only four destroyed.

Table G.38 - Montgomery County Residence and Structures Threatened and or Destroyed by Wildfire Since 2015 | Source: Mississippi Forestry Commission

County	Residences Threatened	Residences Destroyed	Commercial Building Threatened	Commercial Building Destroyed	Outbuilding Threatened	Outbuilding Destroyed
Attala	-	-	-	-	-	-
Bolivar	-	-	-	-	-	-
Carroll	113	-	45	-	33	1
Holmes	116	-	3	-	98	2
Humphreys	-	-	-	-	-	-
Leflore	2	-	-	-	6	-
Montgomery	33	-	4	-	43	4
Sunflower	-	-	-	-	-	-
Washington	1	-	-	-	1	-
TOTALS	**414**	**3**	**56**	**-**	**256**	**15**

Probability of Future Occurrence

The frequency and severity of wildfires depends on weather conditions and level of human activity. Compared to the level of forestland coverage, there have been relatively few wildfires in Montgomery County. Recent events have generally been of short duration, from a few hours to one day. Because there is a downward trend in wildfire occurrence, estimates may be inaccurate. Dividing the number of fire events (39) by the number of years for which data is available (six) results in an average of 6.5 fires annually. Data is not readily available for the 2020 RHMP planning period of 19 years. The 6.5 annual figure is unlikely since there were only four events in 2019, none in 2018, and one in 2017. It is more likely there is a 50% chance of fire in any given year considering there has been at least one fire every year since 2014 and a number of acres burned.

Assessing Vulnerability

The places most vulnerable to wildfires are in unincorporated areas of Montgomery County. Current mitigation of fire hazard includes regular thinning of trees and removal of dead limbs and underbrush of the 57,537 acres of county timber land. Electrical power could be impacted by wildfire and service could be temporarily interrupted by wildfire. It is doubtful wildfire would have a lasting impact on water and sewer systems.

A look at the Public Viewer of the Southern public portal of the Southern Group of State Foresters (SGSF) at www.southernwildfirerisk.com shows that, despite the number of forestland acres, most jurisdictions are at relatively low risk. SGSF provides an interactive map on which individual communities can be shown to determine their level of vulnerability to wildfire. Figures G.13a through Figure G.13d are screen shots for Montgomery County, the Town of Duck Hill, the Town of Kilmichael, and the City of Winona from this web site. The map of Montgomery County suggests that the overall region may be at moderate risk to wildfire, and the three municipalities appear to be at relatively low risk to the hazard.

Figure G.13a: Jurisdictional Wildfire Vulnerability - Montgomery County

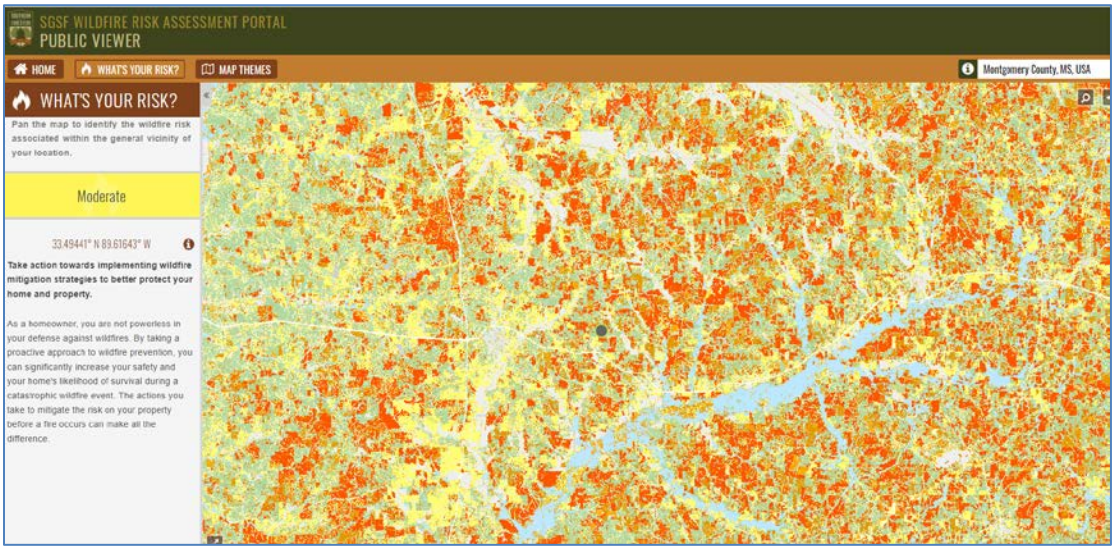


Figure G.13b: Jurisdictional Wildfire Vulnerability -Town of Duck Hill

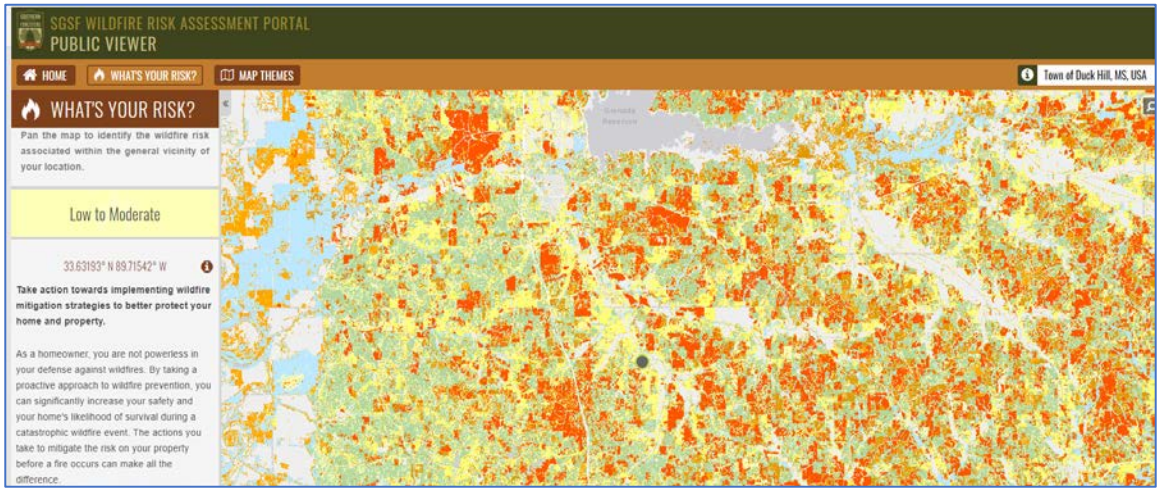


Figure G.13c: Jurisdictional Wildfire Vulnerability -Town of Kilmichael

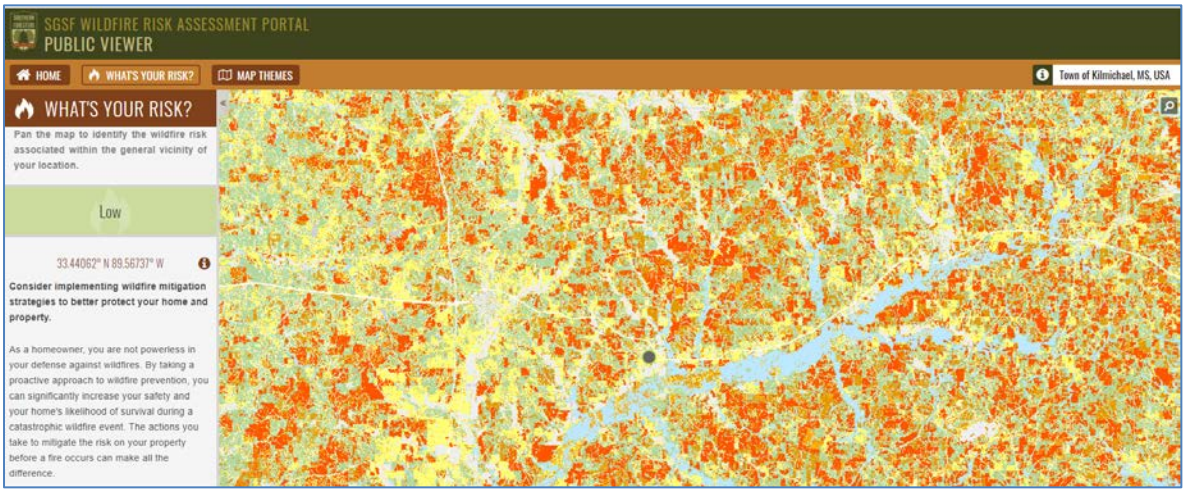
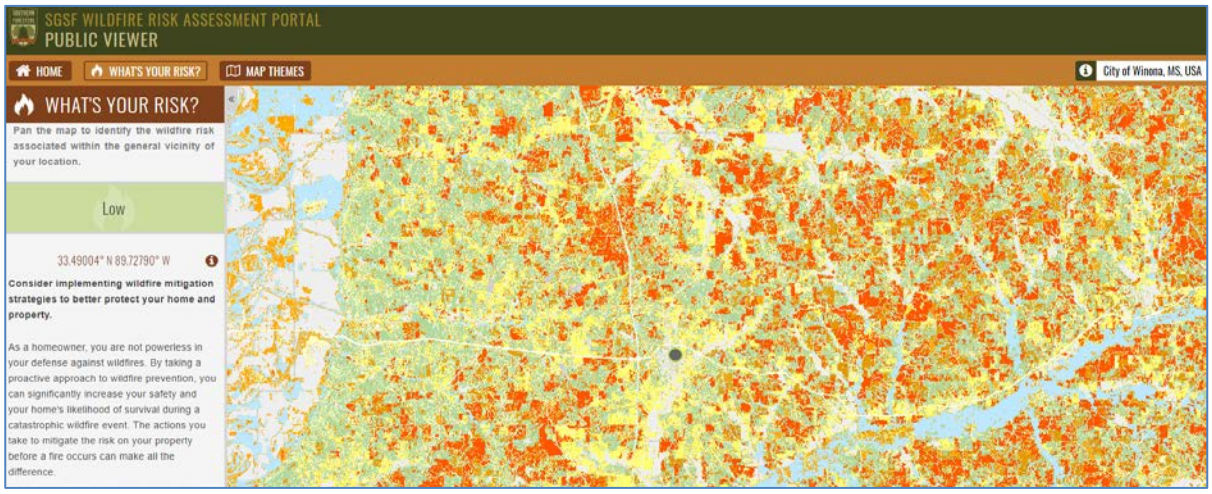


Figure G.13d: Jurisdictional Wildfire Vulnerability -City of Winona



The following table summarizes the risk of Montgomery County and each of its jurisdictions to wildfire:

Table G.39 - Montgomery County Jurisdictional Wildfire Hazard Level

Jurisdiction	Ranking
Unincorporated Montgomery County	Medium
Town of Duck Hill	Low to Medium
Town of Kilmichael	Low
City of Winona	Low
Overall Montgomery County Vulnerability to Wildfire	Low

The hazard was rated as being low overall in the 2015 RHMP and the downward trend in number of fires suggests that there will continue to be lessened risk.

Impact on Future Development: The efforts of public and non-profit water associations ensure there will always be water available for firefighting and structural protection, particularly in rural areas of the County. Several fire stations and districts in the county are not manned on a full-time basis but rely on volunteers, assisted by the Forestry Service, to fight wildfires. This could result in a negative impact on future development especially in the rural areas. The Montgomery County Emergency Management Director mentioned the County is attempting to fund construction of two additional fire stations to provide adequate coverage for potential wildfire needs.

Impacts to Life and Property: Wildfire could impact the community by overextending personnel and financial resources of local emergency response crews and create a need to evacuate residences and businesses. The County's vulnerability to county-wide wildland fire hazard is mitigated somewhat by the presence of fire stations in most parts of the county, as well as the presence of a Sheriff's Office, which serves as an alternate EOC and personnel to augment those resources of fire stations.

Impacts to Critical Facilities: Electrical power could be impacted by wildfire and service could be temporarily interrupted by wildfire. It is doubtful wildfire would have a lasting impact on water and sewer systems.

Hazardous Material Incidents

Location and Extent

Emergencies involving hazardous materials can occur anywhere. Past experience has shown incidents occur more frequently and with greater risk to the public and environment in transportation-related accidents (either highway or railroad) than in accidents from fixed facilities. Many hazardous and toxic materials are transported through Montgomery County on 18-wheelers via Interstate 55 and U.S. Highways 51 and 82. The proximity of these transportation routes to Montgomery County communities increases the risk to residents in a five-mile radius of the major highways/interstate. A secondary risk to a transportation accident involving hazardous materials is the hazard of explosions and fires.

Previous Occurrences

According to the U.S. Environmental Protection Agency (EPA) 2018 Toxic Release Inventory (TRI), there were no releases or spills within a ten-mile range of the Town of Kilmichael or the City of Winona. Likewise, a search for spills in Montgomery County showed no spills using the county's geographic center point as a mapping reference.

There were, however, four companies within ten miles of the Town of Duck Hill were affected by toxic releases as shown in the 2018 report:

Hankins Lumber Co., Inc. 496 Nat G Troutt Road Elliott, MS 38926 Industry Subsector(s): Sawmills and Wood Preservation Date of Last Inspection: 12/17/2018	Thomas Wood Preserving, Inc. 1964 Murff Drive Grenada, MS 38901 Industry Subsector(s): Sawmills and Wood Preservation Date of Last Inspection: 11/20/2013
Modine Manufacturing Co. 3984 Highway 51 S Grenada, MS 38901 Industry Subsector(s): Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing Date of Last Inspection: 12/19/2018	US Army National Guard Camp Ranges 3152 James S. Biddy Road Grenada, MS 38901 Industry Subsector(s): National Security and International Affairs Date of Last Inspection: No Data Available

Additionally, the industries shown in Table G.40 were listed in the 2015 RHMP as allowing releases in previous years.

Table G.40 – TRI Facilities | Source: http://www.epa.gov/enviro/facts/tri/search.html

Facility Name	Address	City	Number of Submitted Reports
Energy Conversion Systems, Winona Division	Hwy 51, Crossroads Industrial Park	Winona	5
Krueger International	4 Old Hey 51 N	Winona	15
Screw Conveyor Corporation	781 Church Street	Winona	103

Probability of Future Occurrence

Based on past disaster events in other communities the probability of future occurrence for this type of disaster is classified as highly likely.

Assessing Vulnerability

Primary Areas of Vulnerability: Unincorporated areas of Montgomery County along I-55, Highways 51 and 82, and on Miss. Hwy. 407 (farmer's chemicals); City of Winona at I-55, 82 and 51 (especially the overpass at I-55 and 82) and Summit Street (location of sub-station for Mississippi Valley Gas); Town of Duck Hill at I-55 and along Highway 51 (the Canadian Illinois Central Railroad also follows Highway 51 through Duck Hill); and the Town of Kilmichael at Highway 82.

Besides the presence of major transportation routes and railways which pose a risk of transportation accidents and hazardous materials incidents, Montgomery County has a number of facilities in which hazardous and/or toxic materials are stored. This creates a potential for hazardous spills or discharges. Table G.41 lists some of these facilities:

Table G.41 – Toxic Storage Facilities | Source: Community Interviews

Facility Name	Address	Jurisdiction
Anel Industries	Highway 51 S	Winona
J.J. Ferguson Sand and Gravel	Highway 82 E	Winona
Leahman Roberts	Highway 82 E	Winona
MMC Materials, Inc	Garrett Dr.	Winona
Crenshaw Farm	Highway 407	Winona

The following maps, included as Figure G.14 through Figure G.17, show the locations of hazardous material handlers in relation to schools and the Tyler-Holmes Hospital.

Figure G.14 – Montgomery School District – Town of Kilmichael

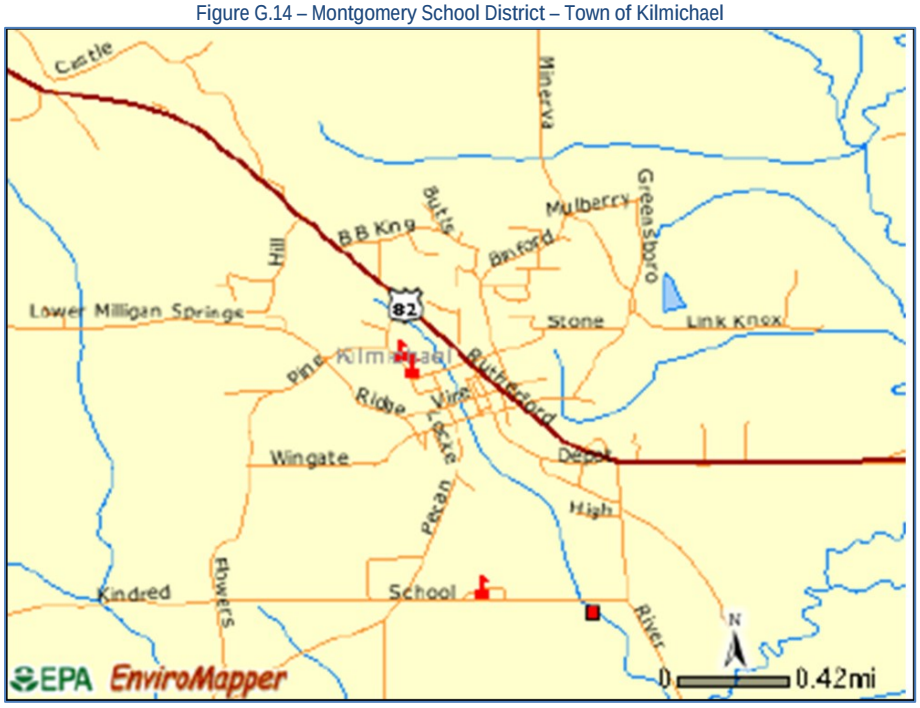


Figure G.15 – Winona School District and Tyler Holmes Memorial Hospital

Figure G.16 – Kilmichael School District

Summary of Risk Assessment

Information from Table G.9, shown at the beginning of discussion of the Montgomery County risk assessment, is shown again here as a summary table.

Table G.42 – County Summary of Hazard Events 2000 – 2019 | Source: NCDC, MDEQ, USGS

Hazard Type	No of Events	Property Damage	Crop Damage	Total Damage	Death	Injury
Dam/Levee Failure	-	-	-	-	-	-
Drought	7	130,000	2,921,000	3,051,000	-	-
Earthquake	-	-	-	-	-	-
Excessive Heat / Heat	5	-	-	-	-	-
Expansive Soil-	-	-	-	-	-	-
Flood	20	1.006,000	-	1,006,000	-	1
Severe Storm	119	2,403,700	200,000	2,603,700	-	-
Severe Winter Weather	11	726,000	-	726,000	-	-
Tornado	12	6,390,100	2,100,000	8,490,100	-	-
Tropical Storm / Hurricane	2	10,020,000	50,050,000	60,070.000	-	-
Wildfire	-	-	-	-	-	-
Totals	177	$ 18,934,800	$ 55,271,000	$ 74,205,800		

The figures illustrate Montgomery County's rural vulnerability. Total property damage ($18,934,800) represents 25% of the overall damage amount, or $74,205,000. However, this should be viewed in light of the fact that damage from hurricane/tropical storms account for most of the crop and the largest property figures cited. While the community is right to be concerned about such events affecting them in the future, the data shows that drought, tornado, and severe storms are the ones most lightly to inflict serious damage.

G.3 Capability Assessment

This section assesses Montgomery County's capability to implement hazard mitigation activities. More detailed information on the purpose and methodology used to conduct the capability assessment can be found in Section 5 - Capability Assessment.

Planning and Regulatory Capability

The findings of the Planning and Regulatory section of capability assessment are described below in Table G.43. This table provides a jurisdictional overview of the plans and programs in place, followed by summary statistics of the *Local Capability Assessment Surveys*. Each county and municipality were asked to self-assess their capabilities.

Table G.43 - Relevant Plans, Ordinances and Programs

Jurisdiction	Comprehensive / Master Plan	Capital Improvements Plan	Economic Development Plan	Emergency Operations Plan	Continuity of Operations Plan	Transportation Plan	Stormwater Management Plan	Community Wildfire Protection Plan	Historic Preservation Plan	Building Codes	Fire Department ISO Rating	Site Plan Review Requirements	Land Use Plan	Zoning Ordinance	Subdivision Regulation	Flood Damage Prevention Ordinance	Flood Insurance Studies	National Flood Insurance Program	Community Rating System
Montgomery County	✓		✓	✓	✓	✓					10			✓		✓	✓	✓	
Duck Hill	✓			✓	✓	✓					9			✓	✓	✓	✓	✓	
Kilmichael	✓			✓	✓	✓					7			✓	✓	✓	✓		
Winona				✓	✓				✓	'02	7	✓	✓	✓	✓	✓		✓	

Emergency Management Capabilities

Hazard Mitigation Plan: A hazard mitigation plan represents a community's blueprint for how they intend to reduce the impact of natural and human-caused hazards on people and the built environment. Elements of a hazard mitigation plan include a risk assessment, capability assessment and mitigation strategy. The jurisdictions within Montgomery County participate in the development and implementation of a hazard mitigation plan.

Emergency Operations Plan: An emergency operations plan outlines responsibility and the means by which resources are deployed during and following an emergency or disaster. Survey results indicate the County and its municipalities have an Emergency Operations Plan.

Continuity of Operation Plan: A continuity of operations plan establishes a clear chain of command, line of succession, and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster. Survey results indicate Montgomery County and the municipalities of Duck Hill, Kilmichael, and Winona all have continuity of operations plan.

General Planning Capabilities

The implementation of hazard mitigation activities often involves individuals beyond the emergency management profession. Stakeholders may include local planners, public works officials, economic development specialists and others. Similarly, hazard mitigation planning cuts across multiple disciplines. As a result, the questions asked in the Local Capability Assessment Survey regarding general planning capabilities were designed to measure the degree to which mitigation is integrated into other planning efforts.

Comprehensive Plan: A comprehensive plan establishes the overall vision for a community and helps to guide municipal decision-making. Survey results indicate Montgomery County and the Towns of Duck Hill and Kilmichael have comprehensive plans.

Economic Plan: An economic plan serves as a road map for economic development decision making, based on the collection of statistical data, historical perspective, and human potential. Survey results indicate Montgomery County has an economic plan.

Community Wildfire Protection Plan: The community wildfire protection plan is a strategic plan that identifies wild land fire issues facing the community and outlines prioritized mitigation actions. Survey results indicate no jurisdictions have community wildfire protection plans.

Transportation Plan: A transportation plan identifies the means to gauge transportation demands and the options to meet those needs, while considering the social, economic and environmental characteristics of the area. The development of transportation networks can significantly impact the amount, type and location of future growth. As a result, transportation planning can have a dramatic impact on future hazard vulnerability. Survey results indicate Montgomery County and the Towns of Duck Hill and Kilmichael have transportation plans.

Capital Improvements Plan: A capital improvements plan guides the scheduling of spending on public improvements. A capital improvements plan can serve as an important mechanism to guide future development away from identified hazard areas. Limiting public spending in hazardous areas is one of the most effective long-term mitigation actions available to local governments. Survey results indicate no jurisdictions have a capital improvement plan.

Historic Preservation Plan: A historic preservation plan is intended to preserve historic structures or districts within a community. An often-overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards to include the identification of the most effective way to reduce future damages. This may involve retrofitting or relocation techniques account for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of harm's way. Survey results indicate the City of Winona has a historic preservation plan.

Zoning Ordinances: As part of a community's police power, zoning is used to protect the public health, safety and welfare. A zoning ordinance is the mechanism through which zoning is typically implemented. Since zoning regulations enable municipal governments to limit the type and density of development, it can serve as a powerful tool when applied in identified hazard areas. Survey results indicate Montgomery County and the municipalities of Duck Hill, Kilmichael, and Winona all have zoning ordinances.

Subdivision Ordinances: A subdivision ordinance is intended to regulate the development of housing, commercial, industrial or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development. Survey results indicate Towns of Duck Hill, Kilmichael and the City of Winona have subdivision ordinances.

Building Codes, Permitting and Inspections: Building codes regulate construction standards. Decisions regarding the adoption of building codes, the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community. Survey results indicate City of Winona has building codes, permitting and inspections.

Floodplain Management Capability

Flooding represents the greatest natural hazard facing the nation and the planning area. At the same time, the tools available to reduce flooding impacts are among the most developed when compared to other hazard-specific mitigation techniques. Information contained in this section has been gathered through surveys and the NFIP Status Book.

Storm Water Management Plan: A storm water management plan is designed to address flooding associated with storm water runoff. The storm water management plan is typically focused on design and construction measures intended to reduce the impact of more frequently occurring minor urban flooding. Survey results indicate no jurisdictions have storm water management plans.

Flood Damage Prevention Ordinance/NFIP participation: A local Flood Damage Prevention Ordinance is a tool used by counties and municipalities to regulate the type of construction that occurs in the floodplain. If a community is an NFIP participant, a Flood Ordinance or Court Order is in place. Survey results indicate Montgomery County and the municipalities of Duck Hill, Kilmichael, and Winona all have flood damage prevention ordinances plans.

Below is a summary from the NFIP database of the participating jurisdictions within Montgomery County. This information is the most recently available data about NFIP participation and shows that there has been no change since publication of the 2015 RHMP.

G.44: Montgomery County NFIP Communities | Source: NFIP Policy and Loss Statistics (3-31-14) & community Status Report (4-4-14), 2018 SHMP

Jurisdiction	NFIP Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date ($)
Montgomery County	9/1/1987	1	175,000	0	0
Duck Hill	4/2/1986	1	42,000	0	0
Winona	N/A	16	1,742,400	0	0
Totals		18	1,959,400	0	0

The Town of Kilmichael is considering participation in the NFIP. Officials will weigh the benefits of the program and determine their next steps. A mitigation action has been included in their action plan in the event the officials move to participate in the program.

Administrative and Technical Capability

Table G.45 provides a summary of the capability assessment results for Montgomery County with regard to administrative and technical capabilities.

Table G.45 - Administrative and Technical Capability

	Planning Commission	Participation in Emergency Management Committee (LEPC or other)	Maintenance program to reduce risk (i.e., tree trimming, clearing drainage systems)	Mutual Aid Compacts	Building Inspection Department	Floodplain Manager	Emergency Manager	Community Planner	Civil Engineer	GIS Coordinator	Warning Systems / Services (i.e., reverse 911 / outdoor warning systems)	Grant Writing Capabilities
Montgomery County	✓	✓	✓	✓		✓	✓		✓		✓	✓
Duck Hill	✓	✓	✓	✓	✓	✓	✓				✓	✓
Kilmichael	✓	✓	✓	✓		✓	✓		✓		✓	✓
Winona	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓

Fiscal Capability

Table G.46 provides a summary of the results of the local capability assessment for Montgomery County with regard to relevant fiscal resources.

Table G.46 - Relevant Financial Resources

Jurisdiction	Capital Improvements Project Funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric services	Impact fees for new development	Stormwater utility fee	Incur debt through general obligation bonds or tax bonds	Incur debt through private activities	Community Development Block Grant (CDBG)	Other federal funding programs	State funding programs
Montgomery County	✓	✓					✓	✓	✓	✓
Duck Hill	✓	✓					✓	✓	✓	✓
Kilmichael	✓	✓					✓	✓	✓	✓
Winona	✓	✓					✓	✓	✓	✓

Education and Outreach Capability

Table G.47 provides the results for the education and outreach capability for Montgomery County.

Table G.47 - Relevant Education Programs and Organizations

Jurisdiction	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Ongoing public education or information programs (e.g. responsible water use, fire safety, household preparedness, environmental education)	Natural disaster or safety-related school programs	StormReady certification	Firewise Community Certification	Public / Private partnership initiatives addressing disaster-related issues
Montgomery County	✓	✓	✓			✓
Duck Hill	✓	✓	✓			✓
Kilmichael	✓	✓	✓			✓
Winona		✓	✓			

Conclusions on Local Capability

Table G.48 shows the results of the capability assessment using the scoring system that can be found in Section 5 of the Base Plan. The scoring for Montgomery County was based on information from the local capability survey and reviewing existing plans. According to the assessment, the average local capability score for the county and its communities is 43.75, which falls into a moderate capability rating.

Table G.48 - Capability Result Summary

Jurisdiction	Overall Capability Score	Overall Capability Rating
Montgomery County	44	Moderate
Duck Hill	47	High
Kilmichael	42	Moderate
Winona	42	Moderate

G.4 Mitigation Strategy

The participating jurisdictions reviewed the mitigation goals and priorities identified in the County's previous plan. Common elements of the previous mitigation goals were used to develop regional goals designed to achieve the implementation of mitigation actions. These refined goals were adopted by the participating jurisdictions. It was determined the priorities for each of the participating jurisdictions had not changed, although the regionwide mitigation goals and objectives were streamlined as discussed in the base plan.

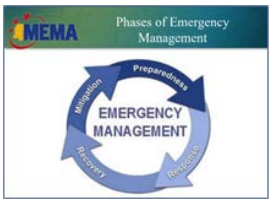
The Mitigation Strategy for Montgomery County includes several changes, including those based on the streamlined list of 2020 Regional Goals and Objectives. The table of action items includes mitigation actions identified in the 2015 plan; the outcome of each; and how the strategy was updated for the 2020 plan; and newly developed mitigation actions. The 2015 plan included two separate tables of mitigation actions: one table to provide a status update on actions mentioned in the previous plan; and a second table outlining the current mitigation strategy. These have been combined into one table in the current plan update.

Previous plans included a large number of mitigation actions considering the size and available resources of some jurisdictions, including those with only a few hundred residents. An example of this is the fact most County Emergency Management (EM) directors are the single departmental employee, or they perform their EM duties while functioning in one or more service roles in their community. The same is often true for leadership at the city or town level, where those in leadership "wear many hats."

Several changes were made to streamline the Mitigation Strategy given the following considerations.

- Actions identified as falling into the Preparedness Phase of the Emergency Management Cycle were removed and recommended for consideration under Preparedness Planning. Examples of this include disaster preparedness initiatives (such as providing weather radios to residents) and NIMS training, which represent actions a community normally does to prepare for a hazard event.

- The image at right, developed for a MEMA presentation, clearly delineates EM agencies operationally function under four phases of emergency management, although sometimes the phases run concurrently. Professional emergency managers and their Emergency Support Functions (ESF), units called up during disaster response, develop specific plans and actions appropriate for each event phase.



- Actions identified as being required as part of the FEMA Hazard Mitigation Planning Process were removed because these are fully spelled out under the Plan Maintenance section of the Base Plan. Examples of this include reviewing the mitigation plan and meeting to discuss needed plan updates after a disaster occurs in the community.

- It was recommended that actions addressing similar activities be combined into one action. For example, there were previously separate action items for educating the public about natural hazards and about manmade (technological, biological, health-related) hazards. A single outreach plan using multiple communications channels can incorporate education about all hazards to all audiences if the outreach plan is fully developed.

- In some instances, long description of previous actions was shortened for plan readability.

- Most action items were identified by all jurisdictions. In these cases, a countywide action was recommended that would be jointly implemented by all participating jurisdictions.

It is hoped the streamlined mitigation strategy would be a useful tool for the District 3 Counties and its jurisdictions to implement.

Progress Made on Mitigation Strategies and Updated Mitigation Strategy

Montgomery County jurisdictions have been proactive in implementing mitigation strategies identified in their previous plan. Actions included in Table G.49 have been sorted so deleted actions appear at the end of each jurisdictional listing. They are highlighted, and a reason for deletion is listed in the column labeled "2020 Status." This column includes use of the following designations to show action status:

Designation	Meaning	Description
D	Deleted	Action was deleted from the plan for the reason described under the Column 2020 Status Description
N	New	New action for the 2020 Plan Update
`R	Retained	Action previously included in the 2015 plan, with a description of how it will be continued in the 2020 plan

In the column labeled *Implementation Timeframe*, initiatives listed as "Continuous Action" refers to an ongoing action that has been initiated but not completed.

The participating jurisdictions reviewed the mitigation goals and priorities identified in the County's previous plan. Common elements of the previous mitigation goals were used to develop regional goals designed to achieve the implementation of mitigation actions. These refined goals were adopted by the participating jurisdictions. It was determined the priorities for each of the participating jurisdictions had not changed.

Table 49: Mitigation Action Plan: Montgomery County and its Municipalities

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
MC-1	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Maintain continuity of emergency services and governmental to protect staff and county property. Existing facilities may lack protective measures and adequate building standards.	Montgomery County	County EMA, BOS, MEMA	All	Undetermined	R	Conduct a study of public critical structures and infrastructure to determine needs and cost; prioritize projects according to need, and consider options such as shatterproof glass, enhanced frames, roofing, and elevation.	2020-2025	1.1	M	HMGP, CDBG, General Budget	2015
MC-2	Mitigate deficient/obsolete bridges	Bridges throughout District 3 are unable to withstand seismic activity and/or are classified by the national bridge inventory as structurally deficient or functionally obsolete. Work with applicable local, federal and state agencies to develop a priority system for improvements.	Montgomery County	County officials and engineers, MDOT, FHWA	Earthquake Flooding	Undetermined	R	Study area roadways to identify priority road and bridge improvements; prioritize based on community need.	2020-2025	1.1	M	MDOT, FHWA, State Aid	2015
MC-3	Create defensible space around structures and infrastructure	Implement defensible space programs to reduce risk to structures and infrastructure such as replacing flammable vegetation with less flammable species to create defensible zones around buildings, gas lines and other infrastructure.	Montgomery County	Public Works, BOS	Wildfire	Undetermined	R	Develop a Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	Continuous Action	1.1	M	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
MC-4	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Lightning strikes can create outages to essential county water and sewer services as well as invite unnecessary damage to county facilities.	Montgomery County	Public Works, BOS	Severe Storm	Undetermined	R	Identify and prioritize critical facilities requiring installation of lightning protection system, starting with water and sewer facilities	2020-2025	1.1	M	General budget	2015
MC-5	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	Montgomery County	Public Works, BOS	Human Infectious Disease (WNV/ other vector-borne illnesses	Undetermined	R	Incorporate community education under overall mitigation public outreach	Continuous Action	1.1	M	General budget	2015
MC-6	Update drainage systems and culverts	Countywide drainage systems and culverts are frequently impacted by flash flood and severe weather events. While no specific locations were identified, needs/issues may arise and should be addressed as funding permits	Montgomery County	BOS, Road Department, Public Works, Drainage Districts	Flood	Undetermined	R	Retain. Develop a countywide Stormwater Management plan that includes updating of drainage system and culvert needs	2020-2025	1.1	M	General budget	2015
MC-7	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events	Montgomery County	Public Works	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include components for stormwater conveyance and detention structures.	Continuous Action	1.1	M	General budget	2015
MC-8	Storm proof/retrofit new critical facilities and infrastructure	New public buildings/ infrastructure will use advanced mitigation techniques when practical: roof and foundation supports,	Montgomery County	BOS, County EMA, MEMA	All	Undetermined	R	Update County and local regulations so that future construction of public buildings/ infrastructure to IBC standards to withstand	2020-2025	1.2	M	HMGP, CDBG, General Budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
		shutters, shatter-proof windows/doors, etc.						all hazards.					
MC-9	Install safe rooms in unserved areas of the county.	Work with the Towns to discuss project locations, logistics, funding, and timetable.	Montgomery County	County EMA, Town Mayors	Tornado, Severe Storm	Undetermined	N	New	2020-2025	1.2	H	HMGP, Local budget	2020
MC-10	Build/promote stormwater detention ponds when appropriate	Use ponds as a vehicle for stormwater management	Montgomery County	Public Works	Flood	Undetermined	R	Develop countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	L	CDBG, Developers	2015
MC-11	Install generators for existing and new critical facilities and infrastructure	As funding becomes available, apply for grants to install generators to support existing or new facilities/infrastructure.	Montgomery County	BOS, County EMA, MEMA	All	Undetermined	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.3	M	HMGP, General budget	2015
MC-12	Action: Develop Critical Infrastructure and Key Resources database (CIKR)	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities and infrastructure for the County and its jurisdictions.	Montgomery County	County EMA, county and community officials, Coordinating Council	All	Undetermined	R	Action will enhance database of CIKR assets within communities. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped.	2020-2025	2.1	M	General budget	2015

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MC-13	Develop Community Wildfire Protection Plan (CWPP)	The Healthy Forests Restoration Act (HFRA) provided communities with a way to influence where and how federal agencies implement fuel reduction projects on federal lands and includes use of a CWPP. Communities with CWPPs are given priority for funding of hazardous fuels reduction projects carried out under the auspices of the HFRA.	Montgomery County	County EMA, Fire Departments	Wildfire	Undetermined	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	2.1	H	MFC, General Budget, State Fire Marshall	2015
MC-14	Develop/update Emergency Action Plans (EAPs) for high and significant hazard dams	EAPs formally identify potential emergency conditions at a dam and specifies preplanned actions in order to minimize property damage or loss of life in the case of a dam failure. An EAP is required for all High Hazard and Significant Hazard dams.	Montgomery County	County EMA, Dam Owners, BOS	Dam Failure	Undetermined	R	Coordinate EAP development for the following high hazard dams classified by the MDEQ Dam Safety Division: Bogue Watershed Structures Y-30-089 (MSO1657) and Y-30-084 (MSO1999). Review the EAPs for other high/significant hazard dams to determine if updates are necessary due to changes in population/land use.	2020-2025	2.1	M	General funds, HMEP, MDEQ	2015

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MC-15	Develop/update Stormwater Management Plan	Include six measures: Public Education/ Outreach/Participation, Managing Illicit Discharge Detection/ Elimination, Control Construction and Post-construction Runoff, Pollution Prevention/Good Housekeeping.	Montgomery County	Public Works	Flood	Undetermined	R	Develop countywide stormwater management plan that includes improvements to all structures -- culverts, drainage, stormwater conveyance, detention ponds, etc.	2020-2025	2.1	M	General budget	2015
MC-16	Become a Certified NWS StormReady Community	StormReady provides communities with communication and safety skills to save lives and property. It also helps community leaders and emergency managers strengthen local safety programs to better prepare communities through advanced planning, education and awareness.	Montgomery County	County EMA, BOS	All	Undetermined	R	Contact NWS for pre-application direction, complete application, schedule verification meeting, and receive approval	2020-2025	2.1	M	General budget	2015
MC-17	Develop/Update the Comprehensive Plan to include hazard mitigation strategies/goals	A comprehensive plan established the overall vision for a community and helps to guide decision making and priorities for addressing growth and changes in land use	Montgomery County	BOS, Applicable Departments	All	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	2020-2025	2.1	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
MC-18	Become a Firewise Community	The Firewise program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in the effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding.	Montgomery County	County EMA, Fire Department, BOS, MFC	Wildfire	N/A	R	Review requirements to become a Firewise community and take first steps toward becoming certified. Obtain a wildfire risk assessment from the state Firewise liaison, form a committee and create an action plan based on assessment, conduct a Firewise day event, and submit an application to State Firewise liaison.	2020-2025	2.1	M	General budget	2015
MC-19	Continue to enforce and improve ordinances and regulations to promote hazard mitigation strategies.	The County has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the County and includes any changes in future development areas.	Montgomery County	BOS, Applicable Departments	All	N/A	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	2.2	M	General budget	2015

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MC-20	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analyses, etc.	Montgomery County	County EMA, BOS, applicable departments	All	N/A	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	2.2	H	General budget	2015
MC-21	Improve/maintain participation in the National Flood Insurance Program and the Community Rating System	Montgomery County participates in NFIP but not the CRS.	Montgomery County	County EMA, Floodplain Manager, Building Official, MEMA	Flood	Undetermined	R	Consider action steps necessary to join CRS.	Continuous Action	2.3	H	General budget	2015
MC-22	Continue efforts on public information and awareness for natural hazards.	The County has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public the public's self-sufficiency. Continue to provide information on all hazards that may include but not be limited to educational information, evacuation routes/procedures, workshop/ training programs, alert	Montgomery County	County EMA, Applicable Departments, MEMA, NWS, FEMA, PDD	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015

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		systems, etc.											
MC-23	Enhance public education and awareness of technological, man-made and health-related hazards	Develop public education and awareness programs for non natural hazards. Identify areas/groups within the County that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the County's web page.	Montgomery County	County EMA, MSDH, Applicable Departments, PDD	West Nile, Pandemic, Hazardous Materials	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	MSDH, EMGP, Homeland Security, General Budget funds	2015
MC-24	Promote workshops for emergency preparedness and continuity of operation plans	Foster family emergency preparedness to include how families reach a safe location, stay connected during disaster, and how to respond to various hazards. Continuity of operation plans establishes a clear chain of command, line of succession, and procedures for backup or alternate emergency facilities in case of extreme emergency or disaster.	Montgomery County	County EMA, BOS, PDD	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	H	General budget, Private funds	2015

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MC-25	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their own interests or for the interest of the whole community is needed.	Montgomery County	County EMA, Applicable Departments, PDD	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	H	General budget	2015
MC-26	Encourage the development of training and emergency planning for private companies that handle hazardous materials.	Hazardous materials improperly handled can adversely impact people and property should spills or other damaging effects be encountered. Officials may conduct educational programs to improve onsite hazardous material safety and increase awareness of chemical issues and reporting.	Montgomery County	County EMA, Police and Fire Officials	Hazardous Spills	N/A	D	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	H	General Budget	2015
MC-27	Install/maintain severe weather warning systems	Weather warning system(s) complement the methods of warning already used by the County Emergency Operations Center and the National Weather Service. Identify site locations and develop cost estimates as needed. For installed sirens, provide routine testing and inspection.	Montgomery County	County EMA, BOS, NWS, MEMA	Severe Storm, Tornado	$35,000	D	Redefined as a Preparedness Planning initiative - Mitigation action. Ongoing action to identify site locations and develop cost estimates as needed. For installed sirens, provide routine testing and inspection.	Continuous Action		H	HMGP, General budget	2015

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MC-28	Support the installation of a NEXRAD Doppler Radar site within District 3	Storm systems in the Delta region are not always detected due to limitations in range from the Doppler radar sites located in Little Rock, AR; Memphis, TN; and Jackson, MS.	Montgomery County	County EMA	Severe Storm, Tornado	$10-20 million	D	Redefined as a Preparedness Planning initiative (not a mitigation action). Ongoing Action to develop and participate in a committee to further advance the development of this project.	Continuous Action		H	HMGP, General budget	2015
MC-29	Develop a weather radio program for vulnerable populations	Although outdoor warning sirens, text messaging, television and other forms of communication has been implemented to alert the public of impending weather, there are areas / population that may not receive notifications due to their location and/or lack of communication devices.	Montgomery County	County EMA, Other District 3 EMAs, MEMA, Private Industries, NWS	All	Undetermined	D	Move to Preparedness Program Planning, not a mitigation initiative.	Continuous Action		L	District 3 EMA Directors, MEMA, Private Industry, NWS	2015
MC-30	Install electronic information alert signs on major evacuation routes	Although outdoor warning sirens, text messaging, television and other forms of communication has been implemented to alert the public of impending weather, there are areas / population that may not receive notifications due to their location and/or lack of communication devices.	Montgomery County	County EMA, FHWA, BOS	All	Undetermined	D	Move to Preparedness Planning, not a mitigation initiative. Ongoing Action to erect a permanent sign to be installed near I-55 and Highway 82 advising community impending conditions and sheltering locations.	Continuous Action		L	MDOT, FHTA	2015

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MC-31	Implement/ maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and roadways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris.	Montgomery County	Road Department, Public Works, BOS	Severe Storms, Tornado, Winter Weather	Undetermined	D	Remove from Mitigation Plan. Routine maintenance is not considered mitigation.	Continuous Action		M	General budget	2015
MC-32	Participate in local and statewide studies, workshops and committees that address the all hazards prone within District 3	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the community.	Montgomery County	County EMA, Planning Department, Building Official	All	N/A	D	Moved to Preparedness Planning initiative	Continuous Action		M	General budget	2015
MC-33	Develop a Commodity Study Flow	Hazardous materials are transported through and to various locations in the County via rail, air and roadway. Identify how and which chemicals are being transported to ensure that appropriate response procedures and equipment is in place.	Montgomery County	Fire Department, EMA	Hazard Material Incidents	$50,000-$75,000	D	Move to Preparedness Planning. Appoint a group to conduct Commodity Flow Study as part of County's overall preparedness and response efforts to hazard material incidents.	Continuous Action		L	MHEP	2015
MC-34	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and addressed in applicable plans and SOPs to	Montgomery County	County EMA	All	General budget	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		L	General budget	2015

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		improve preparedness and response procedures carried out by the community.											
MC-35	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local agency level. Conduct training and verify new employees are integrated into the training programs as necessary	Montgomery County	County EMA	All	Staff time	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action		L	General budget	2015
MC-36	Update the District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44 §206 – communities are required to update their hazard mitigation plan every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in District 3 to schedule plan updates as they become due.	Montgomery County	County EMA	All	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action		H	General budget	2015

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MC-37	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Each disaster presents varying degrees of impacts - no two storms are alike. The city can gain valuable data and insight into impacts as they occur to assess and define appropriate actions in the way of implementing an existing mitigation action or identifying a new need. Convene as soon as appropriate after an event to conduct an after-action report and document this in the appendix of the mitigation plan.	Montgomery County	County EMA	All	N/A	D	This action is included in RHMP Plan Maintenance.	Continuous Action		H	General budget	2015
MC-38	Conduct annual reviews of the District 3 Regional Hazard Mitigation Plan	As defined in the plan maintenance section of this plan, the chairman of the hazard mitigation committee will schedule a committee meeting to review progress made on mitigation actions and identify needs.	Montgomery County	County EMA, Applicable departments	All	N/A	D	Action included in RHMP Plan Maintenance, including use of a worksheet to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings.	Continuous Action		H	General budget	2015
MC-39	Pursue training and funding opportunities for mitigation actions	Funding options for actions identified in this plan should be explored and pursued. Coordinate with public works, engineering, planning and building official on funding evaluation on mitigation projects for cost share	Montgomery County	County EMA, Applicable departments	All	N/A	D	This action is included in RHMP Plan Maintenance.	Continuous Action		H	HMGP, General budget	2015

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		feasibility.											
Town of Duck Hill													
Duck-1	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Maintain continuity of emergency services and governmental to protect staff and county property. Existing facilities may lack protective measures and adequate building standards.	Town of Duck Hill	Mayor's Office, Board of Aldermen, County EMA, BOS, MEMA	All	Undetermined	R	Conduct a study of public critical structures and infrastructure to determine needs and cost; prioritize projects according to need, and consider options such as shatterproof glass, enhanced frames, roofing, and elevation.	2020-2025	1.1	M	HMGP, CDBG, General Budget	2015
Duck-2	Create defensible space around structures and infrastructure	Defensible zones around buildings, power and gas lines and other infrastructure may be lacking throughout the City. Implement defensible space programs to reduce risk to structures and infrastructure such as replacing flammable vegetation with less flammable species	Town of Duck Hill	Public Works	Wildfire	Undetermined	R	Develop a Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	Continuous Action	1.1	M	General budget	2015

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Duck-3	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Lightning strikes can create outages to essential county water and sewer services as well as invite unnecessary damage to county facilities.	Town of Duck Hill	Public Works	Severe Storm	Undetermined	R	Retain. Identify and prioritize critical facilities requiring installation of lightning protection system, starting with water and sewer facilities	2020-2025	1.1	M	General budget	2015
Duck-4	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	Town of Duck Hill	Mayor, Public Works, County EMA, MEMA	Human Infectious Disease (WNV/ other vector-borne illnesses	Undetermined	R	Incorporate into Public Education and Outreach efforts.	Continuous Action	1.1	M	General budget	2015
Duck-5	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events	Town of Duck Hill	Mayor, Public Works, County EMA	Flood	Undetermined	R	Develop a Stormwater Management Plan to include a component for stormwater conveyance and detention structures	Continuous Action	1.1	M	General budget	2015
Duck-6	Update drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events. The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events. These areas should be addressed as funding and opportunities arise.	Town of Duck Hill	Mayor, Public Works, County EMA, BOS, MEMA	Flood	Undetermined	R	Develop a countywide Stormwater Management Plan, which would include a drainage systems and culverts.	2020-2025	1.1	M	General budget	2015

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Duck-7	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/ infrastructure should include advanced mitigation techniques when practical. Measures may include, but are not limited to roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Duck Hill	Mayor's Office, Board of Aldermen, County EMA, BOS, MEMA	All	Undetermined	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	General budget	2015
Duck-8	Install safe rooms in unserved areas of the county.	Work with Montgomery County EMA and other jurisdictions to discuss project locations, logistics, funding, and timetable.	Town of Duck Hill	County EMA, Town Mayors	Tornado, Severe Storm	Undetermined	N	The County EM Department and Towns have discussed a need for additional safe rooms.	2020-2025	1.2	H	HMGP, Local budget	2020
Duck-9	Build/promote stormwater detention ponds when appropriate	Use ponds as a vehicle for stormwater management	Town of Duck Hill	Public Works	Flood	Undetermined	R	Develop countywide Stormwater Management Plan to include a detention pond component	Continuous Action	1.2	L	General budget	2015
Duck-10	Secure generators for existing and new critical facilities and infrastructure	As funding becomes available, the county will apply for grants to install generators to support existing or new facilities/infrastructure.	Town of Duck Hill	Mayor, Public Works, County EMA	All	Undetermined	R	Identify and prioritize sites requiring generators.	2020-2025	1.3	M	HMGP, General budget	2015

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Duck-11	Develop/Update Stormwater Management Plan	A Stormwater Management Plan outlines what is currently being done to prevent stormwater pollution, and what will be done in the future. Six minimum measures must be incorporated into the plan. Measures include:	Town of Duck Hill	Public Works, Engineers, County EMA	Flood	Undetermined	R	Retain and include measures such as Public Education and Outreach; Public Participation and Involvement; Illicit Discharge Detection and Elimination; Construction Site Runoff Control; Post-Construction Runoff Control; Pollution Prevention and Good Housekeeping.	2020-2025	2.1	M	General budget	2015
Duck-12	Action: Develop Critical Infrastructure and Key Resources database (CIKR)	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities and infrastructure for the County and its jurisdictions.	Town of Duck Hill	County EMA, county and community officials, Coordinating Council	All	Undetermined	R	Retain - action will enhance database of CIKR assets within communities. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council	Continuous Action	2.1	M	General budget	2015

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Duck-13	Become a Certified NWS StormReady Community	StormReady provides communities with communication and safety skills to save lives and property--before and during a hazard event. It also helps community leaders and emergency managers strengthen local safety programs to better prepare communities for severe weather through advanced planning, education and awareness.	Town of Duck Hill	Board of Aldermen, County EMA	All	Undetermined	R	Contact NWS for pre-application direction, complete application, schedule verification meeting, and receive approval	2020-2025	2.1	M	General budget	2015
Duck-14	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies.	The County has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the County and includes any changes in future development areas.	Town of Duck Hill	Board of Aldermen, Applicable Departments	All	N/A	R	Continuous Action - Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review. Provide copy of Updated RHMP as guidance.	Continuous Action	2.2	M	General budget	2015
Duck-15	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability	Town of Duck Hill	Board of Aldermen, County EMA, BOS, Applicable Departments	All	General budget	R	Continuous Action - Link to CC-32, Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review. Provide copy of	Continuous Action	2.2	H	General budget	2015

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		analyses, etc.						Updated RHMP as guidance.					
Duck-16	Improve/maintain participation in the National Flood Insurance Program and the Community Rating System	The community participates in NFIP but not CRS	Town of Duck Hill	Board of Aldermen, County EMA Public Works, Engineers, MEMA	Flood	N/A	R	Consider Action Steps necessary to become a member of the CRS	Continuous Action	2.3	H	General budget	2015
Duck-17	Continue efforts on public information and awareness for All hazards, manmade and natural.	The County has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient. Provide information on hazards, evacuation routes/ procedures, workshop/training programs, alert systems and such.	Town of Duck Hill	Mayor, Board of Aldermen, County EMA, PDD	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
Duck-18	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non- natural hazards. Identify areas/groups within the County that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the County's web page.	Town of Duck Hill	Mayor, Board of Aldermen, County EMA	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015
Duck-19	Promote workshops for emergency preparedness and continuity of operation plans	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operation plans establishes a clear chain of command, line of succession, and procedures for backup or alternate emergency facilities in case of extreme emergency or disaster. Provide applicable support to non-profit agencies, Chamber of Commerce, North Delta Planning and Development District and other organizations that assist	Town of Duck Hill	Mayor, County EMA	All	N/A	D	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
		families and business owners with the development of disaster plans.											
Duck-20	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their own interests or for the interest of the whole community is needed.	Town of Duck Hill	Mayor, Board of Aldermen, County EMA	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	H	General budget	2015
Duck-21	Install/maintain severe weather Warning systems	Weather warning system(s) complement the methods of warning already used by the County Emergency Operations Center and the National Weather Service. Identify site locations for additional sirens and develop cost estimates as needed. For installed sirens, provide routine testing and inspection (weekly).	Town of Duck Hill	Mayor, Board of Aldermen, County EMA, MEMA	All	$35,000	D	Redefined as a Preparedness Planning initiative since this is not Mitigation action. Ongoing action to identify site locations and develop cost estimates as needed. For installed sirens, provide routine testing and inspection.	Continuous Action			Local budget	2015
Duck-22	Implement / maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and roadways potentially causing loss of service and/or accidents during and after severe storm,	Town of Duck Hill	Mayor, Board of Aldermen, County EMA, MEMA	Severe Storms, Tornado, Winter Weather	General budget	D	Remove. Routine maintenance is not considered mitigation.	N/A			General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
		tornado and winter-weather events. Keep areas of concern free of unnecessary debris.											
Duck-23	Participate in local and statewide studies, workshops and committees that address the all hazards prone within District 3	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the community.	Town of Duck Hill	County EMA, Planning Department, Building Official	All	General budget	D	Moved to Preparedness Planning	Continuous Action			General budget	2015
Duck-24	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county/city.	Town of Duck Hill	Board of Aldermen, County EMA, BOS, Applicable Departments	All	General budget	D	Move to Preparedness Planning	Continuous Action			General budget	2015
Duck-25	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local agency level. Conduct training and verify new employees are integrated into the training programs as necessary	Town of Duck Hill	Board of Aldermen, County EMA, BOS, Applicable Departments	All	Staff time	D	Move to Preparedness Planning	Continuous Action			General budget	2015
Duck-26	Update the District 3 Regional Hazard Mitigation Plan every five years	Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions 3 to	Town of Duck Hill	Board of Aldermen, County EMA	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Continuous Action			General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
		schedule plan updates as they become due.											
Duck-27	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Each disaster presents varying degrees of impacts - no two storms are alike. The city can gain valuable data and insight into impacts as they occur to assess and define appropriate actions in the way of implementing an existing mitigation action or identifying a new need. Convene as soon as appropriate after an event to conduct an after-action report and document this in the appendix of the mitigation plan.	Town of Duck Hill	Board of Aldermen, County EMA	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Continuous Action			General budget	2015
Duck-28	Conduct annual reviews of the District 3 Regional Hazard Mitigation Plan	As defined in the plan maintenance section of this plan, the chairman of the hazard mitigation committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted into the appendix of this plan once completed. Complete the worksheets provided and attend RHMC meetings as they are scheduled.	Town of Duck Hill	Town Council, County EMA	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Continuous Action			General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
Duck-29	Pursue training and funding opportunities for mitigation actions	Funding options for actions identified in this plan should be explored and pursued. Coordinate with public works, engineering, planning and building official on funding evaluation on mitigation projects for cost share feasibility.	Town of Duck Hill	Board of Aldermen, County EMA	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Ongoing			General budget	2015
Duck-30	Promote workshops for emergency preparedness and continuity of operation plans	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operation plans establishes a clear chain of command, line of succession, and procedures for backup or alternate emergency facilities in case of extreme emergency or disaster. Provide applicable support to non-profit agencies, the Chamber, Planning and Development District and other organizations that assist families and business owners with the development of disaster plans.	Town of Duck Hill	Mayor, County EMA	All	N/A	D	Ongoing action included under Goal 3.1 above.	Continuous Action			General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
Town of Kilmichael													
Kilm-1	Harden/retrofit existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards.	Town of Kilmichael	Mayor's Office, County EMA, MEMA	All	Undetermined	R	Conduct a study of public critical structures and infrastructure to determine needs, cost; prioritize projects according to need	2020-2025	1.1	M	HMGP, CDBG, General budget	2015
Kilm-2	Update drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events. The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	Town of Kilmichael	Mayor's Office, Board of Aldermen, County EMA, BOS, MEMA	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for drainage systems and culverts	2020-2025	1.1	M	General budget	2015
Kilm-3	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events	Town of Kilmichael	Mayor's Office, Board of Aldermen, County EMA	Flood	Undetermined	R	Develop a countywide Stormwater Management Plan to include components for stormwater conveyance and detention structures	Continuous Action	1.1	M	General budget	2015
Kilm-4	Create defensible space around structures and infrastructure	Defensible zones around buildings, power and gas lines and other infrastructure may be lacking throughout the City. Implement	Town of Kilmichael	Public Works	Wildfire	Undetermined	R	Developing a Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.1	M	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
		defensible space programs to reduce risk to structures and infrastructure such as replacing flammable vegetation with less flammable species											
Kilm-5	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Lightning strikes can create outages to essential county water and sewer services as well as invite unnecessary damage to county facilities.	Town of Kilmichael	Public Works	Severe Storm	Undetermined	R	Identify and prioritize critical facilities requiring installation of lightning protection system, starting with water and sewer facilities	2020-2025	1.1	M	General budget	2015
Kilm-6	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	Town of Kilmichael	Public Works	Human Infectious Disease (WNV/ other vector-borne illnesses	Undetermined	R	Incorporate into Public Education and Outreach efforts.	Continuous Action	1.1	M	General budget	2015
Kilm-7	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical. Measures may include, but are not limited to roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Kilmichael	Mayor's Office, Board of Aldermen, County EMA, MEMA	All	Undetermined	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	General budget	2015
Kilm-8	Build/promote stormwater detention ponds when appropriate	Use ponds as a vehicle for stormwater management	Town of Kilmichael	Public Works	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a detention pond component	Continuous Action	1.2	L	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
Kilm-9	Install safe rooms in unserved areas of the county.	Work with Montgomery County EMA and the other jurisdictions to discuss project locations, logistics, funding, and timetable.	Town of Kilmichael	Mayor's Office, Board of Aldermen, County EMA	Tornado, Severe Storm	$250,000 per site	N	New	2020-2025	1.2	H	HMGP, Local budget	2020
Kilm-10	Secure generators for existing and new critical facilities and infrastructure	As funding becomes available, the county will apply for grants to install generators to support existing or new facilities/infrastructure.	Town of Kilmichael	Mayor's Office, Board of Aldermen, County EMA	All	Undetermined	R	Identify and prioritize structures requiring backup power.	2020-2025	1.3	M	HMGP, General budget	2015
Kilm-11	Develop Critical Infrastructure and Key Resources database (CIKR)	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities and infrastructure for the County and its jurisdictions. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped.	Town of Kilmichael	County EMA, county and community officials, the Coordinating Council for Remote Sensing and Geographic Information Systems	All	Undetermined	R	Action will enhance database of CIKR assets within communities	2020-2025	2.1	M	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
Kilm-12	Develop/Update Stormwater Management Plan	A Stormwater Management Plan outlines what is currently being done to prevent stormwater pollution, and what will be done in the future. Six minimum measures must be incorporated into the plan. Measures include:	Town of Kilmichael	Public Works	Flood	Undetermined	R	Continue plan development. And included measures such as Public Education/Outreach, Public Participation and Involvement; Illicit Discharge Detection and Elimination; Construction Site Runoff Control; Post-Construction Runoff Control; Pollution Prevention and Good Housekeeping.	Continuous Action	2.1	M	General budget	2015
Kilm-13	Become a Certified NWS StormReady Community	StormReady provides communities with communication and safety skills to save lives and property--before and during a hazard event. It also helps community leaders and emergency managers strengthen local safety programs to better prepare communities for severe weather through advanced planning, education and awareness.	Town of Kilmichael	Mayor's Office, Board of Aldermen, County EMA	All	Undetermined	R	Contact NWS for pre-application direction, complete application, schedule verification meeting, and receive approval	2020-2025	2.1	M	General budget	2015
Kilm-14	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies.	The County has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and	Town of Kilmichael	Mayor's Office, Board of Aldermen, Applicable Departments	All	N/A	R	Review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review. Provide copy of Updated RHMP as	Continuous Action	2.2	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
		regulations as required to address all hazards prone to the County and includes any changes in future development areas.						guidance.					
Kilm-15	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analyses, etc.	Town of Kilmichael	Mayor's Office, Board of Aldermen, County EMA, BOS, applicable departments	All	General budget	R	Review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review. Provide copy of Updated RHMP as guidance.	Continuous Action	2.2	H	General budget	2015
Kilm-16	Review feasibility of participating in the National Flood Insurance Program	The City of Kilmichael is considering the benefits of joining NFIP	Town of Kilmichael	Mayor's Office, Board of Aldermen, County EMA, Public Works, Engineers, MEMA	Flood	N/A	R	Consider actions necessary to become a member and whether there is adequate staffing or financial resources for same	Continuous Action	2.3	M	General budget	2015
Kilm-17	Continue efforts on public information and awareness for natural hazards.	The County has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient. Provide information on all	Town of Kilmichael	Mayor's Office, Board of Aldermen, Applicable Departments, County EMA, MEMA	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
		hazards that may include but not be limited to educational information, evacuation routes/procedures, workshop & training programs, alert systems and such.											
Kilm-18	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non- natural hazards. Identify areas/groups within the County that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the County's web page.	Town of Kilmichael	Mayor's Office, Board of Aldermen, Applicable Departments, County EMA, MEMA	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015
Kilm-19	Promote workshops for emergency preparedness and continuity of operation plans	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operation plans establishes a clear chain of command, line of succession, and procedures for backup or alternate emergency facilities in case of	Town of Kilmichael	Mayor's Office, Board of Aldermen, Applicable Departments, County EMA, MEMA	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
		extreme emergency or disaster.											
Kilm-20	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their own interests or for the interest of the whole community is needed.	Town of Kilmichael	Mayor's Office, Board of Aldermen, Applicable Departments, County EMA, MEMA	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	H	General budget	2015
Kilm-21	Install/maintain severe weather Warning systems	Weather warning system(s) complement the methods of warning already used by the County Emergency Operations Center and the National Weather Service. Identify site locations for additional sirens and develop cost estimates as needed. For installed sirens, provide routine testing and inspection (weekly).	Town of Kilmichael	Mayor's Office, Board of Aldermen, County EMA, MEMA	All	$35,000	D	Redefined as a Preparedness Planning initiative since this is not Mitigation action.Ongoing action to identify site locations and develop cost estimates as needed. For installed sirens, provide routine testing and inspection.	Continuous action			Local budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
Kilm-22	Implement / maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and roadways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris.	Town of Kilmichael	Public Works, County EMA	Severe Storms, Tornado, Winter Weather	General budget	D	Remove. Routine maintenance is not considered mitigation.	N/A		M	General budget	2015
Kilm-23	Participate in local and statewide studies, workshops and committees that address the all hazards prone within District 3	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the community.	Town of Kilmichael	Mayor's Office, Board of Aldermen, County EMA, Planning Department, Building Official	All	General budget	D	Moved to Preparedness Planning	Continuous Action		M	General budget	2015
Kilm-24	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county/city.	Town of Kilmichael	Mayor's Office, Board of Aldermen, County EMA	All	General budget	D	Move to Preparedness Planning	Continuous Action		L	General budget	2015
Kilm-25	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local agency level. Conduct training, verify new employees are trained as	Town of Kilmichael	Mayor's Office, Board of Aldermen, County EMA	All	Staff time	D	Move to Preparedness Planning	Continuous Action		L	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
		necessary											
Kilm-26	Update the District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44 §206 – communities are required to update their hazard mitigation plan every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in District 3 to schedule plan updates as they become due.	Town of Kilmichael	Mayor's Office, Board of Aldermen, County EMA	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Annually review the plan in anticipation of five-year update		H	General budget	2015
Kilm-27	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Each disaster presents varying degrees of impacts - no two storms are alike. The city can gain valuable data and insight into impacts as they occur to assess and define appropriate actions in the way of implementing an existing mitigation action or identifying a new need. Convene as soon as appropriate after an event to conduct an after-action report and document this in the appendix of	Town of Kilmichael	Mayor's Office, Board of Aldermen, County EMA	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Continuous Action		H	General budget	2015

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		the mitigation plan.											
Kilm-28	Conduct annual reviews of the District 3 Regional Hazard Mitigation Plan	As defined in the plan maintenance section of this plan, the chairman of the hazard mitigation committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted into the appendix of this plan once completed. Complete the worksheets provided and attend RHMC meetings as they are scheduled.	Town of Kilmichael	Mayor's Office, Board of Aldermen, County EMA	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Continuous Action		H	General budget	2015
Kilm-29	Pursue training and funding opportunities for mitigation actions	Funding options for actions identified in this plan should be explored and pursued. Coordinate with public works, engineering, planning and building official on funding evaluation on mitigation projects for cost share feasibility.	Town of Kilmichael	Mayor's Office, Board of Aldermen, County EMA	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Ongoing		H	General budget	2015
City of Winona													

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
Win-1	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards.	City of Winona	Mayor, County EMA, MEMA	All	Undetermined	R	Conduct a study of public critical structures and infrastructure to determine needs, cost; prioritize projects according to need	2020-2025	1.1	M	HMGP, CDBG, General budget	2015
Win-2	Create defensible space around structures and infrastructure	Defensible zones around buildings, power and gas lines and other infrastructure may be lacking throughout the City. Implement defensible space programs to reduce risk to structures and infrastructure such as replacing flammable vegetation with less flammable species	City of Winona	Public Works	Wildfire	Undetermined	R	Develop a Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.1	M	General budget	2015
Win-3	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Lightning strikes can create outages to essential county water and sewer services as well as invite unnecessary damage to county facilities.	City of Winona	Public Works	Severe Storm	Undetermined	R	Identify and prioritize critical facilities requiring installation of lightning protection system, starting with water and sewer facilities	2020-2025	1.1	M	General budget	2015
Win-4	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting	City of Winona	Mayor, Public Works	Human Infectious Disease (WNV/ other vector-borne	Undetermined	R	Include in Public Education and Outreach campaign.	Continuous Action	1.1	M	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
		disease-causing issues.			illnesses								
Win-5	Update drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	City of Winona	Public Works	Flood	Undetermined	R	Develop a countywide Stormwater Management Plan, which would include a detention pond component	2020-2025	1.1	M	General budget	2015
Win-6	Install safe rooms in unserved areas of the community.	Work with the County EMA and other Towns to discuss community needs, project locations, logistics, funding, and timetable.	City of Winona	Mayor's Office, Board of Aldermen, County EMA	Tornado, Severe Storm	Undetermined	New	Review locations of safe rooms, identify needed facilities, and prioritize funding.	2020-2025	1.1	H	HMGP, Local budget	New 2020
Win-7	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/ infrastructure should include advanced mitigation techniques when practical. Measures may include, but are not limited to roof and foundation supports, shutters, shatter-proof windows/doors, etc.	City of Winona	Mayor's Office, Board of Aldermen, County EMA, MEMA	All	Undetermined	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	General budget	2015
Win-8	Build/promote stormwater detention ponds when appropriate	Use ponds as a vehicle for stormwater management	City of Winona	Public Works	Flood	Undetermined	R	Develop a countywide Stormwater Management Plan, which would include a detention pond component.	Continuous Action	1.2	L	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
Win-9	Secure funding for generators for existing and new critical facilities and infrastructure	As funding becomes available, the county will apply for grants to install generators to support existing or new facilities/infrastructure.	City of Winona	Mayor's Office, Board of Aldermen, EMA, MEMA	All	Undetermined	R	Identify and prioritize facilities needing generators.	2020-2025	1.3	M	HMGP, General budget	2015
Win-10	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events	City of Winona	Public Works	Flood	Undetermined	R	Develop a Stormwater Management Plan to include components for stormwater conveyance and detention structures	Continuous Action	2.1	M	General budget	2015
Win-11	Action: Develop Critical Infrastructure and Key Resources database (CIKR)	The state is lacking a comprehensive database of critical facilities and infrastructure. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities and infrastructure for the County and its jurisdictions. Systems to ensure the data is complete and accurately mapped by the Council.	City of Winona	Mayor's Office, Board of Aldermen, County EMA, county and community officials, Coordinating Council	All	Undetermined	R	Action will enhance database of CIKR assets within communities. The county EMA should serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information	Continuous Action	2.1	M	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
Win-12	Develop/Update Stormwater Management Plan	A Stormwater Management Plan outlines what is currently being done to prevent stormwater pollution, and what will be done in the future. Six minimum measures must be incorporated into the plan.	City of Winona	Public Works, Engineers	Flood	Undetermined	R	Continue plan development. Include Education and Outreach; Public Involvement; Illicit Discharge Detection and Elimination; Construction Site Runoff Control; Post-Construction Runoff Control; Pollution Prevention and Good Housekeeping.	2020-2025	2.1	M	General budget	2015
Win-13	Develop/Update Comprehensive Plan to include hazard mitigation strategies/goals	A comprehensive plan established the overall vision for a community and helps to guide decision making and priorities for addressing growth and changes in land use	City of Winona	Mayor's Office, Board of Aldermen,	All	Undetermined	R	Review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	2020-2025	2.1	H	General budget	2015
Win-14	Become a Certified NWS StormReady Community	StormReady provides communities with communication and safety skills to save lives and property--before and during a hazard event. It also helps community leaders and emergency managers strengthen local safety programs to better prepare communities for severe weather through advanced planning, education and awareness.	City of Winona	Mayor's Office, Board of Aldermen, Public Works	All	Undetermined	R	Contact NWS for pre-application direction, complete application, schedule verification meeting, and receive approval	2020-2025	2.1	M	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
Win-15	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies.	The County has ordinances and regulations in place to guide the development and enforcement of construction standards and land uses. Update and/or develop ordinances and regulations as required to address all hazards prone to the County and includes any changes in future development areas.	City of Winona	Mayor's Office, Board of Aldermen, Applicable Departments	All	N/A	R	Review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review. Provide copy of Updated RHMP as guidance.	Continuous Action	2.2	M	General budget	2015
Win-16	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analyses, etc.	City of Winona	Mayor's Office, Board of Aldermen, County EMA, Applicable Departments	All	General budget	R	Review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review. Provide copy of Updated RHMP as guidance.	Continuous Action	2.2	H	General budget	2015
Win-17	Improve/maintain participation in the National Flood Insurance Program and the Community Rating System	The Town of Winona participates in NFIP but not CRS	City of Winona	Public Works, Engineers, County EMA, Public Works, Engineers, MEMA	Flood	N/A	R	Consider actions necessary to become a member of the CRS	Continuous Action	2.3	H	General budget	2015
Win-18	Continue efforts on public information and awareness for natural hazards.	The County has several outreach initiatives to communicate hazard preparedness information. Providing timely information and educational information related to preparedness,	City of Winona	Mayor's Office, Board of Aldermen, County EMA MEMA, NWS, FEMA, PDD	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders,	Continuous Action	3.1	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
		mitigation, response and recovery to the public fosters their ability to become self-sufficient. Continue to provide information on all hazards that may include but not be limited to educational information, evacuation routes/procedures, training programs, alert systems and such.						including families and private businesses, using all communications resources.					
Win-19	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non- natural hazards. Identify areas/groups within the County that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the County's web page.	Town of Winona	Mayor's Office, Board of Aldermen, County EMA, MSDH	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
Win-20	Promote workshops for emergency preparedness and continuity of operation plans	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operation plans establishes a clear chain of command, line of succession, and procedures for backup or alternate emergency facilities in case of extreme emergency or disaster.	Town of Winona	Mayor's Office, Board of Aldermen, County EMA	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	H	General budget	2015
Win-21	Develop public-private partnerships that promote community hazard mitigation and assist in reaching hazard mitigation goals	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their own interests or for the interest of the whole community is needed.	City of Winona	Mayor's Office, Board of Aldermen, County EMA	All	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	H	General budget	2015
Win-22	Install/maintain severe weather Warning systems	Weather warning system(s) complement the methods of warning already used by the County Emergency Operations Center and the National Weather Service. Identify site locations for additional sirens and develop cost estimates as needed.	City of Winona	Mayor's Office, Board of Aldermen, County EMA, MEMA	All	$35,000	D	Redefined as a Preparedness Planning initiative. Ongoing action to identify site locations and develop cost estimates as needed. For installed sirens, provide routine testing and	Continuous Action			Local budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
		For installed sirens, provide routine testing and inspection (weekly).						inspection.					
Win-23	Implement / maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and roadways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris.	City of Winona	Mayor, Road Department, County EMA	Severe Storms, Tornado, Winter Weather	General budget	D	Remove. Routine maintenance is not considered mitigation.	N/A		M	General budget	2015
Win-24	Participate in local and statewide studies, workshops and committees that address the all hazards prone within District 3	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the community.	City of Winona	Mayor's Office, Board of Aldermen, County EMA, Planning Department, Building Official	All	General budget	D	Moved to Preparedness Planning	Continuous Action		M	General budget	2015
Win-25	Conduct annual first responder training for all hazards	First responders train for all hazards on an annual basis. Lessons learned will be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures.	City of Winona	Police and Fire Departments, County EMA	All	General budget	D	Move to Preparedness Planning	Continuous Action	2.3	L	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
Win-26	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from a federal, state and local agency level. Conduct training and verify new employees are integrated into the training programs as necessary	City of Winona	Police and Fire Departments, County EMA	All	Staff time	D	Move to Preparedness Planning	Continuous Action	2.3	L	General budget	2015
Win-27	Update the District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44 §206 – communities are required to update their hazard mitigation plan every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in District 3 to schedule plan updates as they become due.	City of Winona	Mayor's Office, Board of Aldermen, Applicable Departments, County EMA	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Annually review the plan in anticipation of five-year update	2.4	H	General budget	2015
Win-28	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Each disaster presents varying degrees of impacts - no two storms are alike. Convene as soon as appropriate after an event to conduct an after-action report and document this in the appendix of the mitigation plan.	City of Winona	Mayor's Office, Board of Aldermen, Applicable Departments, County EMA	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Continuous Action	2.4	H	General budget	2015
Win-29	Conduct annual reviews of the District 3 Regional Hazard Mitigation Plan	As defined in the plan maintenance section of this plan, the chairman of the hazard mitigation committee will schedule	City of Winona	Mayor's Office, Board of Aldermen, Applicable Departments,	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Continuous Action	2.4	H	General budget	2015

Project #	Action Title	Action Description	Jurisdiction(s)	Agency	Hazard	Estimated Cost	2020 Status C=Completed D-Deleted R-Retained	**2020 Status Description**	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	**Plan Year**
		a meeting with the committee to review progress made on mitigation actions and identify ongoing mitigation needs.		County EMA									
Win-30	Pursue training and funding opportunities for mitigation actions	Funding options for actions identified in this plan should be explored and pursued. Coordinate with public works, engineering, planning and building official on funding evaluation on mitigation projects for cost share feasibility.	City of Winona	Mayor's Office, Board of Aldermen, Applicable Departments, County EMA	All	N/A	D	Remove as Action Item, included in RHMP Plan Maintenance.	Ongoing	2.4	H	General budget	2015

Mitigation Action Worksheets

Montgomery County elected to more fully describe two mitigation actions on a Mitigation Action Worksheet. The two worksheets address the following initiatives:

1. Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms.

2. Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others.

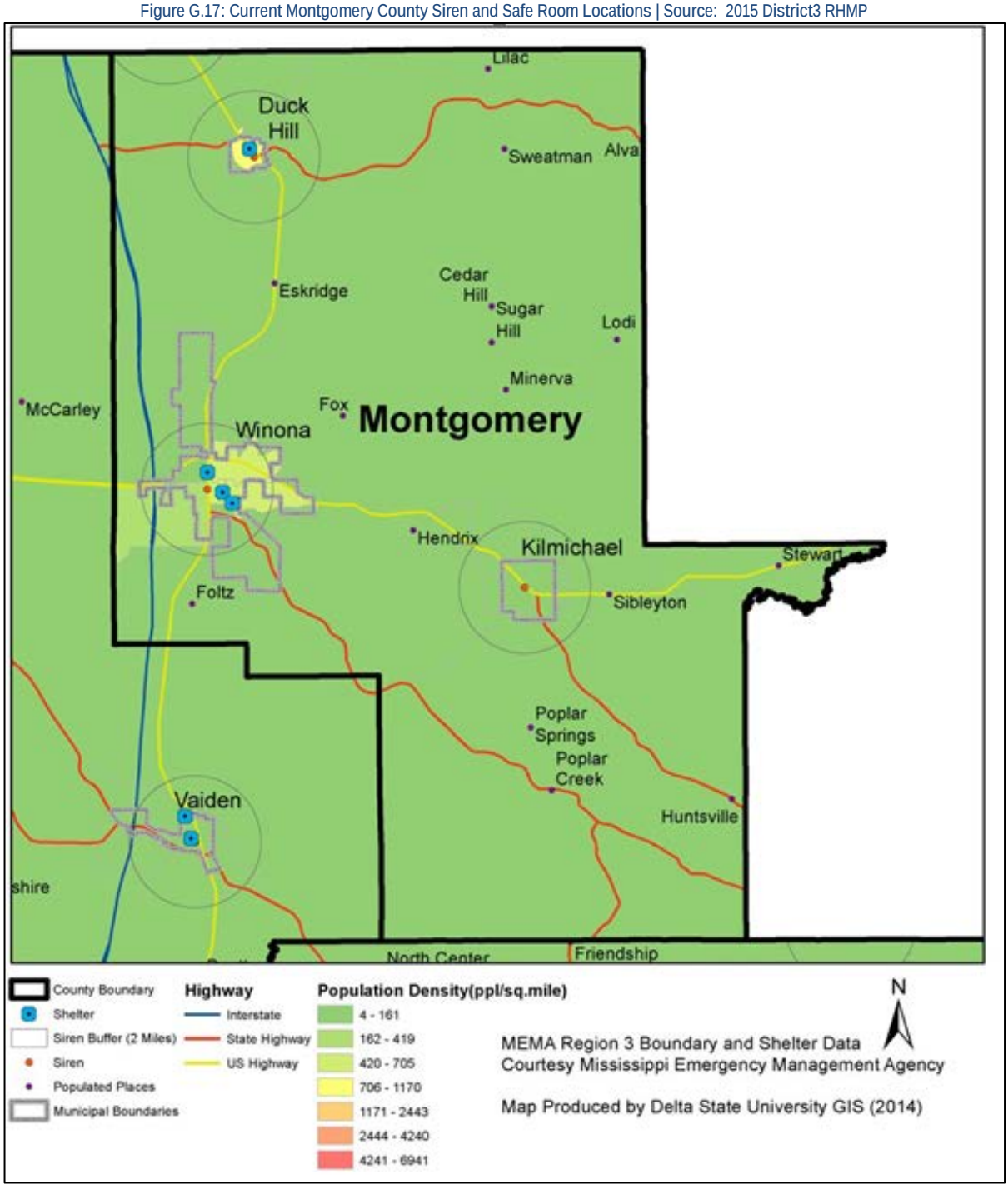
It was decided all jurisdictions within the county will work on these two actions, so a separate action worksheet for each jurisdiction working on both each is included in the Actions Worksheets section. The Action Worksheets for Montgomery County are included first, and jurisdictional worksheets follow.

Montgomery County Mitigation Action Worksheet-1

Mitigation Action Worksheet		
Name of Jurisdiction **Name of Haz. Mitigation Plan:**	Montgomery County, Mississippi Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Protect vulnerable residents, many of whom are elderly and live in manufactured housing and must seek safety during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach a safe location. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safe harbor. See map that follows showing the project locations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms. Alternative: Incorporate safe room space into current government structures. These spaces are not large or secure enough to serve in this function. Alternative: Situation remains as is, leaving residents exposed to severe weather.	
Action or Project Intended for Implementation		
4. Action/Project Number: **Name of Action or Project:**	**Action #: Montgomery-1** Construct safe rooms at several locations so that vulnerable population could reach a structure after a short drive (or walk). Inspect current safe rooms to confirm security and resiliency.	
5. Action or Project Description:	The Emergency Management Director has identified general locations where safe rooms would adequately serve the target population. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Confirming site locations. • Acquire property and develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 **Benefits (losses avoided)** **Estimated Cost** **Other Factors Considered (see STAPLEE Worksheet)**	**BENEFIT** • Protect vulnerable residents from exposure to severe weather. Minimize need for residents to drive during dangerous conditions to reach safety.	**COST** Undetermined, depends on safe room size for new structures, and on level of improvements needed for existing safe rooms (if any).
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Mayors, Jurisdictional legislative bodies, BOS	
8. Action/Project Priority (STAPLEE Score):	20 - High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Montgomery County Emergency Management Plan, Local Operations Plans	
Progress Report		
13. Date of Status Report: **Report of Progress:** **Evaluation of Effectiveness:**	03/2020 – Project initially discussed during a conference call in which the Montgomery County E.M. Director participated during the planning phase of the Hazard Mitigation Plan Update. Discussion included the need to secure with affected jurisdictions required to secure municipal approval and support.	

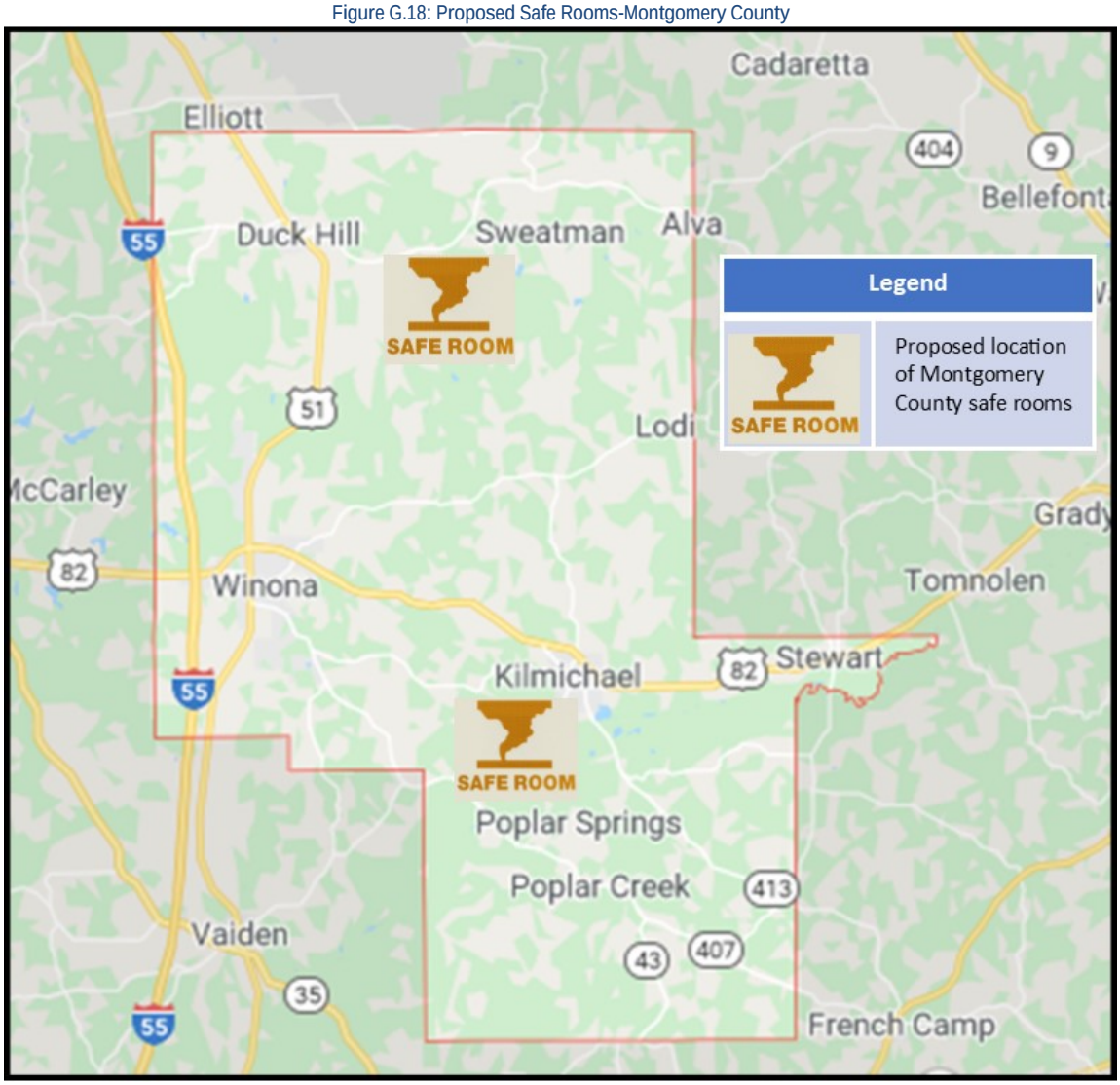
The map below, taken from the 2015 District 3 RHMP, shows the location of current safe rooms and warning sirens, as well as locations where additional facilities could be built to better serve populations countywide.

Figure G.17: Current Montgomery County Siren and Safe Room Locations | Source: 2015 District3 RHMP



To augment safety and security provided by existing safe rooms shown on the previous page, the Montgomery County Emergency Management Director will discuss with leaders in all areas of the county the process for identifying locations that provide additional places for residents to shelter during severe weather events. Pending funding availability, safe room construction is planned for locations that would eliminate the need for residents to travel a distance either before or during severe weather. These locations allow those living in rural areas to quickly reach safe harbor, while also being located near the population centers of Duck Hill, Kilmichael, and Winona. No specific sites have yet been identified, but this map is presented to show the community's interest in ensuring full coverage countywide. This initiative includes studying the condition of current safe rooms to ensure they are resilient enough to withstand high winds generated during a tornado or other severe weather conditions.

Figure G.18: Proposed Safe Rooms-Montgomery County



NOTE: The map shown for the Montgomery County mitigation action worksheet is not repeated for the jurisdictional action worksheets that follow.

Jurisdictional Action Worksheets Demonstrating Cooperative efforts with Mitigation County on Mitigation Action Montgomery-1

Community Need

There is a need to protect vulnerable residents, many of whom are elderly and live in manufactured housing, who must seek a safe location during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach shelter. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home.

Solution

Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms.

Action Worksheet		
Name of Jurisdiction **Name of Haz. Mitigation Plan:**	Town of Duck Hill, Mississippi Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Protect vulnerable residents, many of whom are elderly and live in manufactured housing and must seek a safe location during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach shelter. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms. Alternative: Incorporate safe room space into current government structures. These spaces are not large or secure enough to serve in this function. Alternative: Situation remains as is, leaving residents exposed to severe weather.	
Action or Project Intended for Implementation		
4. Action/Project Number: **Name of Action or Project:**	**Action #: Duck Hill- 1** Support construction of safe rooms in locations throughout the county so that vulnerable population could reach a structure after a short drive (or walk). Inspect current safe rooms to confirm security/resiliency.	
5. Action or Project Description:	Work in cooperation with the County Emergency Management Director, who has identified locations where safe rooms would adequately serve the target population. Funding availability may limit construction. Steps to complete the action include: • Confirming site locations. • Acquire property. • Develop a project budget. • Present recommendation to the Board of Aldermen for approval.	
6. Summary of Evaluation1 **Benefits (losses avoided)** **Estimated Cost** **Other Factors Considered** **(see STAPLEE Worksheet)**	**BENEFIT** • Protect vulnerable residents from exposure to severe weather. Minimize need for residents to travel in inclement weather.	**COST** Undetermined, depends on safe room size for new structures, and on level of improvements needed for existing safe rooms (if any).
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, Police and Fire Departments	
8. Action/Project Priority (STAPLEE Score):	20 - High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of Duck Hill Operations Plan, Montgomery County Emergency Management Plan	
Progress Report		
13. Date of Status Report: **Report of Progress:** **Evaluation of Effectiveness:**	03/2020 – Project initially discussed during a conference call in which the Montgomery County Emergency Management Director participated during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion included the need to secure with affected jurisdictions required to secure municipal approval and support.	

Action Worksheet		
Name of Jurisdiction **Name of Haz. Mitigation Plan:**	Town of Kilmichael, Mississippi Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Protect vulnerable residents, many of whom are elderly and live in manufactured housing and must seek a safe location during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach a safe room. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms. Alternative: Incorporate safe room space into current government structures. These spaces are not large or secure enough to serve in this function. Alternative: Situation remains as is, leaving residents exposed to severe weather.	
Action or Project Intended for Implementation		
4. Action/Project Number: **Name of Action or Project:**	**Action #: Kilmichael-1** Support the effort to construct safe rooms in several locations countywide so that vulnerable population could reach a structure after a short drive (or walk). Inspect current safe rooms to confirm security and resiliency.	
5. Action or Project Description:	Work in cooperation with the County Emergency Management Director, who has identified locations where safe rooms would adequately serve the target population. Funding availability may limit construction. Steps to complete the action include: • Confirming site locations. • Acquire property. • Develop a project budget. • Present recommendation to the Board of Aldermen for approval.	
6. Summary of Evaluation1 **Benefits (losses avoided)** **Estimated Cost** **Other Factors Considered (see STAPLEE Worksheet)**	**BENEFIT** • Protect vulnerable residents from exposure to severe weather. Minimize need for residents to travel in inclement weather.	**COST** Undetermined, depends on safe room size for new structures, and on level of improvements needed for existing safe rooms (if any).
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, Police and Fire Departments, County Emergency Management Department	
8. Action/Project Priority (STAPLEE Score):	20 - High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of Kilmichael Operations Plan, Montgomery County Emergency Management Plan	
Progress Report		
13. Date of Status Report: **Report of Progress:** **Evaluation of Effectiveness:**	03/2020 – Project initially discussed during a conference call in which the Montgomery County Emergency Management Director participated during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion included the need to secure with affected jurisdictions required to secure municipal approval and support.	

Mitigation Action Worksheet

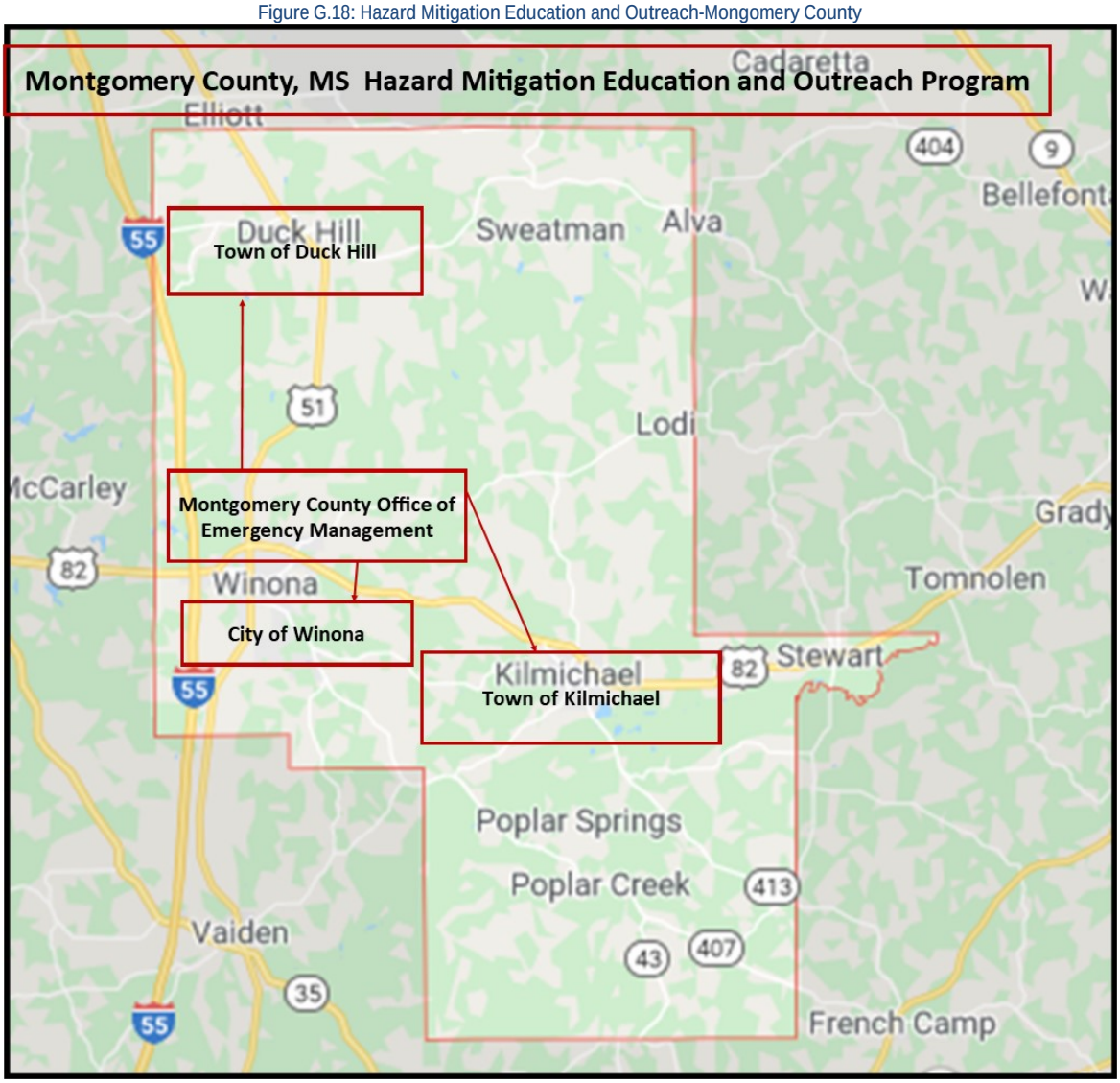
Name of Jurisdiction **Name of Haz. Mitigation Plan:**	City of Winona, Mississippi Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan
Risk / Vulnerability	
2. Problem being Mitigated:	Protect vulnerable residents, many of whom are elderly and live in manufactured housing and must seek a safe location during severe weather. This population has been known to drive through inclement weather at night, when road visibility is limited, in order to reach shelter. The primary hazards addressed by this project are severe weather and tornadoes, but residents may use the safe room during any incident for which they are urged to seek safety outside their home.
Potential Actions/Projects (not being Implemented at this time)	
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Build safe rooms in locations central to vulnerable populations and confirm resilience security of existing safe rooms. Alternative: Incorporate safe room space into current government structures. These spaces are not large or secure enough to serve in this function. Alternative: Situation remains as is, leaving residents exposed to severe weather.
Action or Project Intended for Implementation	
4. Action/Project Number: Name of Action or Project:	**Action #: Winona-1** Support the effort to construct safe rooms in several locations countywide so that vulnerable populations could reach a structure after a short drive (or walk). Inspect current safe rooms to confirm structural security and resiliency.
5. Action or Project Description:	Work in cooperation with the County Emergency Management Director Management Director, who has identified locations where safe rooms would adequately serve the target population. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Confirming site locations. • Acquire property and develop a project budget. • Present recommendation to the Board of Aldermen for approval
6. Summary of Evaluation1 **Benefits (losses avoided)** **Estimated Cost** **Other Factors Considered** **(see STAPLEE Worksheet)**	**BENEFIT** • Protect vulnerable residents from exposure severe weather. Minimize need for residents in inclement weather.
	COST Undetermined, depends on safe room size for new structures, and on level of improvements needed for existing safe rooms (if any).
Plan for Implementation	
7. Responsible Organization:	Mayor's Office, Board of Aldermen, Police and Fire Departments, County Emergency Management Department
8. Action/Project Priority (STAPLEE Score):	20 - High
9. Timeline for Completion:	Two years
10. Useful Life:	50 years
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP
12. Local Planning Mechanisms to be Used in Implementation, if any:	City Operations Plan, Montgomery County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	03/2020 – Project initially discussed during a conference call in which the Montgomery County Emergency Management Director participated during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion included the need to secure with affected jurisdictions required to secure municipal approval and support.

Mitigation Action Worksheet		
Name of Jurisdiction **Name of Haz. Mitigation Plan:**	Montgomery County, Mississippi Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the north Central Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Montgomery County Annex of the District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education/outreach program, leaving stakeholders vulnerable to hazards.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	**Action # Montgomery--2** Work with the North Central MS Planning and Development District to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Montgomery County Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered	**BENEFIT** • Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	**COST** Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Board of Aldermen, PDD	
8. Action/Project Priority (STAPLEE Score):	20 - High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Montgomery County Operations Plan, Montgomery County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Disaster communications originates with the Montgomery County Emergency Management Department. As such, it is appropriate to work with EM staff and the North Central Mississippi Planning and Development District to develop an education and outreach campaign that uses County communications as a touchstone for information about all hazards shared at the local level. Such a plan would include reaching outlying and otherwise hard-to-reach communities, as well as those who may not have access to digital communications.

The illustration below shows the communication mechanism to be used for educating those living and working in all jurisdictions. Mitigation (and other) messages begin with the Emergency Management Director, who works with the PDD to develop and maintain a communications web site to which other jurisdictions can be linked.

Figure G.18: Hazard Mitigation Education and Outreach-Mongomery County



NOTE: Map shown for the Montgomery County mitigation action worksheet is not repeated for the jurisdictional Mitigation Action Worksheets that follow.

Jurisdictional Action Worksheets Demonstrating Cooperative efforts with Montgomery County on Mitigation Action # Montgomery 2

Community Need

Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.

Solution

Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Montgomery County Annex of the District 3 RHMP.

Action Worksheet		
Name of Jurisdiction **Name of Haz. Mitigation Plan:**	Town of Duck Hill, Mississippi Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education/outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project addresses several action items outlined in the Montgomery County Annex. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	**Action #: Duck Hill-2** Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those without digital access.	
5. Action or Project Description:	Supporting efforts led by the Montgomery Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommended plan to the Board of Aldermen and BOS bodies for approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT • Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County E.M. Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 - High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of Duck Hill Operations Plan, Montgomery County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction **Name of Haz. Mitigation Plan:**	Town of Kilmichael, Mississippi Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Montgomery County RHMP Annex. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	**Action #: Kilmichaell-2** Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those without digital access.	
5. Action or Project Description:	Supporting efforts led by the Montgomery Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommended plan to the Board of Aldermen and BOS bodies for approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	**BENEFIT** • Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	**COST** Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County E.M. Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 - High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of Kilmichael Operations Plan, Montgomery County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

Action Worksheet		
Name of Jurisdiction **Name of Haz. Mitigation Plan:**	City of Winona, Mississippi Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program about natural and manmade hazards targeted to all stakeholders, including residents, businesses, civic groups, churches and others. This project addresses several action items outlined in the Montgomery County Annex of the District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	**Action #: Winona-2** Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Supporting efforts led by the Montgomery County Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	**BENEFIT** • Help residents, the business community, and other stakeholders mitigate against all natural/manmade hazards. Save lives/property.	**COST** Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 - High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	City of Winona Operations Plan, Montgomery County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	

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SUNFLOWER COUNTY

H.1 Community Profile

Geography

Located in northwest Mississippi, Sunflower County is adjacent to Coahoma County to the north, Tallahatchie and Leflore Counties to the east, Sunflower County to the south, and Washington and Bolivar Counties to the west. Sunflower County is 100 miles north of Jackson, Mississippi and 100 miles south of Memphis, Tennessee. It includes the following communities (Figure H.1):

Cities	Towns	Unincorporated				
Indianola	Doddsville	Baird	Caile	Heathman	Lombardy	Roundaway
Drew	Inverness	Baltzer	Dockery	Holly Ridge	Minot	Steiner
Moorhead	Sunflower	Blaine	Dwyer	Kinlock	Parchman	Stephensville
Ruleville		Boyer	Fairview	Linn	Rome	

The total area of the county is 707 square miles), of which 698 square miles is land and 9.2 square miles is water. Sunflower County is the longest county in the state, covering approximately 56 miles from between its southern and northern borders. Sunflower is located in the Delta region of Mississippi. Flat plain is the general topography of the region and the soil is characterized as mildly acidic to mildly alkaline. The Mississippi River is approximately 30 miles to the east of the County and the Big Sunflower River transverses through the county.

Indianola is the county seat of Sunflower County. It is located at the junction of U.S. Routes 82 and 49W. The city has a total area of 8.7 square miles, of which 8.6 square miles is land and 0.1 square miles is water, including Indian Bayou, which runs the length of the city and beyond. The topography of Indianola is flat, with the only significant elevation changes along waterways such as Indian Bayou and one Indian mound located on Main Street east of U.S. 49. The approximate elevation in Indianola is 121 feet above sea level.

Drew located on U.S. Route 49W and is 8 miles south of the Mississippi State Penitentiary (Parchman). The total land area for Drew is 1.1 square miles and has an approximate elevation of 135 feet above sea level.

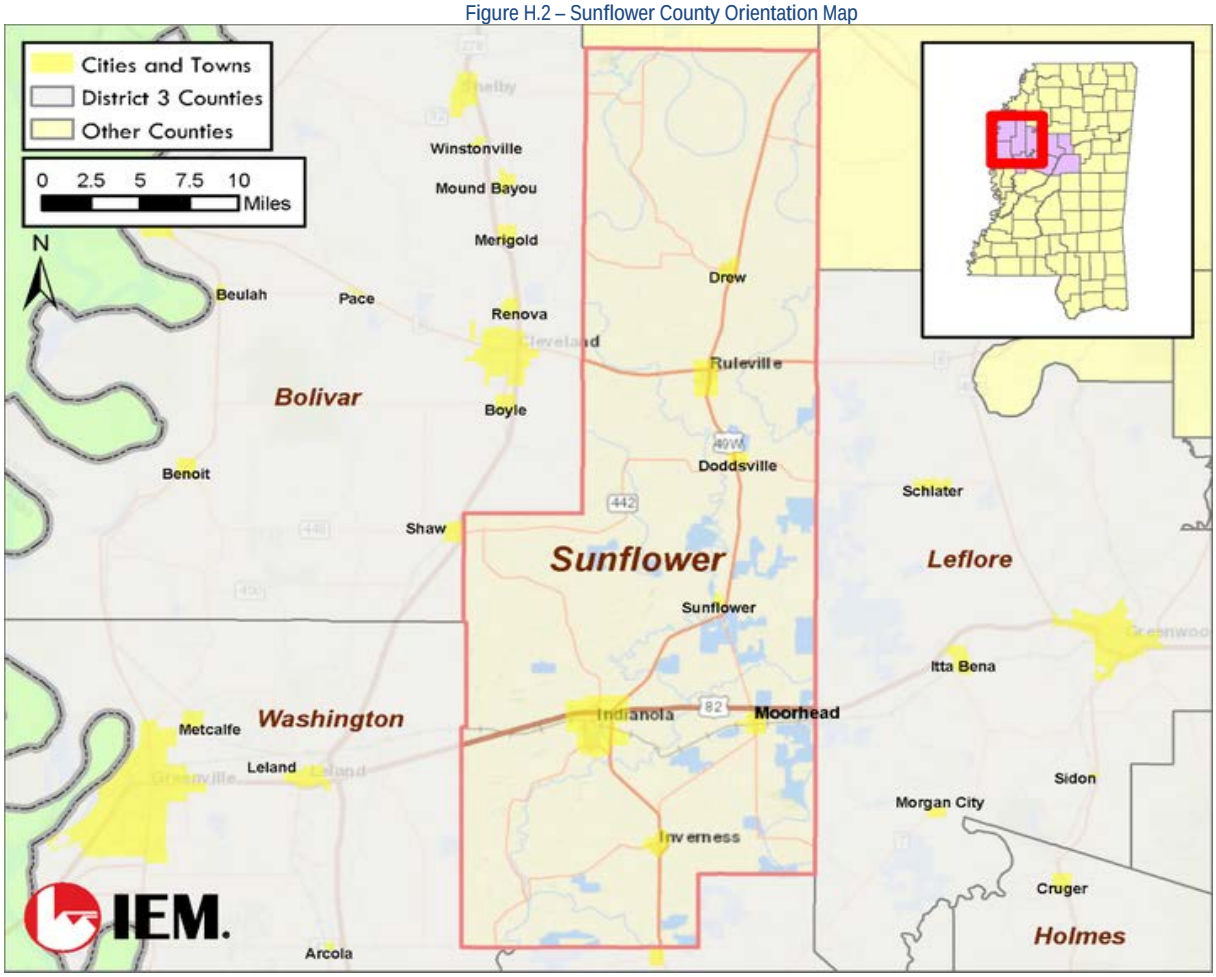
Moorhead is located along U.S. Route 82, east of Indianola and is located at the intersection of the Southern and Yazoo Delta railroads. The city has a total area of 1.3 square miles, of which 1.3 square miles is land and 0.77 square miles is water and has an approximate elevation of 115 feet above sea level. Moorhead is home to Mississippi Delta Community College.
Ruleville is located along U.S. Route 49W and has a total area of 2.5 square miles, of which 2.5 square miles is land and 0.39 square miles is water. The elevation for Ruleville is approximately 135 feet above sea level. The Mississippi State Penitentiary (Parchman) is located 15 miles from the city.

Doddsville is located along U.S. Route 49W and MS State Highway 442 and has a total land area of 0.8 square miles and an elevation of about 131 feet above sea level.

Inverness is located along U.S. Route 49W and has a total land area of 1.4 square miles and an elevation of about 121 feet above sea level

Sunflower is located along U.S. Route 49W and has a total land area of 0.4 square miles and an elevation of about 118 feet above sea level.

Figure H.2 – Sunflower County Orientation Map



Population and Demographics

Sunflower County has had an overall decrease in population as seen in Table H.1. The largest percent of decline occurred in Indianola while Drew showed an increase in population.

Table H.1 - Jurisdiction Population and Demographics I Source: US Census Bureau 2010 and 2018 American Community Survey 5-Year Estimates

	Population				Demographics					
Jurisdiction	2018 Census	2010 Census	Net Change	Percent Change	White	Black	Hispanic	Asian	Native American	2 + Races
Sunflower County	26,532	29,450	-2918	-.14	25.1	74.0	1.4	.3	.2	.5
Doddsville	100	98	+2	-.09	10.7	89.3	.0	.0	.0	.0
Drew	2074	1,927	+147	-.21	14.7	84.8	.7	.2	.2	.3
Indianola	9624	10,683	-1059	-.11	16.9	81.1	1.6	.5	.2	.5
Inverness	915	1,019	-104	-.12	45.4	53.3	.7	.8	.2	.2
Moorhead	1792	2,405	-613	-.07	9.7	89.0	.7	.2	.3	.2
Ruleville	2719	3,007	-8	-.07	19.7	89.8	.7	.1	.3	.5
Sunflower	1158	1,159	-1	.70	18.8	81.2	1.6	.0	.0	.2

Special Populations (elderly, disabled, and low income): Poverty and other social factors were also considered in assessing the vulnerability of Sunflower County and its municipalities. Doddsville has the highest population who are reported as living below poverty level. Inverness has the highest elderly population and the highest percent of population who are disabled. A summary of the percent of population falling into the special population's category are listed in Table H.2.

Other social factors, such as single mother households living below the poverty level, may indicate areas where special childcare considerations may be necessary. Persons with disabilities and the elderly may not be able to evacuate or seek other preventive measures during a disaster. These individuals may be most vulnerable to severe storms, tornadoes and severe winter storms/freezes.

Table H.2 – Special Populations I Source: US Census Bureau 2010 and 2018 American Community Survey 5-Year Estimates

	Below Poverty	Elderly (65 and older)	Disabled (non institutionalized)
Sunflower County	34.7%	12.4%	14.7%
Doddsville	75.9%	6.8%	3.2%
Drew	43.1%	10.9%	18.6%
Indianola	32.6%	15.0%	15.1%
Inverness	21.1%	19.0%	20.4%
Moorhead	45.9%	10.2%	9.7%
Ruleville	37.2%	13.8%	13.0%
Sunflower	49%	8.6%	13.6%

The Centers for Disease Control and Prevention (CDC) produces a county-based Social Vulnerability Index (SoVi, 2016) that discusses social vulnerability overall, as well as vulnerability according to "themes" that include socioeconomic status. Images on the next two tables show the SOVI breakdown using these factors to measure vulnerability in Sunflower County.

Figure H.2a - CDC's Social Vulnerability Index 2016

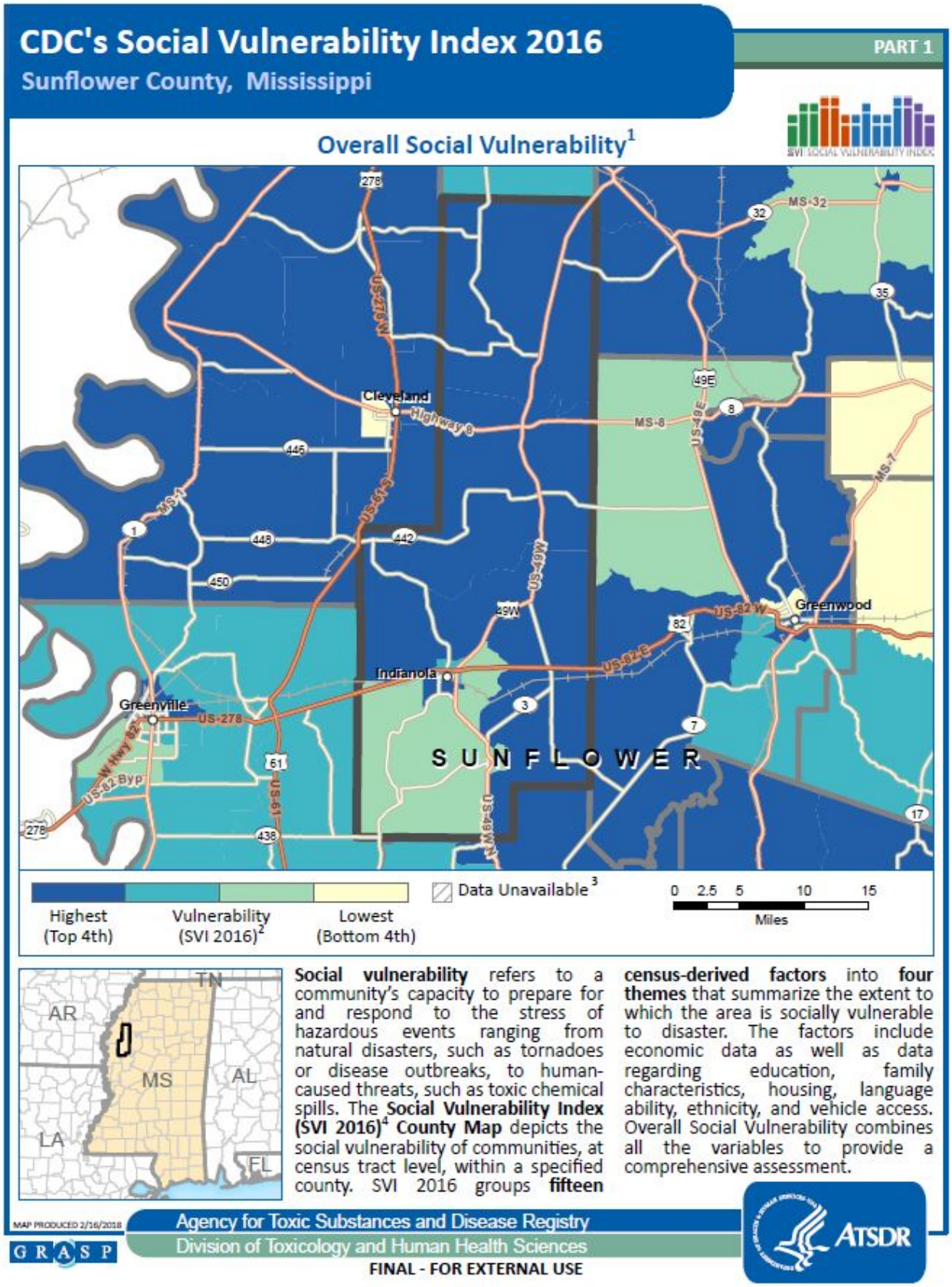
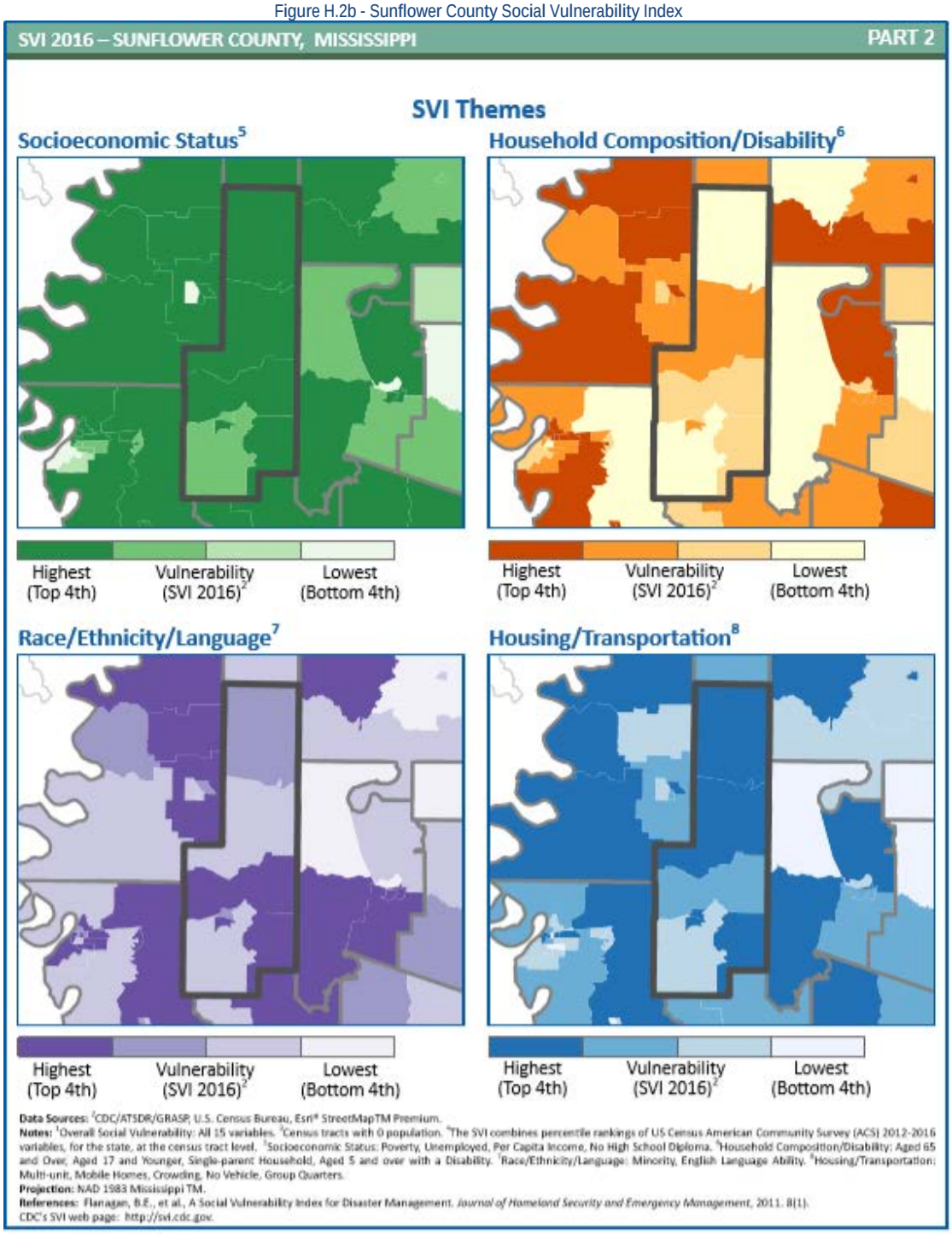


Figure H.2b - Sunflower County Social Vulnerability Index



FINAL - FOR EXTERNAL USE

Housing, Growth Trends, and Land Use

Housing: Housing data was obtained from the 2010 Census and presented below in Table H.3. In summary, 86.7 percent of housing is occupied, 5.2 percent of housing is mobile home/manufactured housing, and a majority of the homes in Sunflower County were constructed prior to 1970 which can indicate these homes may not have design standards to protect against high wind events.

Table H.3 – Housing Statistics I Source: US Census Bureau 2010 and 2018 American Community Survey 5-Year Estimates

Housing Statistic	Estimate	Percent
HOUSING OCCUPANCY		
Total housing units	9,679	100%
Occupied housing units	8,389	86.7%
Vacant housing units	1,290	13.3%
UNITS IN STRUCTURE		
1-unit, detached	7,590	78.4%
1-unit, attached	77	0.80%
2 units	339	3.5%
3 or 4 units	249	2.5%
5 to 9 units	693	7.6%
10 to 19 units	74	0.7%
20 or more units	147	1.5%
Mobile home	510	5.2%
YEAR STRUCTURE BUILT		
Built 2014 or later	82	0.8%
Built 2000 to 2009	27	0.2%
Built 1990 to 1999	756	7.8%
Built 1980 to 1989	1171	12.0%
Built 1970 to 1979	1684	17.3%
Built 1960 to 1969	2585	26.7
Built 1950 to 1959	1436	14.8%
Built 1940 to 1949	943	9.7%
Built 1939 or earlier	995	10.2%
HOUSING TENURE		
Occupied housing units	8389	100%
Owner-occupied	4605	54.9%
Renter-occupied	3784	45.1%
HOUSE HEATING FUEL		
Occupied housing units	8389	100%
Utility gas	5287	63.0%
Bottled, tank, or LP gas	899	10.7%
Electricity	2109	25.1%
Fuel oil, kerosene, etc.	0	0.1%
Wood	12	0.1%
Solar energy	6	0.1%
Other fuel	9	0.1%

Growth Trends: There have been no significant changes in development since the previous plan. New construction and redevelopment have been minimal and there are no known changes in conditions that may affect the risks or vulnerabilities for the participating jurisdictions. The construction of I-69 may bring some additional development to this area, but that project is many years into the future.

Land Use: All of the communities within Sunflower County have a Land Use Plan except for the County. The primary use of land in Sunflower County is open space and agricultural lands. There is some urban development relegated primarily to the county's municipalities because of the presence of centralized sewer in and around those communities. The value of prime agricultural lands, the lack of sewer service, and the presence of environmentally sensitive areas keep most land in agricultural use. There are scattered commercial and ag-serving industrial uses outside the municipal limits mostly around the unincorporated settlements.

Employment and Industry

The Mississippi Department of Employment Securities (MDES) assists individuals in obtaining employment. Through their network of WIN Job Centers, MDES matches qualified, prospective employees with employers. Tables H.4 and H.5 provide a summary of employment statistics for Sunflower County.

Table H.4 - Mississippi Department of Employment Security Annual Labor Force Report-Sunflower County I Source: Mississippi Economic Development Council

Residence Based Amounts – 2013						
County	Average Civilian Labor Force (2013)	Average No. Unemployed (2013)	Average No. Employed (2013)	Average Annual Wage (2012)	Per Capita Income (2012)	Percent Below Poverty (2012)
Sunflower	7560	780	6780	$32,192	$30,568	33.7%
Mississippi				$38,099	$37,834	21.5%

Table H.5 - Mississippi Department of Employment Security Annual Labor Force Report-Sunflower County I Source: Mississippi Economic Development Council

*Establishment Based Amounts 2013			
Manufacturing Total			7380
Non-Manufacturing Total			300
Agriculture, Forestry, Fishing & Hunting	0	Professional & Business Service	60
Mining	0	Management of Companies & Enter	120
Utilities	10	Admin Support & Waste Management	50
Construction	120	Educational Services	80
Wholesale Trade	360	Health Care & Social Assistance	800
Retail Trade	760	Arts, Entertain & Recreation	30
Transportation & Warehousing	860	Accommodation & Food Service	460
Information	20	Other Service (except public admin)	240
Finance & Insurance	200	Government	3,170
Real Estate, Rental & Leasing	40	Education	960

*Note: *Establishment based amounts are estimates and do not include self-employed individuals, religious entities or non-profit institutions. Amounts include a pro-rata share of unclassified employment.*

Critical Assets and Infrastructure

Lifeline sectors provide the framework from which individual critical assets and infrastructure are identified. A lifeline is a sector that provides an indispensable service which enables the continuous operation of critical business and government functions and is critical to human health and safety or economic security. Infrastructure associated with lifelines is a mix of public and private ownership and has many interdependencies. As an example, maintaining the function of a hospital during an event that results in a power failure, is dependent on communication infrastructure and access to temporary power to prevent interruption of services. Assessing these sectors helps to identify root causes of impacts and consequences from previous hazard events and prioritizes the highest issue areas and interdependencies in order to create effective mitigation solutions.

This section provides a listing of those assets and facilities that are considered as critical in nature to the planning area. These facilities are identified in tables and figures based on best available data. Shelters and outdoor warning sirens are also considered as essential and their locations are provided as a figure in the Mitigation Strategy section of this Annex.

***Critical Assets and Facilities*:** Table E.6 provides a listing of the critical assets identified for Sunflower County. A mitigation action has been included to expand the Critical Infrastructure Key Resource (CIKR) database and send to the Remote Sensing Council for inclusion in the statewide CIKR database.

Critical Assets and Infrastructure

Certain assets and facilities are considered as being of critical importance for Sunflower County and the surrounding region. Those identified in the following tables are based on best available data and conversations with the Sunflower County Emergency Management Agency. Shelters and outdoor warning sirens are also considered as essential and their locations are provided as a figure in the Mitigation Strategy section of this Annex.

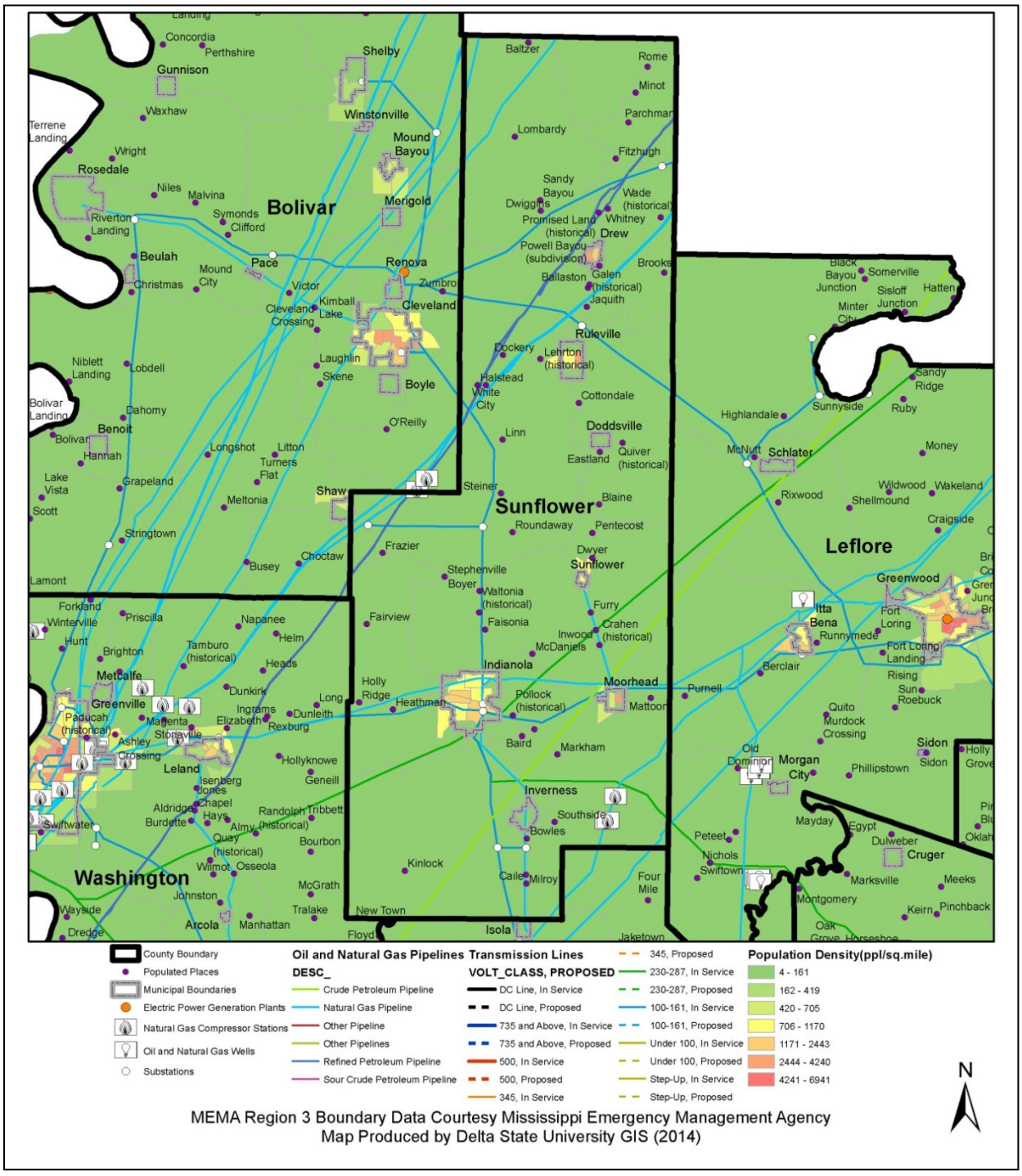
Transportation: As shown in Table H.6, Sunflower County has many major thoroughfares, rail lines and airport access.

Table H.6 –Sunflower County Transportation Routes

Roadway	Rail	Aviation
U.S. Highway 49W U.S. Highway 82 Mississippi Highway 3 Mississippi Highway 8 Mississippi Highway 32	Class III Local - Columbus Greenville (CGAY)	Indianola Municipal Airport Ruleville-Drew Airport

Energy Assets: Oil, natural gas pipelines and electric transmission lines transverse through Sunflower County. Figure H.5 provides the locations of these systems. The County Emergency Management Department confirm the map assets produced for the 2015 RHMP, remains essentially accurate.

Figure H.3 – Sunflower County Energy Assets



Critical Assets and Facilities: Table H.7 provides a listing of the critical assets identified for Sunflower County. The 2020 Hazard Mitigation Strategy includes an action to send the Critical Infrastructure Key Resource (CIKR) database to the Remote Sensing Council for inclusion in the statewide CIKR database.

Table H.7 – Sunflower County Summary of Critical Assets and Facilities

Sunflower County Facilities		Use
Sunflower County Jail Sunflower County Courthouse/EOC	Mississippi State Penitentiary	Government Facilities
Sunflower County Sherriff's Office	Parchman Fire Department	Public Safety
Doddsville Facilities		**Use**
Doddsville Town Hall		Government Facilities
Drew Facilities		**Use**
Drew City Hall		Government Facilities
North Sunflower Academy A W James Elementary School	Drew Hunter Middle School	Educational Facilities
Drew Volunteer Fire Department		Public Safety
Indianola Facilities		**Use**
Indianola City Hall		Government Facilities
Indianola Academy Lockard Elementary School Carver Elementary School	Gentry High School Indianola Career and Vo-Tech Robert L. Merritt Junior High School	Education Facilities
South Sunflower Hospital		Health Care Facilities
Water Storage Tanks	Sewer Lift Stations	Public Utility
Indianola Police Department	Indianola Fire Department	Public Safety
Inverness Facilities		**Use**
Inverness City Hall		Government Facilities
Inverness Elementary School		Education Facilities
Sewer Lift Stations	Federal Compress Tank	Public Utility
Inverness Police Department	Inverness Volunteer Fire Department	Public Safety
Moorhead Facilities		**Use**
Moorhead City Hall		Government Facilities
Mississippi Delta Community College	James Rosser Elementary School Moorhead Middle School	Education Facilities
Moorhead Police Department	Moorhead Volunteer Fire Department	Public Safety
Ruleville Facilities		**Use**
Ruleville City Hall		Government Facilities
Ruleville Central Elementary School Ruleville Middle School	Ruleville Central High School	Educational Facilities
North Sunflower Hospital		Health Care Facilities
Ruleville Volunteer Fire Department		Public Safety
Sunflower Facilities		**Use**
East Sunflower Elementary School		Education Facilities
Sunflower Volunteer Fire Department		Public Safety

As a complement to the previous table, researchers consulted the Mississippi Public Service Commission web site to review the list of utilities shown there. The following Sunflower County utilities companies are included on the web site. Some of these are the same as the ones listed above, and others are not thus included. It was decided that both tables should be incorporated into the MEMA District 3 Base Plan and in each of the county annexes for the sake of thorough documentation.

Table H.8: Mississippi Public Service Commission – County Utilities Listings I Source: Mississippi Public Service Commission – Sunflower County Utilities

Sunflower County Utilities

Gas Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
GC-123-0081-00	Atmos Energy Corporation	Mr. Mathew B. Davidson V-Pres.	790 Liberty Road Flowood, MS 39232-9321	601.420.5020	601.420.5020
GC-123-0861-00	CenterPoint Energy Resources Corp.	Ms. Christie Singleton VP	525 Milam Street, 14th Floor Shreveport, LA 71101	501.377.4740	763.214.6883

Electric Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
EA-103-0031-00	Coahoma EPA	Mr. W. Keith Hurt Manager	P.O. Box 188 Lyon, MS 38645	662.624.8321	662.624.8321
EA-103-0048-00	Delta EPA	Mr. David O'Bryan Gen. Mgr.	P.O. Box 9399 Greenwood, MS 38930		662.453.6352
EC-123-0082-00	Entergy Mississippi Inc.	Mr. Martin McGee Customer Service Support	P.O. Box 1640 Jackson, MS 39215-1640		601.969.2336
EA-100-0042-00	Twin County EPA	Mr. Tim Perkins Manager	P.O. Box 158 Hollandale, MS 38748		662.827.2262

Sewer Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
SA-100-0406-01	Rome Water Association, Inc.	Mr. Bobby Blackwell Pres.	P.O. Box 175 Rome, MS 38768		662.345.6322

Water Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
WA-100-0246-00	Big Yeager Water Assn. Inc.	Mr. Butch Cummins President	72-A Willingham Road Drew, MS 38737	662.745.2376	662.745.2376
WA-100-0855-00	Boyle-Skene Water Corp.	Mr. Todd Holder Pres.	P. O. Box 475 Boyle, MS 38730	662.588.7061	662.843.2320
WM-100-2395-00	City of Drew	Jeffery Kilpatrick Mayor	130 West Shaw Ave. Drew, MS 38737		662.745.8556
WM-100-2379-00	City of Ruleville	Honorable Shirley Edwards Mayor	P. O. Box 428 Ruleville, MS 38771-0428		662.756.2791

WA-100-0903-00	Darlove-Murphy Water Assn. Inc.	Mr. Michael Shorter	P.O. Box 191 Hollandale, MS 38748		662.873.6223
WA-100-0444-00	Delta Choctaw Water Corp.	Mr. Cameron Dakin Mngr.	673 Laughlin Road Cleveland, MS 38732		662.843.4662
WA-100-0591-00	FMH Water Assn. Inc.	Mr. Carlis Lyon President	P. O. Box 1107 Indianola, MS 38751		662.686.7150
WD-103-1213-00	Minter City Water And Sewer District	Mr. Hugh M. Arant Commission	P. O. Box 73 Minter City, MS 38944	662.624.2398	662.756.2034
WA-100-0406-00	Rome Water Association, Inc.	Mr. Bobby Blackwell Pres.	P. O. Box 175 Rome, MS 38768		662.345.6322
WA-003-0687-00	So. Quitman Co. Utilities Assn. Inc.	Mr. G. R.(Bobby) Shields Pres.	409 West Cypress Street Charleston, MS 38921	662.326.2205	662.326.7734
WA-100-0621-00	South Sunflower Water Assoc. Inc.	Mr. Joe Poe Pres.	P. O. Box 88 Inverness, MS 38753		662.265.5219
WA-100-1134-00	Sunflower Water Association Inc.	Mr. Robert Andrews Sec./Trea.	342 Drew-Merigold Road Merigold, MS 38759	662.721.0571	662.721.0571

Telecommunications Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
TC-123-0001-00	BellSouth Telecommunications, LLC	Mr. C. D. Smith Regulatory	2310 7th Street Meridian, MS 39301	601.592.6510	601.917.8787
TC-100-0018-00	Delta Telephone Co. Inc.	Ms. Helen Simmons VP	1018 Highland Colony Parkway Suite 700 Ridgeland, MS 39157	601.384.3350	601.355.1522
TC-100-0006-00	Sledge Telephone Co. Inc.	Mr. Robert O. Sledge Jr. Pres.			

H.2 Hazard Identification and Risk Assessment

This section includes a brief summary of hazards to which Sunflower County is prone, and includes the location and extent, historical events, and probability of future occurrence. Vulnerability assessments are included in this Annex only for hazards for which county-based data is available. Section 4 of the Base Plan includes hazard descriptions for hazards applicable to all jurisdictions covered by the 2020 RHMP Update. Health-related hazards, such as Pandemic Influenza and West Nile virus, are of concern to the County, but there is no county-level data to add to the discussion of this hazard as it is addressed in Section 4 of the Base Plan. That section also includes the most recently available information about Coronavirus Disease of 2019 (COVID-19) at the time of this plan's publication.

Hazard Ranking

As discussed in Section 4 of the Base Plan - Hazard Identification and Risk Assessment, each county evaluated the number of events and damage claims from impacts over the past 10 years to determine their hazard risk ranking.

Sunflower County determined their probability of future occurrence based on reported data and local knowledge of previous events. Definitions for the classifications are provided below:

- Highly Likely – More than 8 occurrences over last 10 years
- Likely – 5 - 7 occurrences over last 10 years
- Low – 1 - 4 occurrences over last 10 years
- Susceptible – Conditions are favorable or there are historic events (greater than 50 years) or local knowledge of unreported events.

Table H.10 provides a summary of the hazard events for Sunflower County followed by the results of their risk ranking exercise (Table H.9).

Table H.9 – Sunflower County Summary of Hazard Events 2000 – 2019 I Source: NCEI, MDEQ, USGS

Hazard Type	No of Events	Death	Injury	Property Damage	Crop Damage
Dam/Levee Failure	-	-	-	-	-
Drought	9	-	-	-	$ 4,301,000
Earthquake	-	-	-	-	-
Extreme Heat / Heat	6	-	-	-	-
Expansive Soil	-	-	-	-	-
Flood	41	-	-	$ 2,757,000	$1,200,000
Severe Storm	136,	-	-	$10,894,000	$ 3,550,000
Severe Winter Weather	16	-	-	$ 1,415,000	-
Tornado	16	-	3	$ 2,070,000	$ 215,000
Tropical Storm / Hurricane	2	-	-	$ 510,000	$5,150,000
Wildfire	-	-	-	-	-
Totals	226	-	3	$ 17,646,000	$ 14,416,000

* Damage estimates not available

Table H.10- Sunflower County Risk Ranking Results

Hazard	Vulnerability Score (Sum of Risk Characteristic Scores)	Probability of Future Occurrence Score	Total Risk Score	RISK LEVEL
Dam/Levee Failure	5	1	5	Low
Drought	8	3	24	Medium
Earthquake	10	1	10	Low
Expansive Soils	2	1	2	Low
Extreme Heat	6	2	12	Low
Flood	7	4	28	Medium
Severe Storm (Thunderstorm, Lightning, Hail and High Wind)	7	5	35	High
Severe Winter Weather	8	3	24	Medium
Tornado	6	3	18	Medium
Tropical Storm	4	1	4	Low
Wildfire	6	2	12	Low
Cyber Incident/Attack	9	1	9	Low
Hazardous Materials	4	2	8	Low
Pandemic/Human Infectious Disease	12	0	12	Low

The following table summarizes the vulnerability of each jurisdiction to each hazard. This information is based on community input, NCEI data, and available resources that discuss each hazard. An example of the latter would be the Mississippi DEQ web site Dam Safety Division, which provides maps illustrating the number and types of dams in each jurisdiction.

Table H.11 – Summary of Hazard Ranking, All Jurisdictions in Sunflower County

Hazard Type	Sunflower County	Town of Doddsville	City of Drew	City of Indianola	Town of Inverness	City of Moorhead	City of Ruleville	Town of Sunflower
Dam/Levee Failure	*Medium*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Drought	*Medium*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Earthquake	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Excessive Heat/Heat	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Expansive Soils	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Flood	*Medium*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Severe Storm	*Medium*	*Medium*	*Medium*	*Medium*	*Medium*	*Medium*	*Medium*	*Medium*
Severe Winter Weather	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Tornado	*Medium*	*Medium*	*Medium*	*Medium*	*Medium*	*Medium*	*Medium*	*Medium*
Tropical Storm/Hurricane	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Wildfire	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*

Mitigation planning researchers are fortunate to have access to the Data Visualization Tool included on the FEMA website. This site provides county-level data on the breakdown of flood events and hazards included in federal emergency and disaster declarations, as well as for flood events recorded by FEMA. The information is updated through June 2020 and shows the disaster name, event type, number of events, and occurrence date. The data includes information from the time FEMA first recording disaster events in the format currently used. While this time frame is longer than that included in this RHMP Update, the following page provides a one-page snapshot of Sunflower County disasters that have been documented by FEMA.

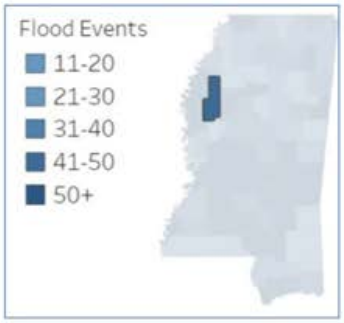
Figure H.4 – Sunflower County FEMA Declarations Statistics

FEMA Declarations: Sunflower County Statistics: 1953 - 2020 ***Source:*** FEMA Data Visualization Web Site

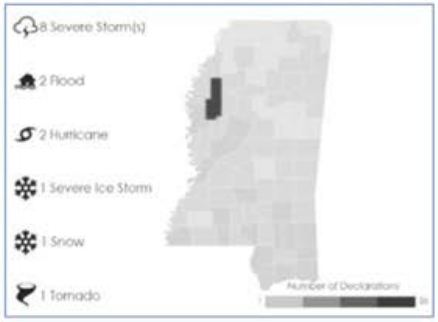
Not Included in data sourced 3/31/2020

- Mississippi COVID EM-3474 (Declared 3/13/2020)

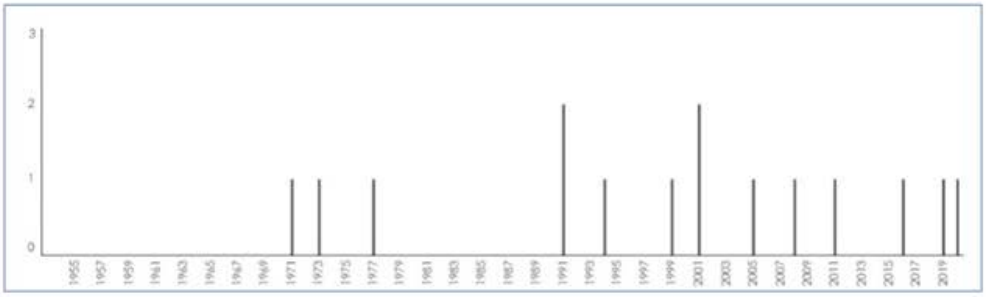
45 Flood Events



15 Declared Events



The charts below show the months and years in which disasters have occurred in Sunflower County



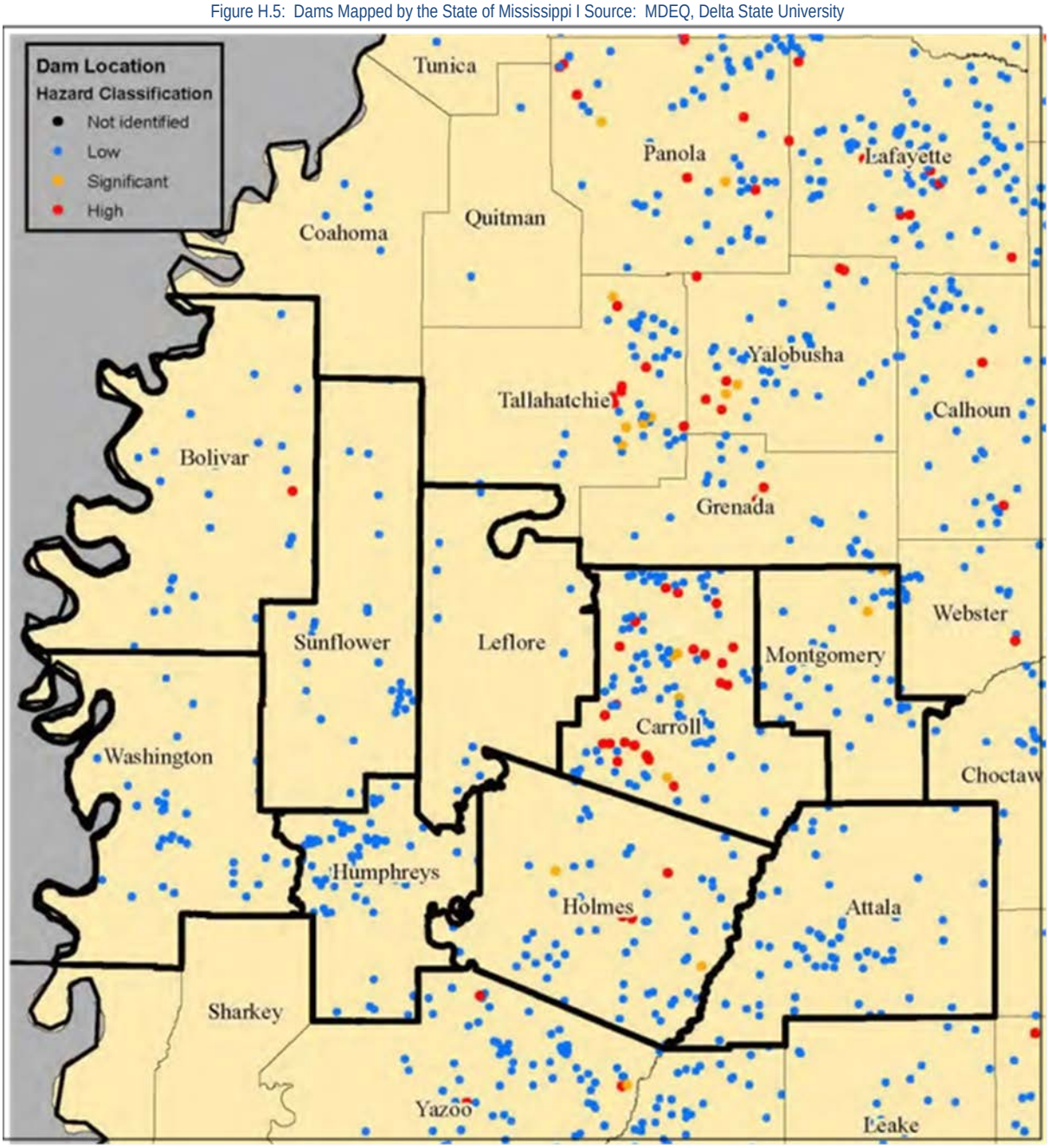
FEMA Declarations for Sunflower County (15)

Year	Declaration Name	Disaster Number	Year	Declaration Name	Disaster Number
1971	Storms and Tornadoes	302	2001	Severe Storms, Tornadoes & Flooding	1398
1973	Heavy Rains, Tornadoes & Flooding	368	2005	Hurricane Katrina	1604
1977	Drought & Freezing	3032	2008	Hurricane Gustav	3291
1991	Severe Storms & Flooding	895	2012	Severe Storms, Tornadoes, Straight-line Winds, Flooding	1972
1991	Severe Storms, Tornadoes & Flooding	906	2016	Severe Storms & Flooding	4268
1994	Severe Winter Storm, Freezing Rain & Sleet	1009	2019	Severe Storms, Straight-line Winds, Tornadoes and Flooding	4429
1999	Severe Winter Storms, Ice and Freezing Rain	1265	2020	Severe Storms, Tornadoes, Straight-line Winds and Flooding	4478
2001	Severe Storms & Tornadoes	1360			

Dam/Levee Failure

Figure H.5 shows a list of dams mapped based on 2015 data secured from the Mississippi Department of Environmental Quality (MDEQ) and included in the previous District 3 RHMP.

Figure H.5: Dams Mapped by the State of Mississippi I Source: MDEQ, Delta State University



Location and Extent

The 2018 SHMP included a MEMA Region 3 Dam Inventory by County, breaking the numbers down for low, high, and significant hazard dams. The numbers of dams for all nine counties in the District are included for the purpose of comparing Sunflower County's level of risk to that of surrounding counties. The table shows there are fewer in Sunflower than in Carroll County about the same as in Bolivar; and more than in Washington County.

Table H.12 MEMA Region 3 Dam Inventory by County – Sunflower County I Source: 2018 Mississippi SHMP

County	Significant	High	Low	Total
Region 3				
Atalla	1	2	44	47
Bolivar	-	-	14	14
Carroll	4	23	86	113
Holmes	1	5	39	45
Sunflower	-	-	4	4
Leflore	-	-	-	-
Montgomery	-	2	22	24
Sunflower	-	-	12	12
Washington	-	-	3	3

There are no significant or high hazard dams in Sunflower County. The Mississippi Department of Environmental Quality (DEQ) provided a copy of the most recent dam inventory to the research team and Sunflower County has 12 low hazard dams.

Table H.13 provides a listing of all low hazard dams in the county. This list does not include dams whose structure has not been categorized.

Table H.13 – Sunflower County Low Hazard Dams

Dam Name	State ID	Latitude	Longitude
Moorhead Lagoon Dam	MS00839	33.4333	-90.4967
Howard Grittman Pond Dam	MS00898	33.8617	-90.5550
Tommy Ellis Pond Dam	MS00900	33.5933	-90.7033
A E Britt Pond Dam	MS00904	33.5617	-90.6650
Fratesi Pond Dam	MS00908	33.4683	-90.6733
Delta Processing Pond Dam	MS02304	33.4420	-90.4934
Ruleville Lagoon Dam	MS02870	33.7283	-90.5333
Indianola Sewage Lagoon Dam	MS02957	33.4217	-90.6450
Sunflower Lagoon Dam	MS02958	33.5500	-90.5217
DREW LAGOON DAM	MS03013	33.7937	-90.5342
DUKE LAKE DAM	MS02977	33.2999	-90.5882
A P B INC LAKE DAM	MS02975	33.4649	-90.5099

Previous Occurrences

There is no record of dam/levee breaches having occurred in Sunflower County.

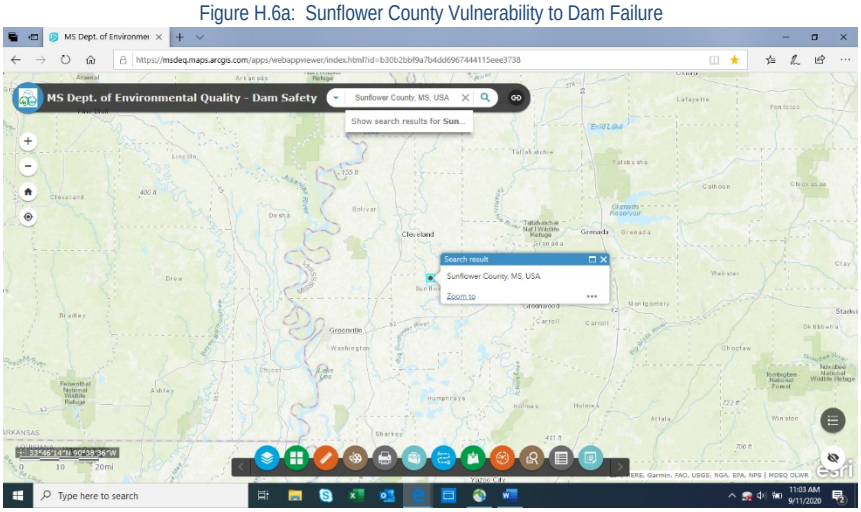
Probability of Future Occurrence

Dam failure is not considered to be among the highest hazards of concern in the county but, since the reclassification there is increased awareness among officials about monitoring such structures. The probability of future occurrence of dam breach is classified as low. It is not possible to develop a statistical probability when there is no recent historical data.

Assessing Vulnerability

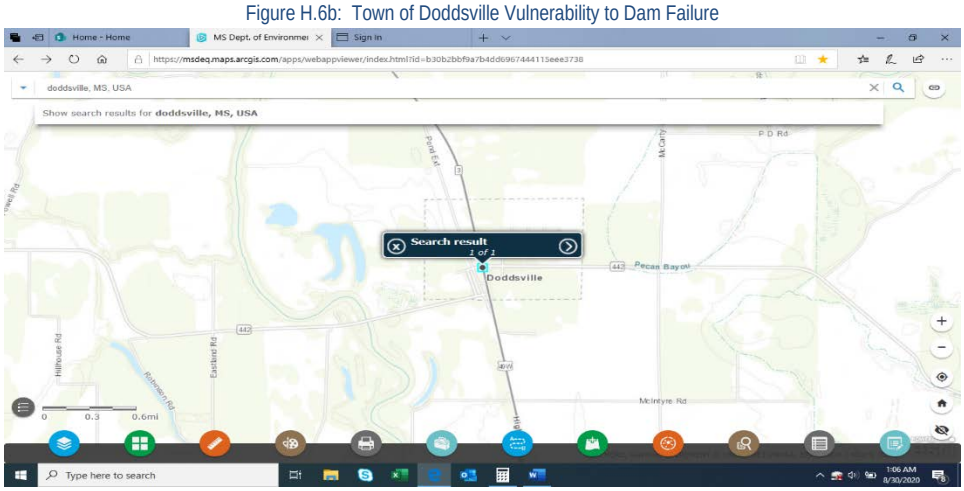
If breached, even a low hazard dam could cause damage to nearby property. The maps below, taken from the MDEQ Dam Safety Division mapping web site, show close up views of the location of dams in all of Sunflower County and for each of its jurisdictions. In each screen shot, the name of the community is shown in the Search Box, and a legend is included to show the degree of hazard for each identified dam.

Figure H.6a: Sunflower County Vulnerability to Dam Failure



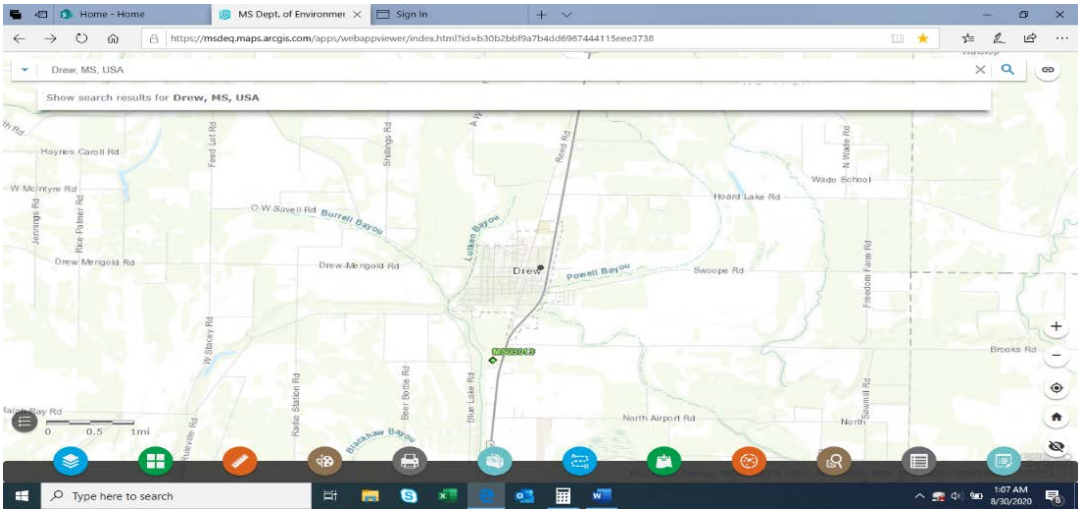
There are no significant or high hazard dams located in Sunflower County. The data presented here suggests that unincorporated Sunflower County overall is at a low risk.

Figure H.6b: Town of Doddsville Vulnerability to Dam Failure



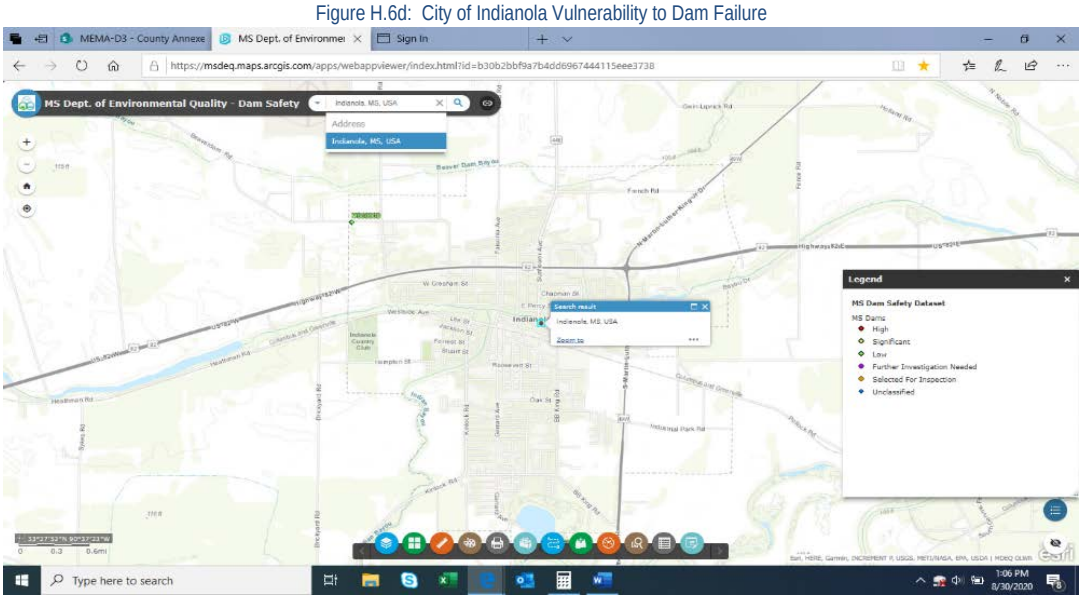
There are no dams within in a short distance of the Town of Doddsville. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Figure H.6c: City of Drew Vulnerability to Dam Failure



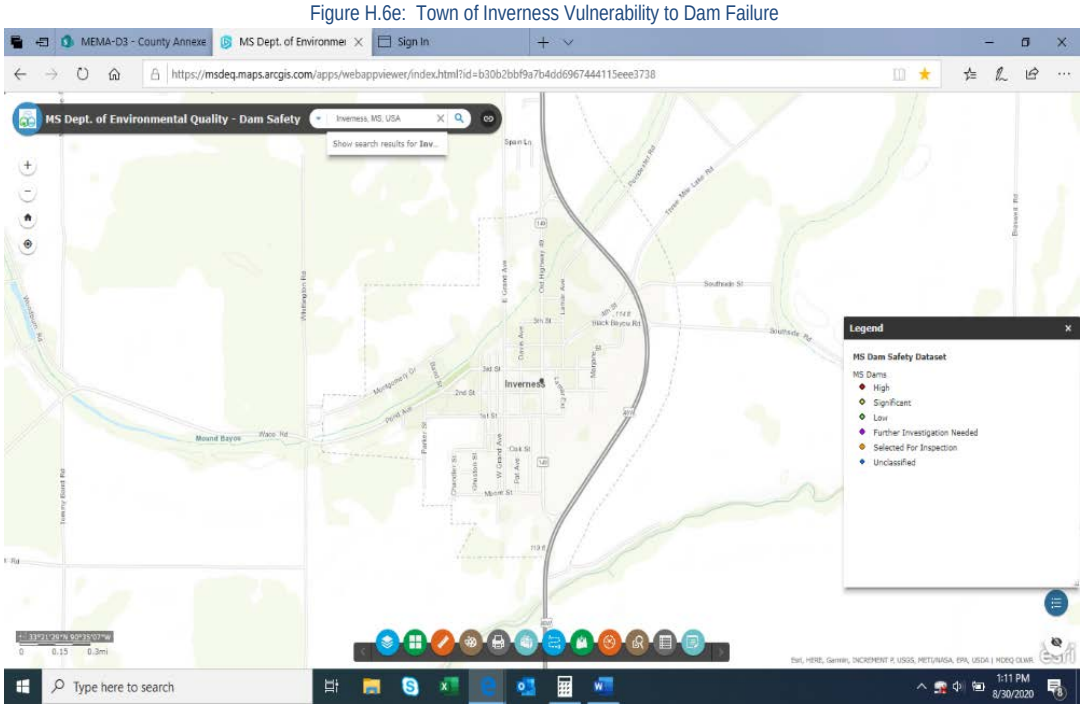
There are no dams within in a short distance of the City of Drew. The city's population center is well away from any identified dams and they pose little risk to the community. As such the City is at a low risk to dam failure.

Figure H.6d: City of Indianola Vulnerability to Dam Failure



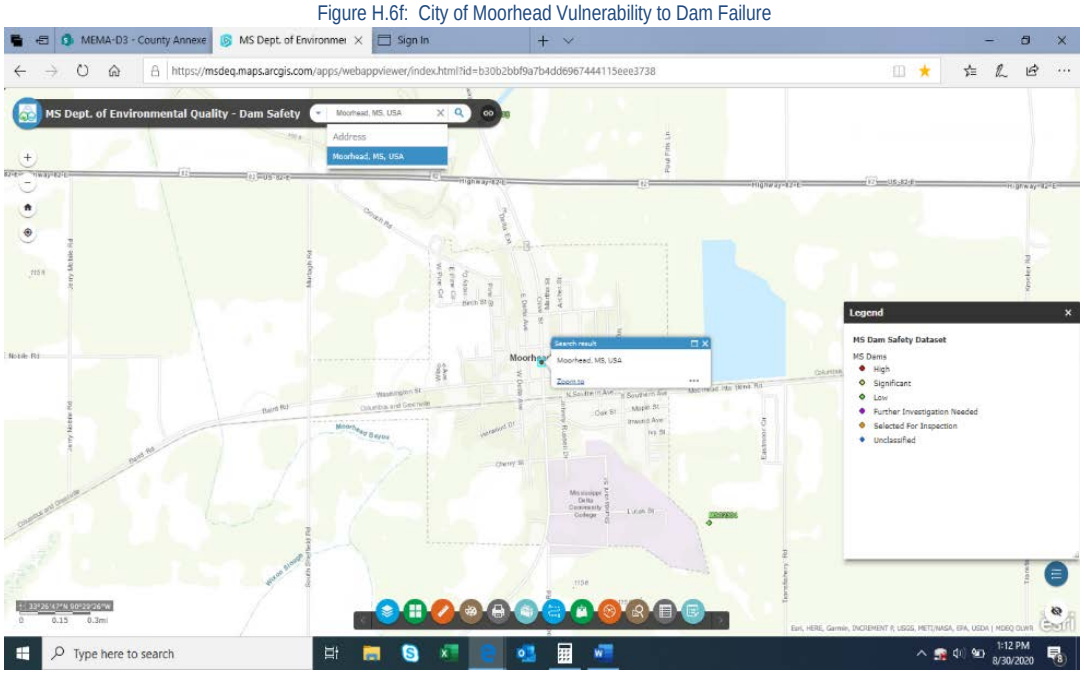
There are no dams within in a short distance of the City of Indianola. The city's population center is well away from any identified dams and they pose little risk to the community. As such the City is at a low risk to dam failure.

Figure H.6e: Town of Inverness Vulnerability to Dam Failure



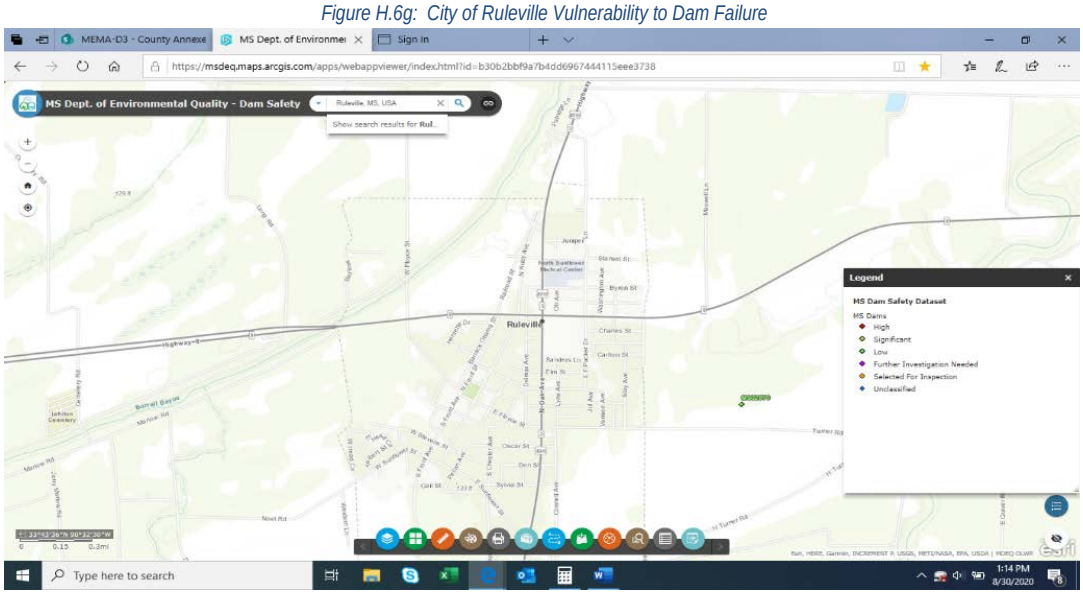
There are no dams within in a short distance of the Town of Inverness. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Figure H.6f: City of Moorhead Vulnerability to Dam Failure



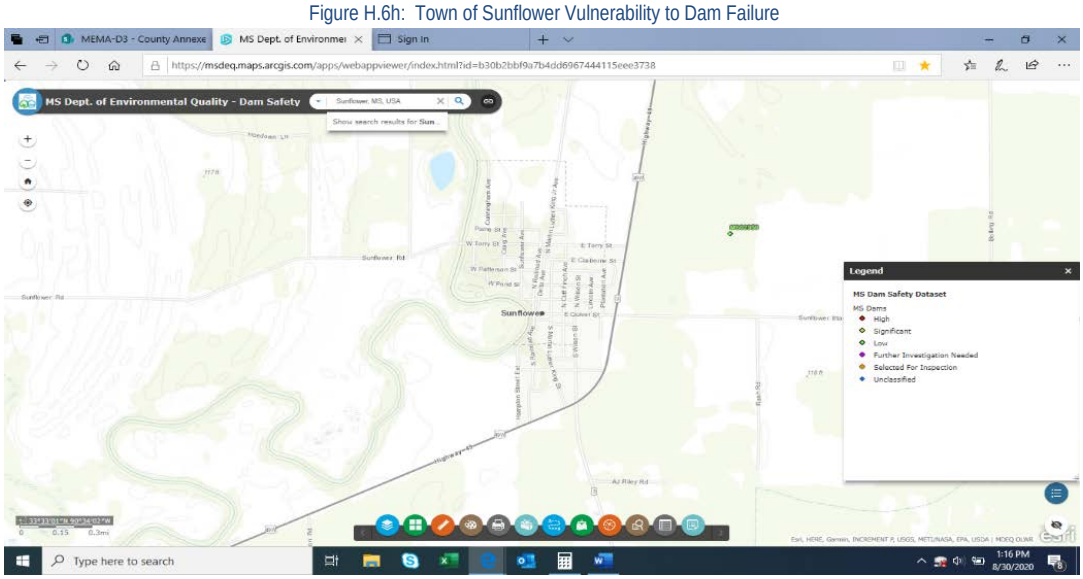
There are no dams within in a short distance of the City of Moorhead. The city's population center is well away from any identified dams and they pose little risk to the community. As such the City is at a low risk to dam failure.

Figure H.6g: City of Ruleville Vulnerability to Dam Failure



There are no dams within in a short distance of the City of Ruleville. The city's population center is well away from any identified dams and they pose little risk to the community. As such the City is at a low risk to dam failure.

Figure H.6h: Town of Sunflower Vulnerability to Dam Failure



There are no dams within in a short distance of the Town of Sunflower. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Overall Vulnerability to Dam Failure

The following table summarizes the vulnerability of each jurisdiction to dam failure.

Table H.14 Sunflower County Overall Vulnerability Dam Failure Ranking | Source: MDEQ

Jurisdiction	Ranking	
Unincorporated Sunflower County	Medium	
Town of Doddsville	Low	
City of Drew	Low	
City of Indianola	Low	
Town of Inverness	Low	
City of Moorhed	Low	
City of Rulevlle	Low	
Town of Sunflower	Low	
Overall Vulnerability to Sunflower County dam failure	Low	

There are no significant or high hazard dams in Sunflower County. Therefore, dam failure is rated as low risk to Sunflower County overall.

Drought

Location and Extent

Drought covers a large area and cannot be confined within geographic boundaries. Therefore, all of Sunflower County could be exposed to drought conditions. The extent of damage from drought typically does not pose a threat to property but can impact agricultural assets within the county.

Previous Occurrences

Table E.15 list 9 events reported in the years of 2000 through 2019 as shown in the National Weather Service Storm Events Database, housed at the National Center for Environmental Information (NCEI). It is important to note that the lack of data during that a given time frame does not mean drought conditions did not exist-they simply were not reported. NCEI reports drought on a countywide basis and not by jurisdiction. The figures show that most drought-related damage is related to agricultural losses.

Table H.15: Drought Occurrences 2000 to 2019 | Source: NCEI

Date	Death	Injury	Property Damage	Crop Damage
12/1/2016	-	-	-	2,000,000
11/15/2016	-	-	-	50,000
10/1/2015			-	1,200
9/1/2015	-	-	-	400,000
10/1/2010	-	-	-	500,000
9/1/2010	-	-	-	500,000
8/1/2010	-	-	-	500,000
7/15/2010	-	-	-	300,000
10/1/2006	-	-	-	2,000,000
Total	-	-	-	$4,301,000

Probability of Future Occurrence

Historical data listed in Table H.15 suggest that drought is likely. It may occur one or more times in a given year or may experience a drought-free period of several years. It is also likely that drought may occur as a result of climate change throughout the United States, which would affect the region's significant agriculture holdings. Of the nineteen years included in NCEI research, a drought has occurred in five years. A probability developed by dividing the number of drought years by the total number of years results in a 21% probability that a drought will occur in any given year.

Assessing Vulnerability

Drought occurs with advance warning because the those in farm community are able to tell when patterns of water availability are changing. Drought is also monitored by the National Weather Service and the Mississippi State University Extension Service, which has offices in each county. Two tools are available for Extension staff and others who monitor drought: the Keetch-Byrum Drought Index and the Palmer Drought Severity Index, which are discussed in Section 4 of the Base Plan as tools for drought monitoring. Drought is not known to cost human lives, but it affects lifestyles and the economic effects may be felt countywide. The NCEI database indicates there have been no known deaths or injuries from drought in the planning area.

All NCEI events are listed as occurring in the Sunflower Zone, so it can be deduced that the entire county is equally at risk to the hazard. However, because the unincorporated areas, which include agricultural assets, are more affected by drought than municipalities, this area ranks the hazard as medium for unincorporated areas. Other areas of the county are determined to be at low vulnerability to drought, so the County overall is listed as having low vulnerability.

Table H.16- Sunflower County Overall Vulnerability to Drought

Jurisdiction	Ranking
Unincorporated Sunflower County	Medium
Town of Doddsville	Low
City of Drew	Low
City of Indianola	Low
Town of Inverness	Low
City of Moorhead	Low
City of Ruleville	Low
Town of Sunflower	Low
Overall Sunflower County Vulnerability to Drought	Low

Earthquake

Location and Extent

Sunflower County, like most of North Central Mississippi, is located within the Modified Mercalli Zone VI. Should an event occur that has a 5.9 to 6.0 magnitude on the Richter Scale, some or all of the following may occur based on descriptions included in the Scale:

- The event would be felt by all or nearly everyone
- People may be awakened from sleep if the event occurs at night
- Widespread frightened population
- Some dishes and windows would be broken.

- Unstable objects would be overturned.
- Pendulum clocks may stop.
- Heavy furniture moved
- Instances of fallen plaster
- Slight damage

Previous Occurrences

No earthquakes have been reported as having taken place in or affected Sunflower County.

Probability of Future Occurrence

In 2002, a study by the Center for Earthquake Research and Information (CERI) at the University of Memphis reported that, in any given 50-year interval, there is a seven to ten percent probability of the region experiencing an event at the level of the devastating 1811-1812 sequence of earthquakes in the New Madrid Zone. The study also estimated that there is an estimated 25 to 40 percent probability that a 6.0 magnitude event occurring a 50-year time period. The probability of future earthquake occurrence is, therefore, classified as susceptible

Assessing Vulnerability

The level of vulnerability is the same for all areas of the county given that there is no substantive geographic variation in distance from one end of the county to the City of New Madrid, MO, the epicenter of the New Madrid Seismic Zone. The distance between the New Madrid and the Town of Drew, in the northwest corner of the county, is an estimated 225.4 miles, and the distance to Town of Inverness as an estimated additional 36 miles further south. There is not enough a distance in proximity to New Madrid to say that one community is more vulnerable than the other.

There are recorded deaths, injuries, or property damage from earthquakes in Sunflower County. There is little likelihood of any detrimental effect on the County's economy, residents' lifestyle, or physical structures. However, the effects on life and property in the area and low hazard dams could be significant if a large earthquake were to occur given the nature of the built environment. In estimates derived from a report by the U.S. Geological Survey (USGS) "New Madrid Earthquake Project," the relative risk for Sunflower County and other sectors of MEMA District 3 for a potential seismic event with a magnitude of between 3 and 4 on the Richter scale.

Based on research completed by the USGS Earthquake Hazard Program suggests that buildings constructed using load-bearing masonry walls are vulnerable to damage by earthquakes, while steel and wood-frame buildings have a lower seismic vulnerability. Low-rise reinforced concrete buildings are also in this lower seismic risk category. Damage expected in such an event within the unincorporated areas of Sunflower County could include buildings, not secured to a solid foundation being shaken off their supports, and chimneys falling away from houses. Multi-story structures built with un-reinforced masonry buildings could be substantially damaged.

In reviewing earthquake effects on dams, the SHMP overlaid significant high hazard dams with historic seismic recordings and developed a dam inventory for earthquake prone counties. Dam/levee systems are also vulnerable to earthquake events as shown by the table below, which was presented earlier as Table H.12.

Table H. 17: Dam Inventory in Relation to Earthquake Prone Counties by Dam Type I Source: 2018 Mississippi StHMP

DISTRICT 3				
County	Significant	High	Medium	Low
Attala	1	2	44	47
Bolivar	-	-	14	14
Carroll	4	23	86	113
Holmes	1	5	39	45
Sunflower	-	-	4	4
Leflore	-	-	-	-
Montgomery	2	22	24	2
Sunflower	-	-	12	12
Washington	-	-	3	3

The County is being proactive on this score by maintaining open communications with the owners of the significant and high hazard dams and encouraging all three to maintain a current EAP.

Extreme Heat

Location and Extent

Heat waves cover a large area and cannot be confined within geographic boundaries. Therefore, all of Sunflower County could be exposed to extreme heat conditions. The extent of damage from heat events typically does not pose a threat to property or crops but can impact people with heat-related injuries or fatalities. The elderly, infants and disabled are most vulnerable to extreme heat conditions. It can cause crop damage and affect the livelihood of those working in the agricultural industry.

Previous Occurrences

As shown in Table H.18, there have been six recorded heat events from 2000 to 2019, and none since the 2015 RHMP was written. There were no damages, or loss of life/injury documented from these events.

Table H.18: Extreme Heat / Heat Occurrences 2000 to 2019 I Source: NCEI

Date	Event	Death	Injury	Property Damage	Crop Damage
8/1/2010	Excessive Heat	-	-	-	-
8/5/2007	Heat	-	-	-	-
7/15/2006	Heat	-	-	-	-
8/17/2005	Heat	-	-	-	-
7/23/2005	Heat	-	-	-	-
7/17/2000	Heat	1	-	-	-
Total		1	-	-	-

National Weather Service event narrative for the most recent occurrence (8/1/2010) is typical of how extent is described for the other events.

> A four day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS

> Jackson, MS forecast area, 19 record highs were set between August 1st and 4th. On August 2nd, the 2nd warmest average temperature was recorded. The low was 78 and the high 105, this resulted in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in 3 fatalities across the forecast area.

The deaths mentioned in this description occurred elsewhere in the region served by the Jackson, MS weather station, so they are a reminder that extreme heat affects the entire county and all populations. It is not feasible to discuss vulnerability broke down by jurisdiction because NCEI data for this hazard is all reported countywide.

Probability of Future Occurrence

While six events are listed in the table of historic events, two of these appear to be from an extended event that occurred over a two-month period. As such, for the purpose of determining probability, it is accurate to say that four events took place over a 19-year period, so there is a 21% percent chance of occurrence in any given year.

Assessing Vulnerability

Extreme Heat can affect certain populations but generally causes no property damage. During periods of extreme heat, there is little physical destruction, although roads can buckle, and livestock die. Extreme heat conditions can pose problems for those not accustomed to the climate or who are outside for prolonged periods of time. Extreme heat can create a threat even to individuals and communities that are accustomed to high temperatures. Excessive heat can also cause utility outages due to an increased demand for electricity. All of the following populations are prone to heat-related conditions: the elderly; young children; those who are immobile; persons who live alone especially without air conditioning; people without transportation; and people suffering from serious illnesses. Because NWS reports are county-based and events described are often regional occurrences, it is safe to say that the entire population of all county locations are vulnerable.

Expansive Soil

Location and Extent

Expansive soils are present throughout Mississippi and have been known to cause considerable damage to housing and infrastructure. Less than 50 percent of soils in Sunflower County consist of clay having is susceptible to swelling.

Previous Occurrences

There has been no record of expansive soil issues in Sunflower County.

Probability of Future Occurrence

The probability of expansive soils is classified as low. While it may be realistic to say that there is a zero percent chance of occurrence, it is not possible to document probability with no historic data. The fact that the community chose to keep this hazard in the plan and to profile it despite the lack of occurrences suggests that there is cause for low-level concern.

Assessing Vulnerability

Expansive soils could cause damage to infrastructure and to both business and residential structures within Sunflower County. Community leaders agreed that this is a hazard of low-level concern but wanted to retain it in the 2020 RHMP update to document that a discussion about the hazard took place.

Flood

Location and Extent

The entire geographic region of Sunflower County is at risk to riverine, flash flooding, and flooding caused by undersized overburdened stormwater management systems. All of the flood events cited from recent NCEI data below are documented as flash floods. Flood data shown below shows that all locations in the county are susceptible to flooding, and the extent of some events is listed as countywide.

Flash floods often occur when rain falls on the built environment where impervious surfaces, gutters, and storm sewers hasten the flow of run-off. Flowing waters can become raging torrents of water that course through streambeds and streets, sweeping away everything in their path.

Previous Occurrences

Table H.19 provides a summary of flood events recorded in Sunflower County from 2000 to 2019. While inadequate stormwater management capability likely contributes to flash flooding in all areas, it is noted where local creeks, rivers and their tributaries are located nearby and may be potential sources of overflow.

Table H.19: Flood Events 2000 to 2019 I Source: NCEI

Location	Date	Time	Type	Death	injury	Property Damage	Crop Damager
Sunflower	6/24/2019	2:20	Flash Flood	-	-	15,000	-
Pollock	5/9/2019	6:05	Flash Flood	-	-	10,000	-
Ruleville	2/22/2019	8:00	Flash Flood	-	-	10,000	-
Indianola	2/22/2019	7:00	Flash Flood	-	-	25,000	-
Moorhead	2/22/2019	2:00	Flash Flood	-	-	8,000	-
Indianola	2/20/2019	2:30	Flash Flood	-	-	4,000	-
Boyer	2/22/2018	9:32	Flash Flood	-	-	200,000	-
Ballaston	8/14/2017	6:54	Flash Flood	-	-	100,000	-
Indianola	7/9/2016	18:37	Flash Flood	-	-	4,000	-
Moorhead	3/31/2016	5:30	Flash Flood	-	-	15,000	
Dwyer	3/31/2016	4:45	Flash Flood	-	-	12,000	-
Moorhead	3/31/2016	4:45	Flash Flood	-	-	150,000	-
Inverness	3/31/2016	4:45	Flash Flood	-	-	90,000	-
Indianola	3/12/2016	20:40	Flood	-	-	200,000	-
Ruleville	3/10/2016	7:00	Flash Flood	-	-	5,000	-
Parchman	3/10/2016	6:59	Flash Flood	-	-	10,000	-
Indianola	3/10/2016	6:12	Flash Flood	-	-	8,000	-
Ruleville	7/18/2014	11:30	Flash Flood	-	-	50,000	-
Indianola	7/18/2013	14:45	Flash Flood	-	-	-	-

Location	Date	Time	Type	Death	injury	Property Damage	Crop Damager
Pollock	1/10/2013	11:00	Flash Flood	-	-	100,000	-
Mc Daniels	9/30/2012	19:30	Flash Flood	-	-	20,000	-
Indianola	9/30/2012	17:35	Flash Flood	-	-	-	-
Indianola	6/11/2012	18:40	Flash Flood	-	-	-	-
Heathman	7/25/2011	19:00	Flash Flood	-	-	30,000	-
Dockery	10/13/2009	14:23	Flash Flood	-	-	500,000	300,000
Ruleville	10/12/2009	9:50	Flash Flood	-	-	25,000	300,000
Ruleville	9/18/2009	5:00	Flash Flood	-	-	600,000	300,000
Sunflower Co.	5/6/2009	4:30	Flash Flood	-	-	5,000	-
Ruleville	2/27/2009	14:10	Flash Flood	-	-	100,000	-
Indianola	9/3/2008	22:00	Flash Flood	-	-	300,000	300,000
Countywide	5/10/2006	2:30	Flash Flood	-	-	100,000	-
Drew	6/17/2003	15:15	Flash Flood	-	-	50,000	-
Countywide	12/24/2002	0:05	Flash Flood	-	-	10,000	-
Countywide	9/26/2002	14:30	Flash Flood	-	-	1,050	-
Drew	7/12/2002	13:00	Flash Flood	-	-	1,000	-
Countywide	1/24/2002	9:45	Flash Flood	-	-	1,000	-
Drew	12/13/2001	17:30	Flash Flood	-	-	-	-
Countywide	11/29/2001	10:00	Flash Flood	-	-	-	-
Countywide	11/29/2001	3:00	Flash Flood	-	-	-	-
Parchman	5/3/2000	23:00	Flash Flood	-	-	10,000	-
Totals				-	-	$2,7570,000	$1,200,000

Table H.20: Sunflower County Flood Events 2001 to 2019 – Sorted by Location I Source: FEMA FIS Sunflower County 2018

Location	*# Events*	*Major Water Bodies*
Unincorporated Sunflower	***17***	*Brown Bayou, County Ditch, Cypress Creek, Dougherty Bayou, East Cypress Bayou, East Prong , East Sixmile Bayou, Lake Dawson, Wikon Slough, Wrong Prong, Lutken Bayou, Locust Bayou, Moorhead Bayou, Mound Bayou, Sixmile Bayou, Sixmile Diversion Channel, Tributary 1,2,3*
Doddsville	4	-
Drew	3	Lutkew Bayou, Powell Bayou,
Indianola	9	East Prong, Indian Bayou, South Bay, West Prong
Inverness	1	Mound Bay
Moorhead	3	Moorhead Bayou,
Ruleville	6	Wikon Slough, Dougherty Bayou, Tributary 1,2,3
Sunflower	1	Powell Bayou, Sixmile Diversion , West Prong

Information from the same table can be further sorted to assess vulnerability for the jurisdictions and unincorporated areas of the Sunflower County. All unincorporated communities, reference to part of the County, will be counted toward incidents not within an identified municipality.

While there is a section devoted to flood vulnerability further in this annex, vulnerability will also be addressed here, in proximity to the previous information.

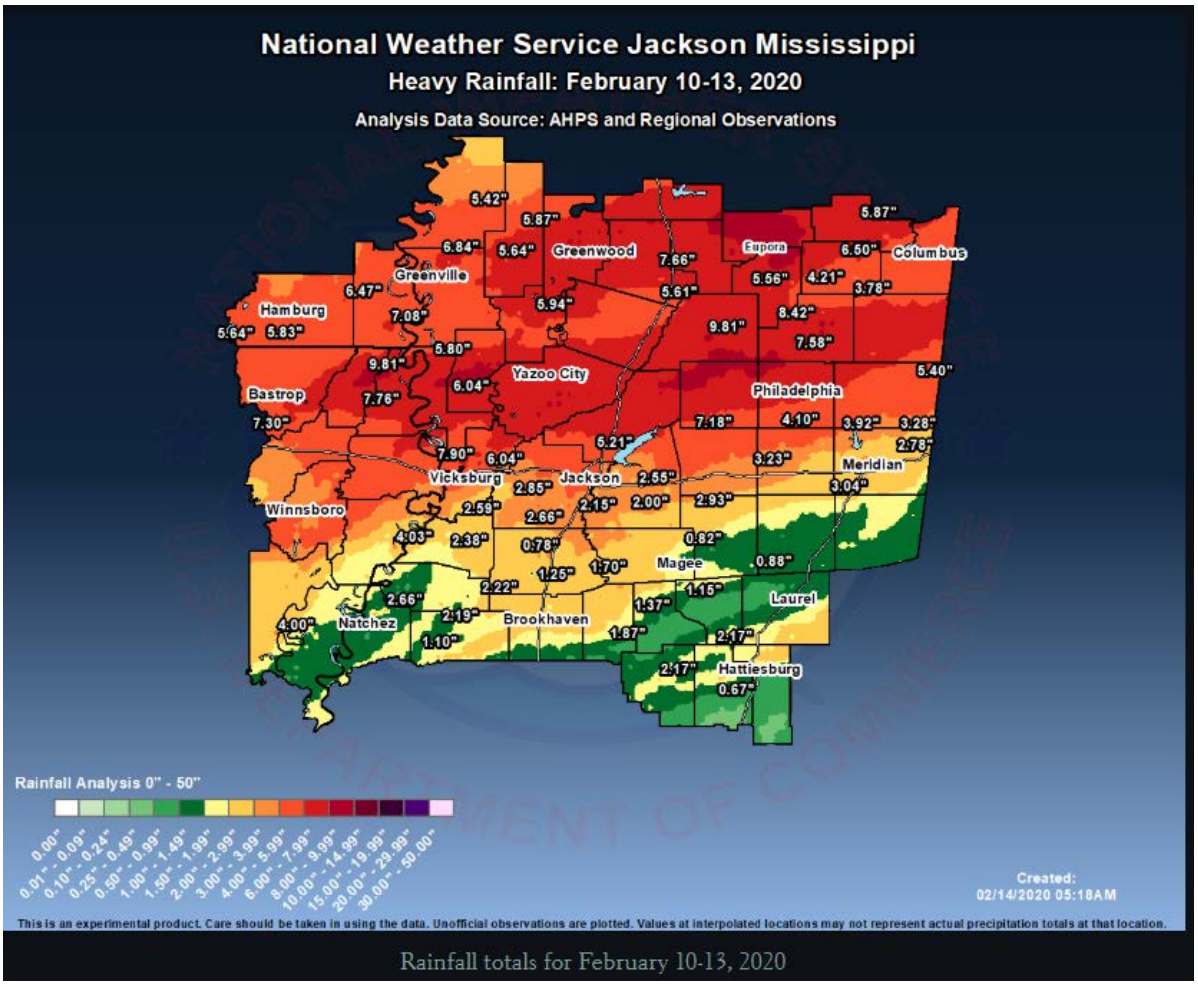
Table H.21: Geographic Vulnerability to Flood by Jurisdiction I Source: NCEI

Location	# Events	Vulnerability Level	Critical Points
Countywide Central Portion, East Portion	18	Medium	Presence of major rivers and tributaries covering most of the county
Town of Doddsville	4	Low	Location near major river and tributaries
City of Drew	3	Low	Location of minor canals throughout the city
City of Indianola	9	Medium	Location of major river running through city
Town of Inverness	1	Low	Location of minor canals throughout the town
City of Moorhead	3	Low	Location of minor canals throughout the city
City of Ruleville	6	Medium	Location of minor canals throughout the city
Town of Sunflower	1	Low	Location of minor canals throughout the town
Overall vulnerability of Sunflower County		Medium	Number events, that do not affect structures, input from the Office of Emergency Management

The planning region overall rated the community as moderately vulnerable to flooding based on the fact most of vulnerable land does not include at-risk structures. Also, the total dollar value of damages is relative given the length of time studied.

In addition to the events documented as occurring through 2019, MEMA District 3 experienced significant rainfall in early 2020 that had not yet been fully documented by NCEI at the time of plan development. The visual included on the next page as Figure H.7 shows that during the period of February 10-13, 2020, communities districtwide received between three to 14 inches of rain, and rain continued to fall – at times heavily – through the rest of the month. The Sunflower County Emergency Management Director said that rainfall affected roadways and caused his department to recognize the need for road improvements in certain areas to mitigate against future flooding. The map shows that Sunflower County received 5.64 inches during the documented period.

Figure H.7: February 10-13, 2020 Heavy Rainfall Event



Sunflower County and its 8 municipalities participate in the National Flood Insurance Program (NFIP).

Based on data obtained through the 2018 State of Mississippi Standard Hazard Mitigation Plan, Sunflower County could experience the following losses (Table H.22).

Table H.22 – Sunflower County HAZUS Flood Results I Source: HAZUS (2018 State of Mississippi Standard Hazard Mitigation Plan)

Structural Damage	Contents Damage	Inventory Loss	Total Building Loss	Income loss	Total Building and Income Loss	Bldg. Loss Ratio
$5,100,000	$5,777,000	$268,000	$11,145,000	$86,000	$11,231,000	3.1%

Residential at Risk	Other at Risk	Total Bldgs. Risk	No. of Bldgs. Substantially Damaged	No. of house-holds	No. of people needing shelter	Countywide Building Exposure
24	0	24	4	120	92	$1,051,934,000

The next two tables were also taken from the 2018 SHMP and, respectively, show the number of RL/SRL properties for Sunflower County and the eight other counties included in District 3 as well as the number of NFIP participating communities and number of properties mitigated for each county.

Table E.23: MEMA District 3 Repetitive Loss and Sever Repetitive Loss Properties – Over time and by County I Source: 2018 Mississippi SHMP

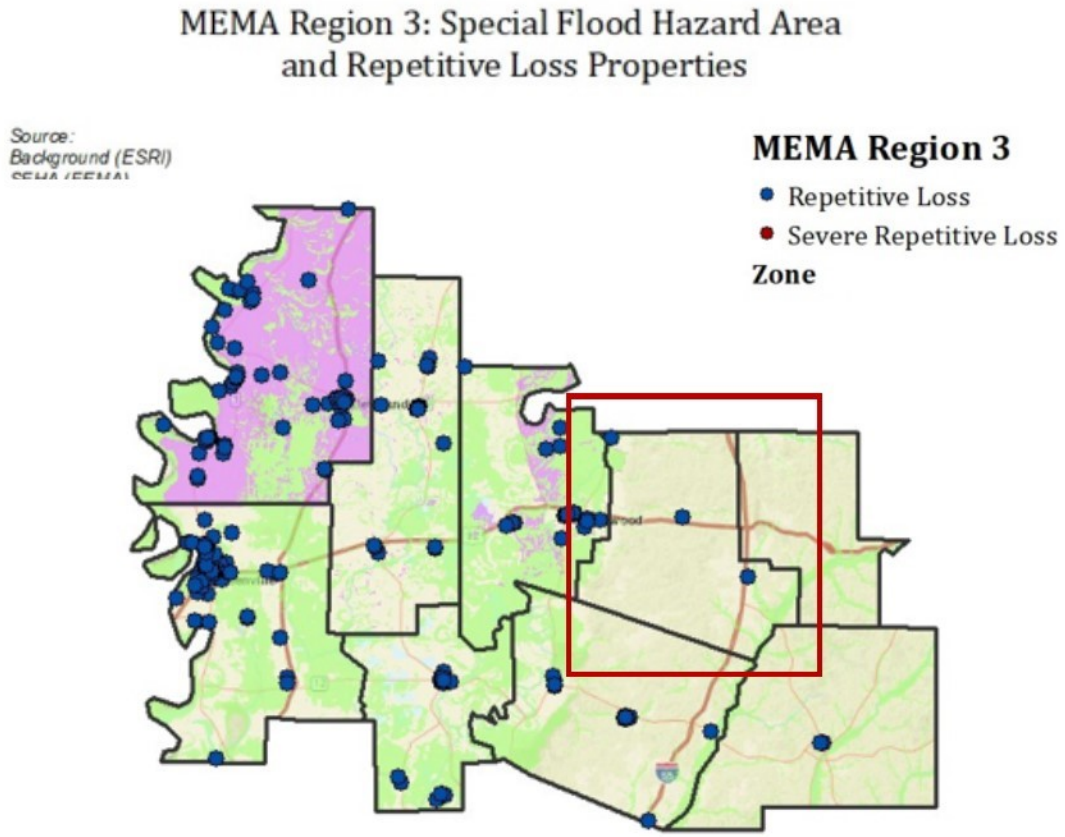
County	Repetitive Loss				Severe Repetitive Loss			
	No. of Properties 2009	No. of Properties 2011	No. of Properties 2016	No. of Flood Claims	No. of Properties 2009	No. of Properties 2011	No. of Properties 2016	No. of Flood Claims
Attala	0	0	1	2	0	0	0	0
Bolivar	155	108	210	631	2	48	2	228
Carroll	4	4	4	8	0	0	0	0
Holmes	11	12	12	27	0	0	0	0
Sunflower	40	31	46	161	2	10	1	61
Leflore	29	27	27	71	0	2	0	8
Montgomery	0	0	0	0	0	0	0	0
Sunflower	19	16	20	72	1	4	0	21
Washington	152	115	191	631	14	48	8	250
Totals	410	313	511	1,603	19	112	11	568

Table E.24: MEMA District 3 Participating Communities and Number of Mitigated Properties by County I Source: 2018 Mississippi SHMP

County	No. of NFIP Communities	No. of Mitigated Properties
Attala	5	0
Bolivar	16	20
Carroll	4	0
Holmes	8	0
Sunflower	5	1
Leflore	6	1
Montgomery	4	0
Sunflower	8	4
Washington	6	26
Totals	61	52

The Capabilities Assessment of this Annex identifies NFIP participation and also the fact that a Flood insurance Study was conducted when FEMA developed local Flood Insurance Rate Maps (FIRMs). There are 20 repetitive loss properties in the county. The map below, also from the 2018 SHMP shows the location of Special Flood Hazard Areas (SFHAs) and RL structures for each county in Region 3 (including the ones in Sunflower County).

Figure H.8: MEMA District 3 Special Flood Hazard Area (SHFA) and Repetitive Loss Structures I Source: 2018 Mississippi SHMP



Repetitive and Severe Repetitive Loss Properties

Based on based available data, as shown in Table H.22, there are 20 properties listed on the state's repetitive loss property database, of which none have been mitigated. These properties probably have not been mitigated due to the fact that providing replacement housing and relocation assistance for the low-income residents in this area is an issue. Additional information regarding these properties is provided in the mitigation strategy chapter of this plan.

Residents of Sunflower County participating in the National Flood Insurance Program (NFIP) have received over $676,386 in flood loss payments. Details regarding the NFIP program by community are provided in the capability's assessment section of this annex.

Table H.25: Repetitive Flood and Severe Repetitive Loss Properties I Source: MEMA RL Listing 02-28-2011

	Repetitive Flood							
Jurisdiction	Community ID	No. of properties	No. Mitigated	No. Insured	Total Losses	Total Bldg. Payments	Total Contents	Total Paid
Sunflower County	280195	4	-	-	9	89,814.80	2,769.46	92,584.26
Drew	280163	5	3	-	19	151,795.22	42,752.04	194,547.26
Indianola	280164	2	-	-	9	28,440.10	11,427.54	39,867.64
Moorhead	280166	1	-	-	2	42,484.27	4,731.42	47,215.69
Ruleville	280167	4	-	-	12	40,376.14	10,491.15	50,867.29
Total Repetitive Flood		16	3	-	51	$352,910.53	$72,171.61	$425,082.14

Jurisdiction	Severe Repetitive Loss							
	Community ID	No. of properties	No. Mitigated	No. Insured	Total Losses	Total Bldg. Payments	Total Contents	Total Paid
Sunflower County	280195	1	-	-	2	24,375.00	2,097.50	26,472.50
Drew	280163	2	-	-	12	106,647.85	41,196.70	147,844.55
Ruleville	280167	1	-	-	7	55,614.48	21,354.49	76,968.97
Total Severe Repetitive Loss		4	-	-	21	$186,637.33	$64,648.69	$251,286.02
Totals		20	3	-	72	$539,547.86	$136,820.30	$676,368.16

Probability of Future Occurrence

Flooding events continue to be a threat in Sunflower County and the probability of future occurrences will remain as highly likely given the history of flood events; the presence of an overtaxed drainage system; and location in the region of the Yazoo River and its many tributaries. NCEI data shows that one or more portions of the County reported flooding in 10 of the 19 years of data being studied. This suggests that there is a 79% chance of flooding in any given year. As such, it is highly likely that the community will see flooding roughly once every 18 to 24 months.

Assessing Vulnerability

Impact on Transportation Systems: Sunflower: County includes several state-owned bridges located on US Highways 49W and State Highways 3, 8 and 32. These serve as vital transportation and evacuation routes for the county and surrounding areas. These bridges cross portions of delineated floodplains and are susceptible to flood damage.

In addition to bridges, roadways are subject to inundation and overtopping by periods of heavy rain, which appear likely to occur more frequently given climate change observations. Storm events generally projected to occur as 100-year flood events are occurring more frequently. The potential loss could include up to the full replacement value of the bridge structure if flooding results in bridge collapse. In severe cases, roadways could also be undermined, causing complete or partial washout of roadbed and collapse of the road surface. Bridges and roadways with a history of flood impact could benefit from mitigation projects.

Impact on Lifeline Utility Systems: Lifeline utility systems such as electric power, gas, utility and water distribution and telephone service are generally not significantly affected by flood events, although flooded lift stations could result in storm water infiltration into treatment facilities. A facility's power source could be interrupted during ***Impact*** a flood and result in expensive repairs unless the supply is elevated.

Severe Storm (Lightning, Hail and Severe Wind)

Location and Extent

Severe storms include non-spatial elements and, therefore, can be described as equally affecting all areas of Sunflower County. All municipalities and unincorporated areas are susceptible to lightning, hail, and severe wind events. Of particular concern are persons who reside in a mobile/manufactured home, as well as the elderly, and disabled because of their potential lack of mobility to respond to an unexpected hazard situation. It is strongly recommended that all manufactured housing be fastened to the ground. The National Association of Certified Home Inspectors (NACHI) describes a housing

tie downs as a system of "heavy-duty straps and anchors designed to stabilize manufactured homes (also known as mobile homes) during high winds." The organization points out that failure to properly install and maintain tie-downs results in reduced capacity to resist sliding and overturning.

Previous Occurrences

The next four tables and subsequent two figures show numerous severe storm events have occurred countywide.

Table H.26: Total Severe Storm Events in Sunflower County I Source: NCEI

Total – All Severe Weather Events					
Hazard Event	**No of Events**	**Property Damage**	**Crop Damage**	**Deaths**	**Injuries**
Lightning	2	202,000	-	-	-
Hail	48	2,477,000	3,500,000	-	-
Severe Wind	86	8,215,000	50,000	-	-
Totals	**136**	**$10,894,000**	**$3,550,000**	-	-

Table H.27 – Lightning Events 2000 to 2019 I Source: NCEI

Location	Date	Time	Death	Injury	Property Damage	Crop Damage
Rome	4/3/2010	2:00	-	-	200,000	-
Blaine	10.9.2009	11:29	-	-	2,000	-
Total					$202,000	-

Between the years 2000 and 2019, two lighting events is listed as having to occur in unincorporated Rome and Blaine area.

Between the years 2000 and 2019, 48 hailstorm events recorded by the National Weather Service. Captured in the table below, the data shows that all incorporated and unincorporated areas of the county were affected, and the recorded hail magnitude ranged from .75" to 2.75" and total recorded damage was $2,477,000 in property damage and $3,500,000 in crop damage.

Table H.28 – Hail Events 2000 to 2019 I Source: NCEI

Location	Date	Event	Mag	Death	Injury	Property Damage	Crop Damage
Ballaston	11/30/2019	Hail	1.00 in.	-	-	-	-
Fairview	11/29/2016	Hail	2.75 in.	-	-	10,000	-
Holly Ridge	6/17/2016	Hail	0.88 in.	-	-	-	-
Rome	3/31/2016	Hail	1.00 in.	-	-	-	-
Indianola	3/3/2016	Hail	1.00 in.	-	-	-	-
Waco	3/31/2015	Hail	1.00 in.	-	-	-	-
Doddsville	10/12/2014	Hail	1.00 in.	-	-	2,000	-
Fairview	03/23/2013	Hail	1.00 in.	-	-	-	-
Bowles	03/18/2013	Hail	1.75 in.	-	-	10,000	
Mackman	08/13/2012	Hail	1.00 in.	-	-	-	-
Linn	08/13/2012	Hail	1.00 in.	-	-	-	-
Drew	08/13/2012	Hail	1.75 in.	-	-	15,000	
Lombardy	08/13/2012	Hail	1.00 in.	-	-	500	
Moorhead	05/30/2012	Hail	1.00 in.	-	-	-	-

Parchman	06/24/2011	Hail	1.75 in.	-	-	20,000	
Caile	04/20/2011	Hail	1.50 in.	-	-	-	-
Caile	03/29/2011	Hail	1.00 in.	-	-	-	-
Dwiggins	03/26/2011	Hail	1.00 in.	-	-	-	-
Ruleville	10/24/2010	Hail	0.88 in.	-	-	-	-
Halstead	10/24/2010	Hail	1.00 in.	-	-	-	-
Frazier	10/24/2010	Hail	1.00 in.	-	-	-	-
Dockery	05/17/2010	Hail	0.75 in.	-	-	-	-
Dockery	05/17/2010	Hail	0.75 in.	-	-	-	-
Inverness	04/23/2010	Hail	1.00 in.	-	-	-	-
Pollock	04/23/2010	Hail	1.75 in.	-	-	2,000	-
Roundaway	04/12/2009	Hail	1.00 in.	-	-	-	-
Heathman	04/02/2009	Hail	0.75 in.	-	-	-	-
Lombardy	04/02/2009	Hail	0.75 in.	-	-	-	-
Drew	04/02/2009	Hail	0.75 in.	-	-	-	-
Frazier	02/27/2009	Hail	0.88 in.	-	-	-	-

Location	Date	Event	Mag	Death	Injury	Property Damage	Crop Damage
Drew	02/27/2009	Hail	1.25 in.	-	-	2,000	-
Mc Daniels	02/27/2009	Hail	0.88 in.	-	-	-	-
Parchman	06/01/2008	Hail	1.50 in.	-	-	25,000	-
Drew	04/22/2008	Hail	0.88 in.	-	-	-	-
Indianola	04/22/2008	Hail	1.75 in.	-	-	-	-
Blaine	11/14/2007	Hail	1.00 in.	-	-	-	-
Indianola	06/08/2007	Hail	1.00 in.	-	-	-	-
Blaine	06/08/2007	Hail	1.00 in.	-	-	-	-
Sunflower	05/15/2007	Hail	0.75 in.	-	-	-	-
Sunflower	05/10/2007	Hail	0.88 in.	-	-	-	-
Ruleville	05/10/2006	Hail	0.75 in.	-	-	-	-
Ruleville	05/10/2006	Hail	0.75 in.	-	-	-	-
Parchman	04/20/2006	Hail	1.00 in.	-	-	-	-
Drew	04/07/2006	Hail	0.88 in.	-	-	-	-
Doddsville	04/07/2006	Hail	1.75 in.	-	-	-	-
Inverness	04/07/2006	Hail	2.00 in.	-	-	700,000	1,000,000
Holly Ridge	04/07/2006	Hail	1.75 in.	-	-	200,000	200,000
Ruleville	04/07/2006	Hail	2.50 in.	-	-	1,200,000	2,000,000
Inverness	04/07/2006	Hail	1.75 in.	-	-	200,000	300,000
Doddsville	03/31/2006	Hail	1.00 in.	-	-	-	-
Moorhead	03/11/2006	Hail	1.75 in.	-	-	10,000	-
Indianola	12/04/2005	Hail	0.88 in.	-	-	-	-
Ruleville	11/15/2005	Hail	0.88 in.	-	-	-	-
Frazier	04/29/2005	Hail	1.00 in.	-	-	-	-
Parchman	04/06/2005	Hail	0.88 in.	-	-	-	-
Dockery	03/26/2005	Hail	0.88 in.	-	-	-	-
Drew	03/13/2005	Hail	0.75 in.	-	-	-	-
Drew	02/23/2005	Hail	1.00 in.	-	-	-	-
Indianola	10/25/2003	Hail	1.00 in.	-	-	1,000	-
Parchman	05/05/2003	Hail	0.88 in.	-	-	1,000	-
Ruleville	05/05/2003	Hail	0.75 in.	-	-	1,000	-
1. Drew	03/13/2003	Hail	1.00 in.	-	-	2,000	-
Drew	07/19/2002	Hail	1.00 in.	-	-	-	-

Ruleville	08/19/2001	Hail	1.00 in.	-	-	15,000	-
Parchman	05/28/2001	Hail	0.88 in.	-	-	-	-
Drew	05/27/2001	Hail	0.88 in.	-	-	-	-
Parchman	02/24/2001	Hail	1.50 in.	-	-	50,000	-
Inverness	03/10/2000	Hail	1.75 in.	-	-	10,000	-
						Property	Crop Damage
Totals				0	0	2,477,000	3,500,000

Historical data for severe wind events shows that they occur with great frequency in all incorporated and unincorporated sections of the county. While agricultural damage was reported in one instance, events primarily create general property damage totaling over $8,215,000 in property damage and $50,000 in crop damage.

Table H.29 – Severe Wind Events 2000 to 2019 I Source: NCEI

Location	Date	Event Type	Mag	Death	Injury	Property Damage	Crop Damage
Pentecost	6/19/2019	Thunderstorm Wind	60 kts. EG	-	-	100,000	-
Indianola	6/19/2019	Thunderstorm Wind	56 kts. EG	-	-	35,000	-
Inverness	5/8/2019	Thunderstorm Wind	50 kts. EG	-	-	5,000	-
Indianola	5/8/2019	Thunderstorm Wind	50 kts. EG	-	-	5,000	-
Cottondale	4/7/2019	Thunderstorm Wind	52 kts. EG	-	-	5,000	-
Pollock	11/1/2018	Thunderstorm Wind	50 kts. EG	-	-	5,000	-
Inverness	8/20/2018	Thunderstorm Wind	50 kts. EG	-	-	5,000	-
Indianola	8/20/2018	Thunderstorm Wind	50 kts. EG	-	-	15,000	-
Drew	8/20/2018	Thunderstorm Wind	50 kts. EG	-	-	10,000	-
Indianola	7/21/2018	Thunderstorm Wind	60 kts. EG	-	-	8,000	-
Drew	7/21/2018	Thunderstorm Wind	63 kts. EG	-	-	50,000	-
Parchman	7/21/2018	Thunderstorm Wind	74 kts. EG	-	-	300,000	-
Ruleville	7/20/2018	Thunderstorm Wind	50 kts. EG	-	-	30,000	-
Moorhead	7/6/2018	Thunderstorm Wind	50 kts. EG	-	-	10,000	-
Doddsville	5/30/2028	Thunderstorm Wind	54 kts. EG	-	-	75,000	-
Linn	5/15/2018	Thunderstorm Wind	50 kts. EG	-	-	5,000	-
McDaniels	4/14/2018	Thunderstorm Wind	55 kts. EG	-	-	15,000	-
Doddsville	4/3/2018	Thunderstorm Wind	50 kts. EG	-	-	5,000	-
Heathman	4/2/2017	Thunderstorm Wind	54 kts. EG	-	-	15,000	-
Dockery	3/25/2017	Thunderstorm Wind	65 kts. EG	-	-	175,000	-
Ruleville	7/14/2016	Thunderstorm Wind	50 kts. EG	-	-	14,000	-
Indianola	7/14/2016	Thunderstorm Wind	55 kts. EG	-	-	10,000	-
Drew	12/23/2015	Thunderstorm Wind	50 kts. EG	-	-	5,000	-
Dwyer	6/24/2015	Thunderstorm Wind	50 kts. EG	-	-	3,000	-
Holly Ridge	5/16/2015	Thunderstorm Wind	50 kts. EG	-	-	4,000	-
Indianola	4/19/2015	Thunderstorm Wind	55 kts. EG	-	-	5,000	-
Lombardy	4/3/2015	Thunderstorm Wind	55 kts. EG	-	-	3,000	-
Dwyer	10/12/2014	Thunderstorm Wind	55 kts. EG	-	-	8,000	-
Moorhead	6/9/2014	Thunderstorm Wind	53 kts. EG	-	-	8,000	-
Inverness	6/9/2014	Thunderstorm Wind	50 kts. EG	-	-	8,000	-
Indianola	6/8/2014	Thunderstorm Wind	50 kts. EG	-	-	10,000	-
Inverness	6/4/2014	Thunderstorm Wind	52 Kts. EG	-	-	-	-
Indianola	4/4/2014	Thunderstorm Wind	54 kts. EG	-	-	7,000	-
Drew	06/09/2013	Thunderstorm Wind	52 kts. EG	-	-	30,000	-
Inverness	05/21/2013	Thunderstorm Wind	50 kts. EG	-	-	15,000	-

Location	Date	Event Type	Mag	Death	Injury	Property Damage	Crop Damage
Fairview	01/29/2013	Thunderstorm Wind	65 kts. EG	-	-	50,000	-
Indianola	12/20/2012	Thunderstorm Wind	50 kts. EG	-	-	15,000	-
Rome	10/17/2012	Thunderstorm Wind	50 kts. EG	-	-	2,000	-
Mc Daniels	08/13/2012	Thunderstorm Wind	50 kts. EG	-	-	1,000	-
Dockery	08/13/2012	Thunderstorm Wind	50 kts. EG	-	-	7,000	-
Drew	08/13/2012	Thunderstorm Wind	50 kts. EG	-	-	3,000	-
Ruleville	08/13/2012	Thunderstorm Wind	50 kts. EG	-	-	2,000	-
Woodburn	06/11/2012	Thunderstorm Wind	44 kts. MG	-	-	100	-
Ruleville	06/11/2012	Thunderstorm Wind	60 kts. EG	-	-	75,000	-
Indianola	06/04/2012	Thunderstorm Wind	50 kts. EG	-	-	15,000	-
Inverness	05/30/2012	Thunderstorm Wind	55 kts. EG	-	-	12,000	-
Mackman	03/02/2012	Thunderstorm Wind	57 kts. EG	-	-	40,000	-
Sunflower (Zone)	02/23/2012	Strong Wind	43 kts. EG	-	-	10,000	-
Dwiggins	02/01/2012	Thunderstorm Wind	55 kts. EG	-	-	30,000	-
Indianola	07/25/2011	Thunderstorm Wind	43 kts. EG	-	-	300	-
Dwyer	07/13/2011	Thunderstorm Wind	50 kts. EG	-	-	3,000	-
Dwyer	07/08/2011	Thunderstorm Wind	50 kts. EG	-	-	5,000	-
Sunflower	07/04/2011	Thunderstorm Wind	48 kts. EG	-	-	500	-
Moorhead	06/13/2011	Thunderstorm Wind	50 kts. EG	-	-	25,000	-
Dwyer	06/13/2011	Thunderstorm Wind	50 kts. EG	-	-	50,000	-
Drew	06/13/2011	Thunderstorm Wind	50 kts. EG	-	-	10,000	-
Waco	06/07/2011	Thunderstorm Wind	50 kts. EG	-	-	5,000	-
Indianola	05/25/2011	Thunderstorm Wind	50 kts. EG	-	-	10,000	-
Drew	05/25/2011	Thunderstorm Wind	50 kts. EG	-	-	25,000	-
Parchman	04/27/2011	Thunderstorm Wind	50 kts. EG	-	-	30,000	-
Indianola	04/04/2011	Thunderstorm Wind	60 kts. EG	-	-	20,000	-
Indianola	02/24/2011	Thunderstorm Wind	65 kts. EG	-	-	60,000	-
Goldfield	02/24/2011	Thunderstorm Wind	70 kts. EG	-	-	40,000	-
Indianola	12/11/2010	Thunderstorm Wind	62 kts. EG	-	-	30,000	-
Cottondale	10/24/2010	Thunderstorm Wind	55 kts. EG	-	-	20,000	-
Linn	10/24/2010	Thunderstorm Wind	52 kts. EG	-	-	3,000	-
Ruleville	05/17/2010	Thunderstorm Wind	50 kts. EG	-	-	1,000	-
Ruleville	05/17/2010	Thunderstorm Wind	52 kts. EG	-	-	-	-
Indianola	04/03/2010	Thunderstorm Wind	50 kts. EG	-	-	15,000	-
Ruleville	04/03/2010	Thunderstorm Wind	50 kts. EG	-	-	15,000	-
Ruleville	10/09/2009	Thunderstorm Wind	50 kts. EG	-	-	5,000	-
Indianola	10/09/2009	Thunderstorm Wind	60 kts. EG	-	-	35,000	-
Inverness	07/16/2009	Thunderstorm Wind	50 kts. EG	-	-	-	-
Doddsville	06/23/2009	Thunderstorm Wind	50 kts. EG	-	-	3,000	-
Sunflower (Zone)	04/18/2009	Strong Wind	43 kts. EG	-	-	2,000	-
Indianola	04/02/2009	Thunderstorm Wind	50 kts. EG	-	-	-	-
Indianola	08/02/2008	Thunderstorm Wind	53 kts. EG	-	-	80,000	-
Parchman	07/27/2008	Thunderstorm Wind	65 kts. EG	-	-	55,000	-
Inverness	06/01/2008	Thunderstorm Wind	60 kts. EG	-	-	15,000	-
Drew	06/01/2008	Thunderstorm Wind	53 kts. EG	-	-	10,000	-

Location	Date	Event Type	Mag	Death	Injury	Property Damage	Crop Damage
Moorhead	01/08/2008	Thunderstorm Wind	55 kts. EG	-	-	25,000	-
Doddsville	01/08/2008	Thunderstorm Wind	57 kts. EG	-	-	12,000	-
Indianola	10/18/2007	Thunderstorm Wind	60 kts. EG	-	-	60,000	-
Caile	08/17/2007	Thunderstorm Wind	58 kts. EG	-	-	10,000	-
Drew	06/18/2007	Thunderstorm Wind	53 kts. EG	-	-	10,000	-
Blaine	06/08/2007	Thunderstorm Wind	55 kts. EG	-	-	4,000	-
Sunflower	05/15/2007	Thunderstorm Wind	50 kts. EG	-	-	-	50,000
Moorhead	05/03/2007	Thunderstorm Wind	50 kts. EG	-	-	-	-
Inverness	05/03/2007	Thunderstorm Wind	65 kts. EG	-	-	25,000	-
Moorhead	05/03/2007	Thunderstorm Wind	52 kts. EG	-	-	-	-
Inverness	11/15/2006	Thunderstorm Wind	50 kts. EG	-	-	-	-
Ruleville	09/23/2006	Thunderstorm Wind	50 kts. EG	-	-	8,000	-
Ruleville	05/10/2006	Thunderstorm Wind	50 kts. EG	-	-	20,000	-
Central Portion	05/10/2006	Thunderstorm Wind	55 kts. EG	-	-	100,000	-
Inverness	04/07/2006	Thunderstorm Wind	67 kts. EG	-	-	500,000	-
Drew	04/07/2006	Thunderstorm Wind	65 kts. EG	-	-	100,000	-
Indianola	03/09/2006	Thunderstorm Wind	80 kts. EG	-	-	5,000,000	-
Indianola	11/15/2005	Thunderstorm Wind	52 kts. EG	-	-	10,000	-
Ruleville	06/08/2005	Thunderstorm Wind	50 kts. EG	-	-	-	-
Inverness	04/06/2005	Thunderstorm Wind	60 kts. EG	-	-	23,000	-
Indianola	12/07/2004	Thunderstorm Wind	55 kts. EG	-	-	1,000	-
Inverness	11/23/2004	Thunderstorm Wind	70 kts. EG	-	-	20,000	-
Blaine	11/23/2004	Thunderstorm Wind	70 kts. EG	-	-	10,000	-
Inverness	06/21/2004	Thunderstorm Wind	70 kts. EG	-	-	50,000	-
Indianola	10/25/2003	Thunderstorm Wind	55 kts. ES	-	-	20,000	-
Sunflower	07/17/2003	Thunderstorm Wind	50 kts. ES	-	-	10,000	-
Sunflower	07/17/2003	Thunderstorm Wind	52 kts. ES	-	-	2,000	-
Inverness	06/11/2003	Thunderstorm Wind	55 kts. ES	-	-	15,000	-
Countywide	06/11/2003	Thunderstorm Wind	50 kts. ES	-	-	10,000	-
Minot	06/11/2003	Thunderstorm Wind	50 kts. MG	-	-	1,000	-
Parchman	06/11/2003	Thunderstorm Wind	50 kts. MG	-	-	1,000	-
Inverness	06/02/2003	Thunderstorm Wind	55 kts. ES	-	-	20,000	-
Indianola	05/11/2003	Thunderstorm Wind	50 kts. ES	-	-	1,000	-
Ruleville	08/19/2001	Thunderstorm Wind	52 kts. ES	-	-	3,000	-
Total				-	-	$8,215,000	50,000

Probability of Future Occurrence

Historical NCEI data suggests a lighting event has a 10.5% change of occurring annually since there has been one event in a 19-year period. There is a89% chance of a hail event occurring in annually and 98 or 100% chance of a severe wind event will occur annually throughout the county.

Assessing Vulnerability

Severe weather events are non-spatial and may occur anywhere in the county. While they cause total property damages of $10,894,500 and $3,550,000 in crop damages, and the dollar value for most events is relatively low. As such, the county is ranked as having a medium vulnerability to severe weather.

Impact on Life and Property: severe storms (high wind, hail, and lightning) do not have particular impacts in any one geographical section of the County. However, hail and heavy rain would have the greatest impact on the agricultural community. The economic impacts of this hazard cannot be evaluated geographically. Critical County infrastructure is unlikely to be affected by this hazard.

While Sunflower County's entire population is considered at medium risk to severe weather. There are frequent occurrences but the level of damage per event is lower than for an event as potentially deadly as a tornado or hurricane. Those living in rural areas and special populations, such as those living in mobile homes, the elderly and disabled, may be most vulnerable.

Maps on the next two pages show a sampling of historic hail and severe wind events that have crossed the county.

Figure H.9 – Sample of Historic Hail Events

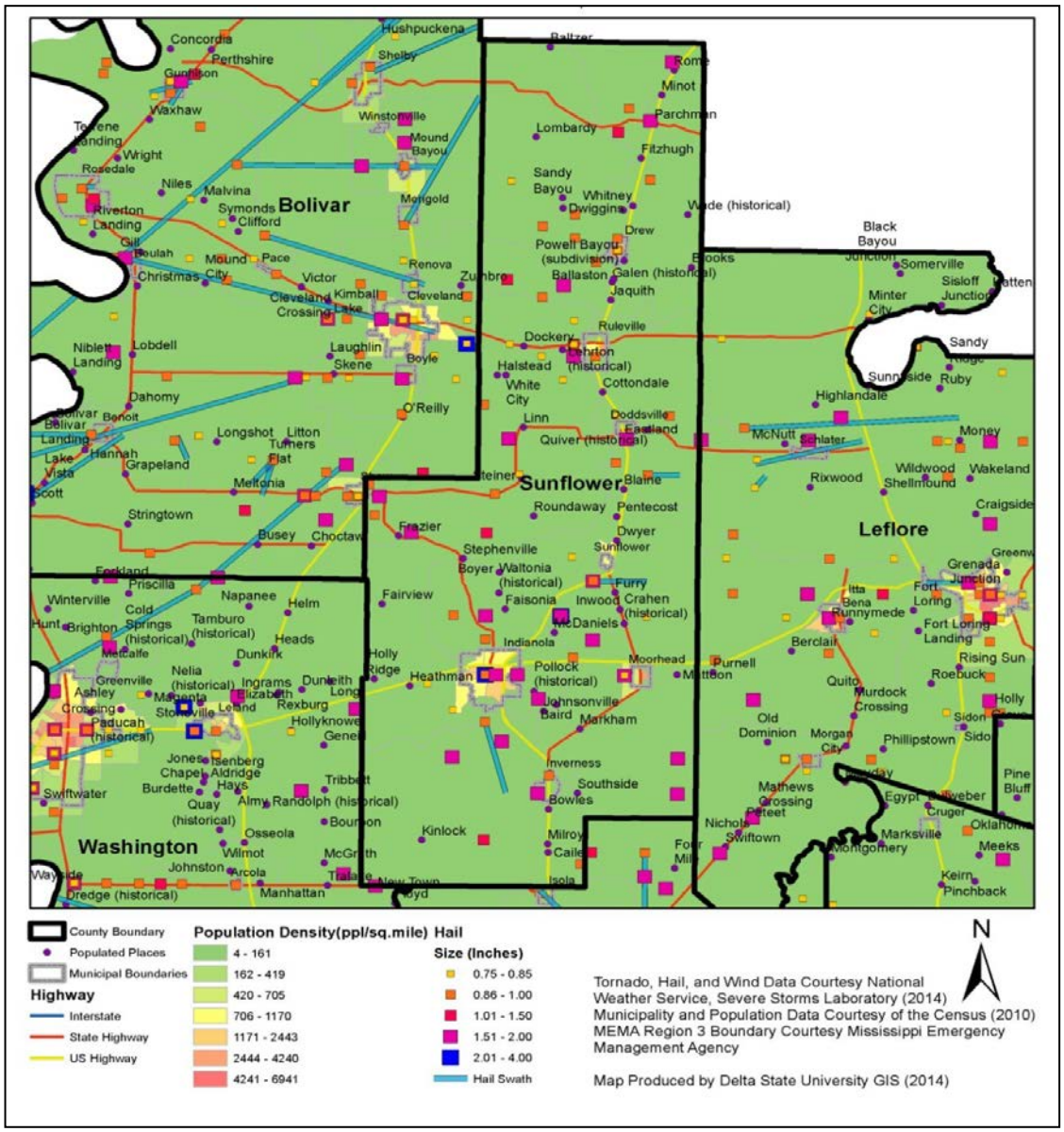
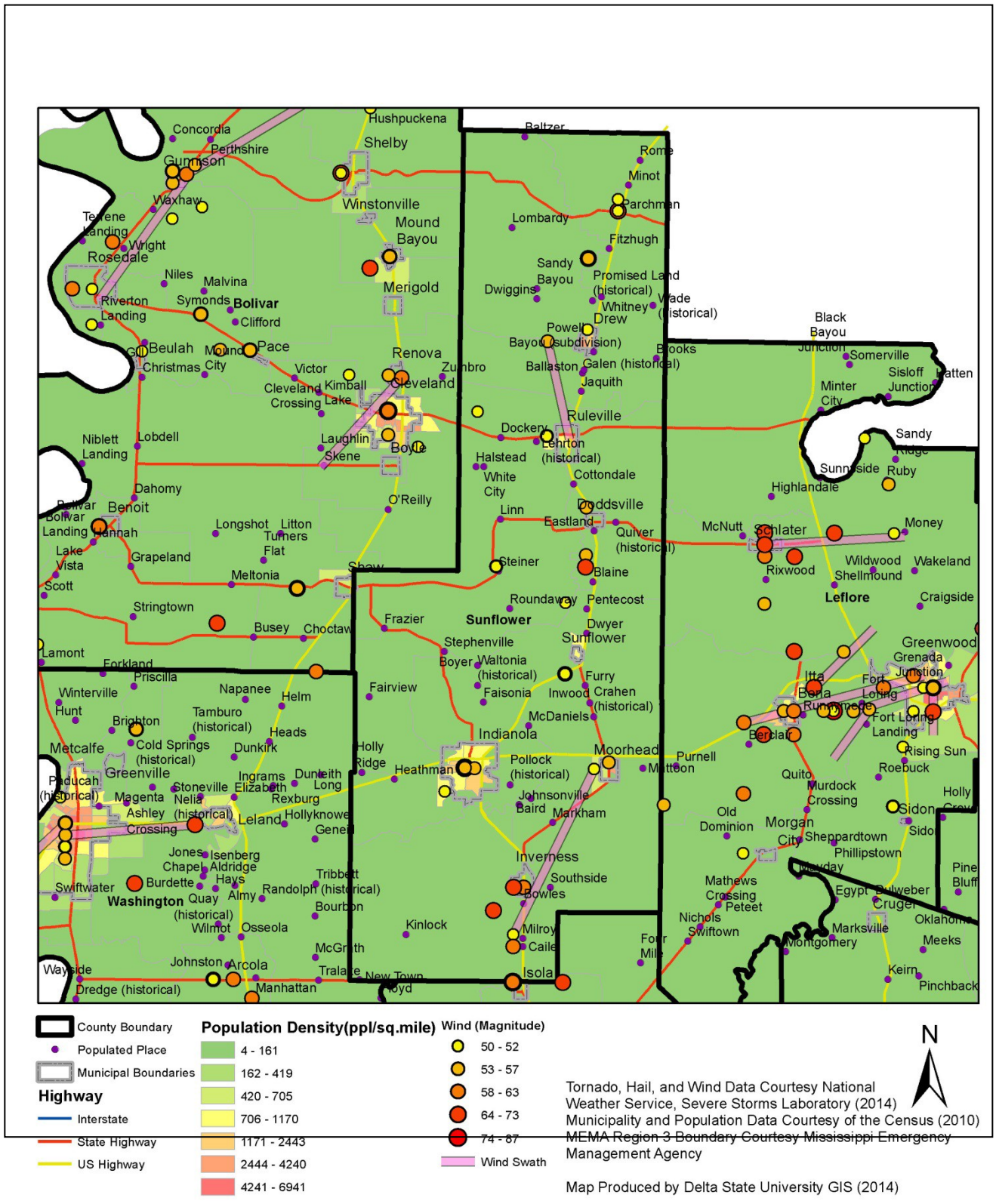


Figure H.10 – Sample of Historic Severe Wind Events



Severe Winter Weather

Location and Extent

All of Sunflower County is susceptible to severe winter storm events. As such, they generally are not confined to one geographic area but may, in fact, extend regionally and across multiple states. The extent of impacts can include prolonged power outages and possible energy shortages. Severe weather may affect businesses operations, causing them to lose income. The same is true for workers, who may be unable to navigate roadways to travel to work, or if workplace is closed due to loss of power. Ice buildup on roads and bridges creates dangerous driving conditions. When ice accumulates on power lines and trees, either or both could be downed from the weight of the ice. All Heavy snow has been known to cause roof cave ins. The elderly and disabled residents in Sunflower County who may have limited mobility should be considered very vulnerable. Measures should be taken to ensure that they are safe and warm

Previous Occurrences

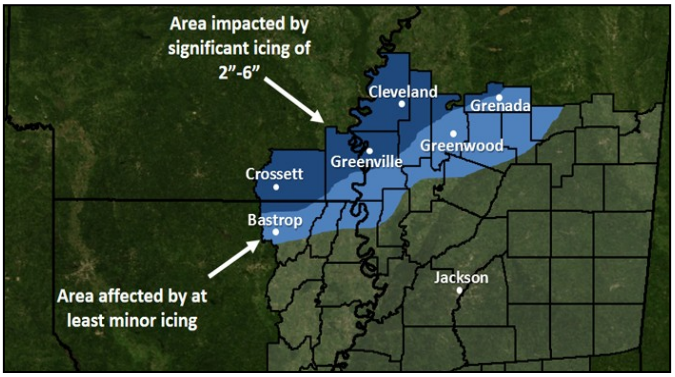
Table H.30 shows that there have been 16 severe winter storm events recorded in Sunflower County between the years 2000 and 2019. These events include hazards such as sleet, cold/wind chill, heavy snow, and ice storm.

Table H.30 – Severe Winter Weather Events 2000 to 2019 I Source: NCEI

Date	Type	Death	Injury	Property Damag	Crop Dama
1/8/2017	Cold/wind chill	-	-	-	-
2/25/15	Heavy Snow	-	-	-	-
1/15/201	Ice Storm	-	-	15,000	-
1/14/201	Ice Storm	-	-	10,000	-
2/9/2011	Heavy Snow	-	-	450,000	-
1/9/2011	Heavy Snow	-	-	20,000	-
1/9/2011	Ice Storm	-	-	30,000	-
3/7/2008	Heavy Snow	-	-	20,000	-
1/25/200	Ice Storm	-	-	150,000	-
2/18/200	Ice Storm	-	-	10,000	-
12/22/20	Ice Storm	-	-	100,000	-
2/26/200	Ice Storm	-	-	5,000	-
12/13/20	Ice Storm	-	-	5,000	-
12/31/20	Heavy Snow	-	-	-	-
1/20/200	Heavy Snow	-	-	100,000	-
Total		-	-	$1,415,000	-

February 9-11, 1994 Ice Storm – ArkLaMiss Delta (source NWS Jackson): The map below represents the approximate area within the NWS Jackson forecast area impacted by the February 1994 ice storm. Areas shaded in light blue experienced at least some icing, mainly during the late-night hours of February 9th into the morning hours of February 10th. Areas shaded in a darker blue experienced a more prolonged period of icing beginning on the evening of February 9th lasting into the morning of February 11th.

This storm began with a sharp cold front with temperatures ranging from 70 degrees at midnight on February 9th to 28 degrees at 8 pm with light to moderate rain showers following the front. Ice began to accumulate causing tree branches to break and eventually entire trees thus causing power outages throughout the Delta. Making matters worse, a new low pressure system developed in the northwestern Gulf of Mexico along the front that had pushed through the area on Wednesday.



This low tracked along the front toward the Mississippi coast on Thursday, spreading a new round of heavy precipitation northward across the state. Moderate freezing rain, which was already enough to cause significant issues Wednesday night and Thursday morning, became heavy freezing rain with thunder around noon on Thursday. This caused a significant escalation of issues as ice accumulated quickly on trees, power and phone lines, and utility poles. It was now impossible for utility companies to keep up with falling lines, snapping poles, and snapping trees. All they could do was attempt to maintain utilities for hospitals, nursing homes, emergency responders, and other priority customers. The heavy precipitation also caused flooding, which was only made worse by storm drains clogged with tree debris. Several fields across the Delta were flooded as surrounding trees were full of ice.

Temperatures finally warmed to above freezing during the daytime hours of February 11th, but only by a few degrees in the hardest-hit areas. The slow thaw continued into the weekend, as temperatures finally reached the 40s by Saturday.

Across northern Mississippi, approximately 3.7 million acres of commercial forestland was significant damaged, with the value of damaged timber estimated to be $1.3 billion. Damage to trees in urban areas was estimated to be another $27 million. Twenty-five percent of Mississippi's pecan crop was destroyed and impacted for years to come, at an estimated cost of $5.5 million per year. Nearly 750,000 customers were without power at some point across North Mississippi, with some outages lasting up to a month. Over 8,000 utility poles were pulled down by the weight of the ice, and over 4,700 miles of lines were downed. About 490 water systems were impacted, with as many as 741,000 customers without water at some point. System wide, Entergy had 250,000 to 300,000 customers without power in Mississippi, Louisiana, and Arkansas. Commercial flights would not resume until the following Wednesday, February 16th.

By most accounts, this was the worst ice storm to impact the ArkLaMiss Delta since January of 1951.

Probability of Future Occurrence

The probability of severe winter weather events in Sunflower County is highly likely. There was severe winter event in ten of the 19 years studied, which suggest there is a 52% chance of an occurrence in a given year. The region may experience an event several years in a row, but then not experience one for several years.

Assessing Vulnerability

Community assets at risk from a winter storm include the electrical and telephone utility system and tree coverage and canopy. Vehicular accidents from icy conditions could cause injury, property damage, or death. Ice laden tree limbs can fall, causing property damage. A hard freeze may also result in decreased water pressure as frozen and damaged pipes thaw and leak. Winter storms impact the entire community. Among essential services, critical facilities and infrastructure likely to be affected are the public safety on roadways and electric, telephone and water services.

The Mississippi Economic Development Council produced figures in 120 Sunflower County workers are employed in the construction sector. Workers such as these, who spend a great deal of time outdoors, are most likely to be affected by severe winter weather.

Populations at Risk: Vulnerable persons during winter weather periods are the homeless, the elderly, young children, and persons with chronic health problems. Above freezing temperatures combined with strong wind can result in felt temperatures below freezing and cause hypothermia, illness, and death.

Property Damage: In the past, this hazard has caused roofs to cave in, trees to fall on houses, prolonged power outages, and dangerous driving conditions.

Critical Facilities and Essential Services: Essential services are not likely to be significantly impacted by a winter storm. For the most part, generators have been installed at critical and essential facilities within the county and participating jurisdictions to ensure that continuity of electricity for dispatch and emergency services.

Transportation Systems: Some major transportation services could be temporarily interrupted should icing occur. Those include bridges and overpasses on U. S. Highway 49W and 82 as well as Highway's 3, 8, 32, and other roads countywide.

Lifeline Utility Systems: The most likely lifeline utility system that could be affected by a winter storm would be electric power, telephone and water line service. It could be anticipated that interruption of those rural water systems that do not have access to generators, services would last long enough in Sunflower County to cause a major problem.

Tornado

Location and Extent

Mississippi consistently ranks in the top 10 states with the most tornadoes in the nation. All areas of the state, including Sunflower County, are susceptible to impacts from EF0 to EF5 magnitude tornado that can cause millions of dollars in damage.

Tornado is a non-spatial hazard, meaning that all jurisdictions in the county are equally likely to experience an event. Of particular concern are persons who reside in a mobile/manufactured home, and the elderly and disabled. According to the 2010 Census, there are approximately 510 mobile/manufactured housing units -- structures at high risk to wind events of any type. These units represent 5.2% of the housing stock in Sunflower County.

Previous Occurrences

A total of 16 tornadoes were recorded in the NCEI database for Sunflower County between 2000 and 2019, and there were no injuries or death reported during this time period. Details of these reported events are summarized below in Table H.32. The table is followed by a discussion of events mapped by the Jackson, MS office of the National Weather Service as having taken place in the year 2020.

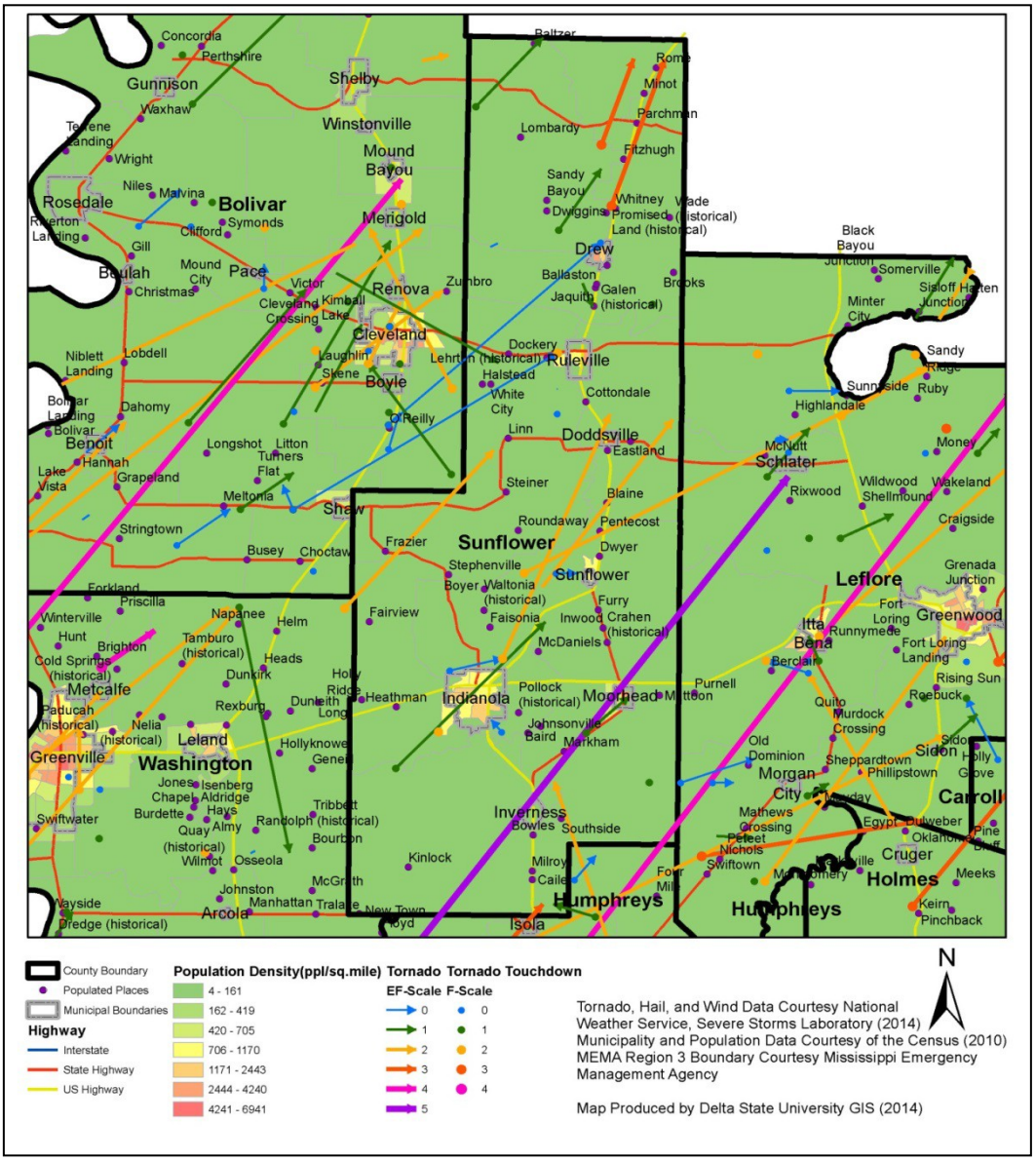
As a result of tornado event occurring on April 26, 2011 in Sunflower County there were three injuries reported in the Town of Sunflower.

Table H.31 – Tornado Events 2000 to 2019 I Source: NCEI

Location	Date	Event	Magnitude	Death	Injury	Property Damage	Crop Damage
Mackman	5/29/2015	Tornado	-	-	-	-	-
Dwiggins	9/20/2013	Tornado	EF0	-	-	25,000	-
Dockery	9/25/2011	Tornado	EF1	-	-	200,000	-
Drew	9/25/2011	Tornado	EF1	-	-	20,000	-
Sunflower	4/26/2011	Tornado	EF2	-	3	300,000	-
Mackman	10/22/2007	Tornado	EF1	-	-	180,000	-
Indianola	2/24/2007	Tornado	EF1	-	-	650,000	-
Indianola	4/7/2006	Tornado	F0	-	-	25,000	-
Inverness	9/24/2005	Tornado	F1	-	-	-	-
Indianola	9/24/2005	Tornado	F0	-	-	-	-
Inverness	9/24/2005	Tornado	F1	-	-	500,000	200,000
Sunflower	9/24/2005	Tornado	F1	-	-	20,000	-
Dockery	9/24/2005	Tornado	F0	-	-	10,000	15,000
Sunflower	4/29/2005	Tornado	F0	-	-	50,000	-
Drew	5/5/2003	Tornado	F0	-	-	10,000	-
Lombardy	11/24/2001	Tornado	F1	-	-	80,000	-
Totals:				-	3	$2,070,000	$215,000

The most recent tornado events occurring in Sunflower County is illustrated in Figure H.11.

Figure H.11: Sample of Historic Tornado Events



Probability of Future Occurrence

NCEI data presented shows that tornado events have occurred in eight of the 19 years being studied for hazards as part of this mitigation planning process. This suggests that there is roughly a 42% chance that Sunflower County will be affected by a tornado in any given year. Equally likely is the possibility that more than one such event will occur within proximity to others – proximity in terms of time and geography.

Assessing Vulnerability

Although technology and warning system capabilities have improved significantly in recent years, tornadoes can still occur with little or no warning, and cause severe destruction, personal injury, and possible loss of life. The list of affected communities included in Table E.32 show that entire county is vulnerable to impacts from tornadoes. Particularly vulnerable are those living in mobile/manufactured housing units.

Impacts to Life and Property: Perhaps most vulnerable to this hazard are those population segments consisting of (elderly, disabled, and poor) who may not have the ability to seek shelter in a timely manner. Older frame houses and mobile homes are particularly vulnerable to tornadoes. According to the 2010 Census, there are about 348 mobile homes within the County. If houses are not constructed to high wind standards, the likelihood of significant roof damage if not roof failure will occur. Unless mobile homes are placed on an anchored foundation, the force of tornado winds will likely lift the structure and overturn it. It is unlikely that damaged mobile homes will ever be returned to habitable status.

Impacts to Natural Resources: Tree canopy and decorative vegetation are all subject to tornado damage. The force of a tornado is powerful enough to uproot trees and vegetation and deposit the debris in standing water, which could result in pollution. Wildlife and farm animals are not likely to survive the force of tornado winds and may be carried to distant ground or deposited in a body of water which may result in pollution. Streams can become clogged with windblown debris and downed trees, causing flooding. If debris is not removed from vacant land it could become a threat to health and safety, create a fire hazard, or create a haven for unwanted vermin or pests.

Impacts to Critical Facilities: A tornado may affect any critical facility or critical infrastructure in Sunflower County. The County and its municipalities require that all new buildings and infrastructure, such as water tanks and towers, be built to high wind-resistant standards. All public and essential service buildings in Sunflower County are still at risk from a direct strike from a tornado; however, there is nothing to indicate that those buildings are more vulnerable than any other building in the County. With the unpredictable nature of tornadoes and the possibility of tornado damage, it is essential to have designated areas that are safer than other areas in all public and essential service buildings.

Tropical Storm / Hurricane

Location and Extent

While Sunflower County is situated over 260 miles from the Mississippi Gulf Coast, the area is vulnerable to the unavoidable effects of tropical storms/hurricanes as they reach land and continue to inland away from the coastal landing point. Storms moving inland have been known to produce violent winds, torrential rains, tornadoes, and flash flooding. Damage levels and be significant or low, depending on the hurricane path and whether it picks up strength before hitting landfall and turning moving inland.

Previous Occurrences

Two recent storms documented by the National Weather Service are listed in Table H.34. They were included in the 2015 MEMA District 3 RHMP and records indicate that no subsequent events have affected the region. Hurricane Katrina caused substantial damage to all 82 Mississippi counties.

Table H.32– Tropical Storm / Hurricane I Source: NCEI

Event Name	Date	Death	Injury	Property Damage	Crop Damage
Hurricane Rita	9/24/2005	-	-	10,000	150,000
Hurricane Katrina	8/29/2005	-	-	500,000	5,000,000
Total		-	-	$510,000	$5,150,000

Probability of Future Occurrence

Based on past events, the probability of tropical storm events is classified as low. Two events occurred in the past 20 years which, if averaged, would yield a 10.5% annual chance of occurrence. While climate change may increase the number and ferocity of hurricane events making landfall, there remains the fact remains that no other events are documented for the period since NCEI began keeping records in the year 1950.

Assessing Vulnerability

Sunflower County is located inland of the Mississippi coastline. Hurricanes affecting the Gulf Coast usually lose strength as they make landfall and move northward, usually without hurricane force winds impacting the area. However, due to the speed, size, and magnitude of the storm, the County could still be affected by damaging winds. The entire population is at risk to tropical storms and hurricanes. Damage during these events may result from spawned tornadoes and flooding from heavy rain.

Table H.33 presents data obtained from HAZUS for tropical storm/hurricane events to evaluate the potential economic losses for the County.

Table H.33 – Direct Economic Losses for Buildings Annualized Losses I Source: State of Mississippi SHMP

Capital Stock Losses				Income Losses				
Cost Building Damage	Cost Contents Damage	Inventory Loss	Loss Ratio %	Relocation Loss	Capital Related Loss	Wages Loss	Rental Income Loss	Total Loss
$36,000	$6,000	0	0.00	$4,000	0	$1,000	$1,000	$49,000

The greatest threat to life and property in Sunflower County would occur in a Category 5 Hurricane directly striking the coastline of Harrison County, Hancock County, St. Bernard, or Plaquemine Parishes, Louisiana. A strike at these locations could place Sunflower County, being located approximately 260 miles north, directly in the path of the highest winds and heaviest rain bands such a storm would produce.

Impacts to People and Property: The very young, the elderly, and the disabled are particularly vulnerable to harm from tropical storms/hurricanes. Older frame homes and residences and businesses housed in manufactured structures are especially vulnerable to the effects of severe winds, rain, and tornadoes generated by hurricanes. Airborne missiles such as tree limbs and branches, signs and signposts, roofing, metal siding, and other pieces of buildings, including entire roofs can penetrate doors and windows. This penetration into the “envelope” of the building allows the force of the wind to act against interior walls and ceilings of the structure – causing structural failure.

Impact on Critical Facilities: Properties at risk may include hospitals, nursing homes and housing likely to contain occupants who may not be sufficiently mobile to avoid death and injury during a flood or other emergency. Public safety facilities such as fire stations, vehicle and equipment storage facilities and emergency operations centers could also be at risk.

Impacts of Natural Resources: The most significant risk to natural resources in tropical storms and hurricanes in Sunflower County is damage to forests canopy and timberlands. Inland rivers and lakes can become clogged with wind-blown debris and trees, slowing recovery from a hurricane. Obstructions, if not removed can become a cause of flooding. Trees toppled onto the

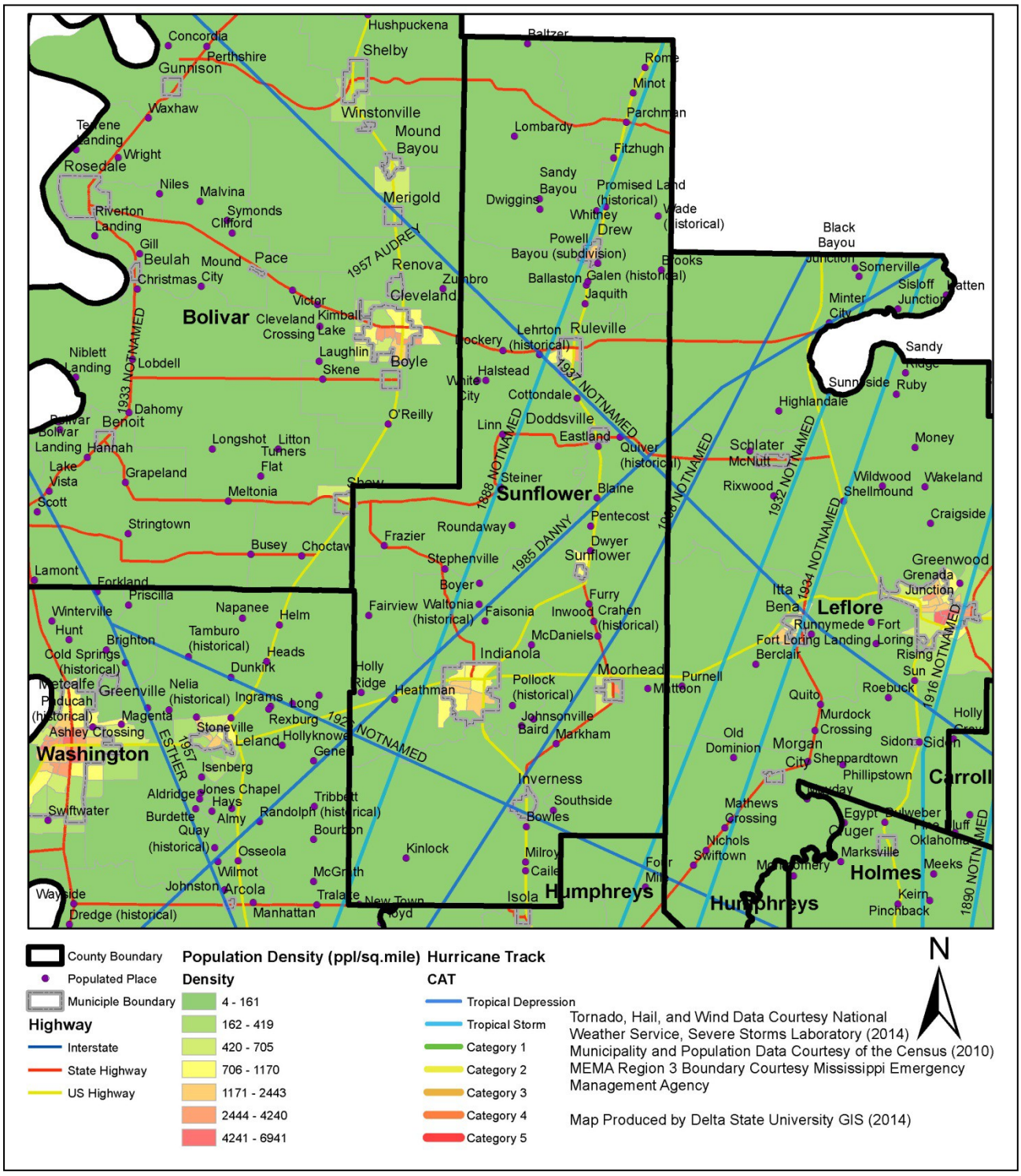
forest floor quickly become a target for infestation from insects that may spread to healthy trees. Water quality may suffer due to unwanted debris and vegetation blown in a hurricane. Potential debris from fallen trees can create fuel for wildfires when the area dries sufficiently to allow for burning through lightning or intervention by mankind. The Mississippi State Forest Commission works continuously to ensure that, through proactive cutting and prescribed burns, fallen trees and debris will not become fuel for a wildfire. In areas where timber is a significant feature of the economy, hurricane winds wreak havoc with growing trees, causing damage that lessens the quality of the timber and increases the likelihood of insect infestation of standing trees.

Impacts on Transportation Systems: Hurricane and/or high winds from tornadoes could result in power poles blown over or broken off onto roadways result in hazardous driving conditions until they can be cleared away. Overhead lines are often still energized until linemen are able to cut power to them. These conditions result in extremely hazardous driving conditions immediately following a hurricane or other windstorm. In heavily populated areas, lack of electricity also results in lack of signal lights at major intersections, creating driving hazards. Rail traffic could be interrupted by damage to railroad lines caused by flooding and damage to bridges and overpasses.

Impact on Lifeline Utility Systems: Overhead electric and telephone lines are damaged by trees and debris blown across them, or power poles and lines are blown over by hurricane force or tornado winds. In some instances, electric power may not be restored for many days or even weeks.

In the aftermath of Hurricane Katrina, the entire grid of Mississippi Power Company was affected down and, in some areas, land lines for telephones were down for weeks or months. This situation affected electrical cooperatives such as Central Electric Power Association (Carthage, Mississippi), which serves a portion of rural Sunflower County. The hurricane also damaged cell phone transmission towers and radio and television transmission towers, many of which were out of service due to electric power failure. Lack of electricity also left some water systems and sewage treatment plants unable to operate until generators could be brought in to restore partial power.

Figure H.12– Tropical Storm/Hurricane Historical Events



Wildfire

Location and Extent

The Sunflower County land area includes approximately 23,174 acres of forestland is equal to 0.05% coverage as a percent of land. County forestland data was derived from the 2019 Forestland Inventory conducted by Mississippi Forestry Commission as shown in the table below.

Table H.34 – 2019 Forestland Statistics* I Source: www.mfc.ms.gov

		Forestland			
County	Total Land Area (Acres)	Acres	Coverage (%)	Pine	Hardwood
Attala	471,597	284,817	60.4	49.1	41.3
Bolivar	279,658	86,465	30.9	0.0	100.0
Carroll	405,982	263,067	64.7	22.5	68.5
Holmes	488,932	197,380	40.3	15.1	84.8
Sunflower	275,892	30,268	10.9	0.0	100.0
Leflore	387,967	57,537	14.8	0.0	100.0
Montgomery	260,948	161,110	61.7	36.1	54.2
Sunflower	452,541	23,174	0.05	0.0	100.0
Washington	487,198	74,984	15.3	0.0	100.0

The Wildfire discussion in the Base Plan mentioned that an analysis of the change in total forestland area from the previous plan shows that the total acreage and percent of coverage has continued on a declining trend in all MEMA District 3 counties, with Attala (-23.2%) and Holmes (-22.8%) Counties showing the greatest decline in forested land. The average loss of the other seven District 3 counties was 5.43 percent. Most forested land in the planning area is under private ownership.

Information provided by the Mississippi Forestry Commission indicates that wildfires may occur during any season but, since 2012, the worst fires (determined by the number of acres burned) have occurred in late Summer and early Fall. Data presented in Table H.35 (above) also indicates the county-level differences in the total number of fires and acreage burned from year to year.

Past wildfires have threatened and destroyed property. Table H.36 presents a statistical analysis of residences, commercial buildings and outbuilding, by county, that have been threatened or destroyed since 2015. Within the planning area, Sunflower County has had no structures threatened or destroyed by wildfire.

Table H.35 Sunflower County Residence and Structures Threatened and or Destroyed by Wildfire Since 2015 I Source: Mississippi Forestry Commission

County	Residences Threatened	Residences Destroyed	Commercial Building Threatened	Commercial Building Destroyed	Outbuilding Threatened	Outbuilding Destroyed
Attala	149	3	4	-	75	8
Bolivar	-	-	-	-	-	-
Carroll	113	-	45	-	33	1
Holmes	116	-	3	-	98	2
Sunflower	-	-	-	-	0	-
Leflore	2	-	-	-	6	-
Montgomery	33	-	4	-	43	4
Sunflower	-	-	-	-	-	-
Washington	1	-	-	-	1	-
TOTALS	**414**	**3**	**56**	**-**	**256**	**15**

Fortunately for all Sunflower County stakeholders, there is a strong fire protective services component between the local fire department and the presence of State forest rangers. These forces are strong and likely able to prevent most any fire from growing to catastrophic levels.

Previous Occurrences

A combination of local weather, drought conditions vegetative cover and topographic conditions may affect the development of wildfires. Documenting fire events is not consistent across the planning region with the local fire departments. The NOAA National Centers for Environmental Information (NCEI), Storm Events Database, shows no reported wildfires in the fifty-nine years between January 1, 1960 and December 1, 2019 for each of the District 3 counties. All available wildfire data is on a county level.

Table H.36 captures wildfire data for each District 3 county for the period 2014 to 2019. Sunflower County data is highlighted.

Table H.36 – Wildfire Data 2009 to 2011 I Source: www.mfc.ms.gov

County	2019		2018		2017		2016		2015		2014	
	Total Fires	**Acres Burned**	**Total Fires**	**Acres Burned**	**Total Fires**	**Acres Burned**	**Total Fires**	**Acres Burned**	**Total Fires**	**Acres Burned**	**Total Fires**	**Acres Burned**
Attala	28	782	21	392	38	468	59	1,170	52	597	32	187
Bolivar	-	-	-	-	-	-	1	80	-	-	-	-
Carroll	5	18	4	32	13	172	24	387	24	268	16	83
Holmes	13	87	15	522	27	532	39	432	43	441	36	486
Sunflower	-	-	-	-	-	-	-	-	-	-	-	-
Leflore	-	-	-	-	-	-	1	22	6	150	-	-
Montgomery	4	34	-	-	1	7	14	139	12	154	8	135
Sunflower	-	-	-	-	-	-	1	-	-	-	-	-
Washington	1	5	-	-	1	32	-	-	1	8	1	40

Information provided by the Mississippi Forestry Commission indicates that wildfires may occur during any season; however, since 2012 the worst fires (determined by acres burned) have occurred in late Summer and early Fall. The data presented in table above also indicates the differences in total fires and acreage burned from year to year and county to county.

Probability of Future Occurrences

Table H.38 below shows the number of fires and acres burned each year between 2014 and 2019, along with mean and median averaged for each.

Table H.38 – Mean and Median Averages for Sunflower County, Number of Fires and Acres Burned I Source: Mississippi Forestry Commission

Total Fires	2019	2018	2017	2016	2015	2014	Total	Mean	Median
Total Fires	-	-	-	-	-	-	-	-	-
Acres Burned	-	-	-	-	-	-	-	-	-

It has been stated that it is difficult to develop probability of wildfire occurrence due to the range of elements that "set the stage" for a wildfire to occur. There is not any historical data for Sunflower County, however it can be stated that in any given year there is a potential for at least 1 fire to develop.

Assessing Vulnerability

Wildfires pose a low threat to all areas of Sunflower County, where just around 0.05 % of acreage is forestland. Current mitigation of the fire hazard includes regular thinning of vegetative fuel, but the County Emergency Management Department works closely with County and local fire departments to educate the public about issues such as backyard burning that can lead to wildfire. Figures E.14a through E.14e are screen shots from the web site of the Southern Wildfire Risk website (www.southernwildfirerisk.com) established by the Southern Group of State Foresters. These images show the overall risk of Sunflower County and its jurisdictions located in the Wildfire Urban Interface (WUI).

Figure E.13a –Jurisdictional Wildfire Vulnerability-Sunflower County

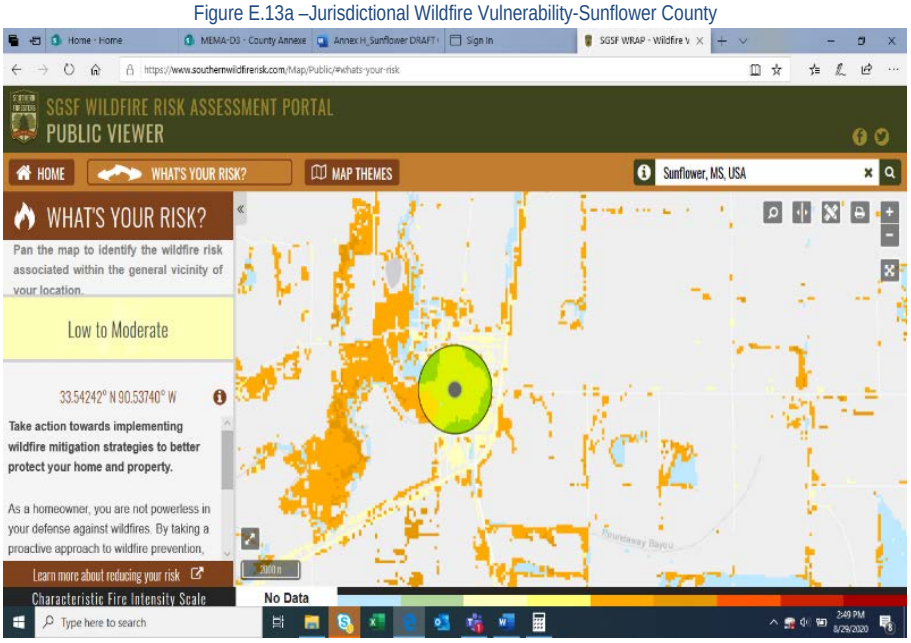


Figure E.13b –Jurisdictional Wildfire Vulnerability-Town of Doddsville

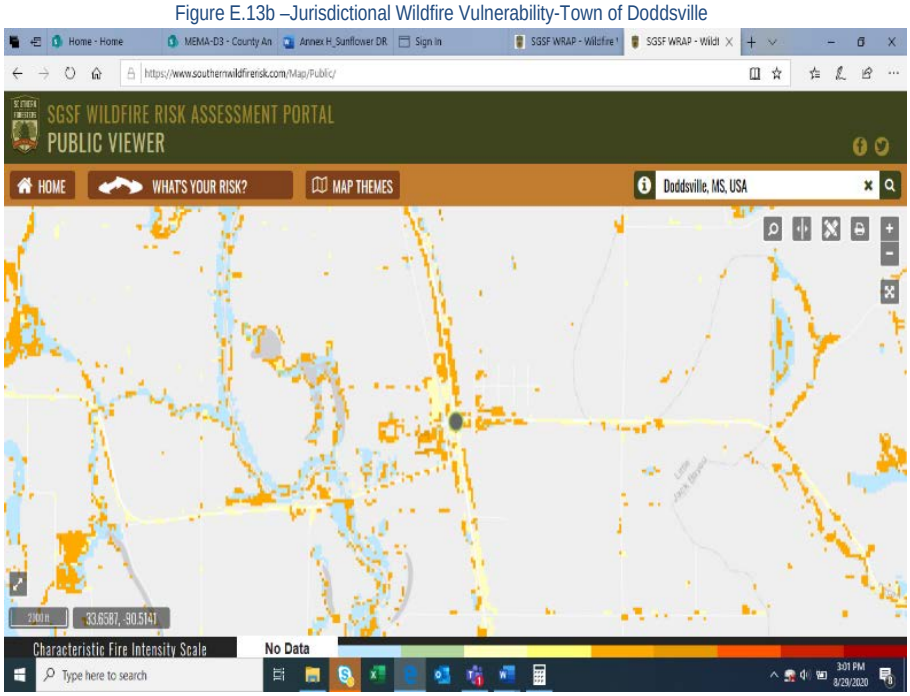


Figure E.13c –Jurisdictional Wildfire Vulnerability-City of Drew

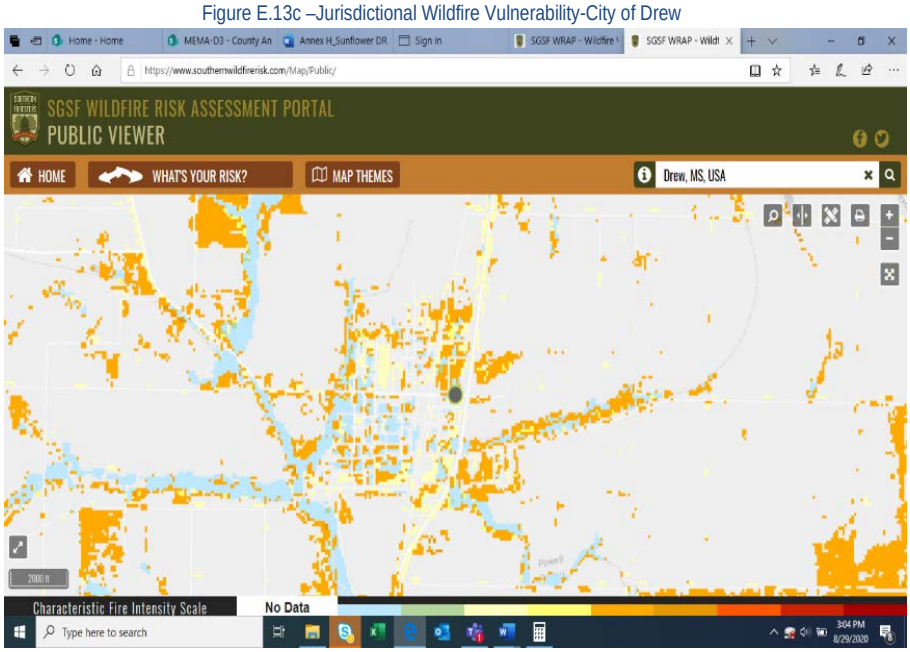


Figure E.13d –Jurisdictional Wildfire Vulnerability-City of Indianola

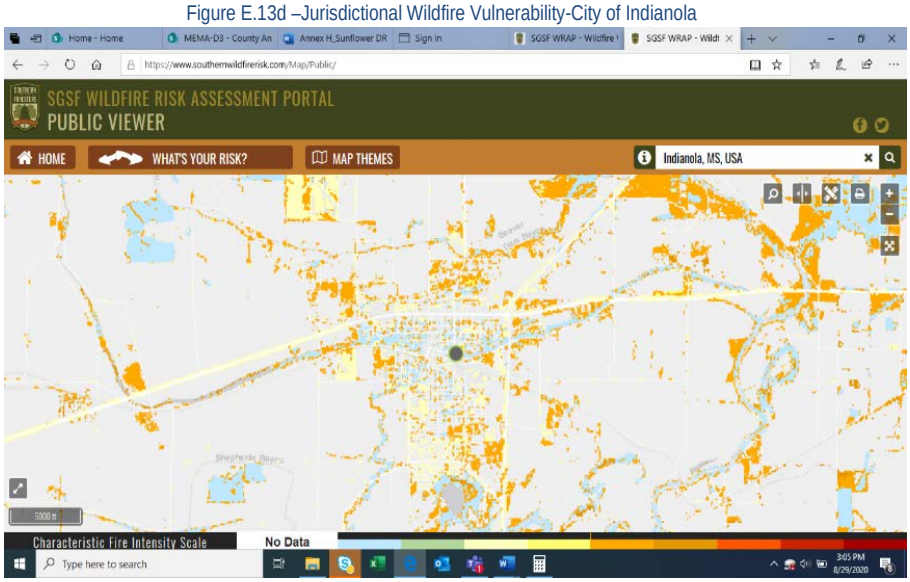


Figure E.13e –Jurisdictional Wildfire Vulnerability-Town of Inverness

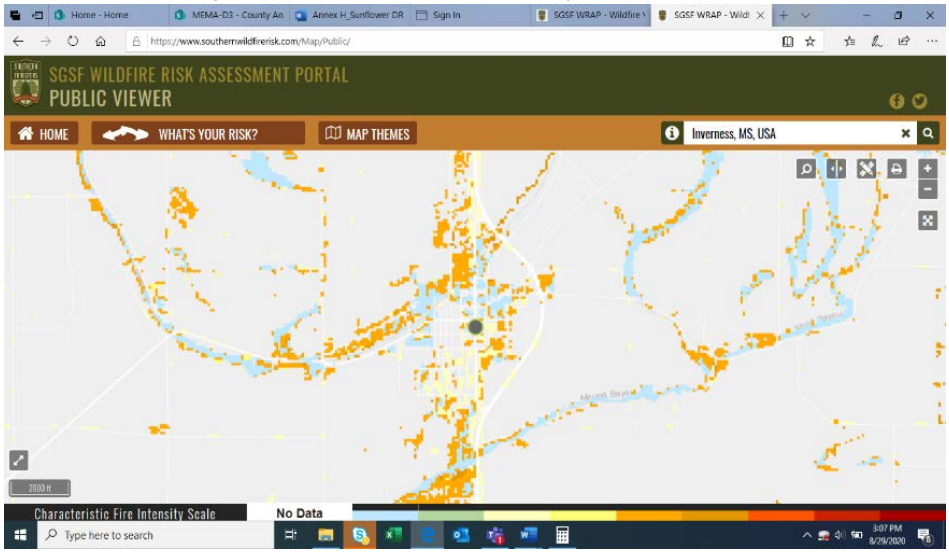


Figure E.13f –Jurisdictional Wildfire Vulnerability-City of Moorhead

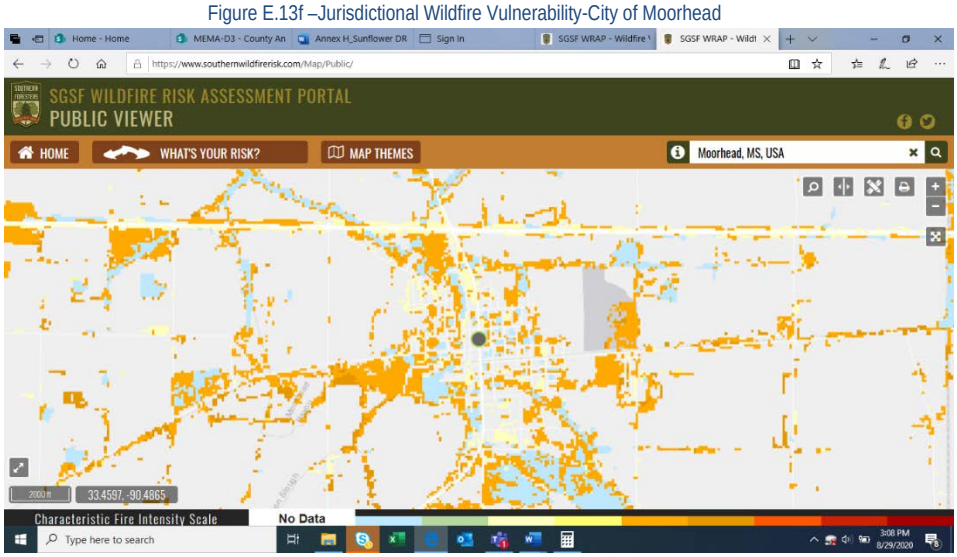


Figure E.13g –Jurisdictional Wildfire Vulnerability-City of Ruleville

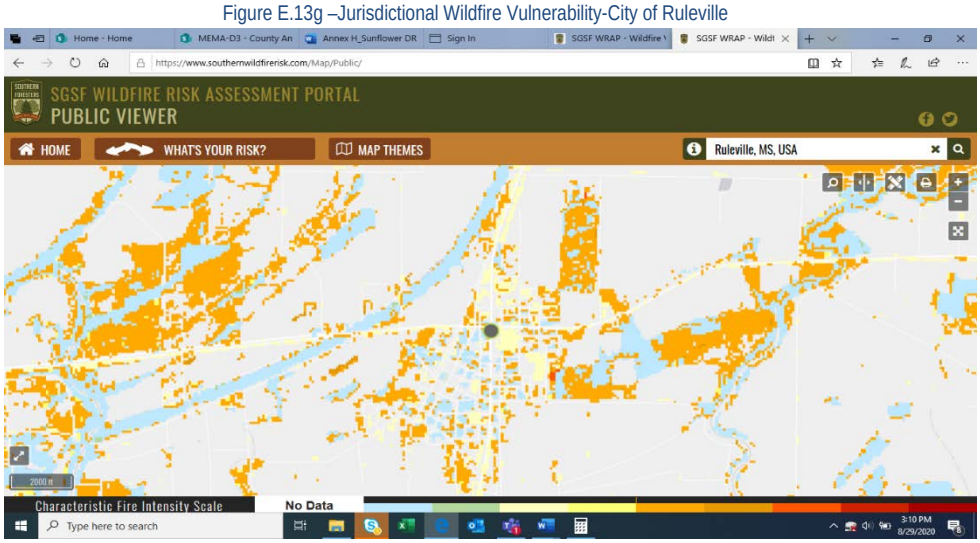


Figure E.13h –Jurisdictional Wildfire Vulnerability-Town of Sunflower

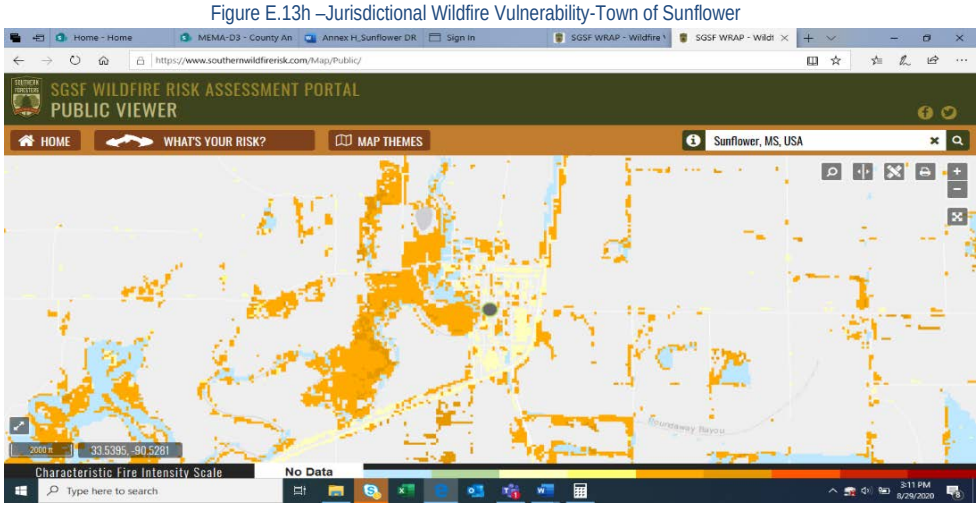


Table H.39 summarizes the risk of Sunflower County and each of its jurisdictions to wildfire SGSF portal.

Table E.39: Geographic Vulnerability to Wildfire by Jurisdiction | Source: MFC

Jurisdiction	Ranking
Unincorporated Sunflower County	Low
Town of Doddsville	Low
City of Drew	Low
City of Indianola	Low
Town of Inverness	Low
City of Moorhead	Low
City of Ruleville	Low
Town of Sunflower	Low
Overall Sunflower County Vulnerability to Wildfire	Low

The hazard was rated as being low overall in the 2015 RHMP. The places most vulnerable to wildfires are forested areas in unincorporated areas of Sunflower County. Current mitigation of fire hazard includes regular thinning of trees and removal of dead limbs and underbrush of the 23,174 acres of forestland.

Impacts to Life and Property: Wildfire could impact the community by overextending personnel and financial resources of local emergency response crews and create a need to evacuate residences and businesses. The County's vulnerability to county-wide wildland fire hazard is mitigated somewhat by the presence of fire stations in most parts of the county, as well as the presence of a Sheriff's Office, which serves as an alternate EOC and personnel to augment those resources of fire stations.

Impacts to Critical Facilities: Electrical power could be impacted by wildfire and service could be temporarily interrupted by wildfire. It is doubtful that wildfire would have a lasting impact on water and sewer systems.

Impact on Future Development: The efforts of public and non-profit water associations ensure that there will always be water available for firefighting and structural protection, particularly in rural areas of the County. Fire stations throughout the county are not manned on a full-time basis but rely on volunteers, assisted by the Forestry Service, to fight wildfires. Firefighting capacity may need to be enhanced should the community reach a point where future development includes significant numbers of residents or large industrial assets.

Hazardous Material Incidents

Location and Extent

Many hazardous and toxic materials are transported through areas of Sunflower County on 18-wheelers via U.S. Highways 49W and 82, and Mississippi State Highway 8.

The proximity of these transportation routes to areas of Sunflower County increase the risk to residents in a five-mile radius for hazards involving transportation accidents and hazardous materials spills. A secondary risk to a transportation accident involving hazardous materials is the hazard of explosions and fires.

Previous Occurrences

Table H.40 provides a summary of toxic release incidents reported in Sunflower County from 2014 through 2019. According to the U.S. Environmental Protection Agency (EPA) Toxic Release Inventory (TRI), the following industries within Sunflower County handle hazardous materials and have had reported releases.

Table H.40- EPA Toxic Release Inventory Summary for Sunflower County 2014-2018 I

Source: U.S. EPA Toxic Release Inventory Program Database; https://www.epa.gov/toxics-release-inventory-tri-program

	2018		2017		2016		2015		2014	
County	No. Facilities	No. Reports	No. Facilities	No. Reports	No. Facilities	No. Reports	No. Facilities	No. Reports	No. Facilities	No. Reports
Sunflower	3	8	3	8	3	9	3	9	3	10

Probability of Future Occurrence

It is likely that an event of this type will occur in Sunflower County at some point in the future given the fact that a major interstate highway and other major state and local roadways pass through the county. Specific areas where such incidents may occur are discussed under Addressing Vulnerability.

Assessing Vulnerability

Location, magnitude, type of problem, wind velocity and direction, and weather conditions vary with each incident, thus making an assessment of vulnerability difficult at best. The possible impact of a hazardous materials incident could include evacuation from homes and businesses, possible deaths or injuries from exposure, long-term environmental damage, and property losses.

Summary of Risk Assessment

Table H.41, shown at the beginning of discussion of Sunflowers hazards, is presented here to as a summary of all hazards discussed.

Table H.41: Total of Sunflower County Hazard Events and Damages I Source: NCEI

Hazard Type	No of Events	Death	Injury	Property Damage	Crop Damage
Dam/Levee Failure	-	-	-	-	-
Drought	9	-	-	-	$ 4,301,000
Earthquake	-	-	-	-	-
Extreme Heat / Heat	6	-	-	-	-
Expansive Soil	-	-	-	-	-
Flood	41	-	-	$ 2,757,000	$1,200,000
Severe Storm	136,	-	-	$10,894,000	$ 3,550,000
Severe Winter Weather	16	-	-	$ 1,415,000	-
Tornado	16	-	3	$ 2,070,000	$ 215,000
Tropical Storm / Hurricane	2	-	-	$ 510,000	$5,150,000
Wildfire	-	-	-	-	-
Totals	226	-	3	$ 17,646,000	$ 14,416,000

* Damage estimates not available

This data shows that, in terms of number and frequency, severe storms are the most regularly occurring and the most damaging to Sunflower County property and crops. Of the $32,162,000 in total damages from 226 events occurring between 2000 and 2019, crop damage represents roughly two -fourth the dollar amount of damage as that to personal property. Figures show that tornadoes and the rare hurricanes that affected Sunflower County were responsible for much of the damage listed.

The Mississippi Department of Revenue 2018 Annual Report showed that there was a 2017 total property assessment value of 2017 equaled $ 200,374,919. A severe hazard event causing damage to 10 percent of property would cause damage in the amount of $ 20,037,492. Assuming that crop damage associated with such an event might run four times this amount, it can be anticipated that crop damage would run approximately $80,149,967. As such, overall combined damage from such an event could run as high as $ 100,187,459. Figures could vary widely depending on event type, location, magnitude, and extent.

H.3 Capability Assessment

This section assesses Sunflower County's capability to implement hazard mitigation activities. More detailed information on the purpose and methodology used to conduct the capability assessment can be found in Chapter 5 - Capability Assessment.

Planning and Regulatory Capability

The findings of the Planning and Regulatory section of capability assessment are described below in Table H.42. This table provides a jurisdictional overview of the plans and programs in place, followed by summary statistics of the Local Capability Assessment Surveys. Each county and municipality were asked to self-assess their capabilities.

Table H.42 – Relevant Plans, Ordinances and Programs

	Comprehensive / Master Plan	Capital Improvements Plan	Economic Development Plan	Emergency Operations Plan	Continuity of Operations Plan	Transportation Plan	Stormwater Management Plan	Community Wildfire Protection Plan	Historic Preservation Plan	Building Codes	Fire Department ISO Rating	Site Plan Review Requirements	Land Use Plan	Zoning Ordinance	Subdivision Regulation	Flood Damage Prevention Ordinance	Flood Insurance Studies	National Flood Insurance Program	Community Rating System
Sunflower County	✓			✓	✓						10				✓	✓	✓	✓	
Doddsville	✓			✓	✓						10		✓	✓		✓	✓	✓	
Drew	✓			✓	✓					'09	7		✓	✓	✓	✓	✓	✓	
Indianola	✓		✓	✓	✓	✓	✓	✓	✓	'09	6	✓	✓	✓	✓	✓	✓	✓	
Inverness	✓	✓		✓	✓			✓		'98	8	✓	✓	✓	✓	✓	✓	✓	
Moorhead	✓		✓	✓	✓	✓	✓			'09	8	✓	✓	✓	✓	✓	✓	✓	
Ruleville	✓		✓	✓	✓	✓	✓			'08	7		✓	✓	✓	✓	✓	✓	
Sunflower	✓		✓	✓	✓					'08	8		✓	✓		✓	✓	✓	

Emergency Management Capabilities

Hazard Mitigation Plan: A hazard mitigation plan represents a community's blueprint for how they intend to reduce the impact of natural and human-caused hazards on people and the built environment. Elements of a hazard mitigation plan include a risk assessment, capability assessment and mitigation strategy.

- The jurisdictions within Sunflower County participate in the development and implementation of a hazard mitigation plan.

Emergency Operations Plan: An emergency operations plan outlines the responsibilities and the means by which resources are deployed during and following an emergency or disaster.

- Survey results indicate that Sunflower County and the Cities of Indianola, Drew,

Moorhead, Ruleville and the municipalities of Doddsville, Inverness, and Sunflower all have emergency operations plans.

Continuity of Operation Plan: A continuity of operations plan establishes a clear chain of command, line of succession, and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster.

- Survey results indicate that Sunflower County and the Cities of Indianola, Drew, Moorhead, Ruleville and the municipalities of Doddsville, Inverness, and Sunflower all have continuity of operations plan.

General Planning Capabilities

The implementation of hazard mitigation activities often involves individuals beyond the emergency management profession. Stakeholders may include local planners, public works officials, economic development specialists and others. Similarly, hazard mitigation planning cuts across multiple disciplines. As a result, the questions asked in the Local Capability Assessment Survey regarding general planning capabilities were designed to measure the degree to which mitigation is integrated into other planning efforts.

Comprehensive Plan: A comprehensive plan establishes the overall vision for a community and helps to guide municipal decision-making.

- Survey results indicate that Sunflower County and the Cities of Indianola, Drew, Moorhead, Ruleville and the municipalities of Doddsville, Inverness, and Sunflower all have comprehensive plans.

Economic Plan: An economic plan serves as a road map for economic development decision making, based on the collection of statistical data, historical perspective, and human potential.

- Survey results indicate that municipalities of Indianola, Moorhead, Ruleville and Sunflower have an economic plan.

Community Wildfire Protection Plan: The community wildfire protection plan is a strategic plan that identifies wild land fire issues facing the community and outlines prioritized mitigation actions.

- Survey results indicate that Indianola and Inverness have community wildfire protection plans.

Transportation Plan: A transportation plan identifies the means to gauge transportation demands and the options to meet those needs, while considering the social, economic and environmental characteristics of the area. The development of transportation networks can

significantly impact the amount, type and location of future growth. As a result, transportation planning can have a dramatic impact on future hazard vulnerability.

- Survey results indicate that the Cities of Indianola, Moorhead and Ruleville have transportation plans.

Capital Improvements Plan: A capital improvements plan guides the scheduling of spending on public improvements. A capital improvements plan can serve as an important mechanism to guide future development away from identified hazard areas. Limiting public spending in hazardous areas is one of the most effective long-term mitigation actions available to local governments.

- Survey results indicate that the Town of Inverness has capital improvement plans.

Historic Preservation Plan: A historic preservation plan is intended to preserve historic structures or districts within a community. An often-overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards to include the identification of the most effective way to reduce future damages. This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of harm's way.

- Survey results indicate the City of Indianola has a historic preservation plan.

Zoning Ordinances: As part of a community's police power, zoning is used to protect the public health, safety and welfare. A zoning ordinance is the mechanism through which zoning is typically implemented. Since zoning regulations enable municipal governments to limit the type and density of development, it can serve as a powerful tool when applied in identified hazard areas.

- Survey results indicate that the Cities of Indianola, Drew, Moorhead, Ruleville and the municipalities of Doddsville, Inverness, and Sunflower all have a zoning ordinance.

Subdivision Ordinances: A subdivision ordinance is intended to regulate the development of housing, commercial, industrial or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development.

- Survey results indicate that Sunflower County and the municipalities of Indianola, Drew, Moorhead, Ruleville, and Inverness have subdivision ordinances.

Building Codes, Permitting and Inspections: Building codes regulate construction standards. Decisions regarding the adoption of building codes, the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community.

- Survey results indicate the Cities of Indianola, Drew, Moorhead, and Ruleville and the Towns of Inverness and Sunflower, all have building codes, permitting and inspections.

Floodplain Management Capability

Flooding represents the greatest natural hazard facing the Nation and the planning area. At the same time, the tools available to reduce the impacts associated with flooding are among the most developed when compared to other hazard-specific mitigation techniques. Information contained in this section has been gathered through surveys and the NFIP Status Book.

Storm Water Management Plan: A storm water management plan is designed to address flooding associated with storm water runoff. The storm water management plan is typically focused on design and construction measures that are intended to reduce the impact of more frequently occurring minor urban flooding.

- Survey results indicate that Cities of Indianola, Moorhead and Ruleville have storm water management plans.

Flood Damage Prevention Ordinance/NFIP participation: A local Flood Damage Prevention Ordinance is a tool used by counties and municipalities to regulate the type of construction that occurs in the floodplain. If a community is an NFIP participant, a Flood Ordinance or Court Order is in place.

Survey results indicate that Sunflower County and the Cities of Indianola, Drew, Moorhead, Ruleville and the Towns of Doddsville, Inverness, and Sunflower all have flood damage prevention ordinances plans.

The table below, taken from the 2018 SHMP, represents the most recently available data about Sunflower County NFIP participation and claims data.

Table H.43: Sunflower County NFIP Communities I Source: NFIP Policy and Loss Statistics (3-31-14) and Community Status Report (4-4-4) 2015 D 3 RHMP

Jurisdiction	NFIP Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date ($)
Sunflower County	9/28/1979	88	20,081,000	26	$165,003
Doddsville	7/17/1986	-	-	-	-
Drew	5/1/1978	9	1,097,000	56	$374,719
Indianola	1/3/1979	85	17,542,000	29	$77,732
Inverness	5/15/1978	7	1,900,000	1	$7,747
Moorhead	4/17/1978	12	1,949,400	16	$183,760
Ruleville	5/1/1978	-	-	-	-
Sunflower	7/17/1978	8	2,330,000	-	-
Total		209	44,899,400	128	$808,961

Continued Compliance to NFIP

Given the flood hazards in the planning area, an emphasis will be placed on continued compliance with the NFIP. The following steps will be taken by each participating community in order to meet or exceed the following minimum requirements as set by the NFIP:

- Issuing or denying floodplain development/building permits
- Inspecting all development to ensure compliance with local ordinance
- Maintaining records of floodplain development
- Assisting in the preparation and revision of flood maps/updates
- Assist residents in obtaining information on flood hazards, floodplain map data, flood insurance and proper construction measures.
- Survey results indicate that Sunflower County and its the municipalities have flood damage prevention ordinances plans.

Administrative and Technical Capability

Table H.44 provides a summary of the capability assessment results for Sunflower County with regard to administrative and technical capabilities.

Table H.44 - Administrative and Technical Capability

Jurisdiction	Planning Commission	Participation in Emergency Management Committee (LEPC or other)	Maintenance program to reduce risk (i.e., tree trimming, clearing drainage systems)	Mutual Aid Compacts	Building Inspection Department	Floodplain Manager	Emergency Manager	Community Planner	Civil Engineer	GIS Coordinator	Warning Systems / Services (i.e., reverse 911 / outdoor warning systems)	Grant Writing Capabilities
Sunflower County		✓	✓	✓		✓	✓		✓		✓	
Doddsville		✓	✓	✓		✓			✓		✓	
Drew		✓	✓	✓	✓	✓			✓		✓	
Indianola	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Inverness	✓	✓	✓		✓	✓	✓		✓		✓	✓
Moorhead		✓	✓		✓	✓	✓		✓		✓	✓
Ruleville		✓	✓	✓	✓	✓			✓		✓	
Sunflower		✓	✓	✓	✓	✓			✓		✓	

Fiscal Capability

Table H.45 provides a summary of the results of the local capability assessment for Sunflower County with regard to relevant fiscal resources.

Table H.45 - Relevant Financial Resources

Jurisdiction	Capital Improvements Project Funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas, or electric services	Impact fees for new development	Stormwater utility fee	Incur debt through general obligation bonds or tax bonds	Incur debt through private activities	Community Development Block Grant (CDBG)	Other federal funding programs	State funding programs
Sunflower County		✓				✓		✓	✓	✓
Doddsville		✓						✓	✓	
Drew		✓	✓			✓		✓	✓	
Indianola	✓	✓	✓	✓		✓		✓	✓	✓
Inverness		✓	✓		✓			✓	✓	✓
Moorhead	✓	✓	✓			✓		✓	✓	✓
Ruleville		✓	✓			✓		✓	✓	
Sunflower		✓	✓			✓		✓	✓	

Education and Outreach Capability

Table H.46 provides the results for the education and outreach capability for Sunflower County.

Table H.46 - Relevant Education Programs

Jurisdiction	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Ongoing public education or information programs (e.g. responsible water use, fire safety, household preparedness, environmental education)	Natural disaster or safety-related school programs	StormReady certification	Firewise Community Certification	Public / Private partnership initiatives addressing disaster-related issues
Sunflower County	✓	✓	✓			
Doddsville						
Drew		✓	✓			
Indianola	✓	✓	✓	✓		✓
Inverness		✓				✓
Moorhead	✓	✓	✓	✓		✓
Ruleville		✓	✓			
Sunflower			✓			

Conclusions on Local Capability

Table H.47 shows the results of the capability assessment using the scoring system that can be found in Section 5 of the base plan. The scoring for Sunflower County was based on information from the local capability survey and reviewing existing plans. According to the assessment, the average local capability score for the county and its communities is 43.25 which falls into a moderate capability rating.

Table H.47 – Capability Results Summary

Jurisdiction	Overall Capability Score	Overall Capability Rating
Sunflower County	36	Moderate
Doddsville	29	Moderate
Drew	39	Moderate
Indianola	62	High

Jurisdiction	Overall Capability Score	Overall Capability Rating
Inverness	46	Moderate
Moorhead	53	High
Ruleville	44	Moderate
Sunflower	37	Moderate

H.4 Mitigation Strategy

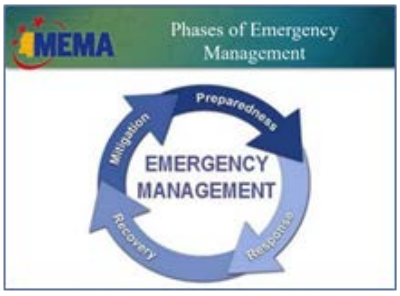
The participating jurisdictions reviewed the mitigation goals and priorities identified in the County's previous plan. Common elements of the previous mitigation goals were used to develop regional goals designed to achieve the implementation of mitigation actions. These refined goals were adopted by the participating jurisdictions. It was determined that the priorities for each of the participating jurisdictions had not changed, although the regionwide mitigation goals and objectives were streamlined as discussed in the base plan.

The Mitigation Strategy for Sunflower County includes several changes, including those based on the streamlined list of 2020 Goals and Objectives. The table of action items includes mitigation actions identified in the 2015 plan; the outcome of each; and how the strategy was updated for the 2020 plan; and newly developed mitigation actions, if any. The 2015 plan included two separate tables of mitigation actions: one table to provide a status update on actions mentioned in the previous plan; and a second table outlining the current mitigation strategy. These have been combined into one table in the current plan update.

Previous plans included a large number of mitigation actions considering the size and available resources of some jurisdictions, including those with only a few hundred residents. An example of this is the fact that most County Emergency Management (EM) Directors are the single departmental employee, or they perform their EM duties while functioning in one or more service roles in their community. The same is often true for leadership at the city or town level, where those in leadership "wear many hats."

Several changes were made to streamline the Mitigation Strategy given the following considerations.

- Actions identified as falling into the Preparedness Phase of the Emergency Management Cycle were removed and recommended for consideration under Preparedness Planning. Examples of this include disaster preparedness initiatives (such as providing weather radios to residents) and NIMS training, which represent actions a community normally does to prepare for a hazard event.
- The image at right, developed for a MEMA presentation, clearly delineates that EM agencies operationally function under four phases of emergency management, although sometimes the phases run concurrently. Professional emergency managers and their Emergency Support Functions (ESF), units called up during disaster response, develop specific plans and actions to as appropriate for each event phase.



- Actions identified as being required as part of the FEMA Hazard Mitigation Planning Process were removed because these are fully spelled out under the Plan Maintenance section of this RHMP Update. Examples of this include reviewing the mitigation plan and meeting to discuss needed plan updates after a disaster occurs in the community.
- It was recommended that actions that were similar activities be combined into one action. For example, there were previously separate action items for educating the public about natural hazards and for educating the public about manmade (technological, biological, health-related) hazards. A single outreach plan using multiple communications channels can incorporate education about all hazards to all audiences if the outreach plan is fully developed.

- In some instances, extensive description of previous actions was shortened for plan readability.

- Most action items were identified by all jurisdictions. In these cases, a countywide action was recommended developed that would be jointly implemented by all participating jurisdictions.

It is hoped that the streamlined mitigation strategy will be more manageable for the District 3 Counties and its jurisdictions to implement.

1. Progress Made on Mitigation Strategies and Updated Mitigation Strategy

Sunflower County jurisdictions have been proactive in implementing mitigation strategies identified in their previous plan. Actions included have been sorted so that deleted actions appear at the end of each jurisdictional listing. They are highlighted, and a reason for deletion is listed in the column labeled "2020 Status." This column includes use of the following designations to show action status:

Designation	Meaning	Description
D	Deleted	Action was deleted from the plan for the reason described under the Column 2020 Status Description
N	New	New action for the 2020 Plan Update
R	Retained	Action previously included in the 2015 plan, with a description of how it will be continued in the 2020 plan
IP	In Progress	Action previously included in the 2015 plan has been initiated, but not yet completed.

In the column labeled *Implementation Timeline*, initiatives listed as "Continuous Action" refers to an ongoing action that has initiated but not completed.

The participating jurisdictions reviewed the mitigation goals and priorities identified in the County's previous plan. Common elements of the previous mitigation goals were used to develop regional goals designed to achieve the implementation of mitigation actions. These refined goals were adopted by the participating jurisdictions. It was determined that the priorities for each of the participating jurisdictions has not changed.

Table E.48: Hazard Mitigation Action Plan for Sunflower County Strategy for and its Jurisdictions

Project #	Action Title	Action Description	Jurisdiction	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
SUN-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Sunflower County	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2015-2025	1.1	M	HMGP, CDBG, general budget	2015
SUN-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof	Sunflower County	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

		glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.						municipal building and public infrastructure.					
SUN-03	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Sunflower County	Sunflower Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2015-2025	1.3	H	HMGP, general budget	2015
SUN-04	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Sunflower County	Sunflower County EMA, MEMA	Flood	Undetermined	R	Apply for HMGP funding to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood. Track RFC/SRL properties not yet and mitigation options with the property owners as funding becomes available.	Continuous Action	1.2	M	FMA	2015

SUN-05	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	Sunflower County	Public Works, Drainage Districts	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would inlcude a component for drainage systems and culverts	2015-2040	1.2	H	HMGP, CDBG, CIAP funding or part of developer agreements	2015
SUN-06	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	Sunflower County	Public Works	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would inlcude a component for storm water conveyance and detention structures	Continuous action	1.2	M	CDBG, CIAP, general budget	2015
SUN-07	Create defensible space around structures and infrastructures.	Defensible zones and buildings, power and gas lines and other infrastructure may be lacking throughout the county.	Sunflower County	Public Works, BOS		Undetermined	R	Develop Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.2	L	General Funds	2015

SUN-08	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Lighting strikes can create outages to essential county water and sewer services as well as invite unnecessary damage to county facilities. Consider program to establish lightning grounding systems on critical water and sewer system elements and other facilities prone to strikes to ensure that essential county service continue.	Sunflower County	Public Works,	Severe Weather	Undetermined	R	Identify and prioritize critical facilities requiring installation of lightning protection systtem, starting with water and sewer facilities	2020-2025	1.2	H	General funds	2015
SUN-09	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the city. Furthermore, we realize hazards have cascading affects which should also be further explored. Identify opportunities to join committees and planning	Sunflower County	Sunflower Co. EMA, MEMA	Multi-hazard	N/A	R	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	2.2	H	General budget	2015

		studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives											
SUN-10	Develop critical infrastructure and Key Resources database (CIKR)	The State is lacking a comprehensive data base of critical facilities, infrastructure and other lifeline activities. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities for the County and its jurisdictions. The County EMA can serve as a liaison to the Coordinating Council for Remote Sensing and Geographic	Sunflower County	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Retain; Action will enhance database of CIKR assets within community.	2020-2025	2.1	H	General budget	2015

		Information Systems to ensure the data is complete and accurately mapped by the Council.											
SUN-11	Develop Community Wildfire Protection Plan (CWPP)	The Healthy Forest Restoration Act provide communities with a tremendous opportunity to influence where and how federal agencies implement fuel reduction projects on federal lands. A CWPP is the most effective way to take advantage of this opportunity. Consider developing a CWPP and contact Mississippi Forest Commission to obtain guidance and potential funding sources.	Sunflower County	Fire Department, County EMA	Wildfire	Undetermined	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	2.1	H	MFC, general budget, State Fire Marshall	2015
SUN-12	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The county has ordinances and regulations in place as required to address all hazards prone to the county and include any	Sunflower County	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be	Continuous Action	2.2	M	General Funds	2015

		changes in future development areas.						included in Comprehensive Plan Review					
SUN-13	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Sunflower County	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	2.2	M	General budget	2015
SUN-14	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	Sunflower County participates in the NFIP, but the CRS program. Consider participating in the CRS program and implement.	Sunflower County	BOS, Floodplain Manager, Building Official, Co EMA, MEMA	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.3	H	General budget	2015

SUN-15	Become a FireWise community	The FireWise Program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in an effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding. Obtain a wildfire risk assessment from the State FireWise Liaison, form a committee and create a action plan based on the assessment.	Sunflower County	BOS, Fire Department, MFC	Multi-hazards	Undetermined	R	Review requirements to become a FireWise community and take first steps toward becoming certified.	Continuous Action	2.1	H	General budget	2015

SUN-16	Continue efforts on public information and awareness for natural hazards	The county has several outreach initiatives to communicate hazard preparedness information to the general public and visitors in the area. Providing timely information and educational information related to preparedness, mitigation, response, and recovery to the public to foster their ability to become self-sufficient.	Sunflower County	Co EMA, applicable department, MEMA, NWS, FEMA	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2015
SUN-17	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the county that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings	Sunflower County	Co EMA, applicable department, MSDH,	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015

		and on the county's' web page.											
SUN-18	Promote workshops for emergency preparedness/continuity of operations.	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans establishes a clear chain of command, line of succession, and procedures for backups and alternative emergency facilities in case of extreme emergency or disaster.	Sunflower County	BOS and Sunflower Co.	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2015
SUN-19	Encourage the development of training and emergency planning for private companies that handle hazard materials	Hazardous materials, if not handled correctly, can adversely impact people and property should spills or damaging effects be encountered.	Sunflower County	Sunflower Co. EMA, Police and Fire Officials	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and	Continuous Action	3.2	M	General budget	2015

								private businesses, using all communications resources.					
SUN-20	Develop public/private partnerships that promote community hazard mitigation and assist in reach hazard mitigation goals	Local businesses is important to all jurisdictions as they provide goods and services to support the community. Identifying business that have interest in hazard mitigation due to their own interests or for the interest of the whole community as needed. The county will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives.	Sunflower County	Sunflower Co. applicable departments	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	M	General budget	2015
SUN-21	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National	Sunflower County	Sunflower County EMA, MEMA	Severe Weather, Tornado	$35,000	D	Moved to Preparedness Planning. Not a mitigation action. Remove - routine maintenance is not considered	Continuous Action	1.1	H	HMGP, Local Funds	2015

		Weather Service: identify site locations and develop cost estimates, including installation, testing and inspection						to be mitigation					
SUN-22	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Sunflower County	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.2	M	NWS	2015
SUN-23	Develop weather radio program for vulnerable populations	Outdoor warning sirens, text messaging, television and other forms of communication have been implemented to alert the public; however, areas/population that may not receive notifications due to location and/or lack of communication devices: develop committee to explore benefit/ cost, vendors, funding options, etc. to provide weather radios	Sunflower County	MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	Tornado, Severe Storm	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	2 yr	1.1	H	NWS, Private Funds	2015

		to vulnerable populations.											
SUN-24	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	Sunflower County	BOS	Human Infect. Disease	Undetermined	D		Continuous Action	1.2	H	General budget	2015
SUN-25	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	Sunflower County	Road Department, Public Works,	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove from Mitigation Plan. Routine maintenance is not considered mitigation.	Continuous Action	1.2	H	General budget	2015

SUN-26	Update the Comprehensive Emergency Management Plan (CEMP)	A CEMP provides for the preparation for and the carrying out all emergency functions to mitigate, prepare for, respond to, recover from emergencies and disasters, and to aid victims suffering from injury or damage, resulting from disasters caused by all hazards, whether natural, technological, or human caused and to provide support for search and rescue operations for person and property in distress.	Sunflower County	EMA, Police and Fire Departments	Multi-hazard	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	2.1	H	Homeland Security, EMPG	2015
SUN-27	Develop a Commodity Flow Study	Hazardous materials are transported through and to various locations in the county. The routes include rail, air and roadway. This study will provide valuable data in the way of what chemicals are being	Sunflower County	Fire Department, County EMA	Hazardous Material	$50,000-$75,000	D	Move to Preparedness Planning. Appoint a group to conduct Commodity Flow Study as part of County's overall preparedness and response efforts to	2018	2.1	L	HMEP	2015

		transported to confirm that the county has appropriate response procedures and equipment needed. The county should consider assembling a committee to determine if a Commodity Flow Study would be beneficial.						hazard material incidents.					
SUN-28	Develop/update the Comprehensive Plan to include hazard mitigation strategy/goals	A comprehensive plan establishes the overall vision for a community and help to guide decision making and priorities for addressing growth and changes in land use.	Sunflower County	BOS	Multi-hazards	$50,000-$75,000	D	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	2015-2020	2.1	M	General funds	2015
SUN-29	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response	Sunflower County	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action	2.1	M	General budget	2015

		procedures carried out by the county.											
SUN-30	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from federal, state and local level.	Sunflower County	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action	2.1	M	General budget	2015
SUN-31	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Sunflower County	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020	2.2	H	HMGP, general budget	2015

SUN-32	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The county can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Sunflower County	Sunflower County EMA	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action	3.1	M	General budget	2015
SUN-33	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this	Sunflower County	Sunflower County EMA, applicable departments	Multi-hazards	Undetermined	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings.	Continuous Action	2.2	M	General budget	2015

		plan once completed.											
SUN-34	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of	Sunflower County	Sunflower County EMA, applicable departments	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action	3.1	M	General budget	2015

		requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.											
SUN-35	Promote/Build storm water detention ponds when appropriate.	Detention ponds could be a solution for addressing flood impacts.	Sunflower County	Public Works	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.3	L	CDBG, developers	2015
	Town of Doddsville												
DOD-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Doddsville	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

DOD-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Town of Doddsville	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public cruitical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure.	2015-2025	1.1	M	HMGP, CDBG, general budget	2015
DOD-03	Promote/Build storm water detention ponds when appropriate.	Detention ponds could be a solution for addressing flood impacts.	Town of Doddsville	Public Works	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.1	L	CDBG, developers	2015

DOD-04	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Doddsville	Sunflower Co. EMA, MEMA	Multi-hazard	300000	R	Develop priority list for generator acquisition as funding becomes available	2015-2025	1.2	H	HMGP, general budget	2015
DOD-05	Continue efforts on mitigating Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	Town of Doddsville	Sunflower County EMA, MEMA	Flood	Undetermined	R	Apply for HMGP funding to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood. Track RFC/SRL properties not yet and mitigation options with the property owners as funding becomes available.	Continuous Action	1.2	M	FMA	2015
DOD-06	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the city are frequently impacted by flash flood and severe weather events.	Town of Doddsville	Public Works, Drainage Districts	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would inlcude a components for drainage systems and culverts	2015-2040	1.1	H	HMGP, CDBG, CIAP funding or part of developer agreements	2015

DOD-07	Create defensible space around structures and infrastructures.	Defensible zones and buildings, power and gas lines and other infrastructure may be lacking throughout the city.	Town of Doddsville	Public Works, BOS		Undetermined	R	Develop Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2015-2020	1.2	L	General Funds	2015
DOD-08	Develop critical infrastructure and Key Resources database (CIKR)	The State is lacking a comprehensive data base of critical facilities, infrastructure and other lifeline activities. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities for the County and its jurisdictions. The County EMA can serve as a liaison to the Coordinating	Town of Doddsville	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Retain; Action will enhance database of CIKR assets within community.	2020-2025	2.2	H	General budget	2015

		Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.											
DOD-09	Develop/update the Comprehensive Plan to include hazard mitigation strategy/goals	A comprehensive plan establishes the overall vision for a community and help to guide decision making and priorities for addressing growth and changes in land use.	Town of Doddsville	BOS	Multi-hazards	$50,000-$75,000	R	Continuous Action - Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	2020-2025	2.1	M	General funds	2015
DOD-10	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The city has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Town of Doddsville	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Continuous Action, Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review. Provide copy of Updated RHMP as guidance.	Continuous Action	3.1	M	General Funds	2015

DOD-11	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Town of Doddsville	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Continuous Action, Review all planning-related ordinances and initiatives, Provide copy of Updated RHMP as guidance.	Continuous Action	3.1	M	General budget	2015
DOD-12	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	The Town of Doddsville participates in the NFIP, but the CRS program. Consider participating in the CRS program and implement.	Town of Doddsville	BOS, Floodplain Manager, Building Official, Co EMA, MEMA	Multi-hazards	Undetermined	R	Retain and revise for City to take actions necessary to become a member of the CRS	Continuous Action	2.3	H	General budget	2015
DOD-13	Continue efforts on public information and awareness for natural hazards	The city and county has several outreach initiatives to communicate hazard preparedness information to the general public and visitors in the area. Providing timely information and educational information related to preparedness,	Town of Doddsville	Co EMA, applicable department, MEMA, NWS, FEMA	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communicati	Continuous Action	3.2	M	General budget	2015

		mitigation, response, and recovery to the public to foster their ability to become self-sufficient.						ons resources.					
DOD-14	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the county that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the county's' web page.	Town of Doddsville	Co EMA, applicable department, MSDH,	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	
DOD-15	Develop public/private partnerships that promote community hazard mitigation and assist in reach hazard mitigation goals	Local businesses is important to all jurisdictions as they provide goods and services to support the community. Identifying business that have interest in hazard mitigation due to their own	Town of Doddsville	Sunflower Co. applicable departments	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and	Continuous Action	3.2	M	General budget	2015

		interests or for the interest of the whole community as needed. The county will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives.						private businesses, using all communications resources.					
DOD-16	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including installation, testing and inspection	Town of Doddsville	Sunflower County EMA, MEMA	Severe Weather, Tornado	35000	D	Moved to Preparedness Planning. Not a mitigation action. Remove-routine maintenance is not considered to be mitigation	Continuous Action	1.1	H	HMGP, Local Funds	2015
DOD-17	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to	Town of Doddsville	Public Works	Flood	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for storm water conveyance	Continuous action	1.2	M	CDBG, CIAP, general budget	2015

		implement preventive maintained to water conveyance systems						and detention structures					
DOD-18	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	Town of Doddsville	Road Department, Public Works,	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove from Mitigation Plan. Routine maintenance is not considered mitigation.	Continuous Action	3.1	H	General budget	2015
DOD-19	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the city. Furthermore, we realize hazards have cascading affects which should also be further explored. Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them	Town of Doddsville	Sunflower Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	2.1	H	General budget	2015

		into future planning and regulatory initiatives											
DOD-20	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Town of Doddsville	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Moved to Preparedness Planning.	Continuous Action	2.1	M	General budget	2015
DOD-21	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from an federal, state and local level.	Town of Doddsville	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Moved to Preparedness Planning.	Continuous Action	3.1	M	General budget	2015
DOD-22	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance.	Town of Doddsville	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	Removed as an action item, included in RHMP Plan Maintenance	2020	2.1	H	HMGP, general budget	2015

		Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.											
DOD-23	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The city can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Town of Doddsville	Sunflower County EMA	Multi-hazards	Undetermined	D	Removed as an action item, included in RHMP Plan Maintenance	Continuous Action	2.1	M	General budget	2015
DOD-24	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress	Town of Doddsville	Sunflower County EMA, applicable departments	Multi-hazards	Undetermined	D	Removed as an action item, included in RHMP Plan Maintenance	Continuous Action	2.3	M	General budget	2015

		made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.											
DOD-25	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on	Town of Doddsville	Sunflower County EMA, applicable departments	Multi-hazards	Undetermined	D	Removed as an action item, included in RHMP Plan Maintenance	Continuous Action	3.1	M	General budget	2015

		HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.											
	City of Drew												
DRE-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	City of Drew	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

DRE-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and town property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	City of Drew	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure.	2015-2025	1.1	M	HMGP, CDBG, general budget	2015
DRE-03	Promote/Build storm water detention ponds when appropriate.	Detention ponds could be a solution for addressing flood impacts.	City of Drew	Public Works	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.1	L	CDBG, developers	2015

DRE-04	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	City of Drew	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	300000	R	Develop priority list for generator acquisition as funding becomes available	2015-2025	1.2	H	HMGP, general budget	2015
DRE-05	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the town are frequently impacted by flash flood and severe weather events.	City of Drew	Public Works, Drainage Districts	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for drainage systems and culverts	2015-2040	1.2	H	HMGP, CDBG, CIAP funding or part of developer agreements	2015
DRE-06	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	City of Drew	Public Works	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for storm water conveyance and detention structures	Continuous action	1.1	M	CDBG, CIAP, general budget	2015
DRE-07	Develop critical infrastructure and Key Resources database (CIKR)	The State is lacking a comprehensive data base of critical facilities, infrastructure and other lifeline activities. A Council has been	City of Drew	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic	Multi-hazard	Undetermined	R	Retain; Action will enhance database of CIKR assets within community.	2020-2025	3.1	H	General budget	2015

		created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities for the County and its jurisdictions. The County EMA can serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.		Information Systems, MEMA									
DRE-08	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The town has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future	City of Drew	Mayor's office, County EMA, applicable departments	Multi-hazards	Undetermined	R	Continuous Action, Revise to review all planning-related ordinances and initiatives to be included in Comprehensi	Continuous Action	2.1	M	General Funds	2015

		development areas.						ve Plan Review. Provide copy of Updated RHMP as guidance.					
DRE-09	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	City of Drew	Mayor's office, County EMA, applicable departments	Multi-hazards	Undetermined	R	Continuous Action, review all planning-related ordinances and initiatives, Provide copy of Updated RHMP as guidance.	Continuous Action	2.2	M	General budget	2015
DRE-10	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	The City of Drew participates in the NFIP, but the CRS program. Consider participating in the CRS program and implement.	City of Drew	Mayor's office, Floodplain Manager, Building Official, Co EMA, MEMA	Multi-hazards	Undetermined	R	Retain and revise for City to take actions necessary to become a member of the CRS	Continuous Action	2.1	H	General budget	2015
DRE-11	Continue efforts on public information and awareness for natural hazards	The city and county have several outreach initiatives to communicate hazard preparedness information to the general public and visitors in the area. Providing	City of Drew	Mayor's office, Co EMA, applicable department, MEMA, NWS, FEMA	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including	Continuous Action	2.3	M	General budget	2015

		timely information and educational information related to preparedness, mitigation, response, and recovery to the public to foster their ability to become self-sufficient.						families and private businesses, using all communications resources.					
DRE-12	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the county that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the county's' web page.	City of Drew	Mayor's office, Co EMA, applicable department, MSDH,	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015
DRE-13	Develop public/private partnerships that promote community hazard mitigation and assist in reach	Local businesses are important to all jurisdictions as they provide goods and services to support the community.	City of Drew	Mayor's office, applicable departments	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign	Continuous Action	3.1	M	General budget	2015

	hazard mitigation goals	Identifying business that have interest in hazard mitigation due to their own interests or for the interest of the whole community as needed. The county will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives.						about all hazards, across stakeholders, including families and private businesses, using all communications resources.					
DRE-14	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including installation, testing and inspection	City of Drew	Mayor's office, Sunflower County EMA, MEMA	Severe Weather, Tornado	35000	D	Moved to Preparedness Planning. Not a mitigation action. Remove - routine maintenance is not considered to be mitigation	Continuous Action	1.1	H	HMGP, Local Funds	2015

DRE-15	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	City of Drew	Mayor's office, Road Department, Public Works,	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove from Mitigation Plan. Routine maintenance is not considered mitigation.	Continuous Action	1.2	H	General budget	2015
DRE-16	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the city. Furthermore, we realize hazards have cascading affects which should also be further explored. Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives	City of Drew	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning.	Continuous Action	1.2	H	General budget	2015

DRE-17	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	City of Drew	Mayor's office, County EMA, Fire and Police	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action. Access available free online training through FEMA web site.	Continuous Action	2.1	M	General budget	2015
DRE-18	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from an federal, state and local level.	City of Drew	Mayor's office, County EMA, Fire and Police	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action. Access available free online training through FEMA web site.	Continuous Action	3.1	M	General budget	2015
DRE-19	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan	City of Drew	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020	3.1	H	HMGP, general budget	2015

		update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.											
DRE-20	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The town can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	City of Drew	Mayor's office, Sunflower County EMA	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	2.1	M	General budget	2015
DRE-21	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should	City of Drew	Mayor's office, Sunflower County EMA, applicable departments	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	2.1	M	General budget	2015

		be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.											
	City of Indianola									3.2			
IND-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should	City of Indianola	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update county and municipal regulations to ensure	2015-2025	1.2	M	HMGP, CDBG, general	2015

		include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.						that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards				budget	
IND-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	City of Indianola	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public cruitical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure.	2015-2025	1.1	M	HMGP, CDBG, general budget	2015

IND-03	Promote/Build storm water detention ponds when appropriate.	Detention ponds could be a solution for addressing flood impacts.	City of Indianola	Public Works	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2015-2025	1.1	H	HMGP, general budget	2015
IND-04	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	City of Indianola	Sunflower County EMA, MEMA	Flood	Undetermined	R	Develop priority list for generator acquisition as funding becomes available	Continuous Action	1.2	M	FMA	2015
IND-05	Upgrade drainage systems and culverts	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	City of Indianola	Public Works	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for drainage systems and culverts	Continuous action	1.2	M	CDBG, CIAP, general budget	2015
IND-06	Create defensible space around structures and infrastructures.	Defensible zones and buildings, power and gas lines and other infrastructure may be lacking throughout the county.	City of Indianola	Public Works, BOS		Undetermined	R	Develop Wildfire Protection Plan that identifies vulnerable hazard locations and	2020-2025	1.2	L	General Funds	2015

								flammable species.					
IND-07	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the city. Furthermore, we realize hazards have cascading affects which should also be further explored. Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives	City of Indianola	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Review all codes and ordinances to ensure highest standards of mitigation against natural and manmade hazards and to integrate into other planning mechanisms	2020-2025	3.1	H	General budget	2015

IND-08	Develop critical infrastructure and Key Resources database (CIKR)	The State is lacking a comprehensive data base of critical facilities, infrastructure and other lifeline activities. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities for the County and its jurisdictions. The County EMA can serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.	City of Indianola	EMA, Police and Fire Departments	Multi-hazard	Undetermined	R	Retain; Action will enhance database of CIKR assets within community.	2020-2025	2.1	H	Homeland Security, EMPG	2015
IND-09	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The town has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	City of Indianola	Mayor's office, County EMA, applicable departments	Multi-hazards	Undetermined	R	Continuous Action, Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review. Provide copy of Updated RHMP as guidance.	Continuous Action	2.2	M	General budget	2015

IND-10	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision reviews process, land suitability analysis, etc..	City of Indianola	Mayor's office, County EMA, Fire and Police	Multi-hazards	Undetermined	R	Continuous Action, Review all planning-related ordinances and initiatives, Provide copy of Updated RHMP as guidance.	Continuous Action	2.1	M	General budget	2015
IND-11	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	The City of Indianola participates in the NFIP, but the CRS program. Consider participating in the CRS program and implement.	City of Indianola	Mayor's office, Fire Department, MFC	Multi-hazards	Undetermined	R	Retain and revise for Town to take actions necessary to become a member of the CRS	Continuous Action	2.3	H	General budget	2015
IND-12	Continue efforts on public information and awareness for natural hazards	The city and county have several outreach initiatives to communicate hazard preparedness information to the general public and visitors in the area. Providing timely information and educational information related to preparedness,	City of Indianola	Mayor's office, Co EMA, applicable department, MSDH,	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communicati	Continuous Action	3.1	H	General budget	2015

		mitigation, response, and recovery to the public to foster their ability to become self-sufficient.						ons resources.					
IND-13	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the county that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the county's' web page.	City of Indianola	Mayor's office, and Sunflower Co.	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2015
IND-14	Develop public/private partnerships that promote community hazard mitigation and assist in reach hazard mitigation goals	Local businesses are important to all jurisdictions as they provide goods and services to support the community. Identifying business that have interest in hazard mitigation due to their own interests or for	City of Indianola	Mayor's office, Sunflower Co. applicable departments	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private	Continuous Action	3.2	M	General budget	2015

		the interest of the whole community as needed. The county will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives.						businesses, using all communications resources.					
IND-15	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including installation, testing and inspection	City of Indianola	Mayor's office, Sunflower County EMA, MEMA	Severe Weather, Tornado	35000	D	Moved to Preparedness Planning. Not a mitigation action. Remove - routine maintenance is not considered to be mitigation	Continuous Action	1.1	H	HMGP, Local Funds	2015
IND-16	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement	City of Indianola	Public Works	Flood	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for storm water conveyance and detention structures	Continuous action	1.2	M	CDBG, CIAP, general budget	2015

		preventive maintained to water conveyance systems											
IND-17	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	City of Indianola	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.2	H	General budget	2015
IND-18	Conduct annual first responder training for all hazards	National Incident Management System (NIMS) is essential and required for coordinating efforts from federal, state and local level.	City of Indianola	Mayor's office, County EMA, Fire and Police	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action	3.1	M	General budget	2015
IND-19	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from federal, state and local level.	City of Indianola	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Moved to Preparedness Planning.	Continuous Action	3.1	M	General budget	2015

IND-20	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	City of Indianola	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020	3.1	H	HMGP, general budget	2015
IND-21	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and	City of Indianola	Mayor's office, Sunflower County EMA, applicable departments	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	3.1	M	General budget	2015

		should be inserted in the appendix of this plan once completed.											
IND-22	Conduct annual reviews of the MEMA District 3 RHMP	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating	City of Indianola	Mayor's office, Sunflower County EMA, applicable departments	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	Continuous Action	2.1	M	General budget	2015

		training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.											
IND-23	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding	City of Indianola	Mayor's office, Floodplain Manager, Building Official, Co EMA, MEMA	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	2.1	H	General budget	2015

		that would be useful for the town to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.											
	Town of Inverness												
INV-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Inverness	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

INV-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Town of Inverness	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure.	2015-2025	1.2	M	HMGP, CDBG, general budget	2015
INV-03	Promote/Build storm water detention ponds when appropriate.	Detention ponds could be a solution for addressing flood impacts.	Town of Inverness	Public Works	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.1	L	CDBG, developers	2015

INV-04	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Inverness	Sunflower County EMA, MEMA	Flood	Undetermined	R	Develop priority list for generator acquisition as funding becomes available	Continuous Action	1.2	M	FMA	2015
INV-05	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the town are frequently impacted by flash flood and severe weather events.	Town of Inverness	Public Works, Drainage Districts	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for drainage systems and culverts	2015-2040	1.2	H	HMGP, CDBG, CIAP funding or part of developer agreements	2015
INV-06	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	Town of Inverness	Public Works Department		Undetermined	R	Develop a Stormwater Management Plan, which would include a componens for storm water conveyance and detention structures	2020-2025	1.1	L	General Funds	2015

INV-07	Develop critical infrastructure and Key Resources database (CIKR)	The State is lacking a comprehensive data base of critical facilities, infrastructure and other lifeline activities. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities for the County and its jurisdictions. The County EMA can serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.	Town of Inverness	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Retain; Action will enhance database of CIKR assets within community.	2020-2025	3.1	H	Homeland Security, EMPG, General Budget	2015
INV-08	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The Town of Inverness has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Town of Inverness	Fire and Police Department, Sunflower County EMA	Multi-hazards	Undetermined	R	Continuous Action, Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review.	Continuous Action	2.1	M	General budget	2015

								Provide copy of Updated RHMP as guidance.					
INV-09	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision reviews process, land suitability analysis, etc..	Town of Inverness	Mayor's Office, applicable departments	Multi-hazards	Undetermined	R	Continuous Action, review all planning-related ordinances and initiatives, Provide copy of Updated RHMP as guidance.	Continuous Action	2.2	M	General budget	2015
INV-10	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	The Town of Inverness does not participate in National Flood Insurance Program.	Town of Inverness	Floodplain Managers, Building Officials, Sunflower EMA, MEMA	Multi-hazards	Undetermined	R	Encourage and assist the Town's staff with developing and submitting an application to participate in the NFIP.	Continuous Action	2.1	H	General budget	2015

INV-11	Continue efforts on public information and awareness for natural hazards	The town and county have several outreach initiatives to communicate hazard preparedness information to the general public and visitors in the area. Providing timely information and educational information related to preparedness, mitigation, response, and recovery to the public to foster their ability to become self-sufficient.	Town of Inverness	Mayor's Office, Sunflower Co. EMA, MEMA, NWS, FEMA	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	2.3	H	General budget	2015
INV-12	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the county that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the county's' web page.	Town of Inverness	Mayor's Office, Sunflower Co. EMA, MSDA	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2015

INV-13	Develop public/private partnerships that promote community hazard mitigation and assist in reach hazard mitigation goals	Local businesses are important to all jurisdictions as they provide goods and services to support the community. Identifying business that have interest in hazard mitigation due to their own interests or for the interest of the whole community as needed. The city will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives.	Town of Inverness	Mayor's Office, Sunflower Co. EMA	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2015
INV-14	Install/maintain severe weather warning system	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Town of Inverness	Mayor's office, Sunflower Co. EMA, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning.	2015-2020	1.1	M	NWS	2015

INV-15	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	Town of Inverness	Road Department, Public Works, Mayor's Office	Multi-hazard	N/A	D	Moved to Preparedness Planning. Ongoing maintenance does not qualify as mitigation.	Continuous Action	1.2	H	General budget	2015
INV-16	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the town.	Town of Inverness	Mayor's Office, applicable departments	Multi-hazard	Undetermined	D	Continuous action, moved to preparedness Planning initiative.	2019	1.2	H	General budget	2015
INV-17	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Town of Inverness	Fire and Police Department, Sunflower County EMA	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action. Access available free online training through FEMA web site.	Continuous Action	2.1	M	General budget	2015

INV-18	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from an federal, state and local level.	Town of Inverness	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Moved to Preparedness Planning.	Continuous Action	3.1	M	General budget	2015
INV-19	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Town of Inverness	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020	3.1	H	HMGP, general budget	2015
INV-20	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to	Town of Inverness	Mayor's Office, Sunflower County EMA	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	2.1	M	General budget	2015

		review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.											
INV-21	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.	Town of Inverness	Sunflower County EMA, applicable departments	Multi-hazards	Undetermined	D	Removed as an action item, included in RHMP Plan Maintenance	Continuous Action	2.3	M	General budget	2015

INV-22	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA	Town of Inverness	Mayor's Office, Sunflower County EMA	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	2.1	H	General budget	2015

		program and learn techniques for completing an effective application and benefit cost analysis.											
	City of Moorhead												
MOO-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	City of Moorhead	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2015-2025	1.1	M	HMGP, CDBG, general budget	2015
MOO-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may	City of Moorhead	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

		include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.						may include any municipal building and public infrastructure.					
MOO-03	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	City of Moorhead	Sunflower Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2015-2025	1.3	H	HMGP, general budget	2015
MOO-04	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	City of Moorhead	Sunflower County EMA, MEMA	Flood	Undetermined	R	Apply for HMGP funding to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood. Track RFC/SRL properties not yet and mitigation options with the property owners as funding becomes available.	Continuous Action	1.2	M	FMA	2015

MOO-05	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the County are frequently impacted by flash flood and severe weather events.	City of Moorhead	Public Works, Drainage Districts	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for drainage systems and culverts	2015-2040	1.2	H	HMGP, CDBG, CIAP funding or part of developer agreements	2015
MOO-06	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	City of Moorhead	Public Works	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for storm water conveyance and detention structures	Continuous action	1.2	M	CDBG, CIAP, general budget	2015
MOO-07	Create defensible space around structures and infrastructures.	Defensible zones and buildings, power and gas lines and other infrastructure may be lacking throughout the county.	City of Moorhead	Public Works, BOS		Undetermined	R	Develop Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.2	L	General Funds	2015

MOO-08	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Lighting strikes can create outages to essential county water and sewer services as well as invite unnecessary damage to county facilities. Consider program to establish lightning grounding systems on critical water and sewer system elements and other facilities prone to strikes to ensure that essential county service continue.	City of Moorhead	Public Works,	Severe Weather	Undetermined	R	Identify and prioritize critical facilities requiring installation of lightning protection system, starting with water and sewer facilities	2020-2025	1.2	H	General funds	2015
MOO-09	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the city. Furthermore, we realize hazards have cascading affects which should also be further explored. Identify opportunities to join committees and planning	City of Moorhead	Sunflower Co. EMA, MEMA	Multi-hazard	N/A	R	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	2.2	H	General budget	2015

		studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives											
MOO-10	Develop critical infrastructure and Key Resources database (CIKR)	The State is lacking a comprehensive data base of critical facilities, infrastructure and other lifeline activities. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities for the County and its jurisdictions. The County EMA can serve as a liaison to the Coordinating Council for Remote Sensing and Geographic	City of Moorhead	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Retain; Action will enhance database of CIKR assets within community.	2020-2025	2.1	H	General budget	2015

		Information Systems to ensure the data is complete and accurately mapped by the Council.											
MOO-11	Develop Community Wildfire Protection Plan (CWPP)	The Healthy Forest Restoration Act provide communities with a tremendous opportunity to influence where and how federal agencies implement fuel reduction projects on federal lands. A CWPP is the most effective way to take advantage of this opportunity. Consider developing a CWPP and contact Mississippi Forest Commission to obtain guidance and potential funding sources.	City of Moorhead	Fire Department, County EMA	Wildfire	Undetermined	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	2.1	H	MFC, general budget, State Fire Marshall	2015
MOO-12	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The county has ordinances and regulations in place as required to address all hazards prone to the county and include any	City of Moorhead	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be	Continuous Action	2.2	M	General Funds	2015

		changes in future development areas.						included in Comprehensive Plan Review					
MOO-13	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	City of Moorhead	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	2.2	M	General budget	2015
MOO-14	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	Sunflower County participates in the NFIP, but the CRS program. Consider participating in the CRS program and implement.	City of Moorhead	BOS, Floodplain Manager, Building Official, Co EMA, MEMA	Multi-hazards	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.3	H	General budget	2015

MOO-15	Become a FireWise community	The FireWise Program encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in an effort to protect people and property from wildfire risks. The benefits of the program include: a framework for action, community building, citizen pride, publicity and access to funding. Obtain a wildfire risk assessment from the State FireWise Liaison, form a committee and create a action plan based on the assessment.	City of Moorhead	BOS, Fire Department, MFC	Multi-hazards	Undetermined	R	Review requirements to become a FireWise community and take first steps toward becoming certified.	Continuous Action	2.1	H	General budget	2015

MOO-16	Continue efforts on public information and awareness for natural hazards	The City and county have several outreach initiatives to communicate hazard preparedness information to the general public and visitors in the area. Providing timely information and educational information related to preparedness, mitigation, response, and recovery to the public to foster their ability to become self-sufficient.	City of Moorhead	Co EMA, applicable department, MEMA, NWS, FEMA	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2015
MOO-17	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the county that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at	City of Moorhead	Co EMA, applicable department, MSDH,	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015

		public meetings and on the county's' web page.											
MOO 18	Promote workshops for emergency preparedness/continuity of operations.	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans establishes a clear chain of command, line of succession, and procedures for backups and alternative emergency facilities in case of extreme emergency or disaster.	City of Moorhead	BOS and Sunflower Co.	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2015
MOO-19	Encourage the development of training and emergency planning for private companies that handle hazard materials	Hazardous materials, if not handled correctly, can adversely impact people and property should spills or damaging effects be encountered.	City of Moorhead	Sunflower Co. EMA, Police and Fire Officials	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders,	Continuous Action	3.2	M	General budget	2015

								including families and private businesses, using all communications resources.					
MOO-20	Develop public/private partnerships that promote community hazard mitigation and assist in reach hazard mitigation goals	Local businesses are important to all jurisdictions as they provide goods and services to support the community. Identifying business that have interest in hazard mitigation due to their own interests or for the interest of the whole community as needed. The county will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives.	City of Moorhead	Sunflower Co. applicable departments	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.2	M	General budget	2015
MOO-21	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations	City of Moorhead	Sunflower County EMA, MEMA	Severe Weather, Tornado	$35,000	D	Moved to Preparedness Planning. Not a mitigation action .Remove - routine maintenanc	Continuous Action	1.1	H	HMGP, Local Funds	2015

		Center and National Weather Service: identify site locations and develop cost estimates, including installation, testing and inspection						e is not considered to be mitigation					
MOO-22	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	City of Moorhead	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.2	M	NWS	2015
	City of Ruleville												
RUL-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	City of Ruleville	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

RUL-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	City of Ruleville	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure.	2015-2025	1.1	M	HMGP, CDBG, general budget	2015
RUL--03	Promote/Build storm water detention ponds when appropriate.	Detention ponds could be a solution for addressing flood impacts.	City of Ruleville	Public Works	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.1	L	CDBG, developers	2015

RUL--04	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	City of Ruleville	Sunflower Co. EMA, MEMA	Multi-hazard	300000	R	Develop priority list for generator acquisition as funding becomes available	2015-2025	1.2	H	HMGP, general budget	2015
RUL--05	Continue efforts on mitigating Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Grant funding through the Hazard Mitigation Grant Program may be used to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood.	City of Ruleville	Sunflower County EMA, MEMA	Flood	Undetermined	R	Apply for HMGP funding to mitigate Repetitive Flood Claim (RFC) and Severe Repetitive Loss (SRL) properties that repeatedly flood. Track RFC/SRL properties not yet and mitigation options with the property owners as funding becomes available.	Continuous Action	1.2	M	FMA	2015
Rul--06	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the city are frequently impacted by flash flood and severe weather events.	City of Ruleville	Public Works, Drainage Districts	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for drainage systems and culverts	2015-2040	1.1	H	HMGP, CDBG, CIAP funding or part of developer agreements	2015

Rul--07	Create defensible space around structures and infrastructures.	Defensible zones and buildings, power and gas lines and other infrastructure may be lacking throughout the city.	City of Ruleville	Public Works, BOS		Undetermined	R	Develop Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.2	L	General Funds	2015
RUL--08	Develop critical infrastructure and Key Resources database (CIKR)	The State is lacking a comprehensive data base of critical facilities, infrastructure and other lifeline activities. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities for the County and its jurisdictions. The County EMA can serve as a liaison to the Coordinating	City of Ruleville	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Retain; Action will enhance database of CIKR assets within community.	2020-2025	2.2	H	General budget	2015

		Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.											
RUL-09	Develop/update the Comprehensive Plan to include hazard mitigation strategy/goals	A comprehensive plan establishes the overall vision for a community and help to guide decision making and priorities for addressing growth and changes in land use.	City of Ruleville	BOS	Multi-hazards	$50,000-$75,000	R	Continuous Action - Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	2020-2025	2.1	M	General funds	2015
RUL-10	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The city has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	City of Ruleville	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Continuous Action, Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review. Provide copy of Updated RHMP as guidance.	Continuous Action	3.1	M	General Funds	2015

RUL-11	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	City of Ruleville	BOS, County EMA, applicable departments	Multi-hazards	Undetermined	R	Continuous Action, review all planning-related ordinances and initiatives, Provide copy of Updated RHMP as guidance.	Continuous Action	3.1	M	General budget	2015
RUL-12	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	The City of Ruleville participates in the NFIP, but the CRS program. Consider participating in the CRS program and implement.	City of Ruleville	BOS, Floodplain Manager, Building Official, Co EMA, MEMA	Multi-hazards	Undetermined	R	Retain and revise for City to take actions necessary to become a member of the CRS	Continuous Action	2.3	H	General budget	2015
RUL-13	Continue efforts on public information and awareness for natural hazards	The city and county has several outreach initiatives to communicate hazard preparedness information to the general public and visitors in the area. Providing timely information and educational information related to preparedness,	City of Ruleville	Co EMA, applicable department, MEMA, NWS, FEMA	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communicati	Continuous Action	3.2	M	General budget	2015

		mitigation, response, and recovery to the public to foster their ability to become self-sufficient.						ons resources.					
RUL-14	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the county that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at public meetings and on the county's' web page.	City of Ruleville	Co EMA, applicable department, MSDH,	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	
RUL-15	Develop public/private partnerships that promote community hazard mitigation and assist in reach hazard mitigation goals	Local businesses are important to all jurisdictions as they provide goods and services to support the community. Identifying business that have interest in hazard mitigation due to their own interests or for	City of Ruleville	Sunflower Co. applicable departments	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private	Continuous Action	3.2	M	General budget	2015

		the interest of the whole community as needed. The county will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives.						businesses, using all communications resources.					
RUL-16	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including installation, testing and inspection	City of Ruleville	Sunflower County EMA, MEMA	Severe Weather, Tornado	35000	D	Moved to Preparedness Planning. Not a mitigation action. Remove - routine maintenance is not considered to be mitigation	Continuous Action	1.1	H	HMGP, Local Funds	2015
RUL-17	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement	City of Ruleville	Public Works	Flood	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for storm water conveyance and detention structures	Continuous action	1.2	M	CDBG, CIAP, general budget	2015

		preventive maintained to water conveyance systems											
RUL-18	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	City of Ruleville	Road Department, Public Works,	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove from Mitigation Plan. Routine maintenance is not considered mitigation.	Continuous Action	3.1	H	General budget	2015
RUL-19	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the city. Furthermore, we realize hazards have cascading affects which should also be further explored. Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future	City of Ruleville	Sunflower Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	2.1	H	General budget	2015

		planning and regulatory initiatives											
RUL-20	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	City of Ruleville	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Moved to Preparedness Planning.	Continuous Action	2.1	M	General budget	2015
RUL-21	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from federal, state and local level.	City of Ruleville	County EMA, Fire and Police	Multi-hazards	Undetermined	D	Moved to Preparedness Planning.	Continuous Action	3.1	M	General budget	2015
RUL-22	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan	City of Ruleville	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	Removed as an action item, included in RHMP Plan Maintenance	2020	2.1	H	HMGP, general budget	2015

		update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.											
RUL-23	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The city can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	City of Ruleville	Sunflower County EMA	Multi-hazards	Undetermined	D	Removed as an action item, included in RHMP Plan Maintenance	Continuous Action	2.1	M	General budget	2015
RUL-24	Conduct annual reviews of the MEMA District 3 RHMP	As defined in the plan maintenance section of this plan, the Chairman of the Hazard Mitigation Committee will schedule a meeting with the committee to review progress made on	City of Ruleville	Sunflower County EMA, applicable departments	Multi-hazards	Undetermined	D	Removed as an action item, included in RHMP Plan Maintenance	Continuous Action	2.3	M	General budget	2015

		mitigation actions and identify needs. A worksheet has been developed to facilitate this process and should be inserted in the appendix of this plan once completed.											
RUL-25	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding	City of Ruleville	Sunflower County EMA, applicable departments	Multi-hazards	Undetermined	D	Removed as an action item, included in RHMP Plan Maintenance	Continuous Action	3.1	M	General budget	2015

		that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.											
	Town of Sunflower												
SUN-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Town of Sunflower	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2015-2025	1.2	M	HMGP, CDBG, general budget	2015

SUN-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and town property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Town of Sunflower	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure.	2015-2025	1.1	M	HMGP, CDBG, general budget	2015
SUN-03	Promote/Build storm water detention ponds when appropriate.	Detention ponds could be a solution for addressing flood impacts.	Town of Sunflower	Public Works	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.1	L	CDBG, developers	2015

SUN-04	Secure generators for existing and new critical facilities and infrastructure	Generators are essential to providing continual operations in the event of a disaster	Town of Sunflower	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	300000	R	Develop priority list for generator acquisition as funding becomes available	2015-2025	1.2	H	HMGP, general budget	2015
SUN-05	Upgrade drainage systems and culverts	The drainage systems and culverts throughout the town are frequently impacted by flash flood and severe weather events.	Town of Sunflower	Public Works, Drainage Districts	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for drainage systems and culverts	2015-2040	1.2	H	HMGP, CDBG, CIAP funding or part of developer agreements	2015
SUN-06	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	Town of Sunflower	Public Works	Flood	Undetermined	R	Develop a Stormwater Management Plan, which would include a component for storm water conveyance and detention structures	Continuous action	1.1	M	CDBG, CIAP, general budget	2015

SUN-07	Develop critical infrastructure and Key Resources database (CIKR)	The State is lacking a comprehensive data base of critical facilities, infrastructure and other lifeline activities. A Council has been created by the State to begin gathering relevant data to build out a mapping system to further the state's preparedness and response abilities for all hazards. Develop the location and other relevant information on critical facilities for the County and its jurisdictions. The County EMA can serve as a liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the Council.	Town of Sunflower	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Retain; Action will enhance database of CIKR assets within community.	2020-2025	3.1	H	General budget	2015

SUN-08	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The town has ordinances and regulations in place as required to address all hazards prone to the county and include any changes in future development areas.	Town of Sunflower	Mayor's office, County EMA, applicable departments	Multi-hazards	Undetermined	R	Continuous Action, Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review. Provide copy of Updated RHMP as guidance.	Continuous Action	2.1	M	General Funds	2015
SUN-09	Integrate hazard mitigation into local planning	Hazard Mitigation can be integrated into local planning efforts through integrating risk assessment and hazard mitigation principles into the comprehensive plan, local development and subdivision review process, land suitability analysis, etc.	Town of Sunflower	Mayor's office, County EMA, applicable departments	Multi-hazards	Undetermined	R	Continuous Action, review all planning-related ordinances and initiatives, Provide copy of Updated RHMP as guidance.	Continuous Action	2.2	M	General budget	2015
SUN-10	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	The Town of Sunflower participates in the NFIP, but the CRS program. Consider participating in the CRS program and implement.	Town of Sunflower	Mayor's office, Floodplain Manager, Building Official, Co EMA, MEMA	Multi-hazards	Undetermined	R	Retain and revise for Town to take actions necessary to become a member of the CRS	Continuous Action	2.1	H	General budget	2015

SUN-11	Continue efforts on public information and awareness for natural hazards	The town and county has several outreach initiatives to communicate hazard preparedness information to the general public and visitors in the area. Providing timely information and educational information related to preparedness, mitigation, response, and recovery to the public to foster their ability to become self-sufficient.	Town of Sunflower	Mayor's office, Co EMA, applicable department, MEMA, NWS, FEMA	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	2.3	M	General budget	2015
SUN-12	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards. Identify areas/groups within the county that are prone to technological, man-made and health-related hazards. Develop or acquire suitable materials and disseminate at	Town of Sunflower	Mayor's office, Co EMA, applicable department, MSDH,	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	H	General budget	2015

		public meetings and on the county's' web page.											
SUN-13	Develop public/private partnerships that promote community hazard mitigation and assist in reach hazard mitigation goals	Local businesses are important to all jurisdictions as they provide goods and services to support the community. Identifying business that have interest in hazard mitigation due to their own interests or for the interest of the whole community as needed. The county will work with these businesses to develop additional strategies to meet hazard mitigation goals and objectives.	Town of Sunflower	Mayor's office, applicable departments	Multi-hazards	Undetermined	R	Ongoing action, Develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	3.1	M	General budget	2015
SUN-14	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service:	Town of Sunflower	Mayor's office, Sunflower County EMA, MEMA	Severe Weather, Tornado	35000	D	Moved to Preparedness Planning. Not a mitigation action. Remove - routine maintenance is not considered	Continuous Action	1.1	H	HMGP, Local Funds	2015

		identify site locations and develop cost estimates, including installation, testing and inspection						to be mitigation					
SUN-15	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Trees and other vegetation can encroach overhead power lines and road ways potentially causing loss of service and/or accidents during and after severe storm, tornado and winter-weather events. Keep areas of concern free of unnecessary debris	Town of Sunflower	Mayor's office, Road Department, Public Works,	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove from Mitigation Plan. Routine maintenance is not considered mitigation.	Continuous Action	1.2	H	General budget	2015
SUN-16	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	New hazards were added to the 2013 plan that will require further education to determine how they can potentially impact the city. Furthermore, we realize hazards have cascading affects which should also be further explored. Identify opportunities to join committees and planning studies to learn	Town of Sunflower	Mayor's office, Sunflower Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning.	Continuous Action	1.2	H	General budget	2015

		about all hazards in an effort to integrate them into future planning and regulatory initiatives											
SUN-17	Conduct annual first responder training for all hazards	First responders participate in various training programs for all hazards on an annual basis. Lessons learned during the drills should be captured and address in applicable plans and SOPs to improve preparedness and response procedures carried out by the county.	Town of Sunflower	Mayor's office, County EMA, Fire and Police	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action. Access available free online training through FEMA web site.	Continuous Action	2.1	M	General budget	2015
SUN-18	Conduct annual NIMS training for first responders, officials and critical employees	National Incident Management System (NIMS) is essential and required for coordinating efforts from federal, state and local level.	Town of Sunflower	Mayor's office, County EMA, Fire and Police	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action. Access available free online training through FEMA web site.	Continuous Action	3.1	M	General budget	2015

SUN-19	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Under CFR 44.206 - Communities are required to update their hazard mitigation plans every five years to remain eligible for disaster assistance. Coordinate plan update with MEMA Mitigation Planning Bureau and the participating jurisdictions in MEMA District 3 to schedule plan updates as they come due.	Town of Sunflower	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazards	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020	3.1	H	HMGP, general budget	2015
SUN-20	Conduct post-disaster meetings for declared and/or major events to access the impact to people and property	Every disaster presents varying degrees of impact, no two storms are alike. The town can obtain valuable data and insight into impacts as they occur to access and define appropriate actions in the way of implementing an existing mitigation action or identifying new needs.	Town of Sunflower	Mayor's office, Sunflower County EMA	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	2.1	M	General budget	2015

SUN-21	Pursue training and funding opportunities for mitigation actions	Funding options for action identified in this plan should be explored and pursued. Coordination with Public Works, engineering, planning and the building official on anticipated projects should be evaluated for mitigation funding when appropriate. In the past, the local cost share has not been available and may have prevented the county from obtaining grants through HMA. MEMA on occasion providing workshops on HMA funding that would be useful for the county to obtain for further education/information. Participating training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques for completing an effective application and benefit cost analysis.	Town of Sunflower	Mayor's office, Sunflower County EMA, applicable departments	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	2.1	M	General budget	2015

Mitigation Action Worksheets

Sunflower County elected to more fully describe two mitigation actions on a Mitigation Action Worksheet. The two worksheets address the following initiatives:

2. Retrofitting of critical infrastructure to provide protection from floods and high wind events.

3. Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others.

It was decided that all jurisdictions within the county will work on these two actions, so a separate action worksheet for each jurisdiction working on both each is included in the Actions Worksheets section. The Action Worksheets for Sunflower County are included first, and then jurisdictional worksheets follow.

Mitigation Action Worksheet		
Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Sunflower County, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the county severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	**Action #: Sunflower County-1** Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	**BENEFIT** Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	**COST** Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	

9. Timeline for Completion:	Two years
10. Useful Life:	50 years
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding
12. Local Planning Mechanisms to be Used in Implementation, if any:	Sunflower County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Discussion with affected jurisdictions required to secure local approval and support.

Sunflower County Mitigation Action Worksheet-2

Disaster communications originates with the Sunflower County Emergency Management Department. As such, it is appropriate to work with EM staff and the North Central Mississippi Planning and Development District to develop an education and outreach campaign that uses County communications as a touchstone for information about all hazards shared at the local level, included unincorporated and hard-to-reach communities.

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Sunflower County, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Sunflower County Annex of the MEMA District 3 RHMP. • Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. • Alternative :Have no education and outreach program, thus leaving stakeholders vulnerable to hazards.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Sunflower -2 Work with the North Central MS Planning and Development Council to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Sunflower Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Board of Supervisors, Mayors, City/Board of Aldermens, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	

10. Useful Life:	Five years – revisit as local needs require
11. Potential Fund Sources:	County and local budgets, PDD
12. Local Planning Mechanisms to be Used in Implementation, if any:	Sunflower County Emergency Management Plan, Town/City Communications Plans
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Jurisdictional Action Worksheets Demonstrating Cooperative efforts with Sunflower on Mitigation Action Sunflower -2

Community Need

Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.

Solution:

Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Sunflower County Annex of the District 3 RHMP.

Mitigation Action Worksheet		
Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Town of Doddsville, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan Critical Facility Retrofit	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	**Action #: Doddsville-1** Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	**BENEFIT** Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	**COST** Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	Local and County Budget, FEMA HMGP funding	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Sunflower County Emergency Management Plan	

Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Sunflower County Emergency Management Director participated during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Doddsville, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan Communication Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Sunflower County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative :Have no education and outreach program, thus leaving stakeholders vulnerable to hazards.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Doddsville -2 Work with the North Central MS Planning and Development Council to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Sunflower Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Board of Supervisors, Mayors, City/Board of Aldermens, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	

9. Timeline for Completion:	Two years
10. Useful Life:	Five years – revisit as local needs require
11. Potential Fund Sources:	County and local budgets, PDD
12. Local Planning Mechanisms to be Used in Implementation, if any:	Sunflower County Emergency Management Plan, Town/City Communications Plans
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Mitigation Action Worksheet		
Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Town of Drew, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan Critical Facility Retrofit	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	**Action #: Drew-1** Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	**BENEFIT** Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	**COST** Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	

9. Timeline for Completion:	Two years
10. Useful Life:	50 years
11. Potential Fund Sources:	Local and County Budget, FEMA HMGP funding
12. Local Planning Mechanisms to be Used in Implementation, if any:	Sunflower County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Sunflower County Emergency Management Director participated during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Drew, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan Communications plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Sunflower County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative :Have no education and outreach program, thus leaving stakeholders vulnerable to hazards.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Drew -2 Work with the North Central MS Planning and Development Council to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Sunflower Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Board of Supervisors, Mayors, City/Board of Aldermens, PDD	

8. Action/Project Priority (STAPLEE Score):	20 – High
9. Timeline for Completion:	Two years
10. Useful Life:	Five years – revisit as local needs require
11. Potential Fund Sources:	County and local budgets, PDD
12. Local Planning Mechanisms to be Used in Implementation, if any:	Sunflower County Emergency Management Plan, Town/City Communications Plans
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Mitigation Action Worksheet		
Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	City of Indianola, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan Critical Facility Retrofit	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	**Action #: Indianola-1** Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	**BENEFIT** Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	**COST** Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	

9. Timeline for Completion:	Two years
10. Useful Life:	50 years
11. Potential Fund Sources:	Local and County Budget, FEMA HMGP funding
12. Local Planning Mechanisms to be Used in Implementation, if any:	Sunflower County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Sunflower County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Indianola, Mississippi MEMA District 3 Multi-Jurisdictional Hazard Mitigation Plan Communications plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Sunflower County Annex of the District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative :Have no education and outreach program, thus leaving stakeholders vulnerable to hazards.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Indianola -2 Work with the North Central MS Planning and Development Council to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Sunflower Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Board of Supervisors, Mayors, City/Board of Aldermens, PDD	

8. Action/Project Priority (STAPLEE Score):	20 – High
9. Timeline for Completion:	Two years
10. Useful Life:	Five years – revisit as local needs require
11. Potential Fund Sources:	County and local budgets, PDD
12. Local Planning Mechanisms to be Used in Implementation, if any:	Sunflower County Emergency Management Plan, Town/City Communications Plans
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Mitigation Action Worksheet

Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Town of Inverness, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan Critical Facility Retrofit	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	**Action #: Inverness-1** Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	**BENEFIT** Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	**COST** Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	

9. Timeline for Completion:	Two years
10. Useful Life:	50 years
11. Potential Fund Sources:	Local and County Budget, FEMA HMGP funding
12. Local Planning Mechanisms to be Used in Implementation, if any:	Sunflower County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Sunflower County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Inverness, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan Communications plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Sunflower County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative :Have no education and outreach program, thus leaving stakeholders vulnerable to hazards.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Inverness -2 Work with the North Central MS Planning and Development Council to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Sunflower Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Board of Supervisors, Mayors, City/Board of Aldermens, PDD	

8. Action/Project Priority (STAPLEE Score):	20 – High
9. Timeline for Completion:	Two years
10. Useful Life:	Five years – revisit as local needs require
11. Potential Fund Sources:	County and local budgets, PDD
12. Local Planning Mechanisms to be Used in Implementation, if any:	Sunflower County Emergency Management Plan, Town/City Communications Plans
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Mitigation Action Worksheet		
Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Town of Moorhead, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan Critical Facility Retrofit	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	**Action #: Moorhead-1** Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	**BENEFIT** Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	**COST** Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	

8. Action/Project Priority (STAPLEE Score):	20 – High
9. Timeline for Completion:	Two years
10. Useful Life:	50 years
11. Potential Fund Sources:	Local and County Budget, FEMA HMGP funding
12. Local Planning Mechanisms to be Used in Implementation, if any:	Sunflower County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Sunflower County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Moorhead, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Sunflower County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative :Have no education and outreach program, thus leaving stakeholders vulnerable to hazards.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Moorhead -2 Work with the North Central MS Planning and Development Council to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Sunflower Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Board of Supervisors, Mayors, City/Board of Aldermens, PDD	

8. Action/Project Priority (STAPLEE Score):	20 – High
9. Timeline for Completion:	Two years
10. Useful Life:	Five years – revisit as local needs require
11. Potential Fund Sources:	County and local budgets, PDD
12. Local Planning Mechanisms to be Used in Implementation, if any:	Sunflower County Emergency Management Plan, Town/City Communications Plans
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Mitigation Action Worksheet		
Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Town of Ruleville, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan Critical Facility Retrofit	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: **Name of Action or Project:**	**Action #: Ruleville-1** Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 **Benefits (losses avoided) Estimated Cost** **Other Factors Considered (see STAPLEE Worksheet)**	**BENEFIT** Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	**COST** Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	

8. Action/Project Priority (STAPLEE Score):	20 – High
9. Timeline for Completion:	Two years
10. Useful Life:	50 years
11. Potential Fund Sources:	Local and County Budget, FEMA HMGP funding
12. Local Planning Mechanisms to be Used in Implementation, if any:	Sunflower County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Sunflower County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Ruleville, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Sunflower County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative :Have no education and outreach program, thus leaving stakeholders vulnerable to hazards.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Ruleville -2 Work with the North Central MS Planning and Development Council to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Sunflower Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Board of Supervisors, Mayors, City/Board of Aldermens, PDD	

8. Action/Project Priority (STAPLEE Score):	20 – High
9. Timeline for Completion:	Two years
10. Useful Life:	Five years – revisit as local needs require
11. Potential Fund Sources:	County and local budgets, PDD
12. Local Planning Mechanisms to be Used in Implementation, if any:	Sunflower County Emergency Management Plan, Town/City Communications Plans
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Mitigation Action Worksheet		
Name of Jurisdiction: **Name of Haz. Mitigation Plan:**	Town of Sunflower, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan Critical Facility Retrofit	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	**Action #: Sunflowere-1** Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 **Benefits (losses avoided) Estimated Cost** **Other Factors Considered (see STAPLEE Worksheet)**	**BENEFIT** Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	**COST** Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	

11. Potential Fund Sources:	Local and County Budget, FEMA HMGP funding
12. Local Planning Mechanisms to be Used in Implementation, if any:	Sunflower County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Sunflower County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Sunflower, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Sunflower County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative :Have no education and outreach program, thus leaving stakeholders vulnerable to hazards.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Sunflower -2 Work with the North Central MS Planning and Development Council to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Sunflower Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Board of Supervisors, Mayors, City/Board of Aldermens, PDD	

8. Action/Project Priority (STAPLEE Score):	20 – High
9. Timeline for Completion:	Two years
10. Useful Life:	Five years – revisit as local needs require
11. Potential Fund Sources:	County and local budgets, PDD
12. Local Planning Mechanisms to be Used in Implementation, if any:	Sunflower County Emergency Management Plan, Town/City Communications Plans
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

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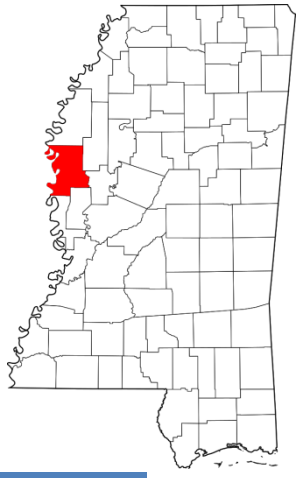
WASHINGTON COUNTY

I.1 Community Profile

Geography



Located in northwest Mississippi, Washington County is adjacent to Bolivar County to the north, Sunflower and Washington Counties to the east, and Sharkey and Issaquena Counties to the south. Washington County is 107 miles north of Jackson, Mississippi and 156 miles south of Memphis, Tennessee. It includes the following communities (Figure I.1):

Cities	Towns	Unincorporated
Greenville Hollandale Leland	Arcola Metcalfe	Avon Elizabeth Tralake Burdett Glen Allan Chatham Tribbett Murphy Wayside Darlove Stoneville Winterville

The total area of the county is 761 square miles, of which 725 square miles is land and 36 square miles, is water. Washington County is in the Delta region of Mississippi. Flat plain is the general topography of the region and the soil is characterized as mildly acidic to mildly alkaline. The Mississippi River borders the western side of the county and Deer Creek transverses through the county.

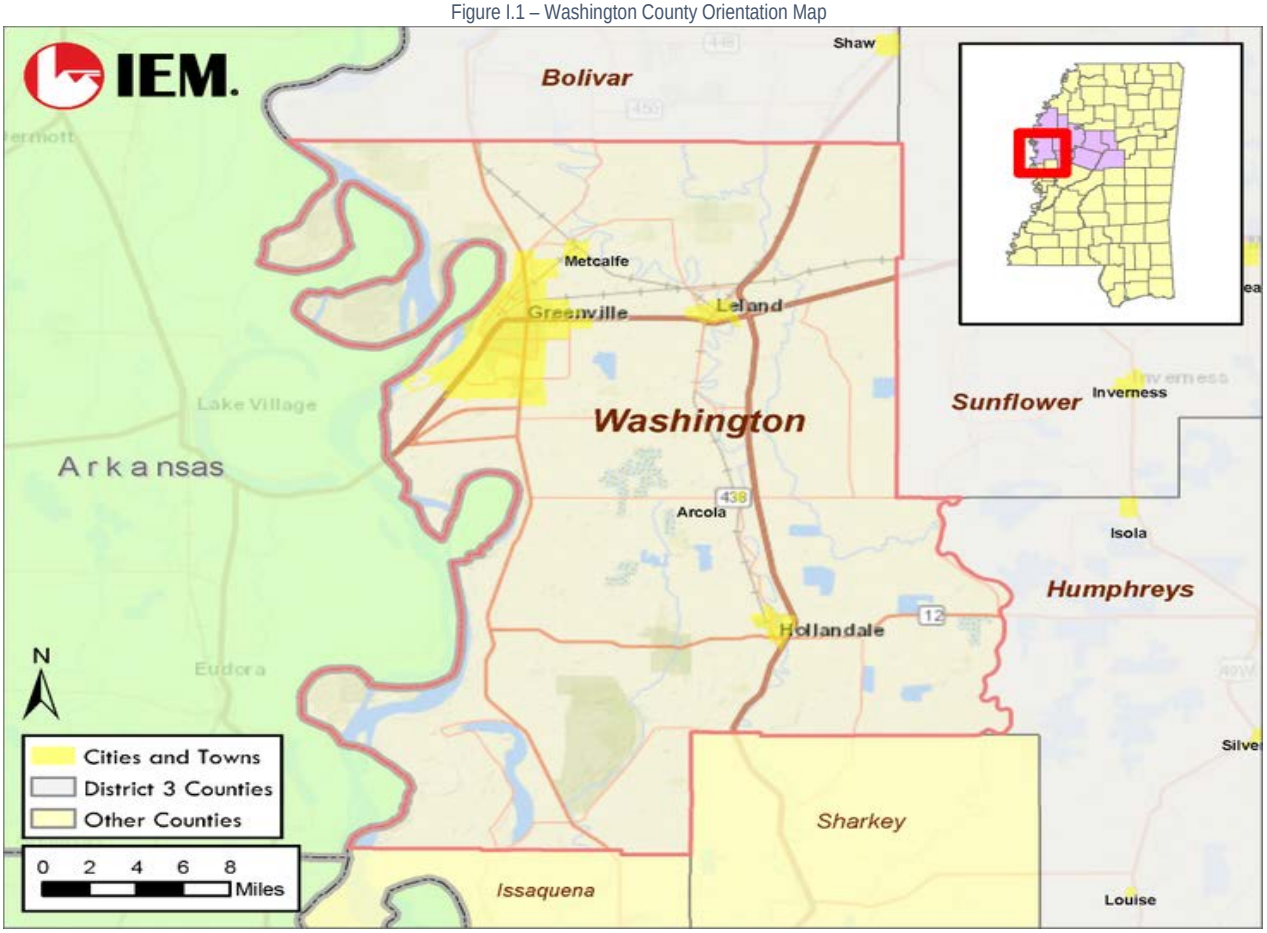
The Town of Arcola is located near U.S. Highway 61 and MS State Route 438. The town has a total land area of 0.2 square miles and an elevation of about 121 feet above sea level.

Greenville is the county seat of Washington County. It is located on the eastern bank of Lake Ferguson, an oxbow lake left from an old channel of the Mississippi River and is served by transportation routes including U.S. Highways 82 and 61 and MS State Route 1. With an approximate land area of 27.7 square miles, of which 26.9 is land and .08 square miles is water. Greenville's elevation is about 131 feet above sea level.

The City of Hollandale is located off Mississippi Highway 12 and U.S. Highway 61. With an approximate land area of 2.2 square miles the city's elevation is about 115 feet above sea level.

The City of Leland is located off U.S. Highway 82 east of Greenville in the heart of the Mississippi Delta on the banks of Deer Creek. With a total area of 2.1 square miles, of which 2.06 square miles is land and 0.04 square miles is water, Leland's elevation is about 125 feet above sea level. The Town of Metcalfe is located on MS State Route 1. The town has a total land area of 1.0 square miles and an elevation of about 125 feet above sea level.

Figure I.1 – Washington County Orientation Map



Population and Demographics

As shown in Table I.1, there has been a decline in population between the 2000 and 2010 Census reports. The largest decline in population occurred in Hollandale and Leland with a loss of 31 and 18 percent respectively of their population. To further demonstrate the changes in population, Figure I.2 and I.3 is provided showing the current population based on census block data.

Table I.1 - Jurisdiction Population and Demographics I Source: US Census Bureau 2010 and 2018 American Community Survey 5-Year Estimates

Jurisdiction	Population				Demographics					
	2010 Census	2018 Estimates	Net Change	Percent Change	White	Black	Hispanic	Asian	Native American	2 + races
Washington County	51,137	47,086	-4051	-8	25.7	72.2	1.7	.7	.3	.6
Arcola	361	316	-22	-.12.47	5.92	94.08	.0	.0	.0	.0
Greenville	34,400	28,508	-4502	-.17.13	17.02.2	80.85	.7	.84	.2	.7
Hollandale	27034	2266	-1063	-31.95	16.4	83.0	.2	.1	.0	.2
Leland	4,481	3671	--618	-18.08	26.27	69.84	.8	.54	.2	.1
Metcalfe	1067	973	-78	-.8.81	.9	99.1	.0	.0	.0	.0

Special Populations (elderly, disabled, and low income): Poverty and other social factors were also considered in assessing the vulnerability of Washington County and its municipalities. Within the unincorporated areas of Washington County, there are some areas of extreme poverty, where individual resources for dealing with hazards are extremely limited. These are neighborhoods in which residents would be most dependent on public resources after a disaster and could therefore be considered as good investment areas for hazard mitigation activities. By focusing on these areas, Washington County can not only help to reduce the vulnerability of individuals but can also help reduce the future impacts on public services. A summary of the percent of population falling into the special populations' category are listed in Table I.2.

Other social factors, such as single mother households living below the poverty level, and children living with elderly grandparents may indicate areas where special childcare considerations may be necessary. Many communities within Washington County have at least 22 percent of the total number of grandparents responsible for the basic needs of their grandchildren. Persons with disabilities and the elderly may not be able to evacuate or seek other preventive measures during a disaster. These individuals may be most vulnerable to extreme heat, severe storms, tornadoes and severe winter storms/freezes.

Table I.2 – Special Populations I Source: US Census Bureau 2010 and 2018 American Community Survey 5-Year Estimates

Jurisdiction	Below Poverty	Elderly (65 and older)	Disabled (Non-Institutionalized)
Washington County	37.5%	12.3%	19.7%
Arcola	42.90%	10.2%	9.2%
Greenville	30,07%	12.2%	20.4%
Hollandale	31.95%	12.8%	19.7%
Leland	27.70%	12.2%	18.5%
Metcalfe	51.00%	9.3%	18.2%

While population vulnerability within the assessment of each hazard identified as affecting Washington County, the Centers for Disease Control and Prevention (CDC) produces a county-based Social Vulnerability Index (SOVI, 2016) that discusses social vulnerability overall, as well as vulnerability according to "themes" that include socioeconomic status. Images on the next two tables show the SOVI breakdown using these factors to measure vulnerability in Washington County.

Figure I.2a Social Vulnerability Index 2016

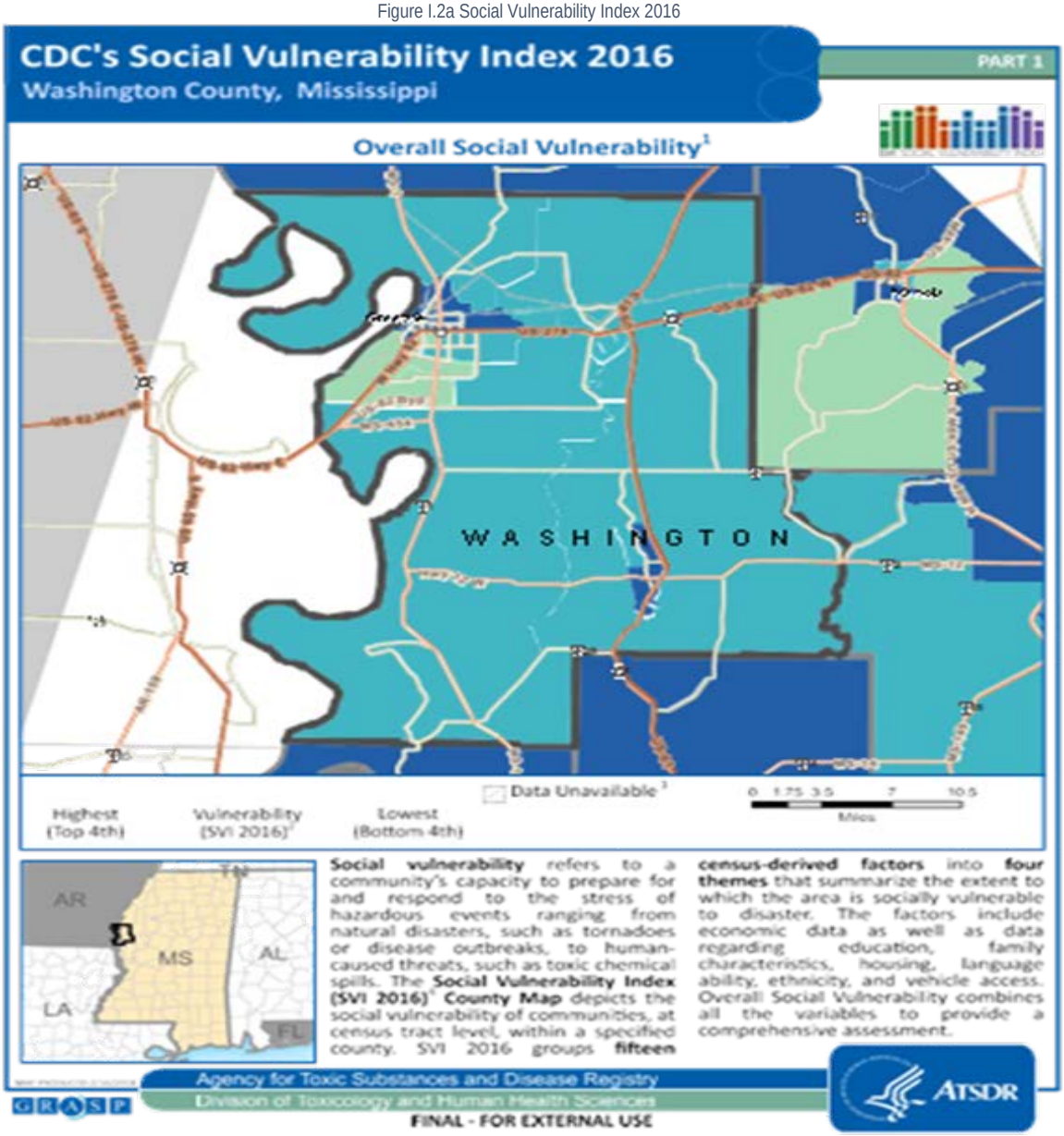
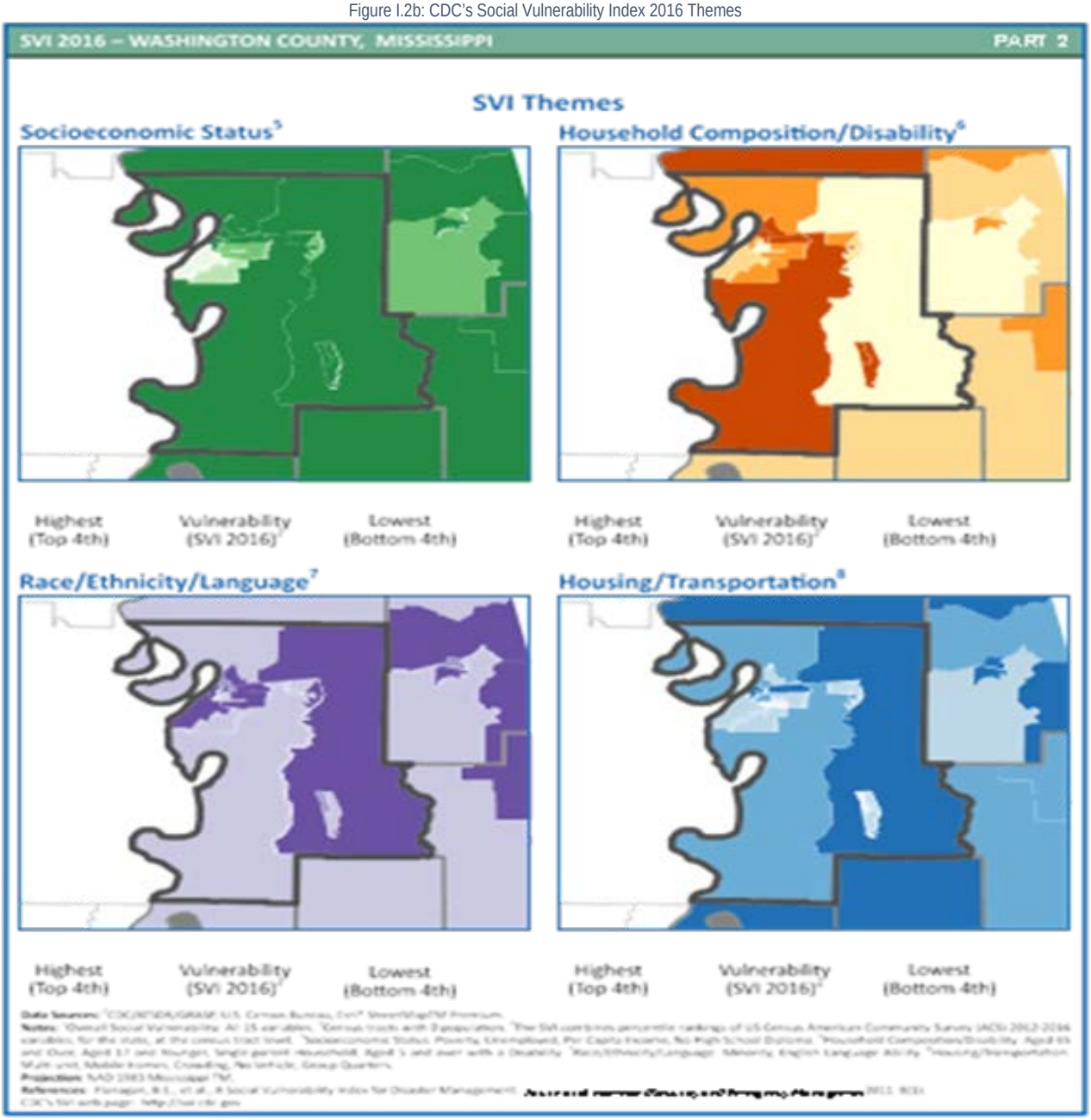


Figure I.2b: CDC's Social Vulnerability Index 2016 Themes



Housing, Growth Trends, and Land Use

Housing: Housing data was obtained from the 2018 Population estimates from the 2010 Census and presented below in Table I.3. In summary, between 2014 and 2018 there were 21,591 housing units, with 10, 224 households in Washington County and an average household size of 2.5 people. In addition, 85 percent of housing is occupied, 8.3 percent of housing is mobile home/manufactured housing, and the majority of homes were constructed prior to 1970. The percentage of unoccupied housing units remained steady at 15 percent from 2010 to 2018.

Table I.3 – Housing Statistics I Source: US Census Bureau 2010 and 2018 American Community Survey 5-Year Estimates

Housing Statistics	Estimate	Percent
HOUSING OCCUPANCY		
Total housing units	21,591	100%
Occupied housing units	18,299	85.0%
Vacant housing units	3,292	15.0%
UNITS IN STRUCTURE		
1-unit, detached	15,759	73.0%
1-unit, attached	102	0.6%
2 units	961	4.4%
3 or 4 units	757	3.5%
5 to 9 units	980	4.5%
10 to 19 units	542	2.5%
20 or more units	704	3.2%
Mobile home	1,786	8.3%
Boat, RV, van, etc.	0	0.0%
YEAR STRUCTURE BUILT		
Built 2014 or later	93	0.4
Built 2010 or later	183	0.8%
Built 2000 to 2009	1352	6.2%
Built 1990 to 1999	2043	9.5%
Built 1980 to 1989	3107	14.4%
Built 1970 to 1979	4744	22.0%
Built 1960 to 1969	4341	20.1%
Built 1950 to 1959	3221	14.9%
Built 1940 to 1949	1145	5.3%
Built 1939 or earlier	1363	6.3%
HOUSING TENURE		
Occupied housing units	18,299	100%
Owner-occupied	9888	54.0%
Renter-occupied	8,411	46.0%
HOUSE HEATING FUEL		
Occupied housing units	18,299	100%
Utility gas	10,931	59.7%
Bottled, tank, or LP gas	1,409	8.0%
Electricity		32.0%
Fuel oil, kerosene, etc.	6	3.3%
Wood		0.1%
Other fuel	67	0.3%
Solar Energy	7	3.8

Growth Trends: There have been no significant changes in development since the previous plan. New construction and redevelopment have been minimal and there are no known changes in conditions that may affect the risks or vulnerabilities for the participating jurisdictions. The communities in Washington County have all experienced a decline in population. Population

projects for the county indicates a 9 percent drop in population since 2015. This trend my continue unless strategies are put in place and actively pursued. The majority of land in Washington County is in rural areas and is primarily used for agriculture and timber industries. The construction of I-69 may bring some additional development to the County, but that project is many years into the future

Land Use: The primary use of land in the Washington County is open space and agricultural lands. There is some "urban" development relegated primarily to the county's municipalities because of the presence of centralized sewer in and around those communities. The value of prime agricultural lands, the lack of sewer service, and the presence of environmentally sensitive areas keeps most land in agricultural use. There are scattered commercial and ag serving industrial uses outside the municipal limits mostly around the unincorporated settlements. The city of Greenville is in the process of updating their comprehensive plan and has a land use plan in place. The other communities have a comprehensive plan but no land use plan in place.

Employment and Industry

Historically, Washington County's economy has been built upon agribusiness, manufacturing, and services. Mississippi State University and the federal government maintain an agriculture research station at Stoneville, Mississippi on the outskirts of Leland. Cotton, soybeans and catfish are the leading crops. Delta and Pine Land Company is based in Hollandale and Greenville is home to several industries such as Mars Food, Brown Corporation, U.S. Gypsum and Leading Edge. New opportunities for logistics companies, green manufacturing, and green agribusiness are rapidly increasing in numbers within the County.

The 2020 Annual Labor Force Report, Mississippi Department of Employment Security, indicates that, although the average civilian labor force has declined slightly since the last plan, the average number of unemployed has declined significantly, from 2820 (2013) to 1310 (2020). Growth in job areas has been greatest overall in health and social assistance, accommodations and food services, government and education. Tables I.4 and I.5 provide a summary of employment statistics for Washington County.

Table I.4 – Mississippi Department of Employment Security Annual Labor Force Report -Washington County

		Residence Based Amounts – 2018				
County	Average Civilian Labor Force (2018)	Average No. Unemployed (2018)	Average No. Employed (2018)	Average Annual Wage (2018)	Per Capita Income (2018)	Percent Below Poverty (2018)
Washington	16,700	1310	15,400	$38,099	$37,834	21.5
Mississippi				$38,099	$37,834	21.5

Table I.5 – Mississippi Department of Employment Security Annual Labor Force Report-Washington County I Source: Mississippi Economic Development Council

*Establishment Based Amounts 2018					
Manufacturing Total					1180
Non-Manufacturing Total					14,860
Agriculture, Forestry, Fishing & Hunting	0		Professional & Business Service		400
Mining	20		Management of Companies & Enter		180
Utilities	40		Admin Support & Waste Management		550
Construction	330		Educational Services		170
Wholesale Trade	660		Health Care & Social Assistance		2420
Retail Trade	2210		Arts, Entertain & Recreation		260
Transportation & Warehousing	610		Accommodation & Food Service		1769
Information	180		Other Service (except public admin)		740
Finance & Insurance	340		Government		3800
Real Estate, Rental & Leasing	190		Education		1290
*Note: *Establishment based amounts are estimates and do not include self-employed individuals, religious entities or non-profit institutions. Amounts include a pro-rata share of unclassified employment.*					

The Mississippi Department of Employment Securities (MDES) assists individuals in obtaining employment. Through their network of WIN Job Centers, MDES matches qualified, prospective employees with employers.

Lifeline Sectors, Critical Assets and Infrastructure

Lifeline sectors provide the framework from which individual critical assets and infrastructure are identified. A lifeline is a sector that provides an indispensable service which enables the continuous operation of critical business and government functions and is critical to human health and safety or economic security. Infrastructure associated with lifelines is a mix of public and private ownership and has many interdependencies. As an example, maintaining the function of a hospital during an event that results in a power failure is dependent on communication infrastructure and access to temporary power to prevent interruption of services. Assessing these sectors helps to identify root causes of impacts and consequences from previous hazard events and prioritizes the highest issue areas and interdependencies in order to create effective mitigation solutions.
This section provides a listing of those assets and facilities that are considered as critical in nature to the planning area. These facilities are identified in tables and figures based on best available data. Shelters and outdoor warning sirens are also considered as essential and their locations are provided as a figure in the Mitigation Strategy section of this Annex. The jurisdictions within Washington County identified the assets in Table I.7 as critical lifelines.

Critical Assets and Infrastructure

This section provides a listing of those assets and facilities that are considered as critical in nature to the planning area. These facilities are identified in tables and figures based on best available data. Shelters and outdoor warning sirens are also considered as essential and their locations are provided as a figure in the Mitigation Strategy section of this Annex.

Transportation: As shown in Table I.6, Washington County has many major thoroughfares, rail lines and airport access.

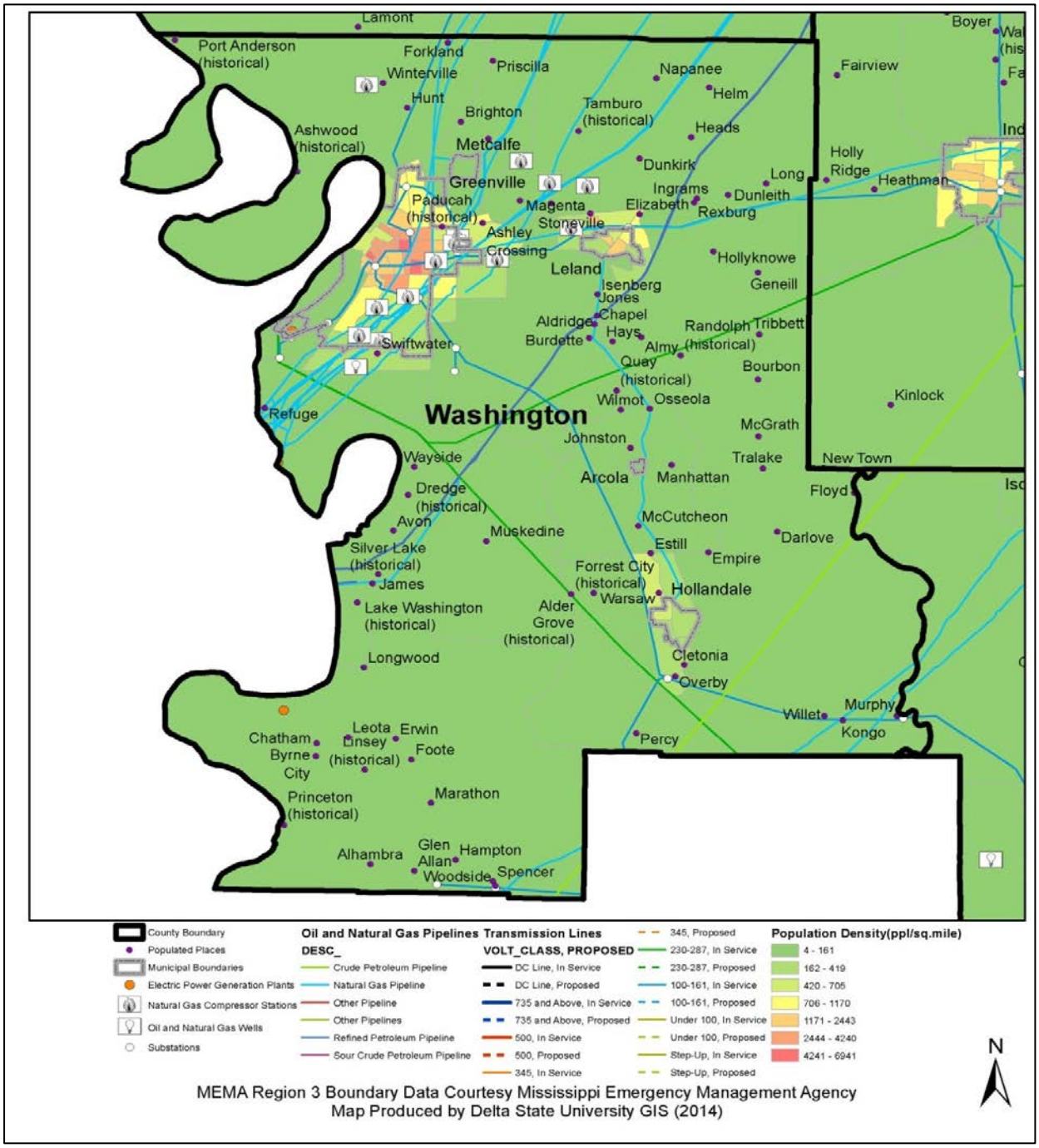
Table I.6 –Washington County Transportation Routes

Roadway/Bridge	Rail/Port	Aviation
U.S. Highway 82 U.S. Highway 61 U.S. Highway 278 Mississippi Highway 1 Mississippi Highway 12 U.S. Highway Bridge over the Mississippi River	Class III Local - Columbus Greenville (CGAY) Port of Greenville	Mid Delta Regional Airport (Greenville) Hollandale Municipal Airport

Energy Assets: Oil, natural gas pipelines and electric transmission lines transverse through Washington County. Of particular concern are the pipelines that cross over the Mississippi River to Washington County. These systems are vulnerable to impacts from shipping/barge vessels and other potential factors.

The Washington County Emergency Management Department confirmed that the mapped assets produced for the 2015 RHMP remains essentially accurate. Figure I.3 provides the locations of these systems.

Figure I.3 – Washington County Energy Assets



Critical Assets and Facilities: Table I.7 provides a listing of the critical assets identified for Washington County. An updated mitigation actions is included recommending that the list of critical assets and facilities to be sent to the Remote Sensing Council for inclusion into the Infrastructure Key Resource (CIKR) database.

Table I.7 –Washington County Summary of Critical Assets and Facilities

Facilities		Use
Greenville Public Schools Leland Public Schools Western Line Public Schools Hollandale School District Washington School	Greenville Christian School St. Joseph Catholic School (2) Deer Creek School WCOI Head Start MDCC Greenville Higher Education Center	Educational Facilities
Delta Regional Medical Center Washington County Health Department Family Medical Center Cardiovascular Physicians, PA Bethesda Cancer Center Greenville Clinic	Arnold Avenue Nursing Home, Autumn Leaves Nursing Home, Legacy Manor Nursing Care, Magnolia Gardens of Greenville, Wellington Place of Greenville, MS Care Center of Greenville	Health Care Facilities
Sheriff's Department Washington County EOC Greenville Police Department Metcalfe Police Department Leland Police Department Arcola Police Department Hollandale Police Department Greenville Fire Department	Metcalfe Fire Department Leland Fire Department Arcola Fire Department Hollandale Fire Department Indian Mounds VFD Riverside VFD Greenville FBI Resident Agency	Public Safety
Washington County Courthouse Greenville City Hall, Metcalfe City Hall Leland City Hall Arcola City Hall Hollandale City Hall Greenville Post Office	Metcalfe Post Office Leland Post Office Arcola Post Office Hollandale Post Office Avon Post Office Chatham Post Office	Government Facilities
Entergy Gerald Andrus Plant (Entergy) Atmos Energy Multiple Rural Water Systems Greenville Water Supply	Metcalfe Water Supply Leland Water Supply Arcola Water Supply Hollandale Water Supply	Public Utilities

As a complement to the previous table, researchers consulted the Mississippi Public Service Commission web site to review the list of utilities shown there. The following Washington County utilities companies are included on the web site. Some of these are the same as the ones listed above, and others are not included. It was decided that both tables should be incorporated into the District 3 Base Plan and in each of the county annexes for the sake of thorough documentation.

Table 8: Mississippi Public Service Commission – County Utilities Listing I Source: Mississippi Public Service Commission – Washington County Utilities

Gas Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
GC-123-0081-00	Atmos Energy Corporation	Mr. Mathew B. Davidson V-Pres.	790 Liberty Road Flowood, MS 39232-9321	601.420.5020	601.420.5020

Electric Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
EA-123-0750-00	Cooperative Energy	Mr. James Compton CEO	P.O. Box 15849 Hattiesburg, MS 39404		601.268.2083
EA-103-0048-00	Delta EPA	Mr. David O'Bryan Gen. Mgr.	P.O. Box 9399 Greenwood, MS 38930		662.453.6352
EC-123-0082-00	Entergy Mississippi Inc.	Mr. Martin McGee Customer Service Support	P.O. Box 1640 Jackson, MS 39215-1640		601.969.2336
EA-100-0042-00	Twin County EPA	Mr. Tim Perkins Manager	P.O. Box 158 Hollandale, MS 38748		662.827.2262

Sewer Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
SD-100-1294-01	Glen Allan Utility District	Mr. Micah Nightingale Manager	P.O. Box 122 Glen Allan, MS 38744		662.379.7700

Water Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
WA-100-1063-00	Black Bayou Water Association Inc.	Mr. Lamar Stone President	P. O. Box 916 Leland, MS 38756		662.686.7150
WM-100-0061-00	City of Greenville	Ms. Amelia D Wicks City Clerk	P. O. Box 897 Greenville, MS 38702-0897	662.378.1583	662.378.1597
WA-100-0903-00	Darlove-Murphy Water Assn. Inc.	Mr. Michael Shorter	P.O. Box 191 Hollandale, MS 38748		662.873.6223
WA-100-0591-00	FMH Water Assn. Inc.	Mr. Carlis Lyon President	P. O. Box 1107 Indianola, MS 38751		662.686.7150
WA-100-0744-00	Grace Water Assn. Inc.	Mr. J. A. Hamblin Pres.	Rt. 1 Box 106 Rolling Fork, MS 39159		662.873.2501

WA-100-0783-00	Lake Jackson Water Assn. Inc.	Mr. David Koehn Mngr.	P. O. 916 Leland, MS 38756		662.686.7150
WA-100-0429-00	Swiftwater Development Assn. Inc.	Ms. Cathy Nunnery President	P. O. Box 916 Leland, MS 38756		662.686.7150
WM-100-1162-00	Town of Arcola	Ms. Annette Morris City Clerk	P.O. Box 25 Arcola, MS 38722	662.827.2063	662.827.2063
WM-100-0153-00	Town of Metcalfe	Ms. Rosie Chillis Town Clerk	P. O. Box 250 Metcalfe, MS 38760		662.335.0212
WA-100-0660-00	Wayside Water Assn. Inc.	Mr. David Koehn	116 Heather Lane Greenville, MS 38701		662.686.7150
WA-100-0350-00	Winterville Water Assn. Inc.	Ms. Mary L. Ellis Pres.	P. O. Box 173 Winterville, MS 38782		662.335.3780

Telecommunications Utilities

Utility ID	Company Name	Contact	Address	Customer Service	Other Phone
TC-123-0001-00	BellSouth Telecommunications, LLC	Mr. C. D. Smith Regulatory	2310 7th Street Meridian, MS 39301	601.592.6510	601.917.8787
TC-100-0018-00	Delta Telephone Co. Inc.	Ms. Helen Simmons VP	1018 Highland Colony Parkway Suite 700 Ridgeland, MS 39157	601.384.3350	601.355.1522
TC-020-0865-00	Lakeside Telephone Company Inc.	Mr. Robert Sledge President	P.O. Box 236 Glen Allan, MS 38744		601.839.267

Historical / Cultural Resources: Historical and cultural resources are of particular concern, not because they are critical to the day-to-day operations of a community, but because they are irreplaceable and contribute to the economic well-being of the communities.

- Arcola Mounds
- Bank of Greenville
- Belmont (Wayside)
- Finlay House (Greenville)
- First National Bank of Greenville
- Gamwyn Park Historical District
- (Greenville)
- Greenville Downtown Historical District
- Griffin-Spragins House Hollyknowe
- (Leland)
- Irwin House
- Leavenworth-Wasson-Carroll House (Greenville)
- Linden (Glen Allen)
- Mount Holly (Foote)
- Old Delta Democrat Times Building
- (Greenville)
- Refuge Plantation
- U.S. Post Office Leland
- Junius R. Ward House (Erwin)
- Washington Ave-Main St. Historical District (Greenville)
- Wetherbee House (Greenville)
- Winterville Site (Greenville)
- Leland Historical District

I.2 Hazard Identification and Risk Assessment

This section includes a brief summary of hazards to which Washington County is prone, and includes the location and extent, historical events, and probability of future occurrence. Vulnerability assessments are included in this Annex only for hazards for which county-based data is available. Section 4 of the Base Plan includes hazard descriptions for hazards applicable to all jurisdictions covered by the 2020 RHMP Update. Health-related hazards, such as Pandemic Influenza and West Nile virus, are of concern to the County, but there is no county-level data to add to the discussion of this hazard as it is addressed in Section 4 of the Base Plan. That section also includes the most recently available information about Coronavirus Disease of 2019 (COVID-19) at the time of this plan's publication.

Hazard Ranking

As discussed in Section 4 - Hazard Identification and Risk Assessment, each county evaluated the number of events and damage claims from impacts over the past 10 years to determine their hazard risk ranking.

Washington County determined their probability of future occurrence based on reported data and local knowledge of previous events. Definitions for the classifications are provided below:

- Highly Likely – More than 8 occurrences over last 10 years
- Likely – 5 - 7 occurrences over last 10 years
- Low – 1 - 4 occurrences over last 10 years
- Susceptible – Conditions are favorable or there are historic events (greater than 50 years) or local knowledge of unreported events.

Table I.9 provides a summary of the hazard events for Washington County followed by the results of their risk ranking exercise (Table I.10). The County's risk ranking has not changed since the previous plan.

Table I.9 – Washington County Summary of Hazard Events 2000 to 2019 I Source: NCEI, MDEQ, USGS

Hazard Type	No of Events	Death	Injury	Property Damage	Crop Damage
Dam/Levee Failure	-	-	-	-	-
Drought	9	-	-	-	$ 7,301,000
Earthquake	-	-	-	-	-
Exteme Heat	7	3	-	-	-
Expansive Soil	-	-	-	-	-
Flood	55	-	-	$ 17,407,000	21,252,000
Severe Storm	226	-	-	$ 5,373,000	$ 409,000
Severe Winter Weather	21	-	-	$ 1,430,000	-
Tornado	10	-	1	$ 4,555,000	$ 3,000
Tropical Storm / Hurricane	3	-	-	$ 586,043	$8,200,000
Wildfire	-	-	-	-	-
Totals	331	3	1	$ 29,351,043	$ 37,165,000

* Damage estimates not available

Table I.10 – Washington County Risk Ranking Results

Hazard Type	Area Impacted	Health/Safety	Property Damage	Environmental Damage	Economic Disruption	Total	Future Occurrence	Risk	Risk Level
Dam/Levee Failure	4	0	4	4	4	16	2	32	Low
Drought	4	0	1	1	4	10	3	30	Low
Earthquake	1	0	2	2	1	6	2	12	Low
Expansive Soils	1	0	2	2	1	6	2	12	Low
Extreme Heat	4	0	0	0	4	8	3	24	Low
Flood	4	0	4	4	4	16	5	80	High
Severe Storm (thunderstorm, lightning, hail and high wind)	4	0	4	4	2	14	5	70	High
Severe Winter Weather	4	0	2	2	1	9	5	45	Medium
Tornado	4	3	1	1	1	10	4	40	Medium
Tropical Storm / Hurricane	4	0	2	2	2	10	2	20	Low
Wildfire	1	0	1	1	1	4	1	4	Low

Table I.11 summarizes the vulnerability of each jurisdiction to each hazard. This information is based on community input, NCEI data, and available resources that discuss each hazard. An example of the latter would be the Mississippi DEQ web site Dam Safety Division, which provides maps illustrating the number and types of dams in each jurisdiction.

Table I.11 – Summary of Hazard Ranking, All Jurisdictions in Washington County

Hazard Type	Washington County	Town of Arcola	City of Greenville	City of Hollandale	City of Leland	Town of Metcalfe
Dam/Levee Failure	*Medium*	*Low*	*Low*	*Low*	*Low*	*Low*
Drought	*Medium*	*Low*	*Low*	*Low*	*Low*	*Low*
Earthquake	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Excessive Heat/Heat	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Expansive Soils	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Flood	*High*	*Low*	*High*	*Low*	*Low*	*Low*
Severe Storm	*High*	*Medium*	*High*	*Medium*	*High*	*Medium*
Severe Winter Weather	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Tornado	*Medium*	*Low*	*Low*	*Low*	*Low*	*Low*
Tropical Storm/Hurricane	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*
Wildfire	*Low*	*Low*	*Low*	*Low*	*Low*	*Low*

Mitigation planning researchers are fortunate to have access to the Data Visualization Tool included on the FEMA website. This site provides county-level data on the breakdown of flood events and hazards included in federal emergency and disaster declarations, as well as for flood events recorded by FEMA. The information is updated through June 2020 and shows the disaster name, event type, number of events, and occurrence date. The data includes information from the time FEMA first recording disaster events in the format currently used. While this time frame is longer than that included in this RHMP Update, the following page provides a one-page snapshot of Washington County disasters that have been documented by FEMA

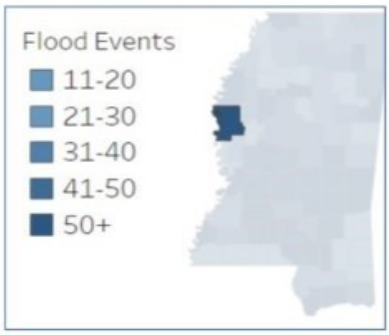
Figure I.4 FEMA Declarations: Washington County Statistics 1953-2020

FEMA Declarations: Washington County Statistics: 1953 - 2020 ***Source:*** FEMA Data Visualization Web Site

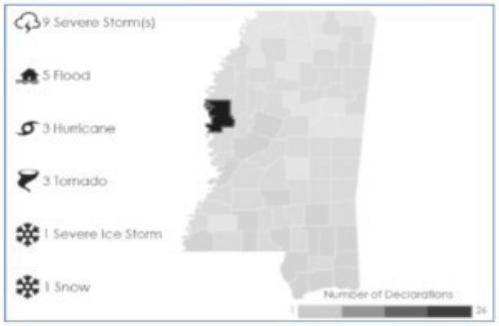
Not Included in data sourced 3/31/2020

- Mississippi COVID EM-3474 (Declared 3/13/2020)

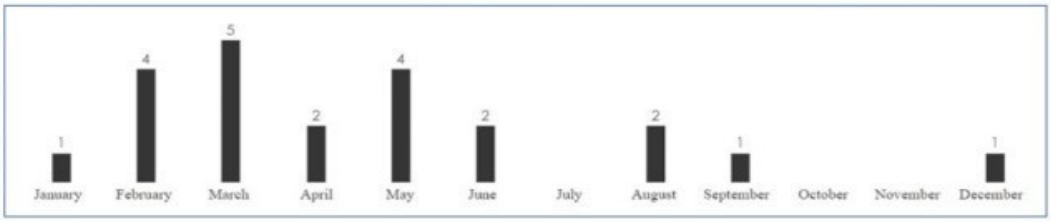
62 Flood Events

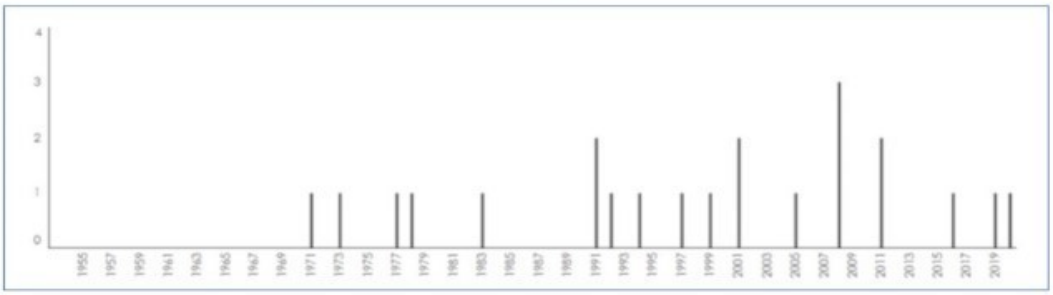


22 Declared Events



The charts below show the months and years in which disasters have occurred in Washington County





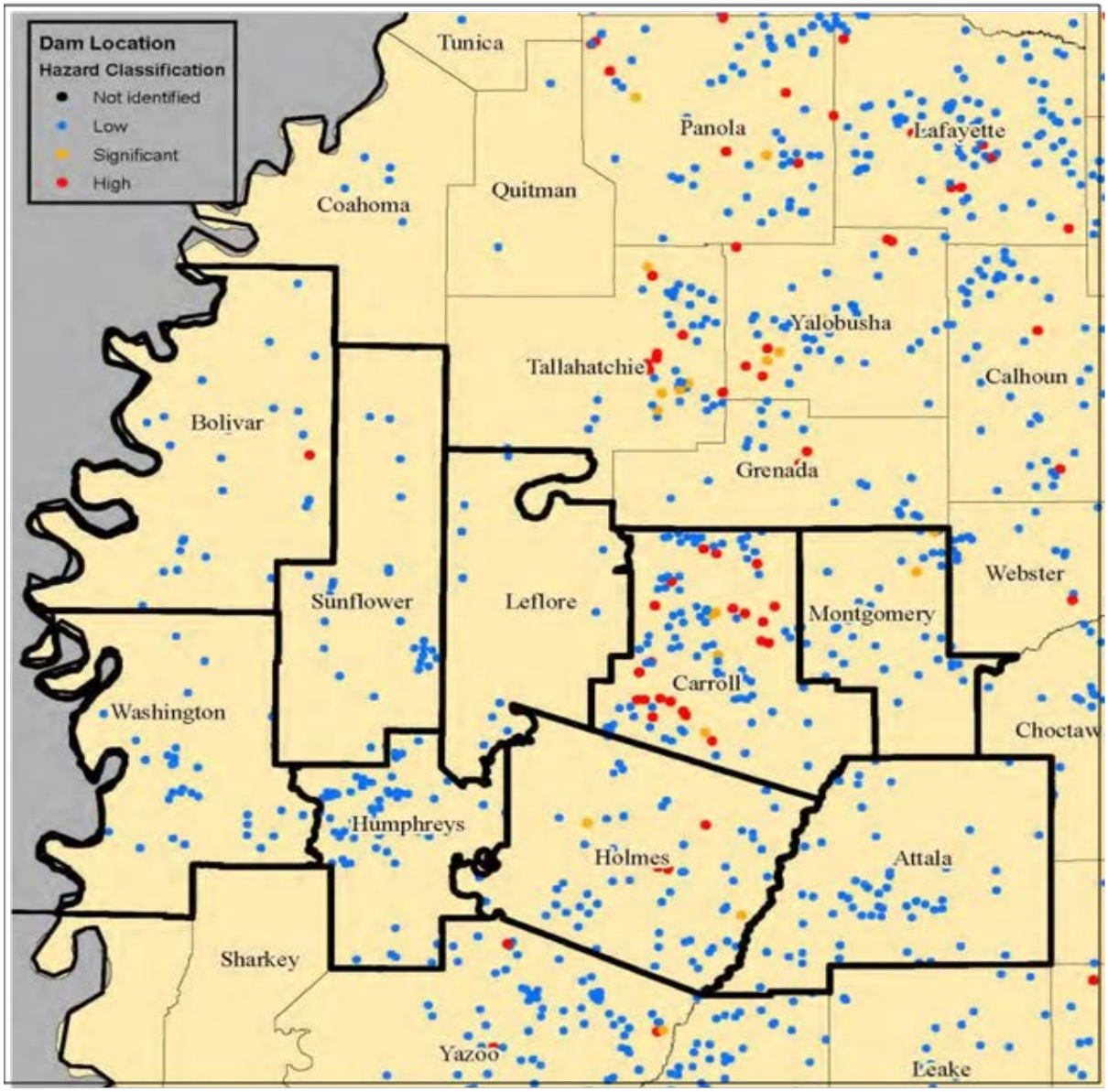
FEMA Declarations for Washington County (22)

Year	Declaration Name	Disaster Number	Year	Declaration Name	Disaster Number
1971	Storms & Tornadoes	302	2001	Severe Storms & Tornadoes	1360
1973	Heavy Rains, Tornadoes & Flooding	368	2001	Severe Storms, Tornadoes & Flooding	1398
1977	Drought & Freezing	3032	2005	Hurricane Katrina	1604
1978	Tornadoes	3063	2008	Hurricane Gustav	1794
1983	Severe Storms, Tornadoes &Flooding	683	2008	Hurricane Gustav	3291
1991	Severe Storms and Flooding	895	2008	Severe Storms & Flooding	1753
1991	Severe Storms, Tornadoes & Flooding	906	2011	Flooding	1983
1992	Severe Storms & Tornadoes	939	2011	Flooding	3320
1994	Severe Winter Storm, Freezing Rain & Sleet	1009	2016	Severe Storms & Flooding	4268
1997	Flooding	1178	2019	Severe Storms, Straight-line Winds, Tornadoes & Flooding	4429
1999	Severe Winter Storms, Ice, Freezing Rain	1265	2020	Severe Storms, Tornadoes, Straight-line Winds and Flooding	4429

Dam/Levee Failure

Figure I.5 below shows a list of dams mapped based on 2015 data secured from the Mississippi Department of Environmental Quality (MDEQ) and included in the previous District 3 RHMP.

Figure I.5: Dams Mapped by the State of Mississippi I Source: MDEQ, Delta State University



Location and Extent

The 2018 SHMP included a District 3 Dam Inventory by County, breaking the numbers down for low, high, and significant hazard dams. The numbers of dams for all nine counties in the District are included for the purpose of comparing Washington County's level of risk to that of surrounding counties. The table shows that there are fewer dams in Washington than in Carroll County; about the same as in neighboring Humphreys County; and less than in Bolivar and Sunflower Counties, its northern neighbors.

Table I.12 District 3 Dam Inventory by County – Washington County I Source: 2018 Mississippi SHMP

County	Significant	High	Low	Total
District 3				
Atalla	1	2	44	47
Bolivar	-	-	14	14
Carroll	4	23	86	113
Holmes	1	5	39	45
Humphreys	-	-	4	4
Leflore	-	-	-	-
Montgomery	-	2	22	24
Sunflower	-	-	12	12
Washington	-	-	3	3

There are no significant or high hazard dams in Washington County. The Mississippi Department of Environmental Quality provided a copy of the most recent dam inventory to the research team and Washington County has 4 low hazard dams.

Table E.13 provides a listing of all low hazard dams in the county. This list does not include dams whose structure has not been categorized.

Table I.13: Low Hazard Dams I Source: 2018 MDEQ

Dam Name	State ID	Latitude	Longitude
Mississippi Power and Light Company Lake Dam	MS00041	33.1517	-91.0717
Bledsoe Lake Dam	MS00491	33.3533	-91.0833
Leland Sewage Lagoon Dam	MS00864	33.3903	-90.9264

Previous Occurrences

There are no records of dam/levee breaches in Washington County.

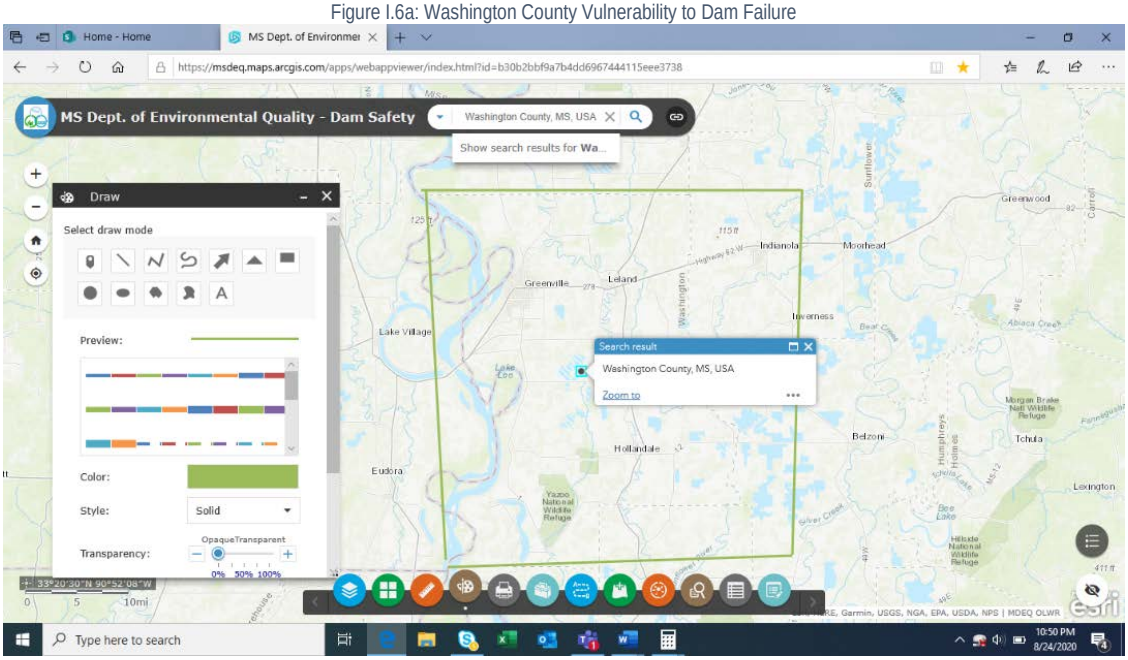
Probability of Future Occurrence

Dam failure is not considered to be among the highest hazards of concern in the county but, since the reclassification, there is increased awareness among officials about monitoring such structures. The probability of future occurrence of dam breach is classified as low. It is not possible to develop a statistical probability when there is no recent historical data.

Assessing Vulnerability

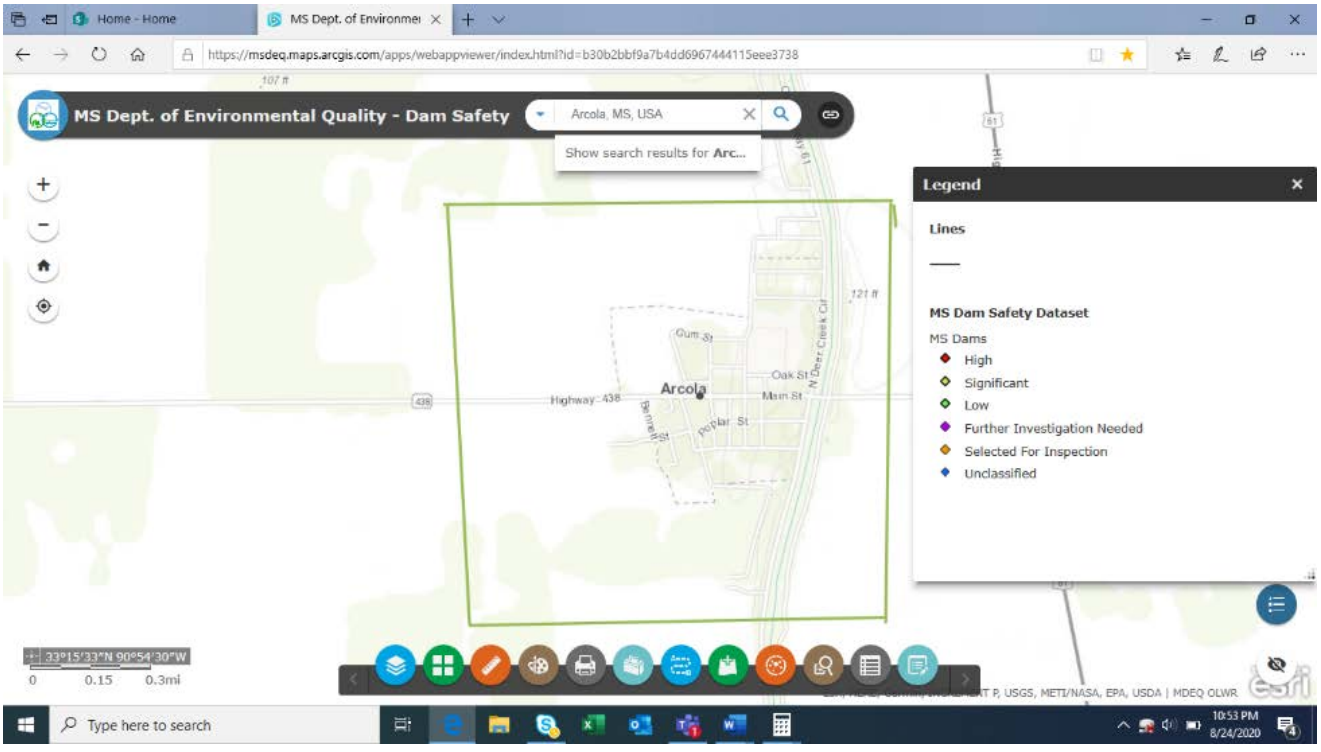
If breached, even a low hazard dam could cause damage to nearby property. The maps below, included as Figures E.6a through E.6e, and taken from the MDEQ mapping web site, show the close-up views of the location of dams in all of Washington County and for each of its jurisdictions. In each screen shot, the name of the community is shown in the Search Box, and a legend is included to show the degree of hazard for each identified dam.

Figure I.6a: Washington County Vulnerability to Dam Failure



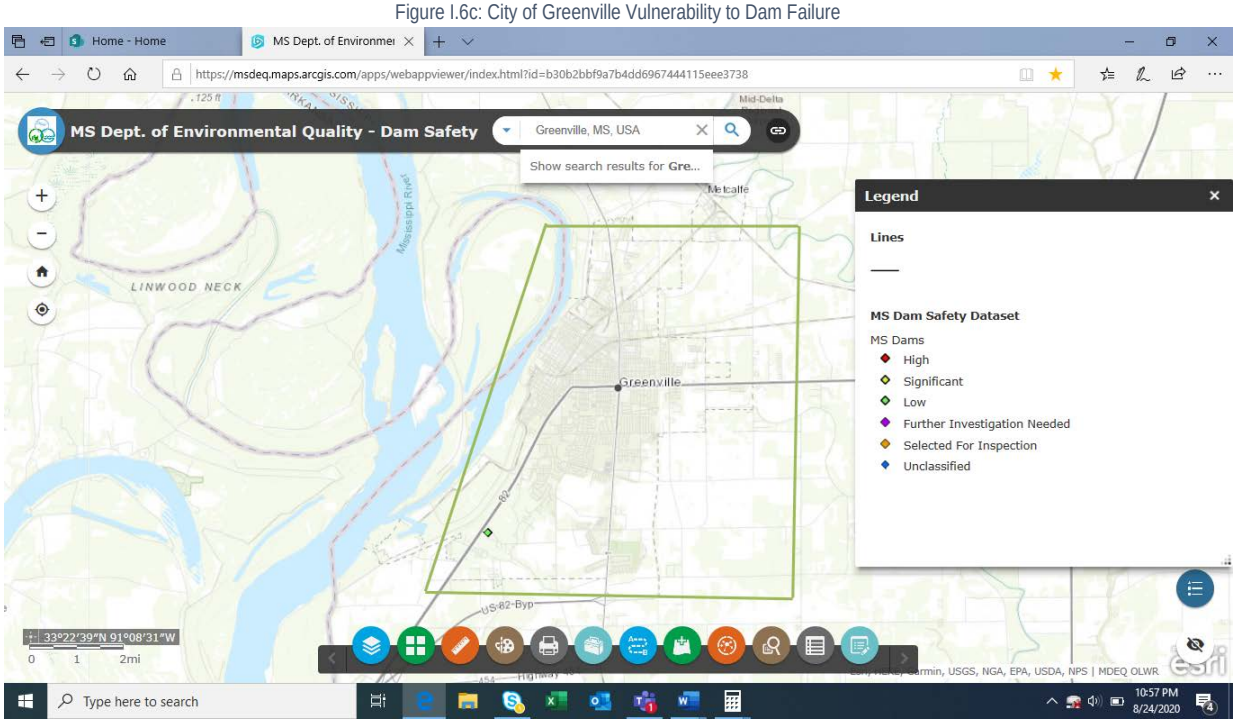
There are no significant or high hazard dams located in Washington County. The data presented here suggests that unincorporated Washington County overall is at a low risk.

Figure I.6b: Town of Arcola Vulnerability to Dam Failure



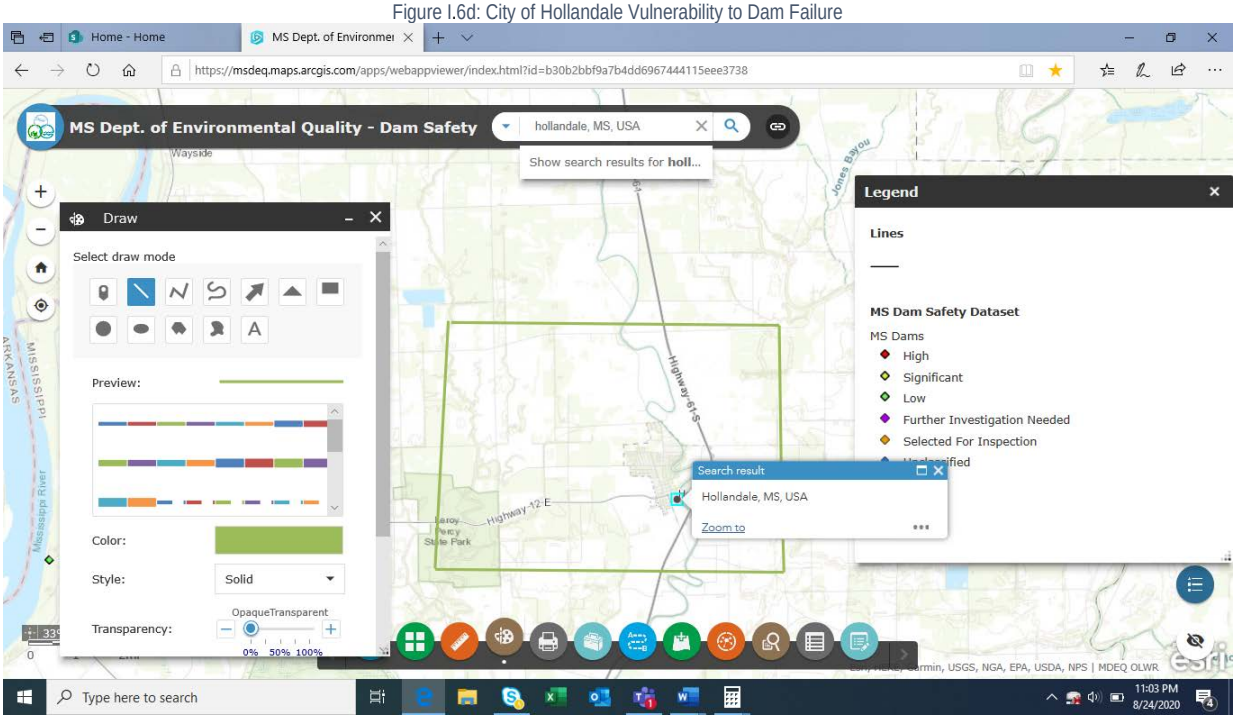
There are no dams within in a short distance of the Town of Arcola. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure.

Figure I.6c: City of Greenville Vulnerability to Dam Failure



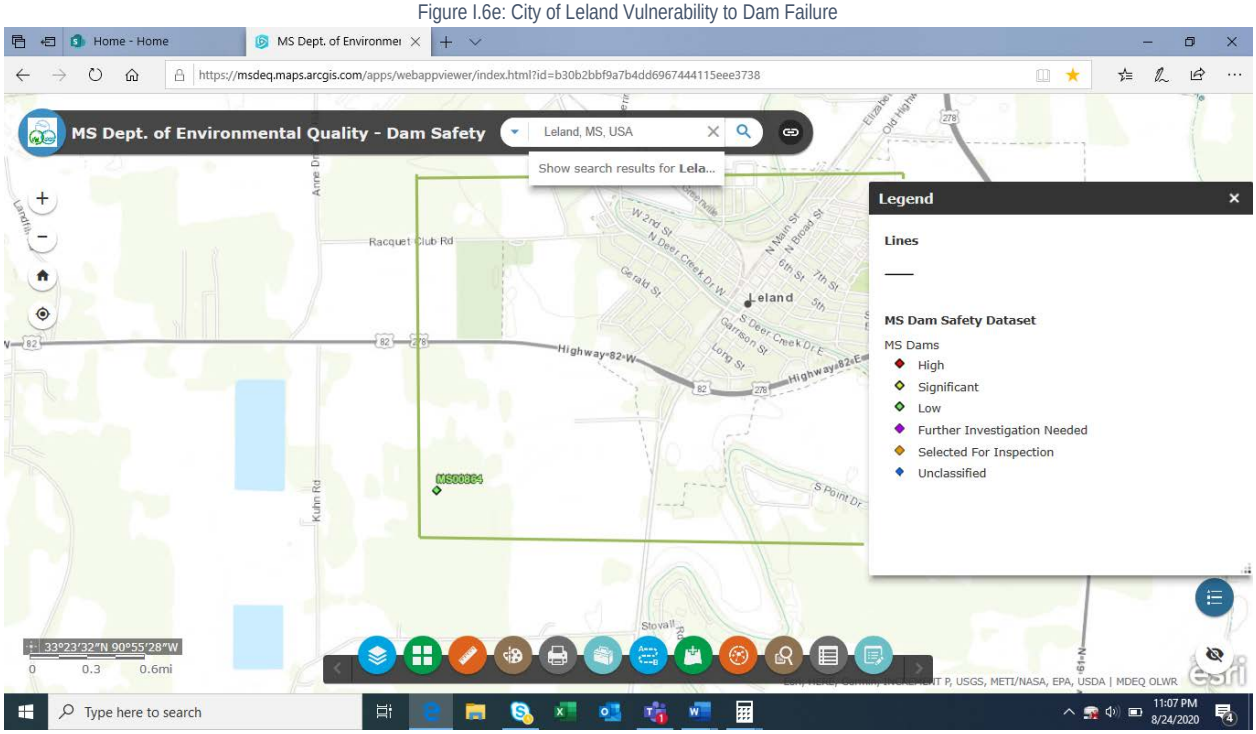
The dam vulnerability map for Greenville shows that two low level dams (Leland Sewage Lagoon and Bledsoe Lake Dams) are located near the city. However, the city is at a low risk to dam failure.

Figure I.6d: City of Hollandale Vulnerability to Dam Failure



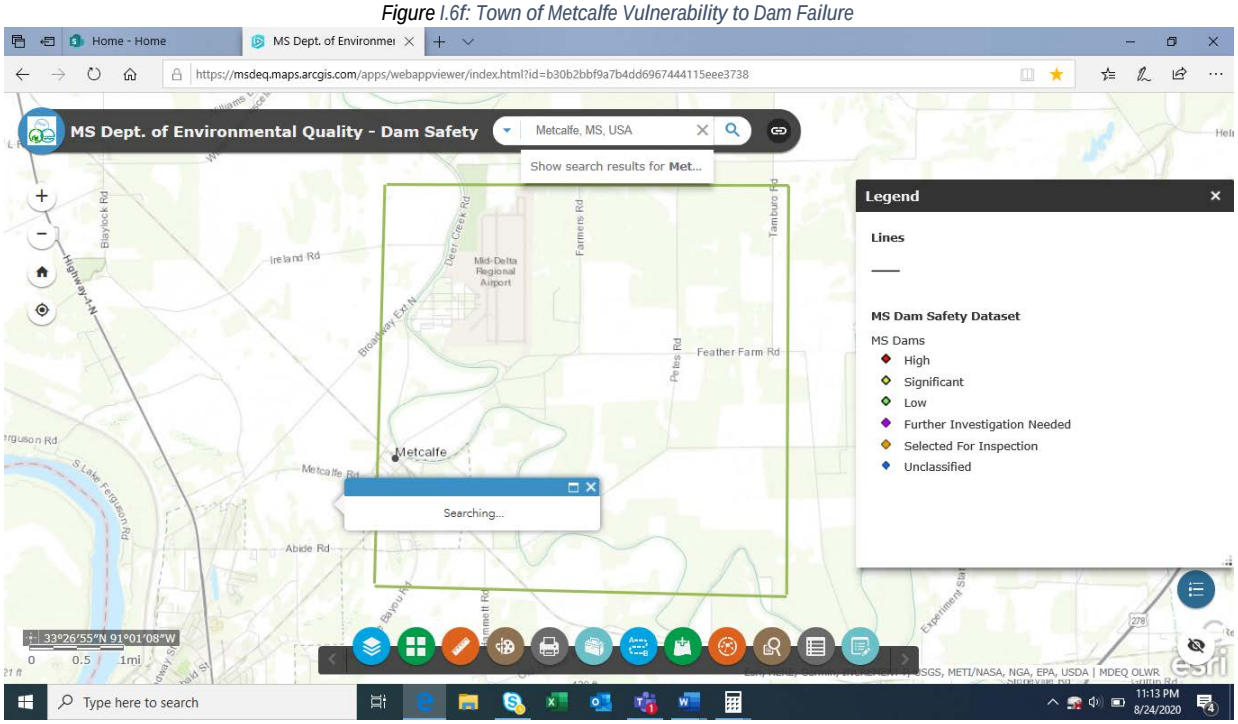
There are no dams within in a short distance of the City of Hollandale. The city's population center is well away from any identified dams and they pose little risk to the community. As such the City is at a low risk to dam failure

Figure I.6e: City of Leland Vulnerability to Dam Failure



There are no dams within in a short distance of the City of Leland. The city's population center is well away from any identified dams and they pose little risk to the community. As such the City is at a low risk to dam failure.

Figure I.6f: Town of Metcalfe Vulnerability to Dam Failure



There are no dams within in a short distance of the Town of Metcalfe. The town's population center is well away from any identified dams and they pose little risk to the community. As such the Town is at a low risk to dam failure

Overall Vulnerability to Dam Failure

The following table summarizes the vulnerability of each jurisdiction to dam failure.

Table I14: Geographic Vulnerability to Dam Failure by Jurisdiction-Washington County I Source: MDEQ

Jurisdiction	Ranking
Unincorporated Washington County	Low
Town of Arcola	Low
City of Greenville	Low
City of Hollandale	Low
City of Leland	Low
Town of Metcalfe	Low
Overall County Vulnerability to dam failure hazard	**Low**

There are no significant or high hazard dams in Washington County. Therefore, dam failure is rated as low risk to Washington County overall.

Drought

Location and Extent

Drought covers a large area and cannot be confined within geographic boundaries. Therefore, all of Washington County could be exposed to drought conditions. The extent of damage from drought typically does not pose a threat to property but can impact agricultural assets within the county.

Previous Occurrences

Table E.15 lists 9 events reported in the years of 2000 through 2019 as shown in the National Weather Service Storm Events Database, housed at the National Center for Environmental Information (NCEI). It is important to note that the lack of data during that a given time frame does not mean drought conditions did not exist-they simply were not reported. NCEI reports drought on a countywide basis and not by jurisdiction. The figures show that most drought-related damage is related to agricultural losses.

Table I.15: Drought Occurrences 2000 to 2020 I Source: *NCEI*

Date	Death	Injury	Property Damage	Crop Damage
12/01/2016	-	-	-	50,000
11/15/2016	-	-	-	50,000
10/01/2015	-	-	-	1,200
9/15/2015	-	-	-	400,000
10/1/2010	-	-	-	500,000
9/1/2010	-	-	-	500,000
8/1/2010	-	-	-	500,000
7/15/2010	-	-	-	300,000
10/1/2006	-	-	-	5,000,000
Total	**-**	**-**	**-**	**$7,301,000**

Probability of Future Occurrence

Historical data listed in Table I.15 suggest that drought is likely. It may occur one or more times in a given year or may experience a drought-free period of several years. It is also likely that drought may occur as a result of climate change throughout the United States, which would affect the region's significant agriculture holdings. Of the nineteen years included in NCEI research, a drought has occurred in five years. A probability developed by dividing the number of drought years by the total number of years results in a 21% probability that a drought will occur in any given year.

Assessing Vulnerability

Drought occurs with advance waring because those in farm community are able to tell when patterns of water availability are changing. Drought is monitored by the National Weather Service and Mississippi State University Extension Service, which has offices in each county. Two tools are available for Extension staff and others who monitor drought: The Keetch-Bynum Drought Index and the Palmer Drought Severity Index, which are discussed in Section 4 of the Base Plan as tools for drought monitoring. Drought is not known to cost human lives may not be lost but it affects lifestyles and the economic effects may be felt countywide.

The agricultural resources of Washington County are particularly vulnerable to drought events. Drought occurs with a great deal of warning. Human lives may not be lost, but lifestyles could be dramatically altered, and the economic effects felt countywide. There is no documented property damage in the NCEI database for the period 2002 to 2019. However, agricultural losses from multiple events from November 2006 through December 2016 timeframe totaled approximately $7,301,000. The unincorporated areas, which include agricultural assets, are more affected by drought than municipalities, this area ranks the hazard as medium.

All NCEI events are listed as occurring in the Washington Zone, so it can be deduced that the entire county is equally at risk to the hazard. However, because the unincorporated areas, which include agricultural assets, are more affected by drought than municipalities, this area ranks the hazard as medium for unincorporated areas. Other areas of the county are determined to be at low vulnerability to drought, so the County overall is listed as having low vulnerability.

Table I.16: Washington County Jurisdictional Vulnerability to Drought I Source: NCEI

Jurisdiction	Ranking
Unincorporated Washington County	Medium
Town of Arcola	Low
City of Greenville	Low
City of Hollandale	Low
City of Leland	Low
Town of Metcalfe	Low
Overall County vulnerability to drought hazard	Low

Earthquake

Location and Extent

Washington County, like most of North Central Mississippi, is located within the Modified Mercalli Zone VI. Should an event occur that has a 5.9 to 6.0 magnitude on the Richter Scale, some or all of the following may occur based on descriptions included in the Scale:

- The event would be felt by all or nearly everyone

- People may be awakened from sleep if the event occurs at night
- Widespread frightened population
- Some dishes and windows would be broken.
- Unstable objects would be overturned.
- Pendulum clocks may stop.
- Heavy furniture moved
- Instances of fallen plaster
- Slight damage

Previous Occurrences

There has been no record of earthquakes occurring in Washington County during the planning period.

Probability of Future Occurrence

In 2002, a study by the Center for Earthquake Research and Information (CERI) at the University of Memphis reported that, in any given 50-year interval, there is a seven to ten percent probability of the region experiencing an event at the level of the devastating 1811-1812 sequence of earthquakes in the New Madrid Zone. The study also estimated that there is an estimated 25 to 40 percent probability that a 6.0 magnitude event occurring a 50-year time period. The probability of future occurrence is classified as susceptible, with a less than 1% probability in a given year.

Assessing Vulnerability

The level of vulnerability is the same for all areas of the county given that there is no substantive geographic variation in distance from one end of the county to the city of New Madrid, MO, the epicenter of the New Madrid Seismic Zone. The distance between New Madrid and the Town of Metcalfe, in the northwest corner of the county, is an estimated 266 miles, and the distance to the Town of Hollandale is an estimated additional 10 miles further south. There is not enough a distance in proximity to New Madrid to say that one community is more vulnerable than the other.

There are recorded deaths, injuries, or property damage from earthquakes in Washington County. There is little likelihood of any detrimental effect on the County's economy, residents' lifestyle, or physical structures. However, the effects on life and property in the area and low hazard dams could be significant if a large earthquake were to occur given the nature of the built environment. In estimates derived from a report by the U.S. Geological Survey (USGS) "New Madrid Earthquake Project," the relative risk for Washington County and other sectors of District 3 for a potential seismic event could have a magnitude of between 3 and 4 on the Richter scale.

Research completed by the USGS Earthquake Hazard Program, buildings constructed using load-bearing masonry walls are vulnerable to damage by earthquakes, while steel and wood-frame buildings have a lower seismic vulnerability. Low-rise reinforced concrete buildings are also in this lower seismic risk category. Damage expected in such an event within the unincorporated areas of Washington County could include buildings not secured to a solid foundation being shaken off their supports, and chimneys falling away from houses. Multi-story structures built with un-reinforced masonry buildings could be substantially damaged.

In reviewing earthquake effects on dams, the 2018 SHMP overlaid significant high hazard dams with historic seismic recordings and developed a dam inventory for earthquake prone counties. Dam/levee systems are also vulnerable to earthquake events as shown below.

Table I.17: Dam Inventory in Relation to Earthquake Prone Counties by Dam Type I Source: 2018 Mississippi SHMP

DISTRICT 3				
County	Significant	High	Medium	Low
Attala	1	2	44	47
Bolivar	-	-	14	14
Carroll	4	23	86	113
Holmes	1	5	39	45
Humphreys	-	-	4	4
Leflore	-	-	-	-
Montgomery	2	22	24	2
Sunflower	-	-	12	12
Washington	-	-	3	3

Extreme Heat

Location and Extent

Heat waves cover a large area and cannot be confined within geographic boundaries. As such, all of Washington County could be exposed to excessive heat conditions. Regarding hazard extent, such events typically do not include property damage, but heat can affect the elderly, infants, and disabled persons, and cause death in persons who are overexposed. It can cause crop damage and affect the livelihood of those working in the agricultural industry.

Previous Occurrences

Table I.18 shows that there have been seven recoded heat events from 2000 to 2019. There were no damages or injuries reported. However, three deaths were associated with these events as described below:

- August 1, 2010: A lady was found dead in her home on the morning of August 5th. The Washington County Coroner's office said the temperature in her home was 100 degrees.
- August 25, 2000: 86 yr. old female
- ***July 20, 2000: 55 yr. old male***

Table I.18: Extreme Heat Occurrences 2000 to 2019 / Source: NCEI

Date	Event	Death	Injury	Property Damage	Crop Damage
8/1/2010	Excessive Heat	1	-	-	-
8/5/2007	Heat	-	-	-	-
7/15/2006	Heat	-	-	-	-
8/17/2005	Heat	-	-	-	-
7/23/2005	Heat	-	-	-	-
8/25/2000	Heat	1	-	-	-
7/20/2000	Heat	1	-	-	-
Total		**3**	**-**	**-**	**-**

The National Weather Service event narrative for the most recent occurrence (8/1/2010) is typical of how extent is described in the other four events.

> A four day stretch of extreme temperatures occurred across the region to start off the month of August. High pressure was firmly entrenched across the southeast and allowed temperatures to soar into the triple digits across much of the region. Across the NWS Jackson, MS forecast area, 19 record highs were set between August 1st and 4th. On August 2nd, the 2nd warmest average temperature was recorded. The low was 78 and the high 105, this resulted in an average temperature of 91.5 degrees. Additionally, relatively high humidity levels made conditions even more oppressive, with heat index readings surpassing 110 degrees in many areas. This extreme heat resulted in 3 fatalities across the forecast area.

There were no data presented on potential impacts in Washington County.

Probability of Future Occurrence

While five events are listed in the table of historic events, two of these appear to be from an extended event that occurred over a two-month period. As such, for the purpose of determining probability, it is accurate to say that four events took place over a 19-year period, so there is a 21% percent chance of occurrence in any given year.

Assessing Vulnerability

Extreme Heat can affect certain populations but generally causes no property damage. During periods of extreme heat, there is little physical destruction, although roads can buckle, and livestock die. Extreme heat conditions can pose problems for those not accustomed to the climate or who are outside for prolonged periods of time. Extreme heat can create a threat even to individuals and communities that are accustomed to high temperatures. Excessive heat can also cause utility outages due to an increased demand for electricity.

All of the following are populations that are prone to heat-related conditions: the elderly; young children; those who are immobile; persons who live alone especially without air conditioning; people without transportation; and people suffering from serious illnesses. All Because NWS reports are county-based and events described are often regional occurrences, it is safe to say that the entire population of all county locations are vulnerable.

Expansive Soil

Location and Extent

Expansive soils are present throughout Mississippi and have been known to cause considerable damage to housing and infrastructure. Less than 50 percent of soils in Washington County consist of clay having high swelling potential.

Previous Occurrences

There has been no record of expansive soil issues in Washington County.

Probability of Future Occurrence

The probability of expansive soils is classified as low. While it may be realistic to say that there is a zero percent chance of occurrence, it is not possible to document probability with no historic

data. The fact that the community chose to keep his hazard in the plan and to profile it despite the lack of occurrences suggests that there is cause for low-level concern.

Assessing Vulnerability

Expansive soils could cause damage to infrastructure and to both business and residential structures within Washington County. Community leaders agreed that this is a hazard of low-level concern but wanted to retain it in the 2020 RHMP update to document that a discussion about the hazard took place.

Flood

Location and Extent

The entire geographic region of Washington County is at risk to riverine, flash flooding, and flooding caused by undersized overburdened stormwater management systems. All of the flood events cited from recent NCEI data below are documented as flash floods. Flood data shown below shows that all locations in the county are susceptible to flooding, and the extent of some events is listed as countywide.

Flash floods often occur when rain falls on the built environment where impervious surfaces, gutters, and storm sewers hasten the flow of run-off. Flowing waters can become raging torrents of water that course through streambeds and streets, sweeping away everything in their path.

Previous Occurrences

Table I.19 provides a summary of the 55 flood events recorded from 2000 to 2019 and Table I.20 shows the events sorted by location within the county. While inadequate stormwater management capability likely contributes to flash flooding in all areas, it is noted where local creeks, rivers and their tributaries are located nearby and may be potential sources of overflow.

Table I.19: Flood Events 2000 to 2019 I Source: NCEI

Location	Date	Type	Death	injury	Property Damage	Crop Damage
Greenville/Fairfield A	5/11/2019	Flash Flood	-	-	5,000	-
Heads	5/9/2019	Flash Flood	-	-	300,000	-
Greenville	2/23/2019	Flash Flood	-	-	50,000	-
Swiftwater	2/22/2019	Flash Flood	-	-	150,000	-
Hollyknow	2/22/2019	Flash Flood	-	-	5,000	-
Greenville	2/22/2019	Flash Flood	-	-	2,000	-
McCutcheon	2/20/2019	Flash Flood	-	-	3,000	-
Greenville	8/20/18	Flash Flood	-	-	15,000	-
Greenville	8/19/2018	Flash Flood	-	-	5,000	-
Priscilla	8/22/2018	Flash Flood	-	-	100,000	-
Greenville	8/14/2017	Flash Flood	-	-	5,000	-
Hollandale	8/8/2017	Flash Flood	-	-	50,000	
Greenville Fair Field A	8/19/2016	Flash Flood	-	-	2,000	-
Overby	6/31/2016	Flash Flood	-	-	20,000	-
Greenville	3/31/2016	Flash Flood	-	-	10,000	-
Greenville	3/30/2026	Flash Flood	-	-	10,000	-
Greenville	03/12/2016	Flood	-	-	50,000	-

Location	Date	Type	Death	injury	Property Damage	Crop Damage
Winterville	3/10/2016	Flash Flood	-	-	7,000	-
Leland	3/10/2016	Flash Flood	-	-	5,000	-
(GLH) Greenville	3/10/2016	Flash Flood	-	-	90,000	-
(GLH) Greenville	3/9/2016	Flash Flood	-	-	10,000	-
North Greenville	3/9/2016	Flash Flood	-	-	10,000	-
Greenville	7/5/2015	Flash Flood	-	-	3,000	-
G Alan Cypress Garden AR	9/24/2013	Flash Flood	-	-	-	-
Swiftwater	6/5/2013	Flash Flood	-	-	-	-
Greenville	1/13/2013	Flash Flood	-	-	10,000	-
Hollandale	1/10/2013	Flash Flood	-	-	10,000	-
Leland	9/30/2012	Flash Flood	-	-	10,000	-
Greenville	8/30/2012	Flash Flood	-	-	15,000	-
Hollandale	6/11/2012	Flash Flood	-	-	60,000	-
Greenville	5/30/2012	Flash Flood	-	-	-	-
Greenville	9/25/2011	Flash Flood	-	-	10,000	-
North Greenville	5/25/2011	Flash Flood	-	-	5,000	2,000
Hampton	5/5/2011	Flood	-	-	5,000,000	200,000
Greenville	10/24/2010	Flash Flood	-	-	500	-
Marathon	1/21/2010	Flash Flood	-	-	5,000	-
Darlove	10/12/2009	Flash Flood	-	-	100,000	400,000
Hollandale	9/14/2009	Flash Flood	-	-	5,000	-
Washington Co.	5/6/2009	Flash Flood	-	-	10,000	-
Hollandale Muni Arpt	9/14/2008	Flash Flood	-	-	10,000	-
Greenville	9/3/2008	Flash Flood	-	-	10,000,000	20,000,000
Glen Allan	5/15/2008	Flash Flood	-	-	1,000,000	500,000
Lake Washington	7/9/2007	Flash Flood	-	-	15,000	150,000
Greenville	9/25/2005	Flash Flood	-	-	80,000	-
Greenville	4/11/2005	Flash Flood	-	-	20,000	-
Greenville	11/23/2004	Flash Flood	-	-	3,000	-
Greenville	6/17/2003	Flash Flood	-	-	10,000	-
Greenville	12/24/2002	Flash Flood	-	-	7,000	-
Countywide	1/24/2002	Flash Flood	-	-	1,000	-
Countywide	12/13/2001	Flash Flood	-	-	-	-
Greenville Abide Arp	12/13/2001	Flash Flood	-	-	-	-
Countywide	12/12/2001	Flash Flood	-	-	1,000	-
Countywide	11/28/2001	Flash Flood	-	-	100,000	-
Countywide	5/3/2000	Flash Flood	-	-	2,000	-
			-	-	**$17,407,000**	**$21,252,000**

Table I.20: Washington County Flood Events 20001 to 2019 – Sorted by Location I Source: FEMA Preliminary FIS (11/14/2018)- Washington County

Location	# Events	Major Water Bodies
Town of Arcola	-	-
City of Greenville	28	Mississippi River, Horseshoes Ditch, Various local tributaries
City of Hollandale	5	
City of Leland	2	Deer Creek
Town of Metcalfe	-	-

Unincorporated Countywide	20	Mississippi River, Big Sunflower, Lake Ferguson, East Sixmile Bayou, lBogue Phalis Creek, East Cypress Slough, Steele Bayou, Wrong Prong Murphy Bayou, Jones Bayou.

Information from the same table can be further sorted to assess vulnerability for the jurisdictions and unincorporated areas of the Washington County. All unincorporated communities, reference to part of the County, will be counted toward incidents not within an identified municipality.

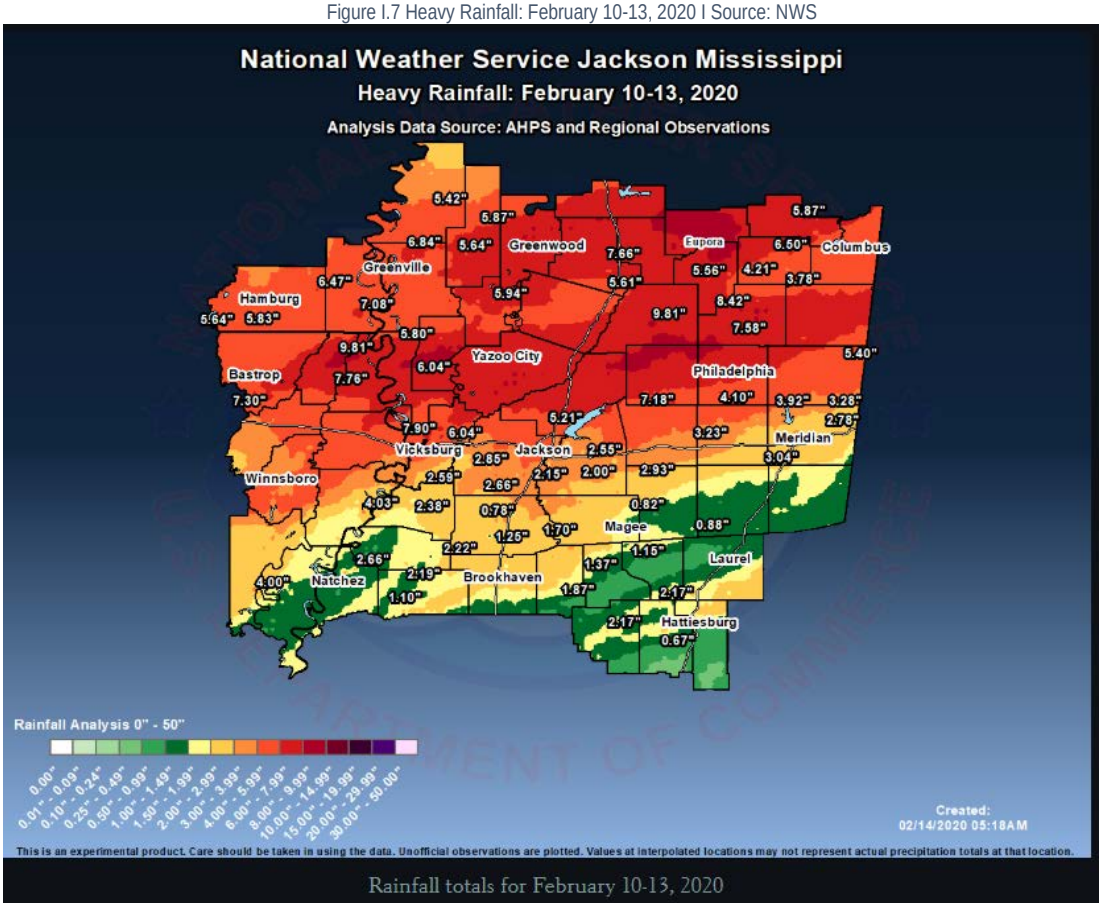
While there is a section devoted to flood vulnerability further in this annex, vulnerability will also be addressed here, in proximity to the previous information.

Table I.21: Geographic Vulnerability to Flood by Jurisdiction I Source: NCEI

Location	# Events	Vulnerability Level	Critical Points
Countywide Central Portion, Western and East Portion	20	High	Presence of major rivers and tributaries covering most of the county
Town of Arcola	-	Low	Minor local streams and creeks
City of Greenville	28	High	Presence of major rivers and tributaries covering most of the city
City of Hollandale	5	Low	Multiple events, flood gauge location
City of Leland	2	low	Location of major river running through town
Town of Metcalfe	-	Low	Minor local streams and creeks
Overall vulnerability of Washington County to flood hazard		High	Number events, that do not affect structures, input from the Office of Emergency Management

In addition to the events documented as occurring through 2019, District 3 experienced significant rainfall in early 2020 that had not yet been fully documented by NCEI at the time of plan development. The visual included on the next page as Figure I.7 shows that during the period of February 10-13, 2020, communities districtwide received between three to 14 inches of rain, and rain continued to fall – at times heavily – through the rest of the month. The Washington County Emergency Management Director said that rainfall affected roadways and caused his department to recognize the need for road improvements in certain areas to mitigate against future flooding. The map shows that Washington County received 6.47 inches during the documented period.

Figure I.7 Heavy Rainfall: February 10-13, 2020 I Source: NWS



Listed below is a summary of significant flood event that have impacted Washington County since the last plan update.

May 19, 2019: A slow-moving low-pressure system moved northeast from the High Plains region toward the Great Lakes between May 8th and 9th. Two short wave troughs moving east ahead of this low-pressure system-initiated squall lines that spread eastward across much of the Gulf Coast region. Thunderstorms embedded in embedded in these squall lines produced damaging wind gusts and a few tornadoes. Additionally, repeated rounds of heavy rain led to scattered flash flooding. Several streets throughout northern portion of the county. In Greenville several structures were flooded, and motorist were rescued from stranded vehicles.

August 22, 2018: A cold front stalled across the western portion of the ArkLaMiss region. Ahead of this, a few storms produced hail and damaging winds. As the front remained stalled, several disturbances moved along it and brought heavy rainfall to the region. This prolonged period of rain resulted in flash flooding across much of the Delta. Numerous roads throughout the unincorporated areas of the county were significantly flooded. The total property damage for the county exceed $100,000.

March 12, 2016: As high pressure over the East Coast refused to move, a storm approached the ArkLaMis from the west and stalled just to the west of the region on March 7th. Warm moist air from the Gulf of Mexico filtered north and encompassed the region, a series of potent upper level disturbances began lifting northeast across the lower Mississippi River Valley. This set the stage for multiple rounds of torrential rain that fell almost continuously across ArkLaMis from March 8th through Mach 12th. These prolonged torrential rains resulted widespread flash flooding and river

flooding across the region, with numerous area rivers reaching moderate and major flood stages. Floodwaters damaged numerous homes, businesses, and closed primary and secondary roads across the region, with some secondary roads washed out. In addition, one weak tornado developed on March 10th as a line of storms began to finally push to the east over central Mississippi. This weak EF-) tornado touched down just west of Raleigh, snapping a few trees and causing minor damage to a metal roof of an outbuilding. As the storm system finally existed the region late on the 12th, another fast moving, compact storm system followed in its wake during the evening of March 13th. This system brought another round of heavy rain to the Delta region, in addition to hail and damaging straight line winds. Two tornadoes were spawned by tis system as well, including an EF-0 tornado that touched down near Cleveland. Scattered roadways across the county were flooded.

May 5, 2011: The Flood of 2011 caused extensive flooding of low-lying farmland and urban areas around the river. All of the flood waters were within the mainline levee. Sixty-one homes were destroyed, 18 sustained major damage and 63 sustained minor damage. One mobile home and a business were destroyed, and 19 businesses sustained minor damage. Twenty-four roads had major damage and three public buildings were destroyed.

September 3, 2008: Hurricane Gustav: During the late afternoon and evening of the 3rd, a heavy band of storms developed across the region and produced 5 to 9 inches of rainfall in 3 to 5 hours. This additional rainfall made the total across Washington County between 7 and 11 inches for the entire three-day event. This extreme rainfall flooded numerous roads, many which were closed or even washed out. Some 250 to 270 structures were flooded with flood damage ranging from minor to major. Flood damage was widespread and significant for this area. Agriculture was hard hit as well. Farmlands were flooded and entire crops were lost or significantly damaged. Any crops that were salvaged produced low yields.

May 15, 2008: Heavy rain fell across the southern and southeast portion of Washington County during the early morning hours of the 15th. This area received 3 to 5 inches of rain as slow-moving storms tracked across the area. Many roads were flooded along with seven homes taking in water.

March 9, 1997: The Mississippi River when above flood stage around the 9th of March and crested between the 21st and 26th. Considerable damage occurred on the Mississippi side of the river. The following is a summary of property damage for each county. Washington County reported a total of 68 homes and mobile homes damaged along with many acres of farmland.

National Flood Insurance Program (NFIP)

Washington County and its five municipalities participate in the National Flood Insurance Program (NFIP).

Based on losses outlined in the 2013 SHMP, the following HAZUS Flood Results were listed for Washington County. Comparable data from the 2018 SHMP was not available to researchers working on the 202 RHMP Update.

Table I.22 – Washington County HAZUS Flood Results I Source: HAZUS (2013 State of Mississippi Standard Hazard Mitigation Plan)

Structural Damage	Contents Damage	Inventory Loss	Total Building Loss	Income loss	Total Building and Income Loss	Bldg. Loss Ratio
$10,138,000	$11,907,000	$800,000	$22,845,000	$311,000	$23,156,000	2.4%

Residential at Risk	Other at Risk	Total Bldgs. Risk	No. of Bldgs. Substantially Damaged	No. of house-holds	No. of people needing shelter	Countywide Building Exposure
76	0	76	8	588	1,288	$2,653,193,000

The next two tables were also taken from the 2018 SHMP and, respectively, show the number of RL/SRL properties for Washington County and the eight other counties included in District 3 and the number of NFIP participating communities for each county and number of properties mitigated.

Table I.23: District 3 Repetitive Loss and Sever Repetitive Loss Properties – Over time and by County I Source: 2018 Mississippi State Hazard Mitigation Plan

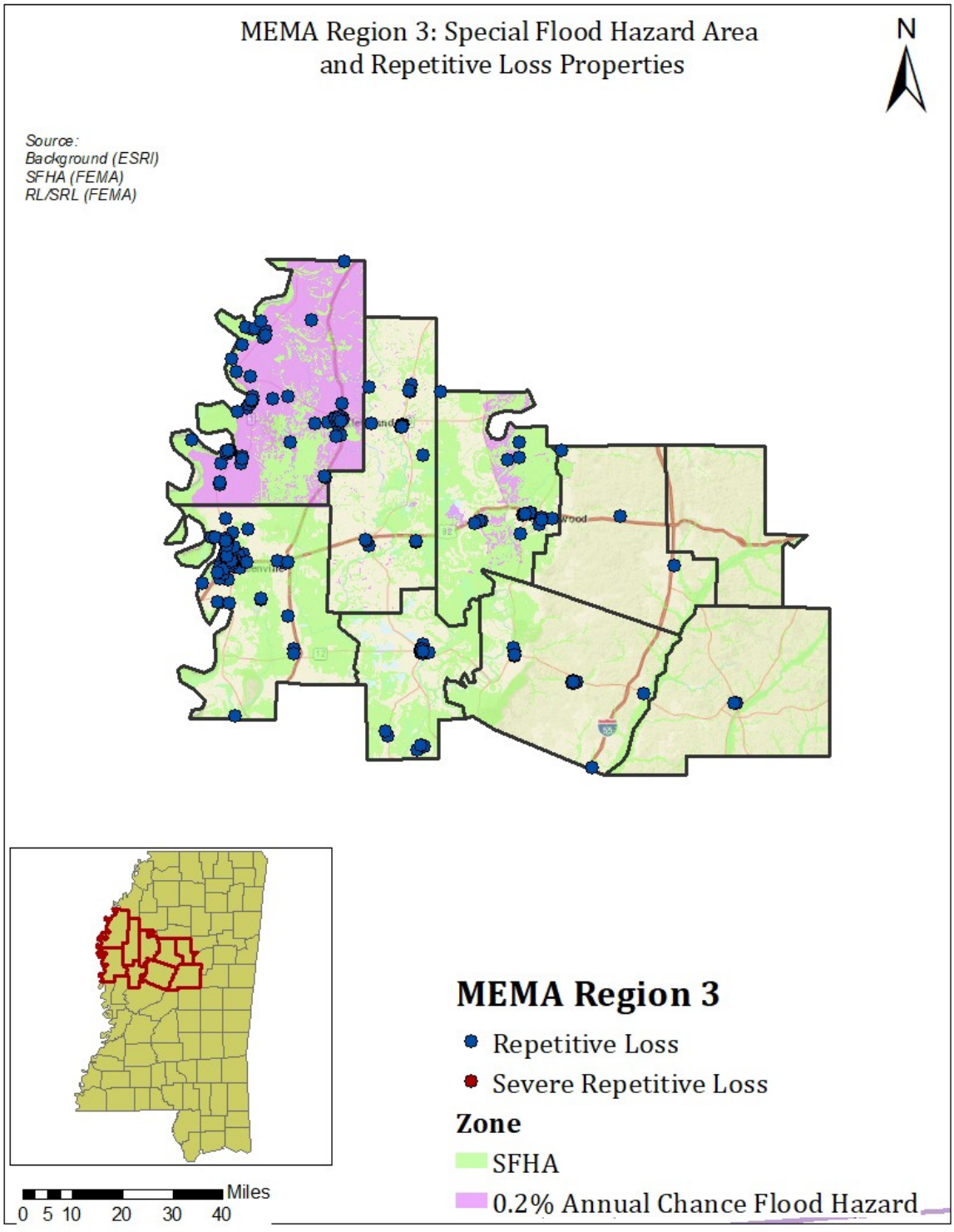
County	Repetitive Loss				Severe Repetitive Loss			
	No. of Properties 2009	No. of Properties 2011	No. of Properties 2016	No. of Flood Claims	No. of Properties 2009	No. of Properties 2011	No. of Properties 2016	No. of Flood Claims
Attala	0	0	1	2	0	0	0	0
Bolivar	155	108	210	631	2	48	2	228
Carroll	4	4	4	8	0	0	0	0
Holmes	11	12	12	27	0	0	0	0
Humphreys	40	31	46	161	2	10	1	61
Leflore	29	27	27	71	0	2	0	8
Montgomery	0	0	0	0	0	0	0	0
Sunflower	19	16	20	72	1	4	0	21
Washington	152	115	191	631	14	48	8	250
Totals	410	313	511	1,603	19	112	11	568

Table I.24: District 3 Participating Communities and Number of Mitigated Properties by County I Source: 2018 Mississippi State Hazard Mitigation Plan

County	No. of NFIP Communities	No. of Mitigated Properties
Attala	5	0
Bolivar	16	20
Carroll	4	0
Holmes	8	0
Humphreys	5	1
Leflore	6	1
Montgomery	4	0
Sunflower	8	4
Washington	6	26
Totals	61	52

The Capabilities Assessment of this Annex identifies NFIP participation and also the fact that a Flood insurance Study was conducted when FEMA developed local Flood Insurance Rate Maps (FIRMs). As of 2016, there was 163 repetitive loss properties in the county. The map below, also from the 2018 SHMP, shows the location of Special Flood Hazard Areas (SFHAs) and RL structures for each county in District 3.

Figure I.8: District 3 Special Flood Hazard Area (SHFA) and Repetitive Loss Structures I *Source: 2018 Mississippi State Hazard Mitigation Plan*



Repetitive Flood and Severe Repetitive Loss

Based on best available data, as shown in Table I.25, there are a total of 163 properties listed on the state's repetitive loss property database, of which nine have been mitigated. The remaining properties probably have not been mitigated due to the fact that providing replacement housing and relocation assistance for the low-income residents in this area is an issue. Additional information regarding these properties is provided in the mitigation strategy chapter of this plan.

Residents of Washington County participating in the National Flood Insurance Program (NFIP) have received over $8,454,466 in flood loss payments. Details regarding the NFIP program by community are provided in the capability's assessment section of this annex.

Table I.25: Repetitive Flood and Severe Repetitive Loss Properties I Source: MEMA RL Listing 02-28-2011

	Repetitive Flood							
Jurisdiction	Community ID	No. of properties	No. Mitigated	No. Insured	Total Losses	Total Bldg. Payments	Total Contents	Total Paid
Washington County	280177	82	9	9	199	2478890	486,255.74	2,965,145.63
Greenville	280179	31	0	9	83	709,627.98	133,992.39	843,620.37
Leland	280181	2	0	0	4	131,034.77	1,833.03	132,867.80
Total Repetitive Flood		**115**	**9**	**18**	**286**	**$3,319,552.64**	**$622,081.16**	**$3,941,633.80**
	Severe Repetitive Loss							
Jurisdiction	Community ID	No. of properties	No. Mitigated	No. Insured	Total Losses	Total Bldg. Payments	Total Contents	Total Paid
Washington County	280177	34	0	1	83	914,544.31	388,750.15	1,303,294.46
Greenville	280179	13	0	0	4	74709	0	74709
Leland	280181	1	0	0	163	2758414	376415	3134829
Total Severe Repetitive Loss		**48**	**0**	**1**	**250**	**$3,747,666.44**	**$765,165.43**	**$4,512,831.87**
Total		**163**	**9**	**19**	**536**	**$7,067,219.08**	**$1,387,246.59**	**$8,454,465.67**

Probability of Future Occurrence

The probability of flooding in Washington County is listed as highly likely given the history of flood events; the presence of an overtaxed drainage system; and location in the region of the Mississippi River and Yazoo Rivers and their many tributaries. NCEI data shows that one or more portions of the County reported flooding in 18 of the 19 years of data being studied. This suggests that there is a 95% chance of flooding in any given year. As such, it is highly likely that the community will see flooding roughly once every 18 to 24 months causing roads and bridges to become impassable and damaged. Agricultural resources could be decimated, and homes could also be damaged or destroyed.

Assessing Vulnerability

All major rivers in Washington County are contained by significant levee systems designed to withstand a 500-year plus 5-foot flood event and are managed by the US Army Corps of Engineers. However, minor river systems in Washington County are not protected by levee systems. These include the Bogue Phalia, Sunflower River, and Jones Bayou. These systems

drain much of Washington, Bolivar and Coahoma County and will flood, as they did in 1960, 1979 and 1991, when prolonged excessive rainfall occurred, clogging transportation routes and sewers and inundating homes and foundations in every jurisdiction within the county.

Of primary concern is the potential for flooding due to prolonged excessive rainfall - something which happens on a fairly frequent basis. Overbank flooding of minor river systems will occur here every 7-10 years and affect areas within Flood Zone A. These areas follow tributary and intermittent streams primarily feed the Bogue Phalia. Other Flood Zone A areas are primarily associated with meander scars. These areas suffer from particularly poor drainage, and once full, take extended periods of time to dry out.

The topology of Washington County also makes it prone to significant ponding of water in low-lying and poorly draining areas when rainfall amounts exceed 2 inches per hour. These areas are generally associated with roadway intersections, areas adjacent to drainage ditches and canals, catchment basins, and yards. The latter is of concern because repeated rapid rainfall events occur during short periods of time (~24 hours) ponding will expand and often affect homes and significant sections of roadway. Such events happen 2-3 times a year during “normal” years and are generally deemed “nuisance flooding”, though repetitive loss does occur

Impact on Transportation Systems: Washington County includes several state-owned bridges located on US Highways 82, 61 and 278, US Bridge across the Mississippi River, and State Highways 1 and 12. These serve as vital transportation and evacuation routes for the county and surrounding areas. These bridges cross portions of delineated floodplains and are susceptible to flood damage.

In addition to bridges, roadways are subject to inundation and overtopping by periods of heavy rain, which appear likely to occur more frequently given climate change observations. Storm events generally projected to occur as 100-year flood events are occurring more frequently. The potential loss could include up to the full replacement value of the bridge structure if flooding results in bridge collapse. In severe cases, roadways could also be undermined, causing complete or partial washout of roadbed and collapse of the road surface. Bridges and roadways with a history of flood impact could benefit from mitigation projects.

Impact on Lifeline Utility Systems: Lifeline utility systems such as electric power, gas, utility and water distribution and telephone service are generally not significantly affected by flood events, although flooded lift stations could result in storm water infiltration into treatment facilities. A facility’s power source could be interrupted during ***Impact*** a flood and result in expensive repairs unless the supply is elevated.

Severe Storm (Lightning, Hail and Severe Wind)

Location and Extent

Severe storms include non-spatial elements and, therefore, can be described as equally affecting all areas of Washington County. All municipalities and unincorporated areas are susceptible to lightning, hail and severe wind events. Of particular concern are persons who reside in a mobile/manufactured home, and the elderly and disabled. It is strongly recommended that all manufactured housing be fastened to the ground. The National Association of Certified Home Inspectors (NACHI) describes a housing tie downs as a system of “heavy-duty straps and anchors designed to stabilize manufactured homes (also known as mobile homes) during high winds.” The organization points out that failure to properly install and maintain tie-downs results in reduced capacity to resist sliding and overturning.

Previous Occurrences

The next four tables and subsequent two figures show numerous severe storm events have occurred countywide.

Table I.26 – All Severe Storm Events 2000 to 2019 I Source: NCEI

Total – All Severe Weather Events					
Hazard Event	No of Events	Property Damage	Crop Damage	Deaths	Injuries
Lightning	3	140,000	-	-	-
Hail	59	1,205,000	404,000	-	-
Severe Wind	133	4,028,000	5,000	1	1
Totals	226	$5,373,000	$409,000	-	-

Table I.27 – Lightning Events 2000 to 2019 I Source: NCEI

Location	Date	Death	Injury	Property Damage	Crop Damage
Swiftwater	10/06/2013	-	-	10,000	-
North Greenville	09/25/2011	-	-	30,000	-
Manhattan	09/15/2011	-	-	100,000	-
Total		-	-	**$140,000**	-

Between the years 2000 and 2019, three lighting events is listed as having to occur in unincorporated areas of the County.

Between 2000 and 2019, 28 hail events were recorded by the National Weather Service as affecting Washington County. Captured in the table below, the data shows that all incorporated and unincorporated areas of the county were affected, and the recorded hail magnitude ranged from .75” to 2.75” and total recorded property damage of $1,205,000 and crop damage $404was $37,000.

Table I.28 – Hail Events 2000 to 2019 I Source: NCEI

Location	Date	Event	Mag	Death	Injury	Property Damage	Crop Damage
Hollandale	5/15/2018	Hail	0.75 in	-	-	-	-
Avon	3/10/2018	Hail	1.75 in	-	-	20,000	-
Winterville	3/10/2018	Hail	2.75 in	-	-	50,000	-
Greenville	11/3/2017	Hail	1.25 in	-	-	15,000	-
Greenville	11/3/2017	Hail	1.75 in	-	-	20,000	-
Metcalfe	11/29/2016	Hail	1.25 in	-	-	2,000	-
Wayside	3/18/2016	Hail	1.0 in	-	-	-	-
Avon	3/18/2016	Hail	.75 in	-	-	-	-
Refuse	3/13/2016	Hail	1.75 in	-	-	50,000	-
Glen Allan	5/15/2015	Hail	1.0 in	-	-	-	-
Hampton	4/19/2015	Hail	1.75 in	-	-	3,000	-
Priscilla	3/31/2015	Hail	1.75 in	-	-	6,000	-
Woodside	10/12/2014	Hail	1.0 in	-	-	-	-

Location	Date	Event	Mag	Death	Injury	Property Damage	Crop Damage
Glen Allan Cypress Garden	7/2/2014	Hail	1.0 in	-	-	-	-
Leland	4/27/2014	Hail	1.0 in	-	-	-	-
Burdett	4/2720/14	Hail	0.75 in	-	-	-	-
Hollandale	4/24/2014	Hail	1.0 in	-	-	-	-
Greenville	4/6/2014	Hail	0.75 in	-	-	-	-
Greenville	4/6/2014	Hail	0.88 in	-	-	-	-
Hollandale	3/28/2014	Hail	1.75 in	-	-	10,000	-
Swiftwater	3/28/2014	Hail	1.75 in	-	-	10,000	-
Greenville fairfld a	3/28/2014	Hail	0.88	-	-	-	-
Wayside	3/28/2014	Hail	2.0 in	-	-	10,000	-
Wayside	3/28/2014	Hail	2.00 in.	-	-	10,0000	-
Greenville fairfld a	3/28/2014	Hail	0.88 in.	-	-	-	-
Winterville	7/11/2013	Hail	1.00 in.	-	-	-	-
Leland	6/5/2013	Hail	1.00 in.	-	-	-	-
Refuge	4/18/2013	Hail	1.00 in.	-	-	-	-
Greenville	3/23/2013	Hail	0.88 in.	-	-	-	-
Greenville	3/18/2013	Hail	1.75 in.	-	-	10,000	-
Greenville	3/18/2013	Hail	1.75 in.	-	-	200,000	-
Manhattan	6/4/2012	Hail	0.88 in.	-	-	-	-
Arcola	6/4/2012	Hail	1.75 in.	-	-	20,000	-
Winterville	6/4/2012	Hail	1.00 in.	-	-	-	-
Greenville	5/30/2012	Hail	0.88 in.	-	-	-	-
Manhattan	4/5/2012	Hail	1.00 in.	-	-	-	-
Wayside	4/5/2012	Hail	1.75 in.	-	-	30,000	-
Winterville	3/2/2012	Hail	1.00 in.	-	-	-	-
Arcola	6/5/2011	Hail	1.00 in.	-	-	10,000	-
Swiftwater	5/25/2011	Hail	1.00 in.	-	-	30,000	-
Manhattan	4/20/2011	Hail	1.00 in.	-	-	-	-
Wayside	4/20/2011	Hail	0.88 in.	-	-	-	-
Hollandale	4/4/2011	Hail	1.00 in.	-	-	-	-
Greenville Fairfield A	4/4/2011	Hail	1.00 in.	-	-	-	-
Hollandale	12/11/2010	Hail	0.88 in.	-	-	-	-
Chatham	12/11/2010	Hail	1.25 in.	-	-	-	-
Magenta	10/24/2010	Hail	0.75 in.	-	-	-	-
Winterville	10/24/2010	Hail	1.00 in.	-	-	-	-
Winterville	10/12/2010	Hail	1.00 in.	-	-	-	-
Brighton	5/16/2010	Hail	1.00 in.	-	-	-	-
Leland	4/23/2010	Hail	0.88 in.	-	-	-	-
Washington Co.	5/27/2009	Hail	0.88 in.	-	-	-	-
Washington Co.	5/6/2009	Hail	1.00 in.	-	-	-	4,000
Darlove	5/5/2009	Hail	0.75 in.	-	-	-	-
Chatham	4/9/2009	Hail	0.75 in.	-	-	-	-

Location	Date	Event	Mag	Death	Injury	Property Damage	Crop Damage
Refuge	4/2/2009	Hail	0.75 in.	-	-	-	-
North Greenville	2/27/2009	Hail	1.75 in.	-	-	-	-
Winterville	2/27/2009	Hail	1.00 in.	-	-	-	-
Glen Allan	2/27/2009	Hail	0.88 in.	-	-	-	-
Greenville	7/10/2008	Hail	0.75 in.	-	-	-	-
Hollandale	5/2/2008	Hail	0.75 in.	-	-	-	-
Chatham	3/14/2008	Hail	1.00 in.	-	-	-	-
Refuge	3/14/2008	Hail	1.75 in.	-	-	100,000	-
Hollandale	11/21/2007	Hail	0.75 in.	-	-	-	-
Glen Allan	5/3/2007	Hail	1.00 in.	-	-	-	-
Hollandale	5/3/2007	Hail	0.75 in.	-	-	-	-
Greenville	3/1/2007	Hail	0.88 in.	-	-	-	-
Greenville	2/24/2007	Hail	0.88 in.	-	-	-	-
Greenville	4/7/2006	Hail	0.88 in.	-	-	-	-
Glen Allan	4/7/2006	Hail	0.75 in.	-	-	-	-
Winterville	4/7/2006	Hail	1.00 in.	-	-	-	-
Arcola	4/7/2006	Hail	1.50 in.	-	-	-	-
Greenville	4/7/2006	Hail	1.75 in.	-	-	400,000	200,000
Greenville	4/7/2006	Hail	1.00 in.	-	-	-	-
Chatham	4/7/2006	Hail	1.75 in.	-	-	200,000	200,000
Hollandale	2/3/2006	Hail	0.88 in.	-	-	-	-
Greenville	8/28/2004	Hail	0.75 in.	-	-	-	-
Swiftwater	5/11/2003	Hail	0.75 in.	-	-	1,000	-
Greenville	4/24/2003	Hail	0.75 in.	-	-	1,000	-
Greenville	4/24/2003	Hail	0.75 in.	-	-	1,000	-
Glen Allan	3/31/2002	Hail	1.75 in.	-	-	-	-
Greenville	3/25/2002	Hail	0.88 in.	-	-	-	-
Greenville	3/25/2002	Hail	0.75 in.	-	-	-	-
Leland	6/27/2001	Hail	1.00 in.	-	-	8,000	-
Leland	6/27/2001	Hail	0.88 in.	-	-	-	-
Wayside	3/27/2000	Hail	0.75 in.	-	-	-	-
Greenville	3/10/2000	Hail	1.75 in.	-	-	8,000	-
Glen Allan	3/10/2000	Hail	1.00 in.	-	-	-	-
Greenville	2/18/2000	Hail	0.75 in.	-	-	-	-
Total				-	-	**$1,205,000**	**$404,000**

Historical data for severe wind events shows that they occur with great frequency in all incorporated and unincorporated sections of the county. While agricultural damage was reported in one instance, events primarily create general property damage totaling over **$4,028,000**.

Table I.29 – Severe Wind Events 2000 to 2019 I Source: NCEI

Location	Date	Event Type	Mag	Death	Injury	Property Damage	Crop Damage
Greenville	12/16/2019	Thunderstorm Wind	52 Kts EG	-	-	5,000	-
Avon	10/21/2019	Thunderstorm Wind	50 kts. EG	-	-	10,0000	-

Location	Date	Event Type	Mag	Death	Injury	Property Damage	Crop Damage
Avon	06/19/2019	Thunderstorm Wind	60 kts. EG	-	-	50,000	-
Winterville	06/19/2019	Thunderstorm Wind	78 kts. EG	-	-	350,000	-
North Greenville	06/19/2019	Thunderstorm Wind	61 kts. EG	-	-	15,000	-
Pricilla	06/19/2019	Thunderstorm Wind	61 kts. EG	1	-	50,000	-
GLH Greenville Municipal Arpt	06/19/2019	Thunderstorm Wind	54 kts. MG	-	-	-	-
Stoneville	05/08/2019	Thunderstorm Wind	52 kts. EG	-	-	8,000	-
GLH Greenville Municipal Arpt	04/07/2019	Thunderstorm Wind	51 kts. MG	-	-	-	-
Brighton	02/11/2019	Thunderstorm Wind	55 kts. EG	-	-	40,000	-
Greenville	02/11/2019	Thunderstorm Wind	50 kts. EG	-	1	25,000	-
Longwood	08/20/2018	Thunderstorm Wind	50 kts. EG	-	-	5,000	-
Manhattan	08/20/2018	Thunderstorm Wind	50 kts. EG	-	-	15,000	-
GLH Greenville Municipal Arpt	07/19/2018	Thunderstorm Wind	64 kts. MG	-	-	-	-
Hollandale	07/19/2018	Thunderstorm Wind	52 kts. EG	-	-	10,000	-
Greenville	07/02/2018	Thunderstorm Wind	50 kts. EG	-	-	8,000	-
Hollandale	06/13/2018	Thunderstorm Wind	50 kts. EG	-	-	1,000	-
Hollandale	05/15/2018	Thunderstorm Wind	52 kts. EG	-	-	15,000	-
North Greenville	04/14/2018	Thunderstorm Wind	50 kts. EG	-	-	1,0000	-
Percy	04/14/2018	Thunderstorm Wind	52 kts. EG	-	-	10,000	-
Greenville	04/03/2018	Thunderstorm Wind	60 kts. EG	-	-	50,000	-
GLH Greenville Municipal Arpt	04/03/2018	Thunderstorm Wind	60 kts. MG	-	-	-	-
Leland	04/03/2018	Thunderstorm Wind	50 kts. EG	-	-	10,000	-
Washington (zone)	08/31/2017	High Wind	52 kts. MG	-	-	-	-
Osseola	06/16/2017	Thunderstorm Wind	60 kts. EG	-	-	30,000	-
Napanee	06/16/2017	Thunderstorm Wind	60 kts. EG	-	-	50,000	-
Magenta	06/16/2017	Thunderstorm Wind	60 kts. EG	-	-	60,000	-
Washington (ZONE)	04/29/2017	Strong Wind	39 kits. EG	-	-	45,000	-
Overby	04/26/2017	Thunderstorm Wind	55 kts. EG	-	-	10,000	-
Swiftwater	04/02/2017	Thunderstorm Wind	50 kts. EG	-	-	10,000	-
GLH Greenville Municipal Arpt	04/02/2017	Thunderstorm Wind	60 kts. MG	-	-	-	-
Pricilla	03/29/2017	Thunderstorm Wind	50 kts. EG	-	-	50,000	-
Arcola	03/29/2017	Thunderstorm Wind	50 kts. EG	-	-	25,000	-
North Greenville	03/25/2017	Thunderstorm Wind	60 kts. EG	-	-	15,000	-
Greenville	11/28/2016	Thunderstorm Wind	43 kts. EG	-	-	50K	-
Leland	11/28/2016	Thunderstorm Wind	43 kts. EG	-	-	10,000	-
Leland	08/06/2016	Thunderstorm Wind	50 kts. EG	-	-	7,000	-
Greenville	08/06/2016	Thunderstorm Wind	35 kts. EG	-	-	3,000	-
Foote	07/14/2016	Thunderstorm Wind	55 kts. EG	-	-	15,000	-
Swiftwater	07/11/2016	Thunderstorm Wind	53 kts. EG	-	-	15,000	-
Greenville	06/17/2016	Thunderstorm Wind	55 kts. EG	-	-	25,000	-
Manhattan	06/17/2016	Thunderstorm Wind	53 kts. EG	-	-	10,000	-
Hollandale Municipal Arpt	06/17/2016	Thunderstorm Wind	52 kts. EG	-	-	12,000	-
Hollandale	05/30/2016	Thunderstorm Wind	50 kts. EG	-	-	40,000	-
Percy	12/13/2015	Thunderstorm Wind	50 kts. EG	-	-	7,000	-

Location	Date	Event Type	Mag	Death	Injury	Property Damage	Crop Damage
Washington (ZONE)	11/17/2015	Strong Wind	40 kts. EG	-	-	2,000	-
Washington (ZONE)	11/17/2015	Strong Wind	40 kts. EG	-	-	6,000	-
Pricilla	03/29/2017	Thunderstorm Wind	50 kts. EG	-	-	50,000	-
North Greenville	10/09/2015	Thunderstorm Wind	50 kts. EG	-	-	3,000	-
Greenville	07/25/2015	Thunderstorm Wind	40 kts. EG	-	-	5,000	-
Tribbett	03/31/2015	Thunderstorm Wind	53 kts. EG	-	-	12,000	-
Swiftwater	10/13/2014	Thunderstorm Wind	63 kts. EG	-	-	30,000	-
Greenville	08/08/2014	Thunderstorm Wind	50 kts. EG	-	-	2,000	-
Manhattan	06/09/2014	Thunderstorm Wind	55 kts. EG	-	-	15,000	-
GLH Greenville Municipal Arpt	04/04/2014	Thunderstorm Wind	51 kts. MG	-	-	-	-
Longwood	02/20/2014	Thunderstorm Wind	65 kts. EG	-	-	30,000	-
Manhattan	02/20/2014	Thunderstorm Wind	55 kts. EG	-	-	10,000	-
Leland	07/11/2013	Thunderstorm Wind	50 kts. EG	-	-	3,000	-
Leland	7/11/2013	Thunderstorm Wind	50 kts. EG	-	-	3,000	-
Swiftwater	6/5/2013	Thunderstorm Wind	50 kts. EG	-	-	-	-
Greenville	5/30/2013	Thunderstorm Wind	50 kts. EG	-	-	30,000	-
Greenville	5/21/2013	Thunderstorm Wind	50 kts. EG	-	-	25,000	-
G Alan Cyprs Grdn Ar	3/23/2013	Thunderstorm Wind	56 kts. EG	-	-	50,000	-
Hollyknowe	1/29/2013	Thunderstorm Wind	65 kts. EG	-	-	200,000	-
Leland	12/20/2012	Thunderstorm Wind	50 kts. EG	-	-	10,000	-
Greenville	10/17/2012	Thunderstorm Wind	78 kts. EG	-	-	150,000	-
Stoneville	6/11/2012	Thunderstorm Wind	50 kts. EG	-	-	1,000	-
(Glh)Greenville Muni	6/11/2012	Thunderstorm Wind	46 kts. MG	-	-	100	-
Manhattan	6/4/2012	Thunderstorm Wind	50 kts. EG	-	-	10,000	-
Greenville	6/4/2012	Thunderstorm Wind	55 kts. EG	-	-	150,000	-
North Greenville	1/22/2012	Thunderstorm Wind	60 kts. EG	-	-	50,000	-
Manhattan	9/22/2011	Thunderstorm Wind	50 kts. EG	-	-	10,000	-
Arcola	6/5/2011	Thunderstorm Wind	50 kts. EG	-	-	25,000	-
Leland	6/5/2011	Thunderstorm Wind	50 kts. EG	-	-	15,000	-
Hollandale	5/25/2011	Thunderstorm Wind	50 kts. EG	-	-	15,000	-
Greenville	5/25/2011	Thunderstorm Wind	69 kts. EG	-	-	30,000	-
Hollandale	4/26/2011	Thunderstorm Wind	53 kts. EG	-	-	1,000	-
Estill	4/15/2011	Thunderstorm Wind	52 kts. EG	-	-	-	-
Winterville	4/15/2011	Thunderstorm Wind	55 kts. EG	-	-	5,000	-
Hollandale	2/24/2011	Thunderstorm Wind	60 kts. EG	-	-	30,000	-
Avon	2/24/2011	Thunderstorm Wind	60 kts. EG	-	-	25,000	-
Refuge	2/24/2011	Thunderstorm Wind	70 kts. EG	-	-	150,000	-
Winterville	10/24/2010	Thunderstorm Wind	52 kts. EG	-	-	15,000	-
North Greenville	10/12/2010	Thunderstorm Wind	56 kts. EG	-	-	11,000	-
Hollandale	8/22/2010	Thunderstorm Wind	60 kts. EG	-	-	5,000	-
Avon	5/17/2010	Thunderstorm Wind	50 kts. EG	-	-	2,000	-
Brighton	5/16/2010	Thunderstorm Wind	65 kts. EG	-	-	80,000	-
Manhattan	10/1/2009	Thunderstorm Wind	50 kts. EG	-	-	3,000	-
Swiftwater	7/16/2009	Thunderstorm Wind	50 kts. EG	-	-	-	-
Leland	6/23/2009	Thunderstorm Wind	60 kts. EG	-	-	55,000	-
Washington Co.	5/9/2009	Thunderstorm Wind	55 kts. EG	-	-	1,000	-
Washington Co.	5/6/2009	Thunderstorm Wind	56 kts. EG	-	-	4,000	-

Location	Date	Event Type	Mag	Death	Injury	Property Damage	Crop Damage
Washington (Zone)	4/18/2009	Thunderstorm Wind	43 kts. EG	-	-	30,000	-
Manhattan	8/2/2008	Thunderstorm Wind	60 kts. EG	-	-	2,000	-
Leland	7/22/2008	Thunderstorm Wind	60 kts. EG	-	-	15,000	-
Greenville	7/10/2008	Thunderstorm Wind	50 kts. EG	-	-	-	-
Washington (Zone)	6/27/2008	Thunderstorm Wind	42 kts. EG	-	-	100,000	-
Washington (Zone)	6/1/2008	Thunderstorm Wind	49 kts. MG	-	-	100	-
Greenville	4/26/2008	Thunderstorm Wind	57 kts. EG	-	-	6,000	-
Darlove	3/14/2008	Thunderstorm Wind	65 kts. EG	-	-	5,000	-
Manhattan	3/14/2008	Thunderstorm Wind	61 kts. EG	-	-	-	-
Hollandale	10/18/2007	Thunderstorm Wind	60 kts. EG	-	-	25,000	-
Arcola	7/1/2007	Thunderstorm Wind	50 kts. EG	-	-	-	-
Glen Allan	5/3/2007	Thunderstorm Wind	55 kts. EG	-	-	200	-
Hollandale	5/3/2007	Thunderstorm Wind	50 kts. EG	-	-	-	-
Arcola	4/25/2007	Thunderstorm Wind	50 kts. EG	-	-	-	-
Greenville	4/25/2007	Thunderstorm Wind	53 kts. EG	-	-	3,000	-
Greenville	2/24/2007	Thunderstorm Wind	70 kts. EG	-	-	300,000	-
Percy	10/16/2006	Thunderstorm Wind	55 kts. EG	-	-	-	-
Hollandale Muni Arpt	9/23/2006	Thunderstorm Wind	60 kts. EG	-	-	70,000	-
Avon	5/4/2006	Thunderstorm Wind	53 kts. EG	-	-	-	-
Greenville	4/21/2006	Thunderstorm Wind	60 kts. EG	-	-	300,000	-
Hollandale	4/7/2006	Thunderstorm Wind	55 kts. EG	-	-	15,000	-
Greenville	4/7/2006	Thunderstorm Wind	58 kts. EG	-	-	50,000	-
Greenville	4/7/2006	Thunderstorm Wind	62 kts. EG	-	-	290,000	-
Chatham	4/7/2006	Thunderstorm Wind	50 kts. EG	-	-	-	-
Arcola	3/9/2006	Thunderstorm Wind	60 kts. EG	-	-	300,000	-
Washington (Zone)	3/9/2006	Thunderstorm Wind	40 kts. MG	-	-	1,000	-
Hollandale	11/28/2005	Thunderstorm Wind	50 kts. EG	-	-	-	5,000
Marathon	11/28/2005	Thunderstorm Wind	52 kts. EG	-	-	30,000	-
Hollandale	9/24/2005	Thunderstorm Wind	50 kts. EG	-	-	-	-
Hollandale	4/29/2005	Thunderstorm Wind	60 kts. EG	-	-	6,000	-
Helm	4/29/2005	Thunderstorm Wind	58 kts. EG	-	-	10,000	-
Greenville	12/7/2004	Thunderstorm Wind	55 kts. EG	-	-	5,000	-
Greenville	11/23/2004	Thunderstorm Wind	70 kts. EG	-	-	50,000	-
Greenville	10/19/2004	Thunderstorm Wind	53 kts. EG	-	-	3,000	-
Hollandale	6/27/2004	Thunderstorm Wind	53 kts. EG	-	-	2,000	-
Hollandale	5/30/2004	Thunderstorm Wind	55 kts. EG	-	-	20,000	-
Arcola	12/9/2003	Thunderstorm Wind	50 kts. EG	-	-	3,000	-
Greenville	5/17/2003	Thunderstorm Wind	50 kts. ES	-	-	1,000	-
Totals				1	1	$4,028,000	$5,000

Probability of Future Occurrence

Historical NCEI data suggests a lighting event has a 15.7% change of occurring annually since there has been three events in a 19-year period. There is a 63% chance of a hail event occurring annually and 89% chance of a severe wind event will occur annually throughout the county.

Assessing Vulnerability

Severe weather events are non-spacial and may occur anywhere in the county. While they cause total property damages of $5,373,000 and $409,000 in crop damages, and the dollar value for most events is relatively low. As such, the county is ranked as having a medium vulnerability to severe weather.

Impact on Life and Property: severe storms (high wind, hail, and lightning) do not have particular impacts in any one geographical section of the County but, hail and heavy rain would have the greatest impact on the agricultural community. Critical County infrastructure is unlikely to be affected by this hazard.
Washington County's entire population is considered at medium risk to severe weather, but the level of damage per event is lower than for an event as potentially deadly as a tornado or hurricane. Those living in rural areas and special populations, such as those living in mobile homes, the elderly and disabled, may be most vulnerable.

Maps on the next two pages show a sampling of historic hail and severe wind events that have crossed the county.

Figure I.9 – Sample of Historic Hail Events- Washington County

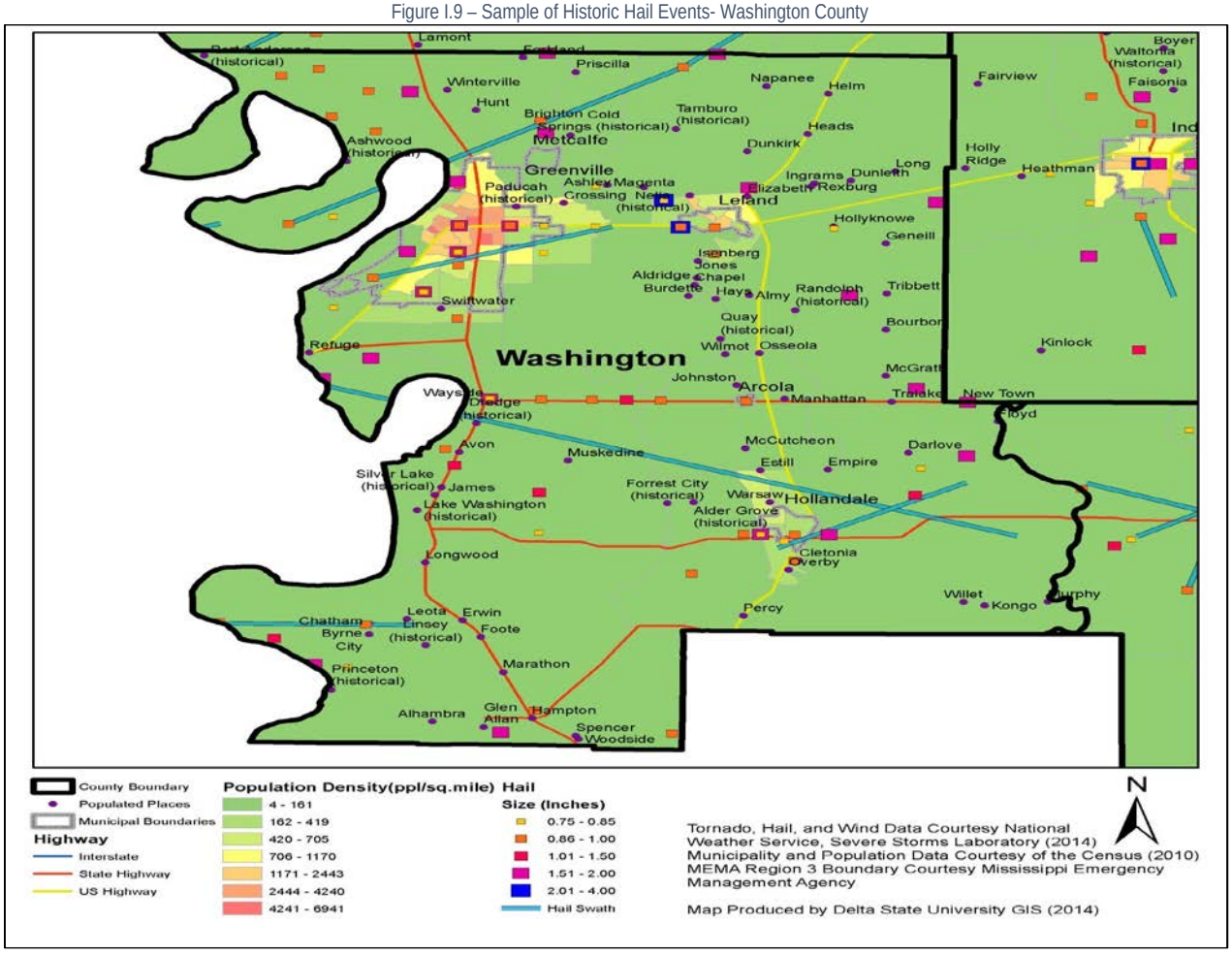
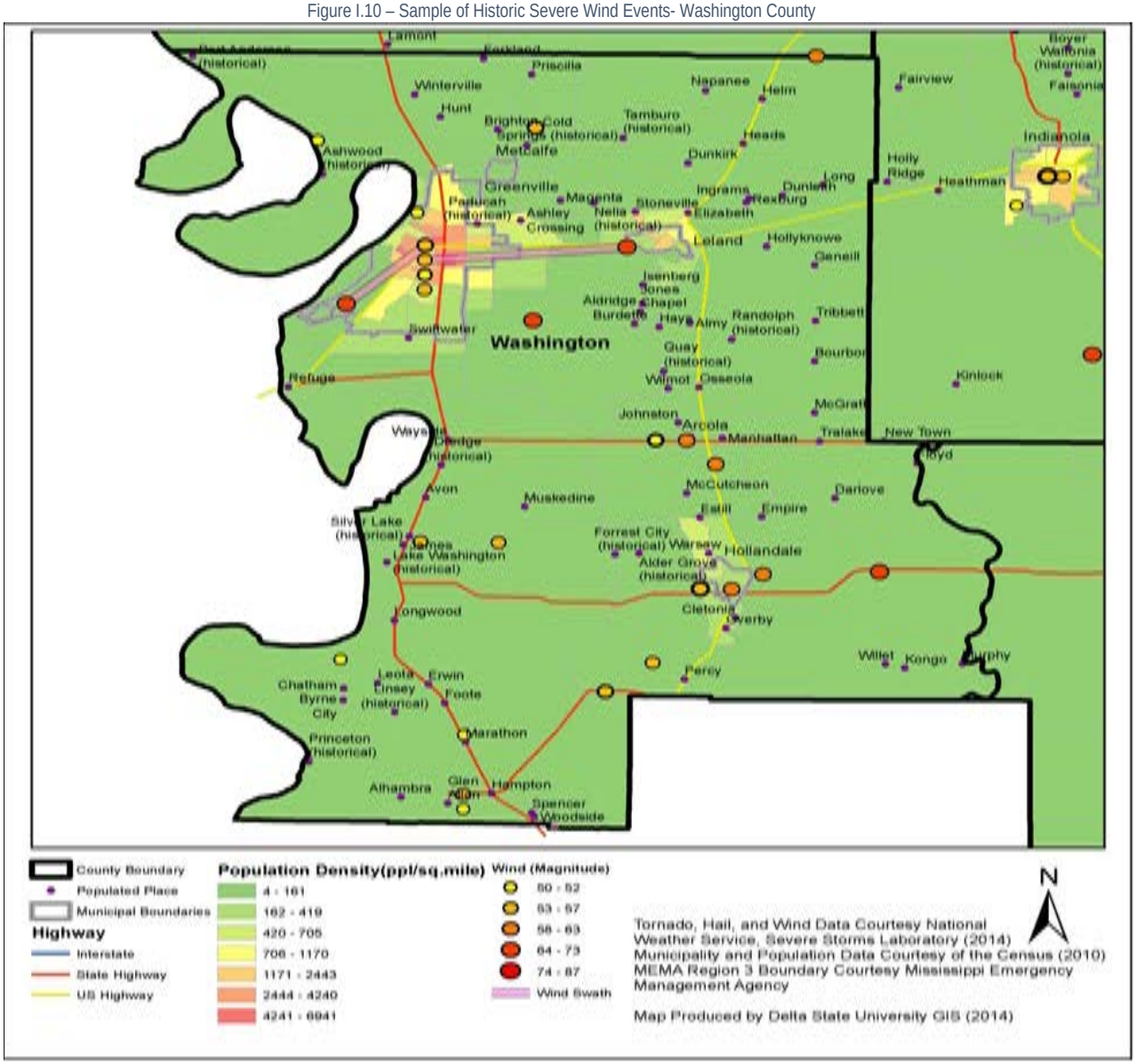


Figure I.10 – Sample of Historic Severe Wind Events- Washington County



Severe Winter Weather

Location and Extent

All of Washington County is susceptible to severe winter storm events. As such, they generally are not confined to one geographic area but may, in fact, extend regionally and across multiple states. The extent of impacts can include prolonged power outages and possible energy shortages. Severe weather may affect businesses operations, causing them to lose income. The same is true for workers, who may be unable to navigate roadways to travel to work, or if workplace is closed due to loss of power. Ice buildup on roads and bridges creates dangerous driving conditions. When ice accumulates on power lines and trees, either or both could be downed from the weight of the ice. All Heavy snow has been known to cause roof cave ins. The elderly and

disabled residents in Washington County who may have limited mobility should be considered very vulnerable. Measures should be taken to ensure that they are safe and warm.

Previous Occurrences

Table I.30 shows that there have been 15 severe winter storm events recorded in Washington County between the years 2000 and 2019. These events include hazards such as sleet, cold/wind chill, heavy snow, and ice storm.

Table I.30: Severe Winter Weather Events 2000 to 2019 I Source: NCEI

Date	Type	Death	Injury	Property Damage	Crop Damage
1/16/2018	Heavy Snow	-	-	20,000	
03/05/2015	Sleet	-	-	-	-
2/25/2015	Heavy Snow	-	-	-	-
sss2/22/2015	Winter Weather	-	-	7,000	-
1/15/2013	Ice Storm	-	-	60,000	-
1/14/2013	Ice Storm	-	-	15,000	-
12/7/2011	Winter Weather	-	-	-	-
2/9/2011	Heavy Snow	-	-	400,000	-
2/3/2011	Ice Storm	-	-	200,000	-
1/9/2011	Ice Storm	-	-	40,000	-
2/11/2010	Heavy Snow	-	-	10,000	-
1/1/2010	Cold/wind Chill	-	-	300,000	-
12/16/2008	Winter Weather	-	-	-	-
12/16/2008	Winter Weather	-	-	-	-
1/25/2008	Ice Storm	-	-	200,000	-
3/7/2008	Heavy Snow	-	-	-	-
12/31/2000	Heavy Snow	-	-	-	-
1/27/2000	Heavy Snow	-	-	150,000	-
2/25/2003	Ice Storm	-	-	30,000	-
12/13/2000	Ice Storm	-	-	5,000	-
Total				**$1,430,000**	**-**

A National Weather Service description of the sleet event that occurred on March 5, 2015 is typical of how severe winter events unfolded over the past two decades. The following is a shortened summary of the event, and the description shows the extent of multiple cascading effects that occur as a result of multiple weather elements, including rain, a freeze, and warming trends.

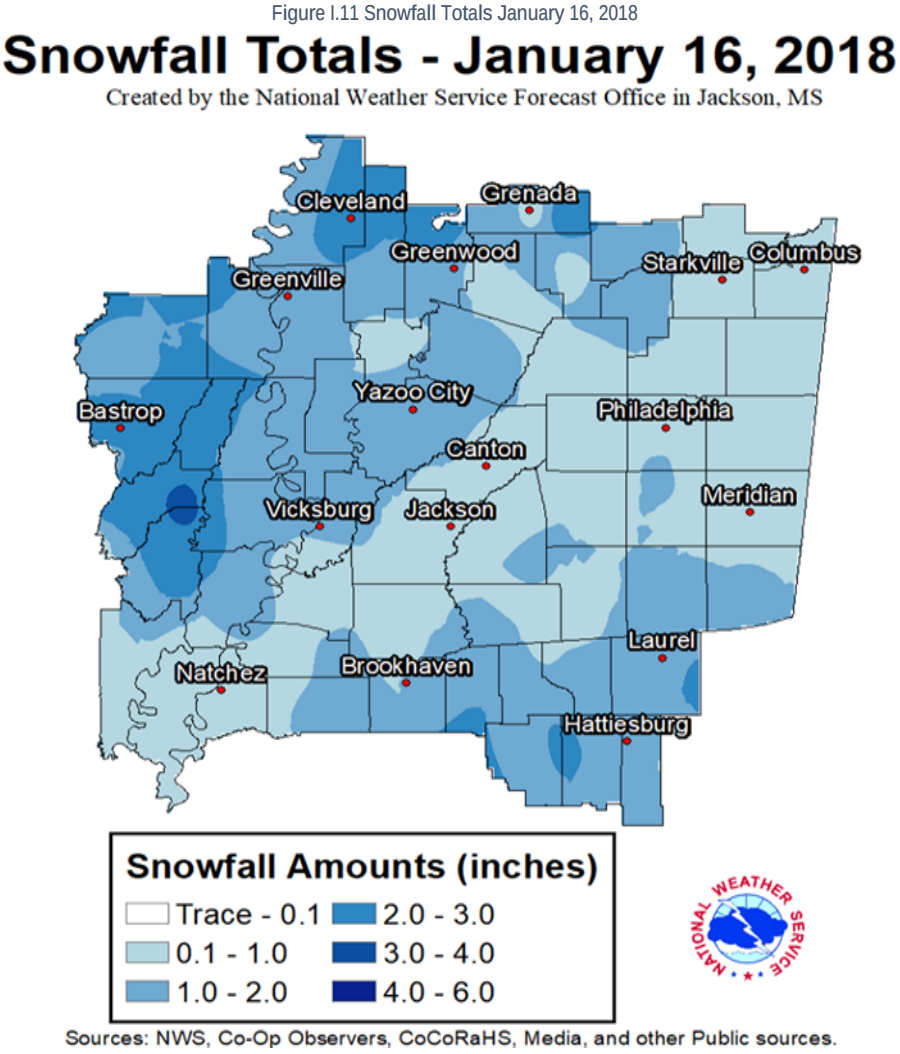
> *Sleet accumulated up to one inch at Duck Hill after a heavy snowfall that occurred the previous week. Fortunately, a warming trend helped alleviate a lot of road issues. Temperatures warmed quickly on March 4th into the mid-70s to low-80s, but this was followed by cold and strong high-pressure building stretching from Canada, through the Plains, and further south. Temperatures quickly plummeted to the 40-50-degree range. Moisture lingered behind the cold front and rain changed*

sleet late the night of March 4th into early morning hours of March 5th. As colder air in the lower parts of the atmosphere continued to filter in, moisture began to transition over to a wintry mix, mainly in the form of sleet, in the northwest Delta. This setup was very favorable for a transition from rain to freezing rain to sleet. Moisture further southeast near the Natchez Trace corridor and Jackson metro began to transition over in the early morning hours of March 5th, with some moderate sleet falling in central Mississippi. Sleet and some snow began to mix into the Delta while the majority of the area saw a significant accumulation of sleet. Some areas in south and east Mississippi also saw some sleet but a little to no accumulation. Precipitation moved out late morning of March 5th. Some areas saw between 1/2 inch to 1-2 inches in the far northern parts of the Delta and northern Mississippi. Because the roads were warm two days previously, bad road conditions were largely limited to areas that received significant heavy sleet accumulation (the Delta and northern Mississippi). Areas in the Jackson Metro region experienced slick roads but warm ground and road temperature from the previous few days alleviated some of the issues.

January 16, 2018: Heavy Snowstorm-Accumulating snow impacted the ArkLaMiss on January 16, 2018 with accumulations ranging from ½ - 3 inches across much of the area. The synoptic setup was atypical compared to more traditional Deep South snowfalls. During the early morning hours on the 15th (~24 hours prior to the onset of snow), a strong arctic cold front was quickly moving through the Central Plains towards the Deep South with an impressive 1050mb surface high pressure ushering in a brutally cold arctic airmass behind the frontal passage. Further aloft in the atmosphere, a closed cold core upper-level low was located over the Upper Midwest with a positively tilted trough axis extending to the west/southwest through the Northern Plains. A 120kt jet streak diving into the base of the trough helped the trough dig further south and west over the Texas/Oklahoma panhandles as the closed low transitioned into an open wave. By sunrise on the 16th, the trough axis was oriented from Lake Michigan southwest through the Southern Plains with a strengthening upper-level jet stretched from northern Arkansas through Maine. This orientation allowed flow to become more backed out of the southwest which resulted in sufficient moisture return over the ArkLaMiss. At the same time, the arctic cold front had raced well ahead of the upper level forcing with temperatures plummeting well below freezing. This set the stage for the moist southwest flow aloft to overrun the cold arctic air and produce a frontal band of snow as right entrance region jet dynamics overspread the area.

Snow began falling in the Delta around 4am and slowly spread south and east. A swath of 1-3” of snow occurred along and northwest of a line from Tensas Parish to Grenada where the best moisture and forcing where juxtaposed. The band of snow became more broken as the better forcing pulled away to the northeast with lighter amounts of ½ - 2” along a line from Natchez through the Jackson metro to Columbus. However, the band of snow filled back in and dropped another 1-3” along and southeast of a line from Brookhaven to southern Lauderdale County as a subtle wave/vorticity maximum helped increase forcing over the area. This snowfall occurred after sunset and quickly accumulated on roads causing extremely dangerous driving conditions during the evening and overnight hours with numerous vehicle accidents reported. Another atypical aspect of this snow event was that the snow itself was very dry and powdery as it fell with temperatures well into the 20s. Most Deep South snows are typically heavy and wet with snow-to-liquid ratios of 10:1 or less. However, this even was unique in that the 0.8” of snow measured at the NWS Jackson office resulted in only 0.04” of liquid equivalent thus resulting in a relatively rare snow-to-liquid ratio of **20:1**. Washington County impacted by in excess of 1.0-2.0 inches of snowfall

Figure I.11 Snowfall Totals January 16, 2018



February 9-11, 1994 Ice Storm – ArkLaMiss Delta (source NWS Jackson): The map below represents the approximate area within the NWS Jackson forecast area impacted by the February 1994 ice storm. Areas shaded in light blue experienced at least some icing, mainly during the late-night hours of February 9th into the morning hours of February 10th. Areas shaded in a darker blue experienced a more prolonged period of icing beginning on the evening of February 9th lasting into the morning of February 11th.

Figure I.12: February 1994 Ice Storms

This storm began with a sharp cold front with temperatures ranging from 70 degrees at midnight on February 9th to 28 degrees at 8 pm with light to moderate rain showers following the front. Ice began to accumulate causing tree branches to break and eventually entire trees thus causing power outages throughout the Delta. Making matters worse, a new low-pressure system developed in the northwestern Gulf of Mexico along the front that had pushed through the area on Wednesday.

This low tracked along the front toward the Mississippi coast on Thursday, spreading a new round of heavy precipitation northward across the state. Moderate freezing rain, which was already enough to cause significant issues Wednesday night and Thursday morning, became heavy freezing rain with thunder around noon on Thursday. This caused a significant escalation of issues as ice accumulated quickly on trees, power and phone lines, and utility poles. It was now impossible for utility companies to keep up with falling lines, snapping poles, and snapping trees. All they could do was attempt to maintain utilities for hospitals, nursing homes, emergency responders, and other priority customers. The heavy precipitation also caused flooding, which was only made worse by storm drains clogged with tree debris. Several fields across the Delta were flooded as surrounding trees were full of ice.

Temperatures finally warmed to above freezing during the daytime hours of February 11th, but only by a few degrees in the hardest-hit areas. The slow thaw continued into the weekend, as temperatures finally reached the 40s by Saturday.

Across northern Mississippi, approximately 3.7 million acres of commercial forestland was significant damaged, with the value of damaged timber estimated to be $1.3 billion. Damage to trees in urban areas was estimated to be another $27 million. Twenty-five percent of Mississippi's pecan crop was destroyed and impacted for years to come, at an estimated cost of $5.5 million per year. Nearly 750,000 customers were without power at some point across North Mississippi, with some outages lasting up to a month. Over 8,000 utility poles were pulled down by the weight of the ice, and over 4,700 miles of lines were downed. About 490 water systems were impacted, with as many as 741,000 customers without water at some point. System wide, Entergy had 250,000 to 300,000 customers without power in Mississippi, Louisiana, and Arkansas. Commercial flights would not resume until the following Wednesday, February 16th.

By most accounts, this was the worst ice storm to impact the ArkLaMiss Delta since January of 1951.

Probability of Future Occurrence

The probability of severe winter weather events in Washington County is highly likely. There was severe winter event in 7 of the 19 years studied, which suggest there is a 37% chance of an occurrence in a given year. The region may experience an event several years in a row, but then not experience one for several years.

Assessing Vulnerability

The community assets at risk from a winter storm include the electrical and telephone utility system and tree coverage and canopy. Vehicular accidents from icy conditions could cause injury, property damage, or death. Ice laden tree limbs can fall, causing property damage. A hard freeze may also result in decreased water pressure as frozen and damaged pipes thaw and leak. Winter storms impact the entire community. Among essential services, critical facilities and infrastructure likely to be affected are the public safety on roadways and electric, telephone and water services.

The Mississippi Economic Development Council produced figures in March 2020 showing that in Washington County there were 330 workers employed in the in the mining sector; and 330 in the construction sector. There were not any figures provided for the number employed in agriculture, forestry, fishing and hunting. Workers such as these, who spend a great deal of time outdoors, are most likely to be affected by severe winter weather.

Populations at Risk: Vulnerable persons during winter weather periods are the homeless, the elderly, young children, and persons with chronic health problems. Above freezing temperatures combined with strong wind can result in felt temperatures below freezing and cause hypothermia, illness, and death.

Property Damage: In the past, this hazard has caused roofs to cave in, trees to fall on houses, prolonged power outages, and dangerous driving conditions. NCEI data show that eight storms occurring between the years 2000 and 2019 caused damage ranging from $5,000 to over $400,000 during each event, and these were not the only incidents with associated damage costs. Over $1.43 million in damages was incurred during the described 19-year period.

Critical Facilities and Essential Services: Essential services are not likely to be significantly impacted by a winter storm. For the most part, generators have been installed at critical and essential facilities within the county and participating jurisdictions to ensure that continuity of electricity for dispatch and emergency services.

Transportation Systems: Some major transportation services could be temporarily interrupted should icing occur. Those include bridges and overpasses. These include bridges and overpasses US Highways 82, 61 and 278, US Bridge across the Mississippi River, and State Highways 1 and 12 and other roads countywide.

Lifeline Utility Systems: The most likely lifeline utility system that could be affected by a winter storm would be electric power, telephone and water line service. It could be anticipated that interruption of those rural water systems that do not have access to generators, services would last long enough in Washington County to cause a major problem.

Tornado

Location and Extent

Mississippi consistently ranks in the top 10 states with the most tornadoes in the nation. All areas of the state, including Washington County, are susceptible to impacts from EF0 to EF5 magnitude tornado that can cause millions of dollars in damage.

Tornado is a non-spatial hazard, meaning that all jurisdictions in the county are equally likely to experience an event. Of particular concern are persons who reside in a mobile/manufactured home, and the elderly and disabled. According to the 2010 Census, there are approximately 1786 mobile/manufactured housing units -- structures at high risk to wind events of any type. These units represent 8.3% of the housing stock in Washington County.

Previous Occurrences

A total of 10 tornadoes were recorded in the NCEI database for Washington County between 2000 and 2019. They are summarized below in Table I.31. The table is followed by a discussion of events mapped by the Jackson, MS office of the National Weather Service as having taken place in the year 2020.
As a result of tornado event occurring on October 9, 2009, in Washington County there was one reported death and two injuries reported in the unincorporated Avon area of the County. Additionally, on November 24, 2001 a F4 tornado touched down in in the unincorporated Winterville area of the County as a resulting in twelve reported injuries and over $3,500,000 in property damage. Details of the reported events are summarized below in Table I.32.

Table I.31 – Tornado Events 2000 to 2019 I Source: NCEI

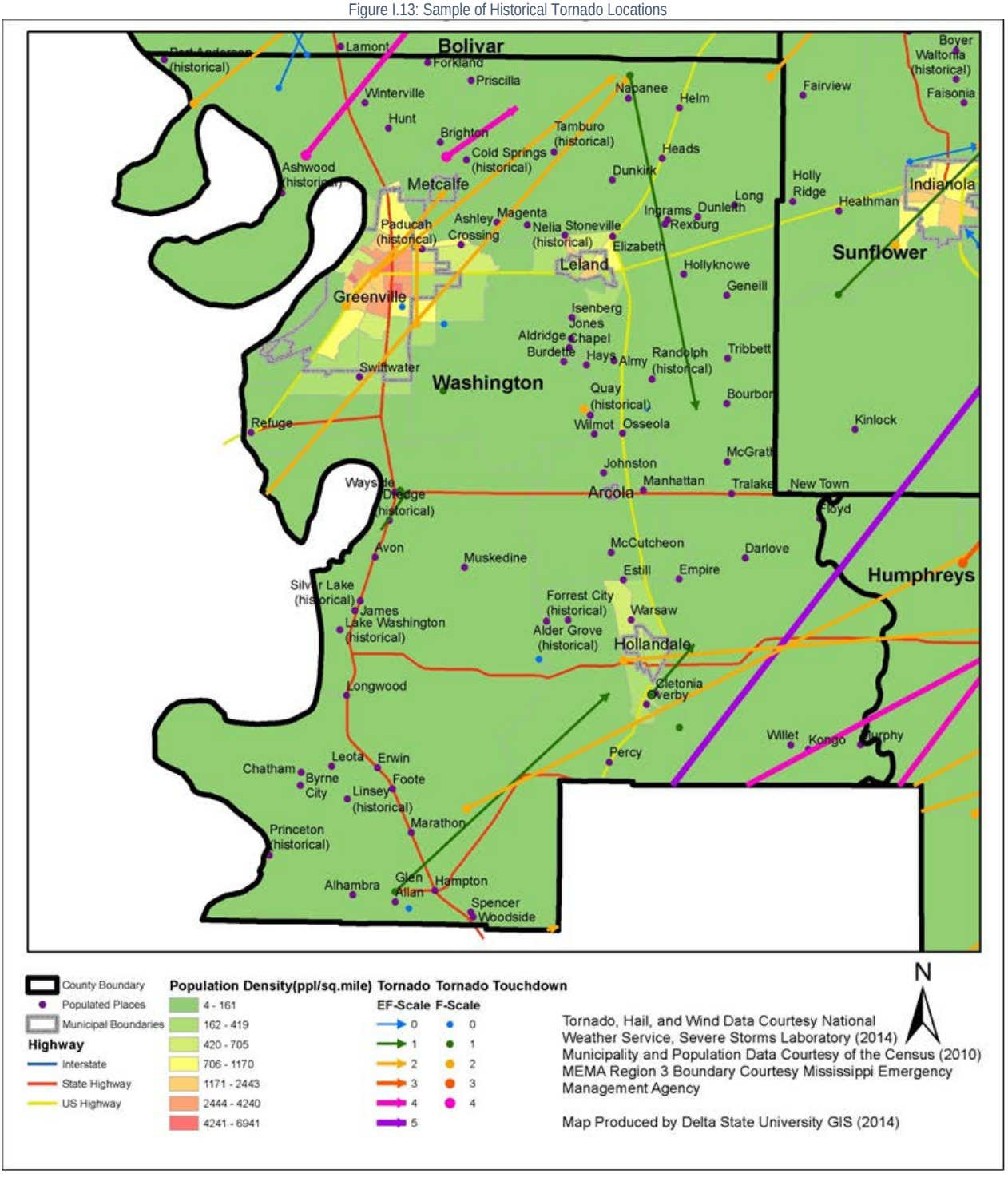
Location	Date	Event	Magnitude	Deaths	Injury	Property Damage	Crop Damage
Bourbon	4/18/2017	Tornado	EF0	-	-	-	-
Tribbett	4/18/2013	Tornado	EF0	-	-	-	-
Avon	10/9/2009	Tornado	EF1	1	2	225,000	-
Winterville	5/2/2008	Tornado	EF0	-	-	-	-
Greenville	4/7/2006	Tornado	F0	-	-	100,000	-
Glen Allan	11/28/2005	Tornado	F0	-	-	50,000	-
Greenville	9/24/2005	Tornado	F2	-	-	680,000	-
Winterville	9/24/2005	Tornado	F0	-	-	-	-
Winterville	11/24/2001	Tornado	F4	-	12	3,500,000	-
Winterville	2/24/2001	Tornado	F0	-	-	-	3,000
Totals			**10**	**1**	**14**	$4,555,000	**$3,000**

More recently, a series of tornadoes struck the Southeastern states, including those occurring over the weekend of April 10-12, 2020, referred to as the Easter Weekend Tornado. While the National Weather Service has not completed damage estimates, it appears as though no damage was recorded in Washington County, but there was property damage in adjacent District 3 counties of Carroll, Holmes and Montgomery.

4/18/2017-A group of thundershowers developed across portions of the county in a warm and unstable environment. This combination of warm air and thundershowers produced a series of land spouts that produce no property damage nor injuries or deaths.

The maps below show the locations of surveyed tornado tracks as determined by the National Weather Service Office in Jackson.

Figure I.13: Sample of Historical Tornado Locations



Probability of Future Occurrence

NCEI data presented shows that tornado events have occurred in 7 of the 19 years being studied as part of this mitigation planning process. This suggests that there is roughly a 39% chance that Washington County will be affected by a tornado in any given year. Equally likely is the possibility that more than one such event will occur within proximity to others – proximity in terms of time and geography.

Assessing Vulnerability

Although technology and warning system capabilities have improved significantly in recent years, tornadoes can still occur with little or no warning, and cause severe destruction, personal injury, and possible loss of life. The list of affected communities included in Table I.31 show that entire county is vulnerable to impacts from tornadoes. Particularly vulnerable are those living in mobile/manufactured housing units, as was discussed below.

Impacts to Life and Property: Perhaps most vulnerable to this hazard are those population segments consisting of (elderly, disabled, and poor) who may not have the ability to seek shelter in a timely manner. Older frame houses and mobile homes are particularly vulnerable to tornadoes. According to the 2018 American Community Survey, produced by the U.S. Census Bureau, there are roughly 1786 mobile homes in the county. This figure represents 8.3% of the total housing units. If other structures are not built to withstand high winds, roof damage or roof failure may occur. Unless mobile homes are placed on an anchored foundation, the force of tornado winds will likely lift and overturn the structure. Severely damaged mobile homes may not be again habitable.

Impacts to Natural Resources: Tree canopy and decorative vegetation are all subject to tornado damage. The force of a tornado is powerful enough to uproot trees and vegetation and deposit the debris in standing water, which could result in pollution. Wildlife and farm animals are not likely to survive the force of tornado winds and may be carried to distant ground or deposited in a body of water which may result in pollution. Streams can become clogged with windblown debris and downed trees, causing flooding. If debris is not removed from vacant land it could become a threat to health and safety, create a fire hazard, or create a haven for unwanted vermin or pests.

Impacts to Critical Facilities: A tornado may affect any critical facility or critical infrastructure in Washington County. The County and its municipalities require that all new buildings and infrastructure, such as water tanks and towers, be built to high wind-resistant standards. All public and essential service buildings in Washington County are still at risk from a direct strike from a tornado; however, there is nothing to indicate that those buildings are more vulnerable than any other building in the County. Given the unpredictable nature of tornadoes and high potential, it is essential to have designated areas that are safer than other areas in all public and essential service buildings.

Tropical Storm / Hurricane

Location and Extent

While Washington County is situated over 250 miles from the Mississippi Gulf Coast, the area is vulnerable to the unavoidable effects of tropical storms/hurricanes as they reach land and continue to inland away from the coastal landing point. Storms moving inland have been known to produce violent winds, torrential rains, tornadoes, and flash flooding. Damage levels can be significant or low, depending on the hurricane path and whether it picks up strength before hitting landfall and moving more inland.

Previous Occurrences

Three recent storms documented by the National Weather Service are listed in Table I.32. They were included in the 2015 District 3 RHMP and records indicate that no subsequent events have affected the region. Hurricane Katrina caused substantial damage to all 82 Mississippi counties.

Table I.32 – Tropical Storm / Hurricane

Event Name	Date	Death	Injury	Property Damage	Crop Damage
Hurricane Rita	9/24/2005	-	-	15,000	200,000
Hurricane Katrina	8/29/2005	-	-	500,000	8,000,000
Hurricane Lily	10/3/2002	-	-	71,043	-
Total		**-**	**-**	**$586,043**	**$8,200,000**

Probability of Future Occurrence

Based on past events, the probability of tropical storm events is classified as low. Three events occurred in the past 20 years which, if averaged, would yield a 15% annual probability of occurrence.

Assessing Vulnerability

Hurricanes affecting the Gulf Coast usually lose strength as they make landfall and move northward, usually without hurricane force winds impacting the area. However, due to the speed, size, and magnitude of the storm, the County could still be affected by damaging winds. The entire population is at risk to tropical storms and hurricanes. Damage during these events may occur as a result from hurricane-spawned tornadoes and flooding from heavy rain.

Table I.33 includes the most recently available data secured from a HAZUS run for tropical storm/hurricane events to evaluate the potential economic losses for Washington County. Information was not available from a more recent source.

Table I.33 – Direct Economic Losses for Buildings Annualized Losses I Source: State of Mississippi Standard Hazard Mitigation Plan

Capital Stock Losses				Income Losses				
Cost Building Damage	Cost Contents Damage	Inventory Loss	Loss Ratio %	Relocation Loss	Capital Related Loss	Wages Loss	Rental Income Loss	Total Loss
$84,000	$17,000	-0	0.00	$7,000	$1,000	$1,000	$3,000	$113,000

Impacts to People and Property: The very young, the elderly, and the disabled are particularly vulnerable to harm from tropical storms/hurricanes. Older frame homes and residences and businesses housed in manufactured structures are especially vulnerable to the effects of severe winds, rain, and tornadoes generated by hurricanes. Airborne missiles such as tree limbs and branches, signs and signposts, roofing, metal siding, and other pieces of buildings, including entire roofs can penetrate doors and windows. This penetration into the “envelope” of the building allows the force of the wind to act against interior walls and ceilings of the structure – causing structural failure.

Impact on Critical Facilities: Properties at risk may include hospitals, nursing homes and housing likely to contain occupants who may not be sufficiently mobile to avoid death and injury during a flood or other emergency. Public safety facilities such as fire stations, vehicle and equipment storage facilities and emergency operations centers could also be at risk.

Impacts of Natural Resources: The most significant risk to natural resources in tropical storms and hurricanes in Washington County is damage to forests canopy and timberlands. Inland rivers

and lakes can become clogged with wind-blown debris and trees, slowing recovery from a hurricane. Obstructions, if not removed can become a cause of flooding. Trees toppled onto the forest floor quickly become a target for infestation from insects that may spread to healthy trees. Water quality may suffer due to unwanted debris and vegetation blown in a hurricane. Potential debris from fallen trees can create fuel for wildfires when the area dries sufficiently to allow for burning through lightning or intervention by mankind. The Mississippi State Forest Commission works continuously to ensure that, through proactive cutting and prescribed burns, fallen trees and debris will not become fuel for a wildfire. In areas where timber is a significant feature of the economy, hurricane winds wreak havoc with growing trees, causing damage that lessens the quality of the timber and increases the likelihood of insect infestation of standing trees.

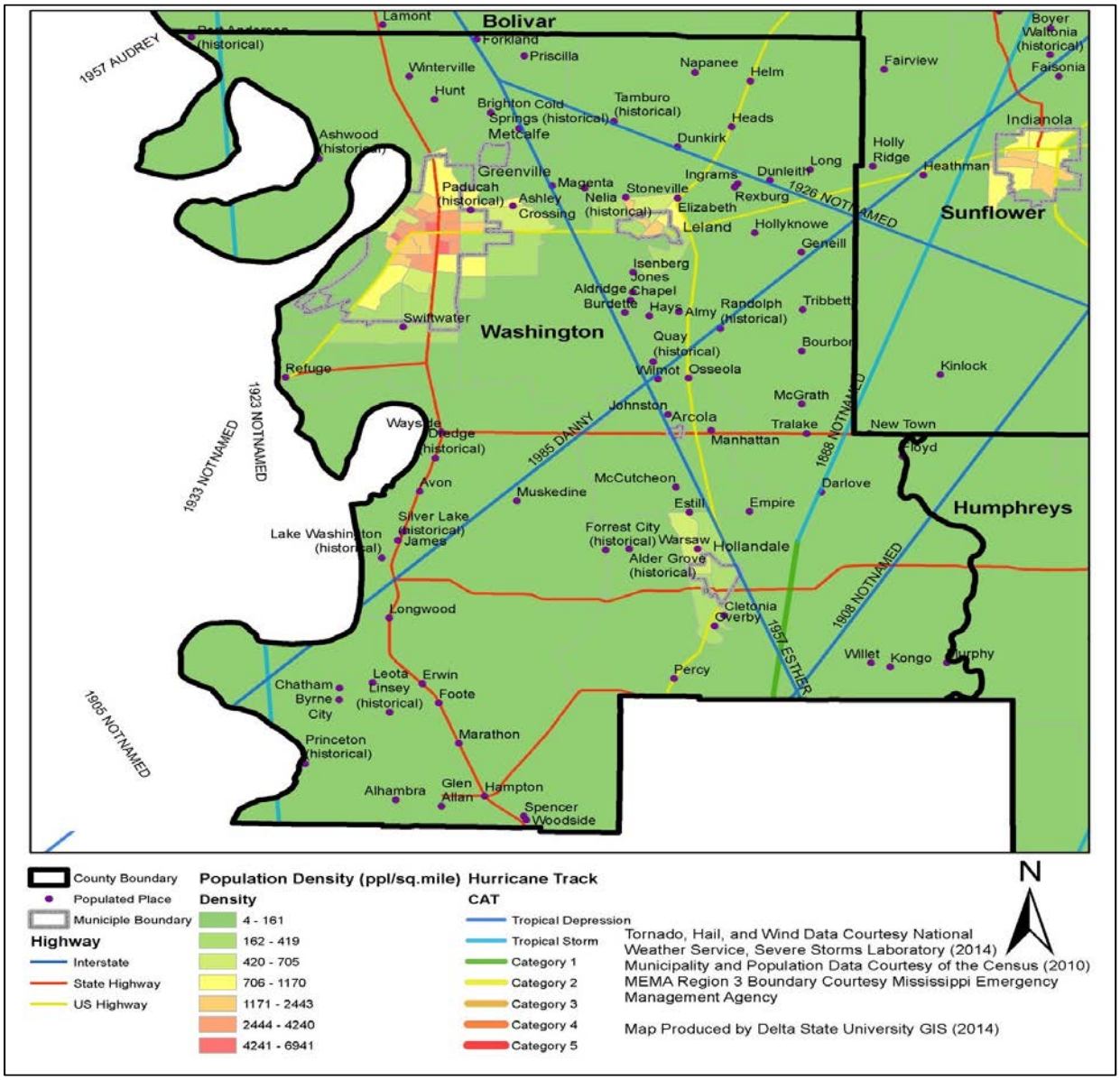
Impacts on Transportation Systems: Hurricane and/or high winds from tornadoes could result in power poles blown over or broken off onto roadways result in hazardous driving conditions until they can be cleared away. Overhead lines are often still energized until linemen are able to cut power to them. These conditions result in extremely hazardous driving conditions immediately following a hurricane or other windstorm. In heavily populated areas, lack of electricity also results in lack of signal lights at major intersections, creating driving hazards. Rail traffic could be interrupted by damage to railroad lines caused by flooding and damage to bridges and overpasses.

Impact on Lifeline Utility Systems: Overhead electric and telephone lines are damaged by trees and debris blown across them, or power poles and lines are blown over by hurricane force or tornado winds. In some instances, electric power may not be restored for many days or even weeks. In the aftermath of Hurricane Katrina, the entire grid of Mississippi Power Company was affected down and, in some areas, land lines for telephones were down for weeks or months. This situation affected electrical cooperatives such as Central Electric Power Association (Carthage, Mississippi), which serves a portion of rural Washington County.

The hurricane also damaged cell phone transmission towers and radio and television transmission towers, many of which were out of service due to electric power failure. Lack of electricity also left some water systems and sewage treatment plants unable to operate until generators could be brought in to restore partial power.

To further demonstrate how tropical storms have penetrated inland over a longer period of time (since the 1959s), the map below shows the tracks Washington County hurricane crossings for roughly the past 70 years, although only two events are documented by NCEI.

Figure I.14: Tropical Storm/Hurricane Historical Events-Washington County I Source: NCEI



Wildfire

Location and Extent

The Washington County land area includes approximately 74,984 acres of forestland is equal to 15.3% coverage as a percent of land. County forestland data was derived from the 2019 Forestland Inventory conducted by Mississippi Forestry Commission as shown in the table below.

Table I.34 – 2019 Forestland Statistics* I Source: www.mfc.ms.gov

		Forestland			
County	Total Land Area	Acres	Coverage (%)	Pine	Hardwood
Attala	471,597	284,817	60.4	49.1	41.3
Bolivar	279,658	86,465	30.9	0.0	100.0
Carroll	405,982	263,067	64.7	22.5	68.5
Holmes	488,932	197,380	40.3	15.1	84.8
Humphreys	275,892	30,268	10.9	0.0	100.0
Leflore	387,967	57,537	14.8	0.0	100.0
Montgomery	260,948	161,110	61.7	36.1	54.2
Sunflower	452,541	23,174	0.05	0.0	100.0
Washington	487,198	74,984	15.3	0.0	100.0

The Wildfire discussion in the Base Plan mentioned that an analysis of the change in total forestland area from the previous plan shows that the total acreage and percent of coverage has continued on a declining trend in all District 3 counties, with Attala (-23.2%) and Holmes (-22.8%) Counties showing the greatest decline in forested land. The average loss of the other seven District 3 counties was 5.43 percent. Most forested land in the planning area is under private ownership.

Information provided by the Mississippi Forestry Commission indicates that wildfires may occur during any season but, since 2012, the worst fires (determined by the number of acres burned) have occurred in late Summer and early Fall. Data presented in above also shows the potential for county-level differences in the total number of fires and acreage burned from year to year based on the percentage of forestland in the county.

Past wildfires have threatened and destroyed property. The next table shows the number of residences, commercial buildings and outbuildings, broken down by county, that have been threatened or destroyed since 2015. Washington County had 1 residence and 1 outbuilding threatened.

Table I.35 Washington County Residence and Structures Threatened and or Destroyed by Wildfire Since 2015 I Source: Mississippi Forestry Commission

County	Residences Threatened	Residences Destroyed	Commercial Building Threatened	Commercial Building Destroyed	Outbuilding Threatened	Outbuilding Destroyed
Attala	149	3	4	0	75	8
Bolivar	-	-	-	-	-	-
Carroll	113	0	45	0	33	1
Holmes	116	0	3	0	98	2
Humphreys	0	0	0	0	0	0
Leflore	2	0	0	0	6	0
Montgomery	33	0	4	0	43	4
Sunflower	0	0	0	0	0	0
Washington	1	0	0	0	1	0
TOTALS	**414**	**3**	**56**	**0**	**256**	**15**

Fortunately for all Washington County stakeholders, there is a strong fire protective services component between the local fire department and the presence of State forest rangers. These forces are strong and likely able to prevent most any fire from growing to catastrophic levels.

Previous Occurrences

A combination of local weather, drought conditions vegetative cover and topographic conditions may affect the development of wildfires. Documenting fire events is not consistent across the planning region with the local fire departments. The NOAA National Centers for Environmental Information (NCEI), Storm Events Database, shows no reported wildfires in the fifty-nine years between January 1, 1960 and December 1, 2019 for each of the District 3 counties. All available wildfire data is on a county level.

Table I.36 captures wildfire data for each District 3 county for the period 2014 to 2019. Washington County data is highlighted.

Table I.36 – Wildfire Data 2014 to 2019 I Source: www.mfc.ms.gov

County	2019		2018		2017		2016		2015		2014	
	Total Fires	**Acres Burned**	**Total Fires**	**Acres Burned**	**Total Fires**	**Acres Burned**	**Total Fires**	**Acres Burned**	**Total Fires**	**Acres Burned**	**Total Fires**	**Acres Burned**
Attala	28	782	21	392	38	468	59	1,170	52	597	32	187
Bolivar							1	80				
Carroll	5	18	4	32	13	172	24	387	24	268	16	83
Holmes	13	87	15	522	27	532	39	432	43	441	36	486
Humphreys												
Leflore	-	-	-	-	-	-	1	22	6	150	-	-
Montgomery	4	34	-	-	1	7	14	139	12	154	8	135
Sunflower	-	-	-	-	-	-	1	-	-	-	-	-
Washington	1	5	-	-	1	32	-	-	1	8	1	40

Information provided by the Mississippi Forestry Commission indicates that wildfires may occur during any season but, since 2012, the worst fires (determined by the number of acres burned) have occurred in late Summer and early Fall. Data presented in Table I.37 (above) also indicates the county-level differences in the total number of fires and acreage burned from year to year.

Probability of Future Occurrences

Table I.37 below shows the number of fires and acres burned each year between 2014 and 2019, along with mean and median averaged for each.

Table I.37 – Mean and Median Averages for Washington County, Number of Fires and Acres Burned I Source: Mississippi Forestry Commission

Total Fires	2019	2018	2017	2016	2015	2014	Total	Mean	Median
Total Fires	1	-	1	-	1	1	4	1	1
Acres Burned	5	-	32	-	8	40	85	34	21.5

It has been stated that it is difficult to develop probability of wildfire occurrence due to the range of elements that "set the stage" for a wildfire to occur. There is not any historical data for Washington County and selecting the lowest figures, it can be stated that in any given year there is a potential for at least 1 fire to develop and burn 40 acres.

Assessing Vulnerability

Wildfires pose a low threat to all areas of Washington County, where just around 15.3 % of acreage is forestland. Current mitigation of the fire hazard includes regular thinning of vegetative fuel, but the County Emergency Management Department works closely with County and local fire departments to educate the public about issues such as backyard burning that can lead to wildfire. Figures I.15a through E.15f are screen shots from the web site of the Southern Wildfire Risk website (www.southernwildfirerisk.com) established by the Southern Group of State Foresters. These images show the overall risk of Washington County and its jurisdictions located in the Wildfire Urban Interface (WUI).

Figure I.15a: Jurisdictional Wildfire Vulnerability -Washington County

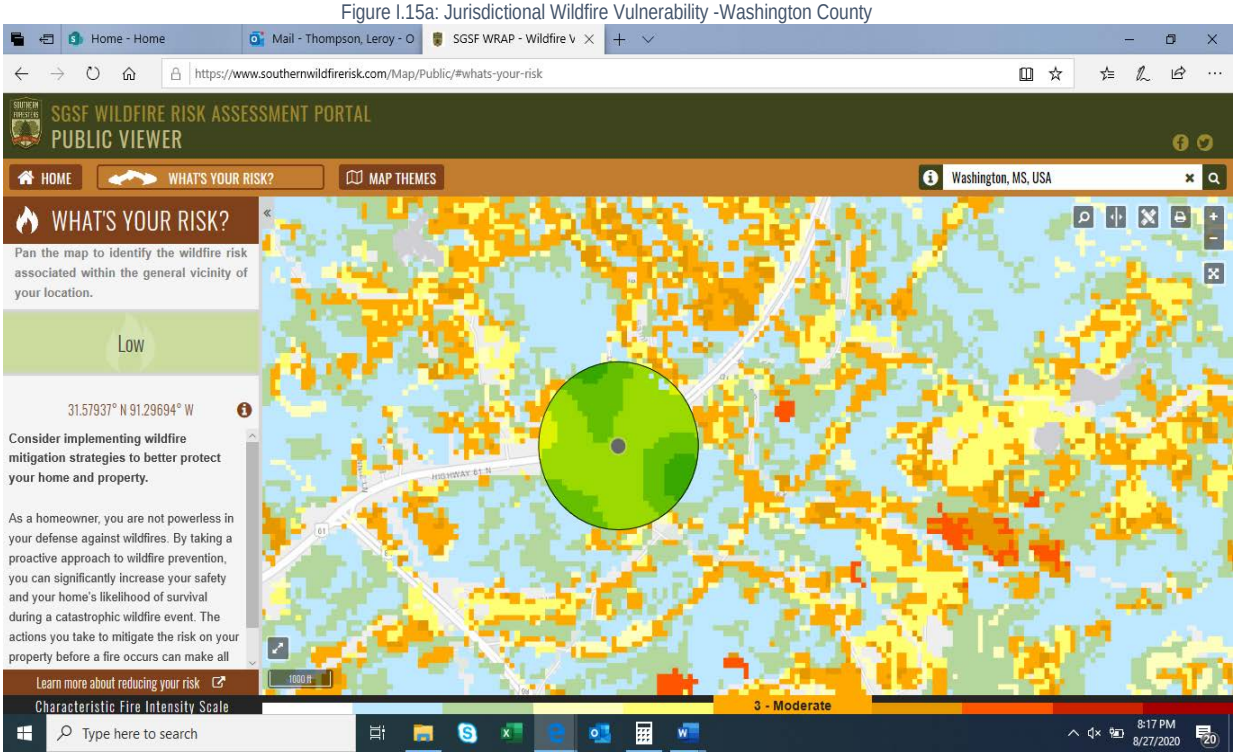


Figure I.15b: Jurisdictional Wildfire Vulnerability -Town of Arcola

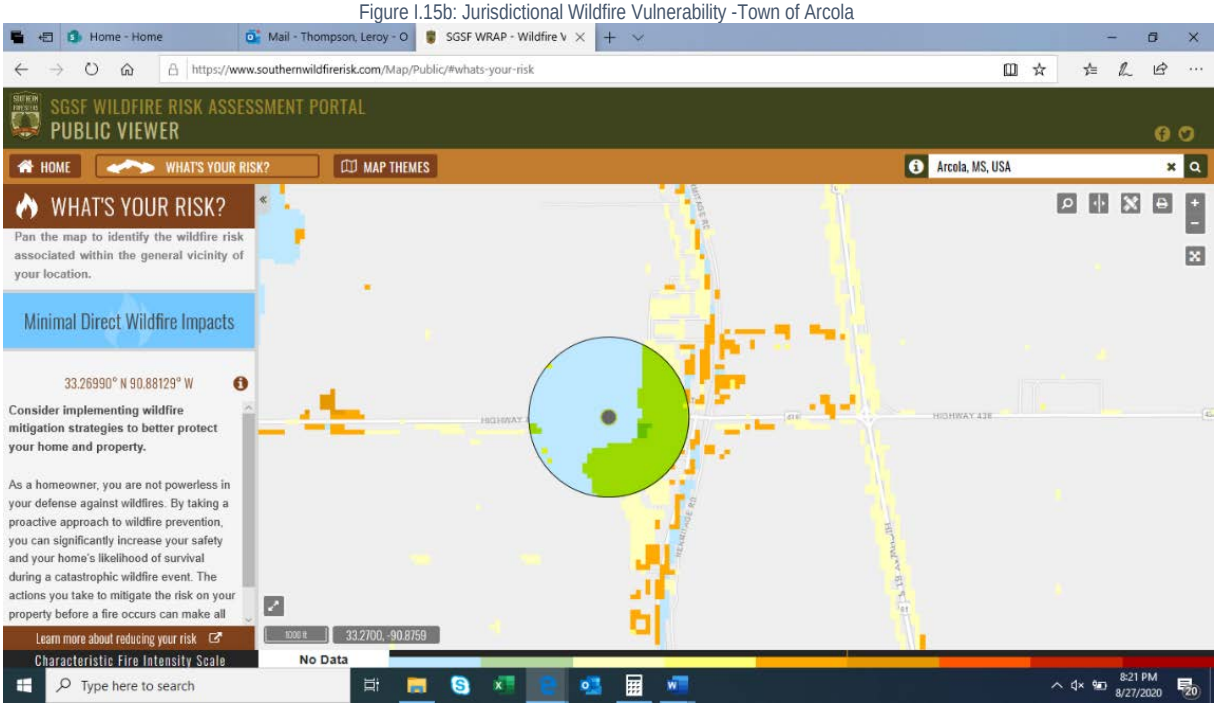


Figure I.15c: Jurisdictional Wildfire Vulnerability -City of Greenville

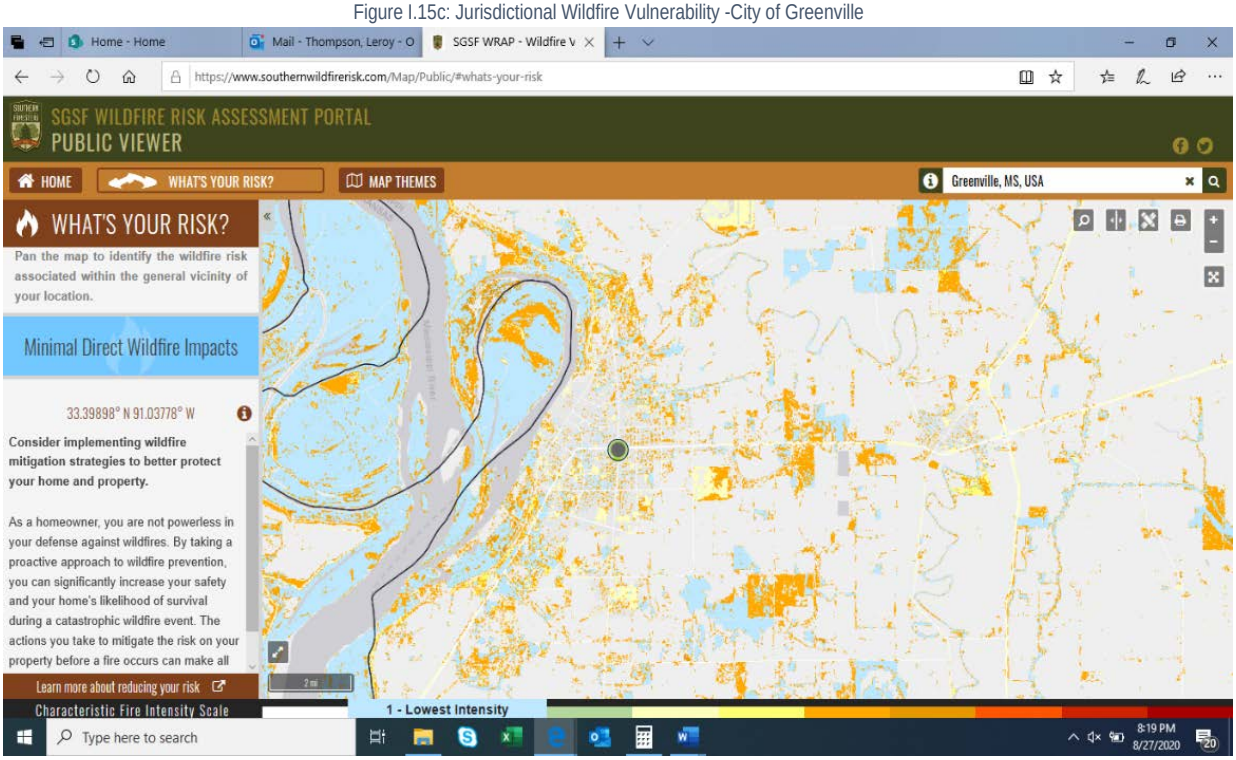


Figure I.15d: Jurisdictional Wildfire Vulnerability -City of Hollandale

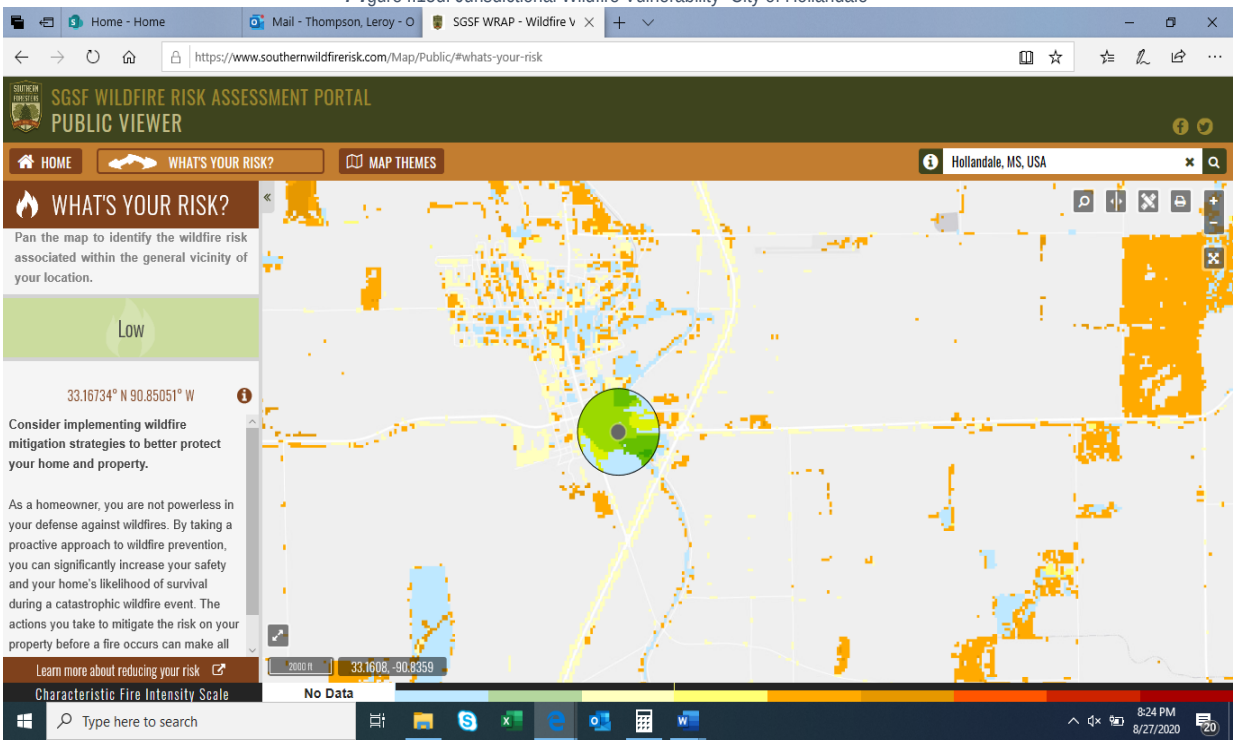


Figure I.15e: Jurisdictional Wildfire Vulnerability -City of Leland

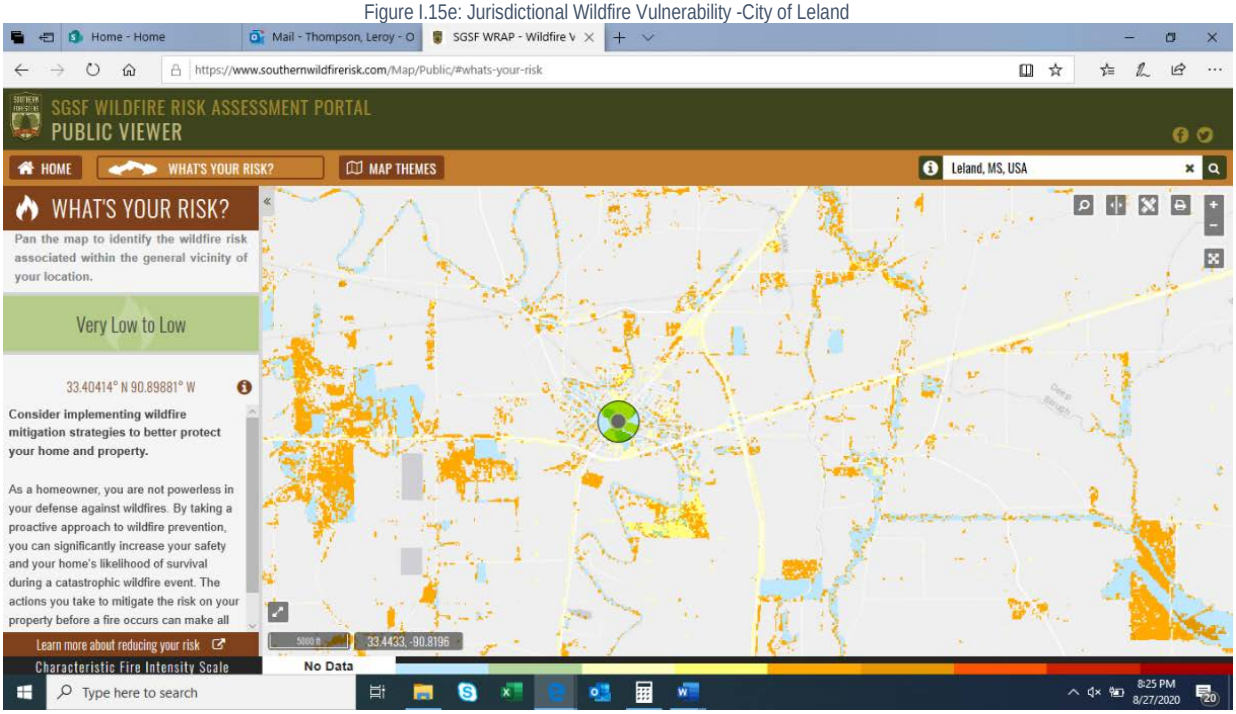


Figure I.15f: Jurisdictional Wildfire Vulnerability -Town of Metcalfe

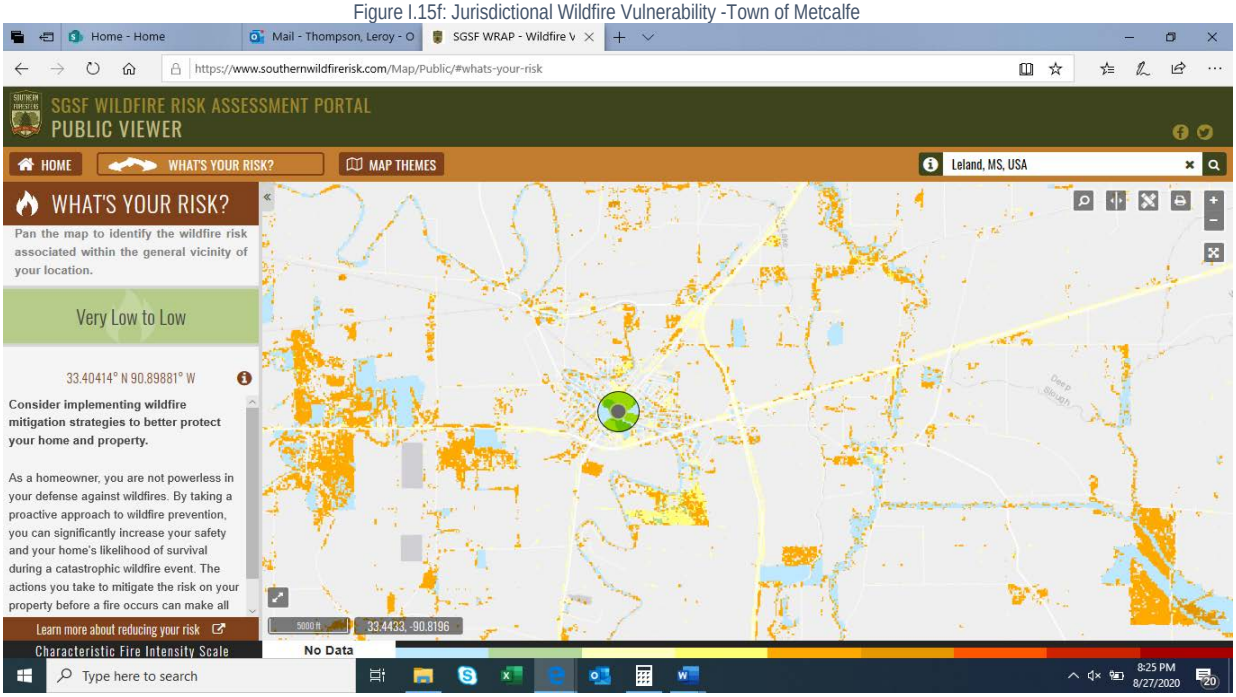


Table I.39 summarizes the risk of Washington County and each of its jurisdictions to wildfire based on information from the SGSF period.

Table I.39: Geographic Vulnerability to Wildfire by Jurisdiction I Source: MFC

Jurisdiction	Ranking
Unincorporated Washington	Low
Town of Arcola	Minimal Direct Impact
City of Greenville	Minimal Direct Impact
Town of Hollandale	Low
Town of Leland	Very Low to Low
Town of Metcalfe	Very Low to Low
Overall County Vulnerability to Wildfire	Low

The hazard was rated as being low overall in the 2015 RHMP. The places most vulnerable to wildfires are forested areas in unincorporated areas of Washington County. Current mitigation of fire hazard includes regular thinning of trees and removal of dead limbs and underbrush of the 74,984 acres of forestland.

Impacts to Life and Property: Wildfire could impact the community by overextending personnel and financial resources of local emergency response crews and create a need to evacuate residences and businesses. The County's vulnerability to county-wide wildland fire hazard is mitigated somewhat by the presence of fire stations in most parts of the county, as well as the presence of a Sheriff's Office, which serves as an alternate EOC and personnel to augment those resources of fire stations.

Impacts to Critical Facilities: Electrical power could be impacted by wildfire and service could be temporarily interrupted by wildfire. It is doubtful that wildfire would have a lasting impact on water and sewer systems.

.

Impact on Future Development: The efforts of public and non-profit water associations ensure that there will always be water available for firefighting and structural protection, particularly in rural areas of the County. Fire stations and districts (except in the City of Cleveland) are not manned on a full-time basis but rely on volunteers, assisted by the Forestry Service, to fight wildfires. This could result in a negative impact on future development, especially large housing areas or industries. Firefighting capacity may need to be enhanced should the community reach a point where future development includes significant numbers of residents or large industrial assets.

Hazardous Material Incidents

Location and Extent

Many hazardous and toxic materials are transported through areas of Washington County on 18-wheelers via U.S. Highways 82 and 61, and Mississippi State Highways 1, and 12. In addition to roadway access, Washington County is also susceptible to railway transport and river-way transports via the Mississippi River on barges and vessels and impacts from pipelines that cross the Mississippi River into the county's border.

The proximity of these transportation routes to areas of Washington County increase the risk to residents in a five-mile radius for hazards involving all modes of transportation accidents and hazardous materials spills. A secondary risk to a transportation accident involving hazardous materials is the hazard of explosions and fires.

Previous Occurrences

Table I.38 provides a summary of toxic release incidents reported in Washington County from 2014 through 2019. According to the U.S. Environmental Protection Agency (EPA) Toxic Release Inventory (TRI), the following industries within Washington County handle hazardous materials and have had reported releases.

Table I.38-- EPA Toxic Release Inventory Summary for Washington County 2014-2018 I Source: U.S. Environmental Protection Agency, Toxic Release Inventory Program Database; https://www.epa.gov/toxics-release-invesntory-tri-program

	2018		2017		2016		2015		2014	
County	No. Facilities	No. Reports	No. Facilities	No. Reports	No. Facilities	No. Reports	No. Facilities	No. Reports	No. Facilities	No. Reports
Washington	2	2	2	2	2	2	1	2	2	2

Probability of Future Occurrence

It is likely that an event of this type will occur in Washington County at some point in the future given the fact that a major interstate highway and other major state and local roadways pass through the county. Specific areas where such incidents may occur are discussed under Addressing Vulnerability.

Assessing Vulnerability

Location, magnitude, type of problem, wind velocity and direction, and weather conditions vary with each incident, thus making an assessment of vulnerability difficult at best. The possible impact of a hazardous materials incident could include evacuation from homes and businesses, possible deaths or injuries from exposure, long-term environmental damage, and property losses.

Summary of Risk Assessment

Table I.39, shown at the beginning of discussion of Washington County hazards, is presented here to as a summary of all hazards discussed.

Table I.39: Total of Washington County Hazard Events and Damages I Source: NCEI

Hazard Type	No of Events	Death	Injury	Property Damage	Crop Damage
Dam/Levee Failure	-	-	-	-	-
Drought	9	-	-	-	$ 7,301,000
Earthquake	-	-	-	-	-
Extreme Heat	7	3	-	-	-
Expansive Soil	-	-	-	-	-
Flood	55	-	-	$ 17,407,000	21,252,000
Severe Storm	226	-	-	$ 5,373,000	$ 409,000
Severe Winter Weather	21	-	-	$ 1,430,000	-
Tornado	10	-	1	$ 4,555,000	$ 3,000
Tropical Storm / Hurricane	3	-	-	$ 586,043	$8,200,000
Wildfire	-	-	-	-	-
Totals	331	3	1	$ 29,351,043	$ 37,165,000

* Damage estimates not available

This data shows that, in terms of number and frequency, severe storms are the most regularly occurring, while drought has caused the most damage to both property and crops totaling over $29,351,043 million in property damage and $37,165,000 million in crop damage. Of the $66,516,043 in total damages from 331 event occurring between 2000 and 2019, crop damage represents roughly just over half the dollar amount of damage as that to personal property. Figures show tornadoes and the rare hurricanes that affect Washington County were responsible for much of the damage.

The Mississippi Department of Revenue 2018 Annual Report showed that there was a 2017 total property assessment value of 2017 equaled $ 438,133,439. A severe hazard event causing damage to 10 percent of property would cause damage in the amount of $ 43,813,344. Assuming that crop damage associated with such an event might run twice this amount, it can be anticipated that crop damage would run approximately has been estimated and roughly one third of property damage, the crop damage associated with such an event would total approximately $ 87,626,688, and overall damage could run as high as $131,440,032. Figures could vary widely depending on event type, location, magnitude, and extent.

I.3 Capability Assessment

This section assesses Washington County's capability to implement hazard mitigation activities. More detailed information on the purpose and methodology used to conduct the capability assessment can be found in Section 5 - Capability Assessment.

Planning and Regulatory Capability

The findings of the Planning and Regulatory section of capability assessment are described below in Table I.40. This table provides a jurisdictional overview of the plans and programs in place, followed by summary statistics of the *Local Capability Assessment Surveys*. Each county and municipality were asked to self-assess their capabilities. The planning and regulatory capabilities in Washington County and its jurisdictions has not changed since the previous plan.

Table I.40 - Relevant Plans, Ordinances and Programs

Jurisdiction	Comprehensive/ Master Plan	Capital Improvement Plan	Economic Development Plan	Emergency Operations Plan	Community Operations Plan	Transportation Plan	Stormwater Management Plan	Community Wildfire Protection	Historic Preservation Plan	Building Codes	Fire Department ISO Rating	State Plan Review Requirements	Land Use Plan	Zoning Ordinances	Sub-division Regulations	Flood Damage Prevention	National Flood Insurance	Flood Insurance Studies	Community Rating System (CRS)
Washington County	✓		✓	✓	✓				✓	'06	10	✓	✓	✓	✓	✓	✓	✓	
Arcola									✓	'06	9			✓		✓	✓	✓	
Greenville	✓	✓	✓	✓	✓	✓	✓	✓	✓	'06	5	✓		✓	✓	✓	✓	✓	8
Hollandale									✓	'06	8			✓		✓	✓	✓	
Leland	✓	✓		✓	✓		✓		✓	'06	8	✓		✓	✓	✓	✓	✓	
Metcalfe									✓	'06	8					✓	✓	✓	

Emergency Management Capabilities

Hazard Mitigation Plan: A hazard mitigation plan represents a community's blueprint for how they intend to reduce the impact of natural and human-caused hazards on people and the built environment. Elements of a hazard mitigation plan include a risk assessment, capability assessment and mitigation strategy.

- The jurisdictions within Washington County participate in the development and implementation of a hazard mitigation plan.

Emergency Operations Plan: An emergency operations plan outlines the responsibility and means by which resources are deployed during and following an emergency or disaster.

- Survey results indicate Washington County and the Cities of Greenville and Leland have emergency operations plans.

Continuity of Operation Plan: A continuity of operations plan establishes a clear chain of command, line of succession, and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster.

- Survey results indicate Washington County and the Cities of Greenville and Leland have continuity of operations plan.

General Planning Capabilities

The implementation of hazard mitigation activities often involves individuals beyond the emergency management profession. Stakeholders may include local planners, public works officials, economic development specialists and others. Similarly, hazard mitigation planning cuts across multiple disciplines. As a result, the questions asked in the Local Capability Assessment Survey regarding general planning capabilities were designed to measure the degree to which mitigation is integrated into other planning efforts.

Comprehensive Plan: A comprehensive plan establishes the overall vision for a community and helps to guide municipal decision-making.

- Survey results indicate Washington County and the Cities of Greenville and Leland have comprehensive plans.

Economic Plan: An economic plan serves as a road map for economic development decision making, based on the collection of statistical data, historical perspective, and human potential.

- Survey results indicate Washington County and the City of Greenville have economic plans.

Community Wildfire Protection Plan: The community wildfire protection plan is a strategic plan that identifies wild land fire issues facing the community and outlines prioritized mitigation actions.

- Survey results indicate the City of Greenville has community wildfire protection plan.

Transportation Plan: A transportation plan identifies the means to gauge transportation demands and the options to meet those needs, while considering the social, economic and environmental characteristics of the area. The development of transportation networks can significantly impact the amount, type and location of future growth. As a result, transportation planning can have a dramatic impact on future hazard vulnerability.

- Survey results indicate the City of Greenville has a transportation plan.

Capital Improvements Plan: A capital improvements plan guides the scheduling of spending on public improvements. A capital improvements plan can serve as an important mechanism to guide future development away from identified hazard areas. Limiting public spending in

hazardous areas is one of the most effective long-term mitigation actions available to local governments.

- Survey results indicate the Cities of Greenville and Leland have capital improvement plans.

Historic Preservation Plan: A historic preservation plan is intended to preserve historic structures or districts within a community. An often-overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards to include the identification of the most effective way to reduce future damages. This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of harm's way.

- Survey results indicate Washington County and the Cities of Greenville, Hollandale, Leland, and the Towns of Arcola and Metcalfe have historic preservation plans.

Zoning Ordinances: As part of a community's police power, zoning is used to protect the public health, safety and welfare. A zoning ordinance is the mechanism through which zoning is typically implemented. Since zoning regulations enable municipal governments to limit the type and density of development, it can serve as a powerful tool when applied in identified hazard areas.

- Survey results indicate Washington County and the Cities of Greenville, Hollandale, Leland, and the Town of Arcola have zoning ordinances.

Subdivision Ordinances: A subdivision ordinance is intended to regulate the development of housing, commercial, industrial or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development.

- Survey results indicate Washington County and the Cities of Greenville and Leland have subdivision ordinances.

Building Codes, Permitting and Inspections: Building codes regulate construction standards. Decisions regarding the adoption of building codes, the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community.

- Survey results indicate Washington County and the Cities of Greenville, Hollandale, Leland, and the Towns of Arcola and Metcalfe have building codes, permitting and inspections.

Floodplain Management Capability

Flooding represents the greatest natural hazard facing the Nation and the planning area. At the same time, the tools available to reduce the impacts associated with flooding are among the most developed when compared to other hazard-specific mitigation techniques. Information contained in this section has been gathered through surveys and the NFIP Status Book.

Storm Water Management Plan: A storm water management plan is designed to address flooding associated with storm water runoff. The storm water management plan is typically focused on design and construction measures that are intended to reduce the impact of more frequently occurring minor urban flooding.

- Survey results indicate the City of Greenville and Leland have storm water management plans.

Flood Damage Prevention Ordinance/NFIP participation: A local Flood Damage Prevention Ordinance is a tool used by counties and municipalities to regulate the type of construction that occurs in the floodplain. If a community is an NFIP participant, a Flood Ordinance or Court Order is in place.

- Survey results indicates that the Washington County and the Cities of Greenville, Hollandale, Leland and the Towns of Arcola and Metcalfe have flood damage prevention ordinances.
- Below is a summary from the NFIP data base of participating jurisdictions within Washington County.

Table I.41: Washington County NFIP Communities I Source: NFIP Policy and Loss Statistics (3-31-14) and Community Status Report (4-4-14) 2015 D 3 RHMP

Jurisdiction	NFIP Date	NFIP Policies in Force	nsurance in Force	Closed Claims	Total Payments to Date ($)
Washington County	9/3/1980	497	$98,704,000	921	$157,024
Arcola	8/1/1986	1	$105,000	-	-
Greenville	8/1/1979	1324	$234,510,000	833	$12,256,094
Hollandale	1/4/1983	21	$4,654,000	6	$63,034
Leland	2/15/1979	-	-	-	-
Metcalfe		12	$1,041,000		
Totals		1,855	$339,041,000	1760	$34,484,396

Continued Compliance to NFIP

Given the flood hazards in the planning area, an emphasis will be placed on continued compliance with the NFIP. The following steps will be taken by each participating community in order to meet or exceed the following minimum requirements as set by the NFIP.

- Issuing or denying floodplain development/building permits
- Inspecting all development to ensure compliance with local ordinance
- Maintaining records of floodplain development
- Assisting in the preparation and revision of flood maps/updates
- Assist residents in obtaining information on flood hazards, floodplain map data, flood insurance and proper construction measures.
- Survey results indicate that Washington County and the Cities of Greenville, Hollandale, Leland, and the Towns of Arcola and Metcalfe have flood damage prevention ordinances plans

Administrative and Technical Capability

Table I.42 provides a summary of the capability assessment results for Washington County with regard to administrative and technical capabilities. The administrative and technical capabilities in Washington County and its jurisdictions has not changed since the previous plan.

Table I.42 - Administrative and Technical Capability

Jurisdiction	Planning Commission	Participation in Emergency Management Committee (LEPC or other)	Maintenance program to reduce risk (i.e. tree trimming, clearing or drainage systems)	Mutual Aid Compacts	Building Inspection Department	Floodplain Manager	Emergency Manager	Community Planner	Civil Engineer	GIS Coordinator	Warning System services (reverse 911, code Red, outdoor sirens/system etc.)	Grant Writing Capabilities
Washington County	✓	✓		✓	✓	✓	✓	✓	✓		✓	
Arcola		✓	✓	✓							✓	
Greenville	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Hollandale		✓	✓	✓							✓	
Leland	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Metcalfe		✓	✓	✓							✓	

Fiscal Capability

Table I.43 provides a summary of the results of the local capability assessment for Washington County with regard to relevant fiscal resources. The fiscal capabilities in Washington County and its jurisdictions has not changed since the previous plan.

Table I.43 - Relevant Fiscal Resources

Jurisdiction	Capital Improvement Project Funding	Authority to levy taxes for specific purposes	Fees for water, sewer, gas or electric services	Impact fees for new development	Storm water utility fee	Incur debt through general obligation bonds or tax	Incur debt through private activities	Community Development Block Grant(s) (CDBG)	Other federal funding programs	State funding programs
Washington County		✓				✓		✓	✓	✓
Arcola		✓	✓			✓		✓	✓	✓
Greenville	✓	✓	✓			✓	✓	✓	✓	✓
Hollandale		✓	✓			✓		✓	✓	✓
Leland	✓	✓	✓		✓	✓	✓	✓	✓	✓
Metcalfe		✓	✓			✓		✓	✓	✓

Education and Outreach Capability

Table I.44 provides the results for the education and outreach capability for Washington County.

Table I.44-Relevant Education Programs and Organizations

Jurisdiction	Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs population	Ongoing public education or information programs (i.e. responsible water use, fire safety, household preparedness, environmental education etc.)	Natural disaster or safety related School programs	StormReady Certification	Firewise Communities	Public /Private Partnersip initiatives addressing disaster-related issues
Washington County	✓	✓				
Arcola	✓	✓				
Greenville	✓	✓	✓	✓		✓
Hollandale	✓	✓	✓			
Leland						
Metcalfe	✓	✓	✓			

The lack of coordinated jurisdictional and countywide mitigation education and outreach resources was identified as a need by all jurisdictions. As such, communities and the County Emergency Management Department have agreed to approach the North Central Mississippi Planning and Development District to help develop a communications and information program using the County web site as its platform. A web page dedicated to this effort would include information on all natural and manmade hazards to which the region is prone. Each jurisdiction could include a hyperlink on its own web site that takes the user to information posted on the County site.

Mitigation action worksheet for this project are included at the end of this annex as a show of support for this countywide mitigation strategy. This approach to communications and outreach is reasonable in light of the Incident Command Structure used in the event of an emergency. Should a major hazard incident occur, the office of District 3 would contact the Emergency Management Director of each county who, in turn, provides status reports to jurisdictional elected officials. Because communities come together to plan for and respond to disasters, they will use this same approach to collectively develop relevant education and outreach programs that educate communities about how to mitigate against regional hazards of concern.

Conclusions on Local Capability

Table I.45 shows the results of the capability assessment using the scoring system that can be found in Section 5 of the base plan. The scoring for Washington County was based on information from the local capability survey and reviewing existing plans. According to the assessment, the average local capability score for the county and its communities is 42 which fall into a moderate capability ranking.

Table I.45 – Capability Results Summary

Jurisdiction	Overall Capability Score	Overall Capability Rating
Washington County	49	High
Arcola	27	Moderate
Greenville	67	High
Hollandale	28	Moderate
Leland	55	High
Metcalfe	26	Moderate

I.4 Mitigation Strategy

The participating jurisdictions reviewed the mitigation goals and priorities identified in the County's previous plan. Common elements of the previous mitigation goals were used to develop regional goals designed to achieve the implementation of mitigation actions. These refined goals were adopted by the participating jurisdictions. It was determined that the priorities for each of the participating jurisdictions had not changed, although the regionwide mitigation goals and objectives were streamlined as discussed in the base plan.

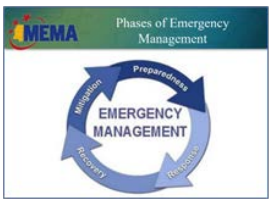
The Mitigation Strategy for Washington County includes several changes, including those based on the streamlined list of 2020 Regional Goals and Objectives. The table of action items includes mitigation actions identified in the 2015 plan; the outcome of each; and how the strategy was updated for the 2020 plan; and newly developed mitigation actions. The 2015 plan included two separate tables of mitigation actions: one table to provide a status update on actions mentioned in the previous plan; and a second table outlining the current mitigation strategy. These have been combined into one table in the current plan update.

Previous plans included a large number of mitigation actions considering the size and available resources of some jurisdictions, including those with only a few hundred residents. An example of this is the fact that most County Emergency Management (EM) directors are the single departmental employee, or they perform their EM duties while functioning in one or more service roles in their community. The same is often true for leadership at the city or town level, where those in leadership "wear many hats."

Several changes were made to streamline the Mitigation Strategy given the following considerations.

- Actions identified as falling into the Preparedness Phase of the Emergency Management Cycle were removed and recommended for consideration under Preparedness Planning. Examples of this include disaster preparedness initiatives (such as providing weather radios to residents) and NIMS training, which represent actions a community normally does to prepare for a hazard event.

- The image at right, developed for a presentation, clearly delineates that EM agencies operationally function under four phases of emergency management, although sometimes the phases run concurrently. Professional emergency managers and their Emergency Support Functions (ESF), units called up during disaster response, develop specific plans and actions to as appropriate for each event phase.



- Actions identified as being required as part of the FEMA Hazard Mitigation Planning Process were removed because these are fully spelled out under the Plan Maintenance section of the Base Plan. Examples of this include reviewing the mitigation plan and meeting to discuss needed plan updates after a disaster occurs in the community.

- It was recommended that actions identifying similar activities be combined into one action. For example, there were previously separate action items for educating the public about natural hazards and for educating the public about manmade (technological, biological, health-related) hazards. A single outreach plan using multiple communications channels

can incorporate education about all hazards to all audiences if the outreach plan is fully developed.

- In some instances, extensive description of previous actions was shortened for plan readability.

- Most action items were identified by all jurisdictions. In these cases, a countywide action was recommended developed that would be jointly implemented by all participating jurisdictions.

It is hoped that the streamlined mitigation strategy a useful tool for the District 3 Counties and its jurisdictions to implement.

Progress Made on Mitigation Strategies and Updated Mitigation Strategy

Washington County jurisdictions have been proactive in implementing mitigation strategies identified in their previous plan. Actions included in Table I.46 have been sorted so that deleted actions appear at the end of each jurisdictional listing. They are highlighted, and a reason for deletion is listed in the column labeled "2020 Status." This column includes use of the following designations to show action status:

Designation	Meaning	Description
D	Deleted	Action was deleted from the plan for the reason described under the Column 2020 Status Description
N	New	New action for the 2020 Plan Update
R	Retained	Action previously included in the 2015 plan, with a description of how it will be continued in the 2020 plan
IP	In Progress	Action previously included in the 2015 plan has been initiated, but not yet completed.

In the column labeled *Implementation Timeline*, initiatives listed as "Continuous Action" refers to an ongoing action that has initiated but not completed.

The participating jurisdictions reviewed the mitigation goals and priorities identified in the County's previous plan. Common elements of the previous mitigation goals were used to develop regional goals designed to achieve the implementation of mitigation actions. These refined goals were adopted by the participating jurisdictions. It was determined that the priorities for each of the participating jurisdictions has not changed.

Project #	Action Title	Action Description	Jurisdiction	Agency	Hazard	Estimated Cost	2020 STATUS (C=Completed; D=Deleted; R=Retain; N=New)	2020 Status Description	Implementation Timeframe	Mitigation Goal/Objectives	Priority Ranking	Potential Funding Source(s)	Status (By Year)
Was-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	Washington County	Washington Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMGP, CDBG, general budget	2020
Was-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	Washington County	Washington Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public cruitical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened	2020-2025	1.2	M	State Aid, FHWA, MDOT	2020

								with appropriate mitigation measures.					
Was-03	Mitigate deficient /obsolete bridges	Bridges throughout District 3 are not designed to withstand seismic activity and/or are classified as structurally deficient or functionally obsolete by the national bridge inventory. Bridges are vital components to the transportation system in the delta and will hamper accessibility if impacted by natural disasters or prevented for use due to its designed standards.	Washington County	Public Works	Earthquakes, flooding	Undetermined	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation measures.	2020-2025	1.2	L	HMGP, CDBG, general budget	2020
Was-04	Promote/build storm water detention ponds when appropriate	Detention ponds could be a solution for addressing flood impacts	Washington County	Public Works	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	1.2	M	CDBG, Developers	2020
Was-05	Secure generators for existing and new critical facilities and infrastructure	During the planning process it was noted that all applicable facilities and	Washington County	Washington Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as	2020-2025	1.2	H	HMGP, general budget	2020

		infrastructure have generators installed. In addition, generators may need to be purchased for any new facilities or infrastructure that may be constructed.						funding becomes available					
Was-06	Continue efforts on mitigating Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Reference - Table of RFC/SRL properties that have not been mitigated. Lexington will explore mitigation options with property owners as funding and opportunities arise.	Washington County	Washington County EMA, MEMA	Flood	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.3	M	FMA	2020
Was-07	Upgrade drainage systems and culverts	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintenance to water conveyance systems	Washington County	Public Works, Drainage Districts	Flood	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system updates	2020-2025	1.2	H	HMGP, CDBG, CIAP funding or part of developer agreements	2020
Was-08	Create defensible space around structures and infrastructure	Defensible space zones around buildings, power and gas lines and other infrastructure such as replacing flammable vegetation with less flammable species.	Washington County	Public Works, BOS	Wildfire	Undetermined	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	1.2	M	General Funds	2020

Was-09	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Consider program to establish lightning grounding systems on critical water and sewer system elements and other facilities prone to strikes to ensure that essential county service continue. Facilities impacted include Hwy 12 W water tank and water well locations.	Washington County	Public Works,	Severe Weather	Undetermined	R	Identify and prioritize critical facilities requiring installation of lightning protection systtem, starting with water and sewer facilities	2020-2025	1.2	H	General funds	2020
Was-10	Preserve natural wetlands and riparian areas through the use of conservation easement.	Land Trust assist individuals and communities to preserve and conserve lands that are valuable in when preserved in their natural state. These values may be emotional or ecological. The land trust works with the landowner to purchase the property or to secure an easement on the property so that the property remains undeveloped. The land trust also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of a community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers streams and bayous which are the	Individual landowner	Individual landowner	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	2.2	L	Private Funds	2020

		floodways of the system. Leaving this property undeveloped allows the natural drainage system to continue to provide a function to the community.											
Was-11	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	Washington County	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	2.1	H	General budget	2020
Was-12	Develop Community Wildfire Protection Plan (CWPP)		Washington County	Washington Co. EMA, Fire Department	Multi-hazard	Undetermined	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	2.2	M	General Budget	2020
Was-13	Develop/update Stormwater Management Plan	Review stormwater management policies and regulations to initiate multi-agency planning process that considers repetitive flood/flash flood issues and best practices	Washington County	Public Works, Building Official	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	2.2	H	General budget	2020

Was-14	Develop a Community Flow Study	Hazardous materials are transported through and to various locations in the County. These routes include rail, air and roadway. This study will provide valuable data in the way of what chemicals are being transported to confirm that the county has appropriate response procedures and equipment needed.	Washington County	Washington Co. EMA, Fire Department	Wildfire	Undetermined	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025	2.1	M	HMEP	2020
Was-15	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	Update and/or develop ordinances and regulations as required to address all hazards prone to Lexington and include any changes in future development areas	Washington County	Washington County	Multi-hazard	N/A	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	2.2	M	General budget	2020
Was-16	Integrate hazard mitigation into local planning	Provide a copy of the 3 RHMP to applicable departments responsible for the enforcement or development of policies and planning initiatives	Washington County	Washington Co. EMA, MEMA, applicable departments	Multi-hazard	N/A	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	3.1	H	General budget	2020
Was-17	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	Continue to participate in the NFIP and seek opportunities to join/improve CRS rating through documentation of activities and projects	Washington County	Washington Co. EMA, MEMA	Flood	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.3	H	General budget	2020

Was-18	Become a Firewise Community	The Firewise Program encourage local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, fire fighters, and others in the effort to protect people and property from wildfire.	Washington County	Fire Department, BOS, MFC, County EMA	Wildfire	N/A	R	Review requirements to become a Firewise community and take first steps toward becoming certified.	2020-2025	2.1	M	MFC, General funds	2020
Was-19	Continue efforts on public information and awareness for natural hazards	The county has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient.	Washington County	Washington Co. EMA, MEMA, applicable departments	Multi-hazard	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	2020-2025	3.1	M	General budget	2020
Was-20	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards.	Washington County	Washington Co. EMA, MEMA, applicable departments	Multi-hazard	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	2020-2025	3.1	H	General budget	2020
Was-21	Promote workshops for emergency preparedness,	Family emergency preparedness plans establish how families	Washington County	Washington Co. EMA, MEMA,	Multi-hazard	N/A	R	Work with the PDD to develop and implement	2020-2025	3.2	M	General budget	2020

	continuity of operation plan	will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans, establish a clear chain of command, line of succession, and procedures for backup or alternative emergency facilities in case of extreme emergency or disaster.		applicable departments				public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.					
Was-22	Encourage development of training and emergency planning for private companies that handle hazardous materials	Hazardous materials, if not handled correctly, can adversely affect people and property should spills or other damaging effects be encountered.	Washington County	Washington Co. EMA, MEMA, applicable departments	Multi-hazard	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	2020-2025	3.1	H	General budget	2020
Was-23	Develop public-private partnerships that that promote community hazard mitigation and assist in reaching hazard mitigation goals.	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their interest or for the interest of the whole community is needed.	Washington County EMA, applicable departments,	Washington Co. EMA, MEMA, applicable departments	Multi-hazard	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all	2020-2025	3.2	H	General budget	2020

								communications resources.					
Was-24	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including installation, testing and inspection	Washington County	Washington County EMA, MEMA	Severe Weather, Tornado	$35,000	D	Completed- Moved to Preparedness Planning. Not a mitigation action. Remove - routine maintenance is not considered to be mitigation	Continuous Action	1.1	H	HMGP, Local Funds	2015
Was-25	Support installation of NEXRAD Doppler Radar site within District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	Washington County	NWS, Department of Defense, District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.1	M	NWS	2015
Was-26	Develop weather radio program for vulnerable populations	Outdoor warning sirens, text messaging, television and other forms of communication have been implemented to alert the public; however, areas/population that may not receive notifications due to location and/or lack of communication devices: develop committee to explore benefit/ cost, vendors, funding options, etc. to provide weather radios to vulnerable populations.	Washington County	District 3 EMA Directors, MEMA, Private Industries, NWS	Tornado, Severe Storm	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	2 yr	1.1	H	NWS, Private Funds	2015

Was-27	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	Washington County	Public Works	Flood	Undetermined	D	Develop a Stormwater Management Plan, which would include a components for stormwater conveyance and detention structures	Continuous action	1.2	M	CDBG, CIAP, general budget	2015
Was-28	Monitor water supply and establish conservation regulations	Consider establishing water conservation ordinances and implement water conservation techniques by regularly checking for leaks to minimize water supply loss.	Washington County	Public Works, Building E12Official,	Drought	Undetermined	D	Develop a Stormwater Management Plan, which would include a components for stormwater conveyance and detention structures	Continuous Action	1.2	H	General budget	2015
Was-29	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	Washington County	Washington County	Human Infect. Disease	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	1.2	H	General budget	2015
Was-30	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Keep areas of concern free of unnecessary debris	Washington County	Road Department, Public Works,	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove from Mitigation Plan. Routine maintenance is not considered mitigation.	Continuous Action	2.1	H	General budget	2015
Was-31	Participate in local and statewide studies, workshops and committees that address the all hazards prone within District 3	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	Washington County	Washington Co. EMA, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	2.2	H	General budget	2015

Was-32	Update the Comprehensive Emergency Operation Plan (CEMP)	A CEMP provides for the preparation for and the carrying out of all emergency functions to mitigate, prepare for, respond to and recover from disasters caused by all hazards whether natural, technological, or human caused, and to provide support for search and recue operations for persons and property	Washington County	Washington C. EMA, Police and Fire Department	Multi-hazard	Undetermined	D	Completed-Moved to Preparedness Planning. Not a mitigation action. - Completed	2015-2020	2.1	H	Homeland Security, EMPG	2015
Was-33	Develop/update the Comprehensive Plan to include to include hazard mitigation strategies/goals	A comprehensive plan established the overall vision for a community and helps to guide decision making and priorities for addressing growth and changes in land use	Washington County	BOS	Multi-hazard	Undetermined	D	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	2015-2025	2.1	M	General funds	2015
Was-34	Conduct annual first responder training for all hazards	Lessons learned during drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county/city	Washington County	Washington Co. EMA, Fire and Police	Multi-hazard	N/A	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action	2.2	H	General budget	2015
Was-35	Conduct annual NIMS training for first responders, officials and critical employees	Conduct training and verify new employees are integrated into training programs as necessary	Washington County	Fire, Police, Washington Co. EMA	Multi-hazard	N/A	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action	3.1	H	General budget	2015
Was-36	Update the District 3 Regional Hazard Mitigation Plan every five years	Coordinate plan update with MEMA Mitigation Planning Bureau and participating jurisdictions in District 3 to schedule plan updates as they become due.	Washington County	District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazard	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020	1.3	H	HMGP, general budget	2015
Was-37	Conduct post disaster meetings for declared and/or major events to	Convene as soon as appropriate after an event to conduct an after action report and	Washington County	Washington Co. EMA	Multi-hazard	N/A	D	This action is included in RHMP Plan Maintenance.	Continuous Action	3.1	H	General budget	2015

	assess the impacts to people and property	document this in the appendix of the mitigation plan.											
Was-38	Conduct annual reviews of District 3 RHMP	Convene as soon as appropriate after an event to conduct an after action report and document this in the appendix o+C35f the mitigation plan.	Washington County	Washington Co. EMA	Multi-hazard	N/A	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings.	Continuous Action	2.2	H	General budget	2015
Was-39	Pursue training and funding opportunities for mitigation actions	Continue to seek funding for eligible mitigation actions as they arise. Participate in training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques of completing an effective application and benefit cost analysis	Washington County	Washington Co. EMA	Multi-hazard	N/A	D	This action is included in RHMP Plan Maintenance.	Continuous Action	3.1	M	HMGP, general budget	2015
Was-40	Become a Certified NWS StormReady Community	Contact NWS before applying, complete application, schedule verification meeting and receive approval.	Washington County	Washington Co. EMA	Multi-hazard	N/A	D	Move to Preparedness Planning. Not a mitigation action.	2015-2020	2.1	H	General budget	2015
	Town of Arcola												

Arc-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	City of Arcola	Mayor's office, Washington Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMGP, CDBG, general budget	2020
Arc-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	City of Arcola	Mayor's office, Washington Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation measures.	2020-2025	1.2	M	HMGP, CDBG, general budget	2020

Arc-03	Promote/build storm water detention ponds when appropriate	Detention ponds could be a solution for addressing flood impacts	City of Arcola	Public Works	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action		M	CDBG, Developers	2020
Arc-04	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Reference - Table of RFC/SRL properties that have not been mitigated. Lexington will explore mitigation options with property owners as funding and opportunities arise.	City of Arcola	Mayor's office, Washington Co. EMA, MEMA	Flood	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.5	M	FMA	2020
Arc-05	Create defensible space around structures and infrastructure	Defensible space zones around buildings, power and gas lines and other infrastructure such as replacing flammable vegetation with less flammable species.	City of Arcola	Public Works, Mayor's office	Wildfire	Undetermined	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025		M	General Funds	2020
Arc-06	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	Update and/or develop ordinances and regulations as required to address all hazards prone to Lexington and include any changes in future development areas	City of Arcola	Mayor's office, applicable departments	Multi-hazard	N/A	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	2.2	M	General budget	2020

Arc-07	Become a Firewise Community	The Firewise Program encourage local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, fire fighters, and others in the effort to protect people and property from wildfire.	City of Arcola	Fire Department, Mayor's Office, MFC, Washington County EMA	Wildfire	N/A	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025		M	MFC, General funds	2020
Arc-08	Preserve natural wetlands and riparian areas through the use of conservation easement.	Land Trust assist individuals and communities to preserve and conserve lands that are valuable in when preserved in their natural state. These values may be emotional or ecological. The land trust works with the landowner to purchase the property or to secure an easement on the property so that the property remains undeveloped. The land trust also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of a community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers streams and bayous which are the floodways of the system. Leaving this	Individual landowner	Individual landowner	Floodin g	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Contin uous Action		L	Private Funds	2020

		property undeveloped allows the natural drainage system to continue to provide a function to the community.											
Arc-09	Secure generators for existing and new critical facilities and infrastructure	During the planning process it was noted that all applicable facilities and infrastructure have generators installed. In addition, generators may need to be purchased for any new facilities or infrastructure that may be constructed.	City of Arcola	Mayor's office, Washington Co. EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.4	H	HMGP, general budget	2020
Arc-10	Upgrade drainage systems and culverts	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintenance to water conveyance systems	City of Arcola	Mayor's office, Public Works, Drainage Districts	Flood	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system updates	2020-2025	1.5	H	HMGP, CDBG, CIAP funding or part of developer agreements	2020
Arc-11	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Consider program to establish lightning grounding systems on critical water and sewer system elements and other facilities prone to strikes to ensure that essential county service continue. Facilities impacted include Hwy 12 W water tank and water well locations.	City of Arcola	Public Works, Mayor's office	Severe Weather	Undetermined	R	Identify and prioritize critical facilities requiring installation of lightning protection systtem, starting with water and sewer facilities	2020-2025	1.5	H	General funds	2020

Arc-12	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	City of Arcola	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.6	H	General budget	2020
Arc-13	Develop/update Stormwater Management Plan	Review stormwater management policies and regulations to initiate multi-agency planning process that considers repetitive flood/flash flood issues and best practices	City of Arcola	Mayor's office	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	2.1	H	General budget	2020
Arc-14	Integrate hazard mitigation into local planning	Provide a copy of the 3 RHMP to applicable departments responsible for the enforcement or development of policies and planning initiatives	City of Arcola	Mayor's Office, Washington Co. EMA, applicable departments	Multi-hazard	N/A	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	2.2	H	General budget	2020
Arc-15	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	Continue to participate in the NFIP and seek opportunities to join/improve CRS rating through documentation of activities and projects	City of Arcola	Mayor's office, Washington Co. EMA, MEMA	Flood	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all	Continuous Action	2.5	H	General budget	2020

								communications resources.					
Arc-16	Continue efforts on public information and awareness for natural hazards	The county has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient.	City of Arcola	Mayor's office, Washington County EMA, applicable departments, MEMA, NWS, FEMA	Multi-hazard	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	2020-2025	2.5	H	General budget	2020
Arc-17	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards.	City of Arcola	Mayor's office, Washington County EMA, MSDH, applicable departments	West Nile, Pandemic, Hazardous Materials	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	2020-2025	2.5	H	General budget	2020

Arc-18	Promote workshops for emergency preparedness, continuity of operation plan	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans, establish a clear chain of command, line of succession, and procedures for backup or alternative emergency facilities in case of extreme emergency or disaster.	City of Arcola	Mayor's office, Washington Co. EMA and BOS	Multi-hazard	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	2020-2025	2.5	H	General budget	2020
Arc-19	Develop public-private partnerships that that promote community hazard mitigation and assist in reaching hazard mitigation goals.	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their interest or for the interest of the whole community is needed.	City of Arcola	Mayor's office, Washington County EMA, applicable departments	Multi-hazard	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	2020-2025	2.5	H	General budget	2020
Arc-20	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including	City of Arcola	Mayor's Office, Washington Co.BOS, MEMA	Severe Weather, Tornado	$35,000	D	Completed-Moved to Preparedness Planning. Not a mitigation action.Remove - routine maintenance is not considered to be mitigation	Continuous Action	1.1	H	HMGP, Local Funds	2015

		installation, testing and inspection											
Arc-21	Support installation of NEXRAD Doppler Radar site within District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	City of Arcola	NWS, Department of Defense, District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.1	M	NWS	2015
Arc-22	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintenance to water conveyance systems	City of Arcola	Public Works	Flood	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for stormwater conveyance and detention structures	Continuous action	1.5	M	CDBG, CIAP, general budget	2015
Arc-23	Pursue training and funding opportunities for mitigaiton actions	Continue to seek funding for eligible mitigation actions as they arise. Participate in training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques of completing an effective application and benefit cost analysis	City of Arcola	Mayor's Office, Washington Co. EMA, applicable departments	Multi-hazard	N/A	D	This action is included in RHMP Plan Maintenance.	Continuous Action	2.4	M	HMGP, general budget	2015

Arc-24	Develop weather radio program for vulnerable populations	Outdoor warning sirenes, text messaging, television and other forms of communication have been implemented to alert the public; however, areas/population that may not receiv notifications due to location and/or lack of communication devices: develop committee to explore benefit/ cost, vendors, funding options, etc. to provide weather radios to vulnerable populations.	City of Arcola	District 3 EMA Directors, MEMA, Private Industries, NWS	Tornado, Severe Storm	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	2 yr	1.1	H	NWS, Private Funds	2015
Arc-25	Monitor water supply and establish conservation regulations	Consider establishing water conservation ordinances and implement water conservation techniques by regularly checking for leaks to minimize water supply loss.	City of Arcola	Public Works, Mayor's Office	Drought	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	1.5	H	General budget	2015
Arc-26	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito iinfestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	City of Arcola	Mayor's Office, Public Works,	Human Infect. Disease	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	1.5	H	General budget	2015
Arc-27	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Keep areas of concern free of unnecessary debris	City of Arcola	Road Department, Public Works, Mayor's office	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove from Mitigation Plan. Routine maintenance is not considered mitigation.	Continuous Action	1.5	H	General budget	2015
Arc-28	Participate in local and statewide studies, workshops and committees	Identify opportunities to join committees and planning studies to learn about all hazards	City of Arcola	Mayor's office, Washington Co. EMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of	Continuous Action	1.6	H	General budget	2015

	that address the all hazards prone within District 3	in an effort to integrate them into future planning and regulatory initiatives.						extensive available FEMA online training.					
Arc-29	Conduct annual first responder training for all hazards	Lessons learned during drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county/city	City of Arcola	Washington Co. EMA, Fire and Police	Multi-hazard	N/A	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action	2.3	H	General budget	2015
Arc-30	Conduct annual NIMS training for first responders, officials and critical employees	Conduct training and verify new employees are integrated into training programs as necessary	City of Arcola	Washington Co. EMA, Fire and Police Fire, Police,	Multi-hazard	N/A	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action	2.3	H	General budget	2015
Arc-31	Update the District 3 Regional Hazard Mitigation Plan every five years	Coordinate plan update with MEMA Mitigation Planning Bureau and participating jurisdictions in District 3 to schedule plan updates as they become due.	City of Arcola	District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazard	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020	2.4	H	HMGP, general budget	2015
Arc-32	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Convene as soon as appropriate after an event to conduct an after action report and document this in the appendix of the mitigation plan.	City of Arcola	Mayor's Office, Washington Co. EMA	Multi-hazard	N/A	D	This action is included in RHMP Plan Maintenance.	Continuous Action	2.4	H	General budget	2015
Arc-33	Conduct annual reviews of District 3 RHMP	Complete the worksheets provided and attend RHMC meetings as they are scheduled.	City of Arcola	Mayor's Office, Washington Co. EMA, applicable departments	Multi-hazard	N/A	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend	Continuous Action	2.4	H	General budget	2015

								scheduled RHMC meetings.					
Arc-34	Become a Certified NWS StormReady Community	Contact NWS before applying, complete application, schedule verification meeting and receive approval.	City of Arcola	Mayor's office, Washington Co. EMA	Multi-hazard	N/A	D	Move to Preparedness Planning. Not a mitigation action.	2015-2020	2.5	H	General budget	2015
	City of Greenville												
Gre-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	City of Greenville	Mayor's office, EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMGP, CDBG, general budget	2020
Gre-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors,	City of Greenville	Mayor's office, EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal	2020-2025	1.2	M	HMGP, CDBG, general budget	2020

		frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.						building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation measures.					
Gre-03	Promote/build storm water detention ponds when appropriate	Detention ponds could be a solution for addressing flood impacts	City of Greenville	Mayor's office, MEMA	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action		M	CDBG, Developers	2020
Gre-04	Secure generators for existing and new critical facilities and infrastructure	During the planning process it was noted that all applicable facilities and infrastructure have generators installed. In addition, generators may need to be purchased for any new facilities or infrastructure that may be constructed.	City of Greenville	Mayor's office, EMA, MEMA	Multi-hazard	$300,000	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.4	H	HMGP, general budget	2020
Gre-05	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Reference - Table of RFC/SRL properties that have not been mitigated. Lexington will explore mitigation options with property owners as funding and opportunities arise.	City of Greenville	Mayor's Office, MEMA	Flood	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and	Continuous Action	1.5	M	FMA	2020

								private businesses, using all communications resources.					
Gre-06	Upgrade drainage systems and culverts	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	City of Greenville	Mayor's office, Public Works, Drainage Districts	Flood	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system updates	2020-2025	1.5	H	HMGP, CDBG, CIAP funding or part of developer agreements	2020
Gre-07	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Consider program to establish lightning grounding systems on critical water and sewer system elements and other facilities prone to strikes to ensure that essential county service continue. Facilities impacted include Hwy 12 W water tank and water well locations.	City of Greenville	Public Works, Mayor's office	Severe Weather	Undetermined	R	Identify and prioritize critical facilities requiring installation of lightning protection systtem, starting with water and sewer facilities	2020-2025	1.5	H	General funds	2020
Gre-08	Preserve natural wetlands and riparian areas through use of conservation easement	Land Trust assist individuals and communities to preserve and conserve lands that are valuable in when preserved in their natural state. These values may be emotional or ecological. The land trust works with the land owner to purchase the property or to secure an easement on the property so that the property remains undeveloped. The land trust also works with the landowner to establish a	City of Greenville	Individual landowner	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	2.2	L	Private Funds	2020

		maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of a community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers streams and bayous which are the floodways of the system. Leaving this property undeveloped allows the natural drainage system to continue to provide a function to the community.											
Gre-09	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	City of Greenville	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Updated: Determine statues of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.6	H	General budget	2020
Gre-10	Develop/update Stormwater Management Plan	Review stormwater management policies and regulations to initiate multi-agency planning process that considers repetitive flood/flash flood issues and best practices	City of Greenville	Public Works, Building Official	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	2.1	H	General budget	2020

Gre-11	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The city has ordinances and regulations in place to guide the development and enforcement of construction standards and land use.	City of Greenville	Mayor's Office, MEMA, applicable departments	Multi-hazard	N/A	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	2.2	H	General budget	2020
Gre-12	Integrate hazard mitigation into local planning	Lessons learned during drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county/city	City of Greenville	Mayor's Office, MEMA, applicable departments	Multi-hazard	N/A	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	2.3	H	General budget	2020
Gre-13	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	Continue to participate in the NFIP and seek opportunities to join/improve CRS rating through documentation of activities and projects	City of Greenville	Mayor's Office, MEMA, applicable departments	Flood	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	2.3	H	General budget	2020
Gre-14	Become a Firewise Community	The Firewise Program encourage local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, fire fighters, and others in the effort to protect people and property from wildfire.	City of Greenville	Fire Department, Mayor's Office, MFC, Washington County EMA	Wildfire	N/A	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025		M	MFC, General funds	2020
Gre-15	Continue efforts on public information	The county has several outreach initiatives to communicate hazard	City of Greenville	Mayor's Office, MEMA,	Multi-hazard	N/A	R	Work with the PDD to develop and implement	Continuous Action	2.5	H	General budget	2020

	and awareness for natural hazards	preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient.		applicable departments				public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.					
Gre-16	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards.	City of Greenville	Washington County EMA, Police and Fire Officials, Mayor's Office	Multi-hazard	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	2.5	H	General budget	2020
Gre-17	Promote workshops for emergency preparedness, continuity of operation plan	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans, establish a clear chain of command, line of succession, and procedures for backup or alternative emergency facilities in	City of Greenville	Washington County EMA, Police and Fire Officials, Mayor's Office	Multi-hazard	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	2.5	H	General budget	2020

		case of extreme emergency or disaster.											
Gre-18	Encourage development of training and emergency planning for private companies that handle hazardous materials	Hazard materials, if not handled correctly, can adversely impact people and property should spills or other damaging effects be encountered.	City of Greenville	Washington County EMA, Police and Fire Officials, Mayor's Office	Hazardous Materials		R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	2.5	H	General budget	2020
Gre-19	Develop public-private partnerships that that promote community hazard mitigation and assist in reaching hazard mitigation goals.	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their interest or for the interest of the whole community is needed.	City of Greenville	Washington County EMA, Police and Fire Officials, Mayor's Office	Multi-hazard	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	2.5	H	General budget	2020
Gre-20	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service: identify site locations and develop cost estimates, including	City of Greenville	County EMA, Mayor's Office, MEMA	Severe Weather, Tornado	$35,000	D	Completed- Moved to Preparedness Planning. Not a mitigation action. Remove - routine maintenance is not considered to be mitigation	Continuous Action	1.1	H	HMGP, Local Funds	2015

		installation, testing and inspection											
Gre-21	Support installation of NEXRAD Doppler Radar site within District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	City of Greenville	NWS, Department of Defense, District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.1	M	NWS	2015
Gre-22	Install electronic information alert signs over major evacuation routes to alert residents and travelers of threat conditions.	Permanent and portable message boards have been installed throughout on State key transportation routes. More systems should be installed as funding becomes available.	City of Greenville	District 3 EMA Directors, MDOT, FHWA, Mayor's Office	Multi-hazards	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2020	1.1	H	NWS, Private Funds	2015
Gre-23	Implement maintenance program for storm water conveyance and detention structures	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	City of Greenville	Public Works	Flood	Undetermined	D	Develop a Stormwater Management Plan, which would include a components for stormwater conveyance and detention structures	2015-2020	1.5	M	CDBG, CIAP, general budget	2015
Gre-24	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	City of Greenville	Mayor's Office	Human Infect. Disease	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	1.5	H	General budget	2015
Gre-25	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Keep areas of concern free of unnecessary debris	City of Greenville	Road Department, Public Works, Mayor's office	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove from Mitigation Plan. Routine maintenance is not considered mitigation.	Continuous Action	1.5	H	General budget	2015

Gre-26	Participate in local and statewide studies, workshops and committees that address the all hazards prone within District 3	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	City of Greenville	Mayor's Office, MEMA, applicable departments	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.6	H	General budget	2015
Gre-27	Update the Comprehensive Emergency Operation Plan (CEMP)	A CEMP provides for the preparation for and the carrying out of all emergency functions to mitigate, prepare for, respond to and recover from disasters caused by all hazards whether natural, technological, or human caused, and to provide support for search and recue operations for persons and property	City of Greenville	Washington C. EMA, Police and Fire Department	Multi-hazard	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action - Completed	2015-2020		H	Homeland Security, EMPG	2015
Gre-28	Conduct annual first responder training for all hazards	Conduct training and verify new employees are integrated into training programs as necessary	City of Greenville	Fire, Police,	Multi-hazard	N/A	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action	2.3	H	General budget	2015
Gre-29	Conduct annual NIMS training for first responders, officials and critical employees	Coordinate plan update with MEMA Mitigation Planning Bureau and participating jurisdictions in District 3 to schedule plan updates as they become due.	City of Greenville	District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazard	Undetermined	D	Move to Preparedness Planning. Not a mitigation action.	2020	2.4	H	HMGP, general budget	2015
Gre-30	Update the District 3 Regional Hazard Mitigation Plan every five years	Convene as soon as appropriate after an event to conduct an after action report and document this in the appendix of the mitigation plan.	City of Greenville	City of Greenville	Multi-hazard	N/A	D	This action is included in RHMP Plan Maintenance.	Continuous Action	2.4	H	General budget	2015
Gre-31	Conduct post disaster meetings for declared and/or major events to	Complete the worksheets provided and attend RHMC	City of Greenville	Washington County EMA, Police and Fire	Multi-hazard	N/A	D	This action is included in RHMP Plan Maintenance.	Continuous Action	2.4	H	General budget	2015

	assess the impacts to people and property	meetings as they are scheduled.		Officials, Mayor's Office									
Gre-32	Conduct annual reviews of District 3 RHMP	Continue to seek funding for eligible mitigation actions as they arise. Participate in training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques of completing an effective application and benefit cost analysis	City of Greenville	Mayor's Office, MEMA, applicable departments	Multi-hazard	N/A	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings.	Continuous Action	2.4	M	HMGP, general budget	2015
Gre-33	Pursue training and funding opportunities for mitigation actions	Continue to seek funding for eligible mitigation actions as they arise. Participate in training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques of completing an effective application and benefit cost analysis	City of Greenville	Mayor's Office, MEMA, applicable departments	Multi-hazard	N/A	D	This action is included in RHMP Plan Maintenance.	Continuous Action	2.2	M	HMGP, general budget	2015
Gre-34	Become a Certified NWS StormReady Community	Contact NWS before applying, complete application, schedule verification meeting and receive approval.	City of Greenville	Mayor's office	Multi-hazard	N/A	D	Move to Preparedness Planning. Not a mitigation action.	2015-2020	2.2	H	General budget	2015
	City of Hollandale												

Hol-01	Storm proof/retrofit new critical facilities and infrastructure	Continuity of emergency services and general governmental operations is necessary to protect staff and county property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatterproof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevation or flood proofing, etc.	City of Hollandale	Mayor's office, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.2	M	HMGP, CDBG, general budget	2020

Hol-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Conduct study to determine appropriate actions to eliminate/reduce flooding; identify funding and implement project when feasible.	City of Hollandale	USACE, County EMA, Mayor's office, MEMA	Flood	Undetermined	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation measures.	2020-2025	1.3	M	General budget, USACE, HMGP	2020
Hol-03	Promote/build storm water detention ponds when appropriate	Retention ponds can be a solution for addressing flood impacts.	City of Hollandale	Public Works	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	1.4	H	HMGP, general budget	2020

Hol-04	Secure generators for existing and new critical facilities and infrastructure	During the planning process it was noted that all applicable facilities and infrastructure have generators installed. In addition, generators may need to be purchased for any new facilities or infrastructure that may be constructed.	City of Hollandale	Mayor's office, Public Works, Drainage Districts	Flood	Undetermined	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.5	H	HMGP, CDBG, CIAP funding or part of developer agreements	2020
Hol-05	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintenance to water conveyance systems	City of Hollandale	Public Works	Flood	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous action	1.5	M	CDBG, CIAP, general budget	2020
Hol-06	Upgrade drainage systems and culverts	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintained to water conveyance systems	City of Hollandale	Public Works, Mayor's office	Severe Weather	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system updates	2020-2025	1.5	H	General funds	2020
Hol-07	Create defensible space around structures and infrastructure	Defensible space zones around buildings, power and gas lines and other infrastructure such as replacing flammable vegetation with less flammable species.	City of Hollandale	Public Works, Mayor's office	Wildfire	Undetermined	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	Continuous Action	1.5	H	General budget	2020

Hol-08	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	City of Hollandale	Mayor's Office	Human Infect. Disease	Undetermined	R	Identify and prioritize critical facilities requiring installation of lightning protection system, starting with water and sewer facilities	Continuous Action	1.5	H	General budget	2020
Hol-09	Preserve natural wetlands and riparian areas through use of conservation easement	Land Trust assist individuals and communities to preserve and conserve lands that are valuable in when preserved in their natural state. These values may be emotional or ecological. The land trust works with the land owner to purchase the property or to secure an easement on the property so that the property remains undeveloped. The land trust also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of a community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers streams and bayous which are the floodways of the system. Leaving this property undeveloped	City of Hollandale	Individual landowner	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	2.2	L	Private Funds	2020

		allows the natural drainage system to continue to provide a function to the community.											
Hol-10	Develop critical infrastructure and Key Resources database (CIKR)	Provide a copy of the MEMA 3 RHMP to applicable departments responsible for the enforcement or development of policies and planning initiatives	City of Hollandale	Mayor's Office, MEMA, applicable departments	Multi-hazard	N/A	R	Updated: Determine statues of State CIKR initiative. Action would enhance database of community CIKR assets.	Continuous Action	2.2	H	General budget	2020
Hol-11	Develop/update Stormwater Management Plan	Lessons learned during drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county/city	City of Hollandale	Fire and Police	Multi-hazard	N/A	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	2.3	H	General budget	2020
Hol-12	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	Conduct training and verify new employees are integrated into training programs as necessary	City of Hollandale	Fire, Police, Washington County EMA	Multi-hazard	N/A	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	2.3	H	General budget	2020
Hol-13	Integrate hazard mitigation into local planning	Coordinate plan update with MEMA Mitigation Planning Bureau and participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	City of Hollandale	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazard	Undetermined	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	2020-2025	2.4	H	HMGP, general budget	2020
Hol-14	Improve/maintain participation in the National Flood Insurance Program (NFIP) and	Continue to participate in the NFIP and seek opportunities to join/improve CRS rating through	City of Hollandale	Mayor's office, MEMA	Flood	N/A	R	Work with the PDD to develop and implement public awareness &	Continuous Action	2.5	H	General budget	2020

	Community Rating System (CRS) Programs	documentation of activities and projects						education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.					
Hol-15	Become a Firewise Community	The Firewise Program encourage local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, fire fighters, and others in the effort to protect people and property from wildfire.	City of Hollandale	Fire Department, Mayor's Office, MFC, Washington County EMA	Wildfire	N/A	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025		M	MFC, General funds	2020
Hol-16	Continue efforts on public information and awareness for natural hazards	The county has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient.	City of Hollandale	Washington County EMA, Police and Fire Officials, Mayor's Office	Multi-hazard	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	2020-2025		M	MFC, General funds	2020
Hol-17	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards.	City of Hollandale	Washington County EMA, Police and Fire Officials, Mayor's Office	Multi-hazard	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards,	2020-2025	2.5	H	General budget	2020

								across stakeholders, including families and private businesses, using all communications resources.					
Hol-18	Promote workshops for emergency preparedness, continuity of operation plan	Family emergency preparedness plans establish how families will get to a safe place; how to contact one another; how to get back together; and what families will do in different situations. Continuity of operations plans, establish a clear chain of command, line of succession, and procedures for backup or alternative emergency facilities in case of extreme emergency or disaster.	City of Hollandale	Washington County EMA, Police and Fire Officials, Mayor's Office	Multi-hazard	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	2020-2025	2.5	H	General budget	2020
Hol-19	Develop public-private partnerships that that promote community hazard mitigation and assist in reaching hazard mitigation goals.	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their interest or for the interest of the whole community is needed.	City of Hollandale	Mayor's office, Washington County EMA, applicable departments	Multi-hazard	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	2020-2025	2.5	H	General budget	2020

Hol-20	Install/maintain severe weather warning system	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	City of Hollandale	NWS, Department of Defense, MEMA District 3 EM Directors, MEMA	Tornado, Severe Weather	$10-$20 million	D	Completed- Moved to Preparedness Planning. Not a mitigation action. Remove - routine maintenance is not considered to be mitigation	2015-2020	1.1	M	NWS	2015
Hol-21	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Outdoor warning sirens, text messaging, television and other forms of communication have been implemented to alert the public; however, areas/population that may not receive notifications due to location and/or lack of communication devices: develop committee to explore benefit/ cost, vendors, funding options, etc. to provide weather radios to vulnerable populations.	City of Hollandale	MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	Tornado, Severe Storm	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	2 yr	1.1	H	NWS, Private Funds	2015
Hol-22	Develop weather radio program for vulnerable populations	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	City of Hollandale	Mayor's office, MEMA	Multi-hazard	Unknown - dependent on facility type	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2025	1.2	M	HMGP, CDBG, general budget	2015
Hol-23	Implement maintenance program for storm water conveyance	Consider establishing water conservation ordinances and implement water conservation	City of Hollandale	Public Works, Building Official, Mayor's office	Drought	Undetermined	D	Develop a Stormwater Management Plan, which would include a	Continuous Action	1.5	H	General budget	2015

	and detention structures	techniques by regularly checking for leaks to minimize water supply loss.						components for stormwater conveyance and detention structures					
Hol-24	Monitor water supply and establish conservation regulations	Keep areas of concern free of unnecessary debris	City of Hollandale	Road Department, Public Works, Mayor's office	Severe Storm, Tornado, Winter Weather	Undetermined	D	Develop a Stormwater Management Plan, which would include a components for stormwater conveyance and detention structures	Continuous Action	1.5	H	General budget	2015
Hol-25	Continue mitigation of mosquito-breeding areas	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	City of Hollandale	Mayor's office, MEMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	1.6	H	General budget	2015
Hol-26	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	City of Hollandale	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	D	Remove from Mitigation Plan. Routine maintenance is not considered mitigation.	2019	1.6	H	General budget	2015
Hol-27	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Update and/or develop ordinances and regulations as required to address all hazards prone to Lexington and include any changes in future development areas	City of Hollandale	Mayor's office	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	2.2	M	General budget	2015

Hol-28	Conduct annual first responder training for all hazards	Convene as soon as appropriate after an event to conduct an after-action report and document this in the appendix of the mitigation plan.	City of Hollandale	Washington Co. EMA	Multi-hazard	N/A	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action	2.4	H	General budget	2015
Hol-29	Conduct annual NIMS training for first responders, officials and critical employees	Complete the worksheets provided and attend RHMC meetings as they are scheduled.	City of Hollandale	Mayor's office	Multi-hazard	N/A	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action	2.4	H	General budget	2015
Hol-30	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Continue to seek funding for eligible mitigation actions as they arise. Participate in training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques of completing an effective application and benefit cost analysis	City of Hollandale	Mayor's office	Multi-hazard	N/A	D	This action is included in RHMP Plan Maintenance.	Continuous Action	2.4	M	HMGP, general budget	2015
Hol-31	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Continue to participate in the NFIP and seek opportunities to join/improve CRS rating through documentation of activities and projects	City of Hollandale	Mayor's office, MEMA	Flood	N/A	D	This action is included in RHMP Plan Maintenance.	Continuous Action	2.5	H	General budget	2015
Hol-32	Conduct annual reviews of MEMA District 3 RHMP	Contact NWS before applying, complete application, schedule verification meeting and receive approval.	City of Hollandale	Mayor's office	Multi-hazard	N/A	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled	2015-2020	2.5	H	General budget	2015

								RHMC meetings.					
Hol-33	Pursue training and funding opportunities for mitigation actions	Continue to seek funding for eligible mitigation actions as they arise. Participate in training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques of completing an effective application and benefit cost analysis	City of Greenville	Washington Co. EMA	Multi-hazard	N/A	D	This action is included in RHMP Plan Maintenance.	Continuous Action	2.4	M	HMGP, general budget	2015
Hol-34	Become a Certified NWS Storm Ready Community	Contact NWS before applying, complete application, schedule verification meeting and receive approval.	City of Hollandale	Mayor's office	Multi-hazard	N/A	D	Move to Preparedness Planning. Not a mitigation action.	2015-2020	2.5	H	General budget	2015
	City of Leland												
Lel-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	City of Leland	Mayor's office, Washington County EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.1	M	HMGP, CDBG, general budget	2020

Lel-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and city property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatter proof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevating of floodproofing, etc.	City of Leland	Mayor's office, Washington County EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public cruitical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation measures.	2020-2025	1.1	M	HMGP, CDBG, general budget	2020
Lel-03	Secure generators for existing and new critical facilities and infrastructure	During the planning process it was noted that all applicable facilities and infrastructure have generators installed. In addition, generators may need to be purchased for any new facilities or infrastructure that may be constructed.	City of Leland	County EMA, Mayor's Office, MEMA	All hazards	Undetermined	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.5	H	HMGP, general budget	2020
Lel-04	Continue efforts to mitigate Repetitive Flood Claim/Severe Repetitive Loss	Reference - Table of RFC/SRL properties that have not been mitigated. Lexington	City of Leland	Mayor's office, Washington Co. EMA, MEMA	Flood	Undetermined	R	Work with the PDD to develop and implement public	Continuous Action	1.5	M	FMA	2020

	(RFC/SRL) properties when feasible and practical	will explore mitigation options with property owners as funding and opportunities arise.						awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.					
Lel-05	Upgrade drainage systems and culverts	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintenance to water conveyance systems	City of Leland	Mayor's office, Public Works, Drainage Districts	Flood	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system updates	2020-2025	1.5	M	HMGP, CDBG, CIAP funding or part of developer agreements	2020
Lel-06	Create defensible space around structures and infrastructure	Defensible space zones around buildings, power and gas lines and other infrastructure such as replacing flammable vegetation with less flammable species.	City of Leland	Public Works, Mayor's office	Wildfire	Undetermined	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025		M	General Funds	2020
Lel-07	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Consider program to establish lightning grounding systems on critical water and sewer system elements and other facilities prone to strikes to ensure that essential county service continue. Facilities impacted include Hwy 12 W water tank and water well locations.	City of Leland	Public Works, Mayor's office	Severe Weather	Undetermined	R	Identify and prioritize critical facilities requiring installation of lightning protection system, starting with water and sewer facilities	2020-2025	1.5	H	General funds	2020

Lel-08	Preserve natural wetlands and riparian areas through use of conservation easement	Land Trust assist individuals and communities to preserve and conserve lands that are valuable in when preserved in their natural state. These values may be emotional or ecological. The land trust works with the landowner to purchase the property or to secure an easement on the property so that the property remains undeveloped. The land trust also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of a community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers streams and bayous which are the floodways of the system. Leaving this property undeveloped allows the natural drainage system to continue to provide a function to the community.	City of Leland	Individual landowner	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	2.2	L	Private Funds	2020
Lel-09	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	City of Leland	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.6	H	General budget	2020

Lel-10	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	The city has ordinances and regulations in place to guide the development and enforcement of construction standards and land use.	City of Leland	Mayor's Office, MEMA, applicable departments	Multi-hazard	N/A	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	2.2	H	General budget	2020
Lel-11	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the Comprehensive Plan, local development regulations and subdivision review process, land stability analysis, etc..	City of Leland	Mayor's Office, Washington Co. EMA, applicable departments	Multi-hazard	N/A	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	2.2	H	General budget	2020
Lel-12	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	Continue to participate in the NFIP and seek opportunities to join/improve CRS rating through documentation of activities and projects	City of Leland	Washington Co. EMA, MEMA	Flood	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	2.5	H	General budget	2020
Lel-13	Become a Firewise Community	The Firewise Program encourage local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, fire fighters, and others in the effort to protect	City of Leland	Fire Department, Mayor's Office, MFC, Washington County EMA	Wildfire	N/A	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025		M	MFC, General funds	2020

		people and property from wildfire.											
Lel-14	Continue efforts on public information and awareness for natural hazards	The county has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient.	City of Leland	Mayor's Office, Washington Co. EMA, applicable departments	Multi-hazard	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	2.5	M	General funds	2020
Lel -15	Enhance public education and awareness of technological, man-made and health-related hazards	A process needs to be developed to address public education and awareness programs for non-natural hazards.	City of Leland	Mayor's Office, Washington Co. EMA, MSDH, applicable departments	Multi-hazard	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	2.5	M	MSDH, EMGP, Homeland Security, general funds	2020
Lel-16	Promote workshops for emergency preparedness, continuity of operation plan	Family emergency preparedness plans establish how families will get to a safe place; how to contact one	City of Leland	Mayor's office, Washington Co. EMA and BOS	Multi-hazard	N/A	R	Work with the PDD to develop and implement public awareness &	Continuous Action	2.5	M	Private funds	2020

		another; how to get back together; and what families will do in different situations. Continuity of operations plans, establish a clear chain of command, line of succession, and procedures for backup or alternative emergency facilities in case of extreme emergency or disaster.						education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.					
Lel-17	Encourage development of training and emergency planning for private companies that handle hazardous materials	Hazard materials, if not handled correctly, can adversely impact people and property should spills or other damaging effects be encountered.	City of Leland	Washington County EMA, Police and Fire Officials, Mayor's Office	Hazardous Materials	NA	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	2.5	H	General budget	2020
Lel18	Develop public-private partnerships that that promote community hazard mitigation and assist in reaching hazard mitigation goals.	Local business is important to all jurisdictions as they provide goods and services to support the community. Identifying businesses that have interest in hazard mitigation due to their interest or for the interest of the whole community is needed.	City of Leland	Mayor's office, Washington County EMA, applicable departments	Multi-hazard	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	2.5	H	General budget	2020

Lel-19	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service:	City of Leland	Mayor's office, Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	D	Completed- Moved to Preparedness Planning. Not a mitigation action. Remove - routine maintenance is not considered to be mitigation	2015-2025	1.2	M	HMGP, CDBG, general budget	2015
Lel-20	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	City of Leland	National Weather Service, Department of Defense, MEMA District 3 EMA Directors, MEMA	Multi-hazard	$10-20 Million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2025	1.1	M	NWS	2015
Lel-21	Monitor water supply and establish conservation regulations	Monitoring the water supply and its functions can save water in the long run.	City of Leland	Road Department, Public Works, Mayor's office	Drought	Undetermined	D	Develop a Stormwater Management Plan, which would include a components for stormwater conveyance and detention structures	Continuous Action	1.5	H	General budget	2015
Lel-22	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	City of Leland	Mayor's Office, Public Works,	Human Infect. Disease	Undetermined	D	Moved to Preparedness Planning.	Continuous Action	1.5	H	General budget	2015
Lel-23	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Keep areas of concern free of unnecessary debris	City of Leland	Road Department, Public Works, Mayor's office	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove from Mitigation Plan. Routine maintenance is not considered mitigation.	Continuous Action	1.5	H	General budget	2015
Lel-24	Participate in local and statewide studies, workshops and committees that address the all hazards prone	Identify opportunities to join committees and planning studies to learn about all hazards in an effort to integrate them into future	City of Leland	Mayor's office, Washington Co. EMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive	Continuous Action	1.6	H	General budget	2015

	within MEMA District	planning and regulatory initiatives.						available FEMA online training.					
Lel-25	Conduct annual first responder training for all hazards	Lessons learned during drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county/city	City of Leland	Co. EMA, Fire and Police	Multi-hazard	N/A	D	Move to Preparedness Planning. Not a mitigation action.	Continuous Action	2.3	H	General budget	2015
Lel-26	Conduct annual NIMS training for first responders, officials and critical employees	Conduct training and verify new employees are integrated into training programs as necessary	City of Leland	Fire, Police, Co. EMA	Multi-hazard	N/A	D	Move to Preparedness Planning. Not a mitigation action.	2.3	H	General budget	2015	2015
Lel-27	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Coordinate plan update with MEMA Mitigation Planning Bureau and participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	City of Leland	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazard	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020	2.4	H	HMGP, general budget	2015
Lel-28	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Convene as soon as appropriate after an event to conduct an after-action report and document this in the appendix of the mitigation plan.	City of Leland	Washington Co. EMA	Multi-hazard	N/A	D	This action is included in RHMP Plan Maintenance.	Continuous Action	2.4	H	General budget	2015
Lel-29	Conduct annual reviews of MEMA District 3 RHMP	Complete the worksheets provided and attend RHMC meetings as they are scheduled.	City of Leland	Co. EMA, Mayor's office	Multi-hazard	N/A	D	This action, included in RHMP Plan Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings.	2.4	H	General budget	2015	2015

Lel-30	Pursue training and funding opportunities for mitigation actions	Continue to seek funding for eligible mitigation actions as they arise. Participate in training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques of completing an effective application and benefit cost analysis	City of Leland	Washington Co. EMA, Mayor's office	Multi-hazard	N/A	D	This action is included in RHMP Plan Maintenance.	Continuous Action	2.4	M	HMGP, general budget	2015
Lel-31	Become a Certified NWS Storm Ready Community	Contact NWS before applying, complete application, schedule verification meeting and receive approval.	City of Leland	Washington Co. EMA Mayor's office	Multi-hazard	N/A	D	Move to Preparedness Planning. Not a mitigation action.	2015-2020	2.5	H	General budget	2015
Lel-32	Develop/update the Comprehensive Plan to include hazard mitigation strategies/goals	A Comprehensive plan established the overall vision foe a community and helps to guide decision making and priorities for addressing growth and changes in land use	City of Leland	Mayor's office	Multi-hazard	Undetermined	R		2020-2025	1.6	M	General budget	2020
	City of Metcalfe												
Mel-01	Storm proof/retrofit new critical facilities and infrastructure	New construction of public buildings/infrastructure should include advanced mitigation techniques when practical, to include measures such as roof and foundation supports, shutters, shatter-proof windows/doors, etc.	City of Metcalfe	Mayor's office, Washington County EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Update County and municipal regulations to ensure that future construction of public buildings and infrastructure meets IBC standards to withstand all hazards	2020-2025	1.1	M	HMGP, CDBG, general budget	2020

Mel-02	Harden existing critical facilities and infrastructure to be more resistant to all hazards	Continuity of emergency services and general governmental operations is necessary to protect staff and city property. Existing facilities may be lacking protective measures and adequate building standards. Mitigation options may include provision of shatter proof glass for windows and doors, frame enhancements, strengthening roofs to withstand high winds, and elevating of floodproofing, etc.	City of Metcalfe	Mayor's office, Washington County EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	R	Conduct a study of County and Town public critical structures and infrastructure to determine needs, cost; prioritize projects according to need. Potential hardening projects may include any municipal building and public infrastructure. The County will be relocating the 911 office into an existing county-owned facility in the future. This building should be hardened with appropriate mitigation measures.	2020-2025	1.1	M	HMGP, CDBG, general budget	2020
Mel-03	Promote/build storm water detention ponds when appropriate	Detention ponds could be a solution for addressing flood impacts	City of Metcalfe	Public Works	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action		M	CDBG, Developers	2020

Mel-04	Secure generators for existing and new critical facilities and infrastructure	During the planning process it was noted that all applicable facilities and infrastructure have generators installed. In addition, generators may need to be purchased for any new facilities or infrastructure that may be constructed.	City of Metcalfe	County EMA, Mayor's Office, MEMA	All hazards	Undetermined	R	Develop priority list for generator acquisition as funding becomes available	2020-2025	1.5	H	HMGP, general budget	2020
Mel-05	Continue efforts on mitigating Repetitive Flood Claim/Severe Repetitive Loss (RFC/SRL) properties when feasible and practical	Reference - Table of RFC/SRL properties that have not been mitigated. Lexington will explore mitigation options with property owners as funding and opportunities arise.	City of Metcalfe	Washington County EMA, MEMA	Flood	Undetermined	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	1.5	M	FMA	2020
Mel-06	Upgrade drainage systems and culverts	Drainage ways and detention structures require routine maintenance to ensure storm water can flow as designed for typical events. Continue to implement preventive maintenance to water conveyance systems	City of Metcalfe	Public Works	Flood	Undetermined	R	Develop priority list for culverts that are need of upsizing as part of drainage system	2020-2025	M	M	CDBG, CIAP, general budget	2020
Mel-07	Create defensible space around structures and infrastructure	Defensible space zones around buildings, power and gas lines and other infrastructure such as replacing flammable vegetation with less flammable species.	City of Metcalfe	Public Works, BOS	Wildfire	Undetermined	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025		M	General Funds	2020

Mel-08	Install lightning grounding systems and protection devices on sewer and water systems and municipal buildings	Consider program to establish lightning grounding systems on critical water and sewer system elements and other facilities prone to strikes to ensure that essential county service continue. Facilities impacted include Hwy 12 W water tank and water well locations.	City of Metcalfe	Public Works,	Severe Weather	Undetermined	R	Identify and prioritize critical facilities requiring installation of lightning protection system, starting with water and sewer facilities	2020-2025	1.5	H	General funds	2020
Mel-09	Preserve natural wetlands and riparian areas through use of conservation easement	Land Trust assist individuals and communities to preserve and conserve lands that are valuable in when preserved in their natural state. These values may be emotional or ecological. The land trust works with the landowner to purchase the property or to secure an easement on the property so that the property remains undeveloped. The land trust also works with the landowner to establish a maintenance endowment to pay taxes on the property and to maintain the property. Open space within a community is important to the safety of a community. Open space can preserve critical drainage ways and wetlands or can maintain easements adjacent to rivers streams and bayous which are the	City of Metcalfe	Individual landowner	Flooding	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	Continuous Action	2.2	L	Private Funds	2020

		floodways of the system. Leaving this property undeveloped allows the natural drainage system to continue to provide a function to the community.											
Mel-10	Develop critical infrastructure and Key Resources database (CIKR)	Develop location and other relevant data on critical facilities and infrastructure for the County and its jurisdictions. County EMA should serve as liaison to the Coordinating Council for Remote Sensing and Geographic Information Systems to ensure the data is complete and accurately mapped by the County.	City of Metcalfe	County EMA, county and community officials, Coordinating Council for Remote Sensing and Geographic Information Systems, MEMA	Multi-hazard	Undetermined	R	Updated: Determine status of State CIKR initiative. Action would enhance database of community CIKR assets.	2020-2025	1.6	H	General budget	2020
Mel-11	Develop/update Stormwater Management Plan	Review stormwater management policies and regulations to initiate multi-agency planning process that considers repetitive flood/flash flood issues and best practices	City of Metcalfe	Public Works, Building Official	Flood	Undetermined	R	Develop a countywide Stormwater Management plan that includes use of detention ponds as appropriate	2020-2025	2.1	H	General budget	2020
Mel-12	Continue to enforce/improve ordinances and regulations to promote hazard mitigation strategies	Update and/or develop ordinances and regulations as required to address all hazards prone to Lexington and include any changes in future development areas	City of Metcalfe	Mayor's office, applicable departments	Multi-hazard	N/A	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	2.2	M	General budget	2020

Mel-13	Integrate hazard mitigation into local planning	Hazard mitigation can be integrated into local planning efforts through incorporating risk assessment and hazard mitigation principles into the Comprehensive Plan, local development regulations and subdivision review process, land stability analysis, etc..	City of Metcalfe	Mayor's Office, Washington Co. EMA, applicable departments	Multi-hazard	N/A	R	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	Continuous Action	2.2	H	General budget	2020
Mel-14	Improve/maintain participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) Programs	Continue to participate in the NFIP and seek opportunities to join/improve CRS rating through documentation of activities and projects	City of Metcalfe	Washington Co. EMA, MEMA	Flood	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	2.5	H	General budget	2020
Mel-15	Become a Firewise Community	The Firewise Program encourage local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, fire fighters, and others in the effort to protect people and property from wildfire.	City of Metcalfe	Fire Department, Mayor's Office, MFC, Washington County EMA	Wildfire	N/A	R	Develop a countywide Wildfire Protection Plan that identifies vulnerable hazard locations and flammable species.	2020-2025		M	MFC, General funds	2020

Mel-16	Continue efforts on public information and awareness for natural hazards	The county has several outreach initiatives to communicate hazard preparedness information to the general public and visitors to the area. Providing timely information and educational information related to preparedness, mitigation, response and recovery to the public fosters their ability to become self-sufficient.	City of Metcalfe	Mayor's Office, Washington Co. EMA, applicable departments	Multi-hazard	N/A	R	Work with the PDD to develop and implement public awareness & education campaign about all hazards, across stakeholders, including families and private businesses, using all communications resources.	Continuous Action	2.5	M	General funds	2020
Mel-17	Install/maintain severe weather warning system	Weather warning systems complement the methods of warning already used by the County Emergency Operations Center and National Weather Service:	City of Metcalfe	Mayor's office, Co. EMA, MEMA	Multi-hazard	Unknown - dependent on facility type	D	Completed- Moved to Preparedness Planning. Not a mitigation action. Remove - routine maintenance is not considered to be mitigation	2015-2025	1.2	M	HMGP, CDBG, general budget	2015
Mel-18	Support installation of NEXRAD Doppler Radar site within MEMA District 3	Storm systems in the delta region are not always detected due to limitations in range from Doppler radar sites located in Little Rock, Memphis and Jackson.	City of Metcalfe	National Weather Service, Department of Defense, MEMA District 3 EMA Directors, MEMA	Multi-hazard	$10-20 Million	D	Moved to Preparedness Planning. Not a mitigation action.	2015-2025	1.1	M	NWS	2015
Mel-19	Develop weather radio program for vulnerable populations	Outdoor warning sirens, text messaging, television and other forms of communication have been implemented to alert the public; however, areas/population that may not receive notifications due to location and/or lack of communication	City of Metcalfe	MEMA District 3 EMA Directors, MEMA, Private Industries, NWS	Tornado, Severe Storm	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	2 yr	1.1	H	NWS, Private Funds	2015

		devices: develop committee to explore benefit/ cost, vendors, funding options, etc. to provide weather radios to vulnerable populations.											
Mel-20	Implement maintenance program for storm water conveyance and detention structures	Consider program to establish lightning grounding systems on critical water and sewer system elements and other facilities prone to strikes to ensure that essential county service continue. Facilities impacted include Hwy 12 W water tank and water well locations.	City of Metcalfe	Public Works, Mayor's office	Severe Weather	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for stormwater conveyance and detention structures	1.5	H	General funds	2015	2015
Mel-21	Monitor water supply and establish conservation regulations	Monitoring the water supply and its functions can save water in the long run.	City of Metcalfe	Road Department, Public Works, Mayor's office	Drought	Undetermined	D	Develop a Stormwater Management Plan, which would include a component for stormwater conveyance and detention structures	Continuous Action	1.5	H	General budget	2015
Mel-22	Continue mitigation of mosquito-breeding areas	Continue to mitigate areas susceptible to mosquito infestations. Alert the public of outbreaks and preventive measures to avoid contracting disease-causing issues.	City of Metcalfe	Mayor's Office, Public Works,	Human Infect. Disease	Undetermined	D	Moved to Preparedness Planning. Not a mitigation action.	Continuous Action	1.5	H	General budget	2015
Mel-23	Implement/maintain tree trimming/removal near power poles, infrastructure and roadside areas	Keep areas of concern free of unnecessary debris	City of Metcalfe	Road Department, Public Works, Mayor's office	Severe Storm, Tornado, Winter Weather	Undetermined	D	Remove from Mitigation Plan. Routine maintenance is not considered mitigation.	Continuous Action	1.5	H	General budget	2015

Mel-24	Participate in local and statewide studies, workshops and committees that address the all hazards prone within MEMA District	Identify opportunities to join committees and studies to learn about all hazards in an effort to integrate them into future planning and regulatory initiatives.	City of Metcalfe	Mayor's office, Washington Co. EMA	Multi-hazard	N/A	D	Moved to Preparedness Planning. Take advantage of extensive available FEMA online training.	Continuous Action	1.6	H	General budget	2015
Mel-25	Develop/update the Comprehensive Plan to include hazard mitigation strategies/goals	A Comprehensive plan established the overall vision foe a community and helps to guide decision making and priorities for addressing growth and changes in land use	City of Metcalfe	Mayor's office	Multi-hazard	Undetermined	D	Revise to review all planning-related ordinances and initiatives to be included in Comprehensive Plan Review	2015-2025	1.6	M	General budget	2015
Mel-26	Conduct annual first responder training for all hazards	Lessons learned during drills should be captured and addressed in applicable plans and SOPs to improve preparedness and response procedures carried out by the county/city	City of Metcalfe	Co. EMA, Fire and Police	Multi-hazard	N/A	D	Move to Preparedness Planning. Not a mitigation action.	2.3	H	General budget	General budget	2015
Mel-27	Conduct annual NIMS training for first responders, officials and critical employees	Conduct training and verify new employees are integrated into training programs as necessary	City of Metcalfe	Fire, Police, Co. EMA	Multi-hazard	N/A	D	Move to Preparedness Planning. Not a mitigation action.	2.3	H	General budget	General budget	2015
Mel-28	Update the MEMA District 3 Regional Hazard Mitigation Plan every five years	Coordinate plan update with MEMA Mitigation Planning Bureau and participating jurisdictions in MEMA District 3 to schedule plan updates as they become due.	City of Metcalfe	MEMA District 3 Communities and MEMA Mitigation Planning Bureau	Multi-hazard	Undetermined	D	This action is included in RHMP Plan Maintenance.	2020	2.4	H	HMGP, general budget	2015
Mel-29	Conduct post disaster meetings for declared and/or major events to assess the impacts to people and property	Convene as soon as appropriate after an event to conduct an after-action report and document this in the appendix of the mitigation plan.	City of Metcalfe	Washington Co. EMA	Multi-hazard	N/A	D	This action is included in RHMP Plan Maintenance.	Continuous Action	2.4	H	General budget	2015
Mel-30	Conduct annual reviews of MEMA District 3 RHMP	Complete the worksheets provided and attend RHMC	City of Metcalfe	Co. EMA, Mayor's office	Multi-hazard	N/A	D	This action, included in RHMP Plan	2.4	H	General budget	2015	2015

		meetings as they are scheduled.						Maintenance, including use of a worksheet developed to facilitate this process and which should be inserted into the appendix of this plan once completed. Attend scheduled RHMC meetings.					
Mel-31	Pursue training and funding opportunities for mitigation actions	Continue to seek funding for eligible mitigation actions as they arise. Participate in training seminars and conferences to stay abreast of requirements under the HMA program and learn techniques of completing an effective application and benefit cost analysis	City of Metcalfe	Washington Co. EMA, Mayor's office	Multi-hazard	N/A	D	This action is included in RHMP Plan Maintenance.	Continuous Action	2.4	M	HMGP, general budget	2015
Mel-32	Become a Certified NWS StormReady Community	Contact NWS before applying, complete application, schedule verification meeting and receive approval.	City of Metcalfe	Washington Co. EMA Mayor's office	Multi-hazard	N/A	D	Move to Preparedness Planning. Not a mitigation action.	2015-2020	2.5	H	General budget	2015

Mitigation Action Worksheets

Washington County elected to more fully describe two mitigation actions on a Mitigation Action Worksheet. The two worksheets address the following initiatives:

1. Retrofitting of hazard critical infrastructure to provide protection from floods and high wind events.

2. Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others.

It was decided that all jurisdictions within the county will work on these two actions, so a separate action worksheet for each jurisdiction working on both each is included in the Actions Worksheets section. The Action Worksheets for Washington County are included first, and then jurisdictional worksheets follow.

Washington County Mitigation Action Worksheets

Disaster communications originates with the Washington County Emergency Management Department. As such, it is appropriate to work with EM staff and the North Central Mississippi Planning and Development District to develop an education and outreach campaign that uses County communications as a touchstone for information about all hazards shared at the local level, included unincorporated and hard-to-reach communities

Mitigation Action Worksheet		
3. Name of Jurisdiction: 4. Name of Haz. Mitigation Plan:	Washington County, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the County severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Washington-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval. • Discuss to duration for which residents are expected to be housed: one or two hours versus a period of several days.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	

12. Local Planning Mechanisms to be Used in Implementation, if any:	Washington County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Washington County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	Washington County, Mississippi MEMA District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Washington County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, thus leaving stakeholders vulnerable to hazards.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Washington -2 Work with the North Central MS Planning and Development Council to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Washington Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Board of Supervisors, Mayors, City/Board of Aldermen, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	

11. Potential Fund Sources:	County and local budgets, PDD
12. Local Planning Mechanisms to be Used in Implementation, if any:	Washington County Emergency Management Plan, Town/City Communications Plans
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Mitigation Action Worksheet		
1. Name of Jurisdiction: Nae of Haz. Mitigation Plan:	Town of Arcola, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Arcola-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval. • Discuss to duration for which residents are expected to be housed: one or two hours versus a period of several days.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	

12. Local Planning Mechanisms to be Used in Implementation, if any:	Washington County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Washington County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Arcola, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Washington County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Alcola-2 Work with the County and Regional Planning and Development Council to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Supporting efforts led by the Washington Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommended plan to the Board of Supervisors and local legislative bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	

8. Action/Project Priority (STAPLEE Score):	20 – High
9. Timeline for Completion:	Two years
10. Useful Life:	Five years – revisit as local needs require
11. Potential Fund Sources:	County and local budgets, PDD
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of Arcola Operations Plan, Washington County Emergency Management Plan,
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Mitigation Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Greenville, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Greenville-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval. • Discuss to duration for which residents are expected to be housed: one or two hours versus a period of several days.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	

12. Local Planning Mechanisms to be Used in Implementation, if any:	Washington County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Washington County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Greenville, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Washington County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Greenville-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Supporting efforts led by the Washington Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommended plan to the Board of Supervisors and local legislative bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	

12. Local Planning Mechanisms to be Used in Implementation, if any:	City Communications Plan, City Emergency Management Plan, Washington County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Mitigation Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Hollandale, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Hollandale-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval. • Discuss to duration for which residents are expected to be housed: one or two hours versus a period of several days.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	

11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding
12. Local Planning Mechanisms to be Used in Implementation, if any:	Washington County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Washington County Emergency Management Director participated during the planning phase of the MEMA District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
1. Name of Jurisdiction:	City of Hollandale, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Washington County Annex of the MEMA District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Hollandale-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Supporting efforts led by the Washington Emergency Management Director and PDD: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommended plan to the Board of Supervisors and local legislative bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	

11. Potential Fund Sources:	County and local budgets, PDD
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of Hollandale Operations Plan, Washington County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Mitigation Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Leland, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Leland-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval. • Discuss to duration for which residents are expected to be housed: one or two hours versus a period of several days.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	
11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP funding	

12. Local Planning Mechanisms to be Used in Implementation, if any:	Washington County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Washington County Emergency Management Director participated during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Leland, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Washington County annex of the District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Metcalfe-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Washington Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	

12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of Metcalfe Operations Plan, Washington County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Mitigation Action Worksheet

1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	Town of Metcalfe, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Throughout the town severe wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe winds pose a threat to lives, property and key critical facilities and infrastructure due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structure of light construction, particularly manufactured homes.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Retrofit/harden building and infrastructure throughout the county to withstand the impacts of flooding and other severe weather hazards. Alternative: Acquire and demolish deteriorating buildings and infrastructures in identified high hazard zones that do not meet current International Building Code standards designed flood or wind zones. Alternative: Situation remains, leaving buildings and infrastructure vulnerable.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Metcalfe-1 Storm proof/retrofit new and existing buildings and infrastructures throughout the county to develop disaster resilient communities.	
5. Action or Project Description:	The Public Works Director will work with County and jurisdictional staff to identify locations of buildings and critical infrastructural that is in need of retrofitting. Funding is a limiting factor in proceeding with construction. Steps to complete the action include: • Identify the location of building and infrastructure that are vulnerable to severe weather events. • Conduct site evaluations of buildings and infrastructure to determine mitigation techniques to be deployed. • Develop a project budget. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval. • Discuss to duration for which residents are expected to be housed: one or two hours versus a period of several days.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Protect vulnerable building and infrastructure from exposure to flooding, tornado, severe storms, & other hazards. Minimize need for repairing damaged buildings and infrastructures and reduce the amount of debris to be cleaned up after hazard event.	COST Undetermined, depends on current condition of the buildings and infrastructure and desired method of retrofitting.
Plan for Implementation		
7. Responsible Organization:	Emergency Management Department, Public Works, Board of Supervisors, Mayors, Jurisdictional legislative bodies	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	50 years	

11. Potential Fund Sources:	County Budget, financial/in-kind support from local jurisdictions, FEMA HMGP
12. Local Planning Mechanisms to be Used in Implementation, if any:	Washington County Emergency Management Plan
Progress Report	
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during a conference in which the Washington County Emergency Management Director participated during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.

Action Worksheet		
1. Name of Jurisdiction: Name of Haz. Mitigation Plan:	City of Metcalfe, Mississippi District 3 Multi-Jurisdictional Hazard Mitigation Plan	
Risk / Vulnerability		
2. Problem being Mitigated:	Develop a communications plan that educates all stakeholder groups about how to mitigate against all natural and manmade hazards, including biotechnical and health-related hazards. At present, mitigation communications within the county is fragmented and occurs as needed during hazard events. The County Emergency Management Department is the point person for all hazard communications, which initiate through him and down to the community level, where Mayors and other local leaders disseminate information to their local populations.	
Potential Actions/Projects (not being Implemented at this time)		
3. Actions/Projects Considered with Summary Evaluation of Each:	Preferred: Work with the County Emergency Management Department and Planning and Development Council to create a mitigation education and outreach program targeted to all stakeholders, including residents, businesses, civic groups, churches and others. Educate the community about all natural and manmade hazards. This project will address several action items outlined in the Washington County annex of the District 3 RHMP. Alternative: Continue to share mitigation information on an as-needed basis, which causes information to "fall through the cracks," so not all information reaches all residents. Alternative: Have no education and outreach program, leaving stakeholders uninformed.	
Action or Project Intended for Implementation		
4. Action/Project Number: Name of Action or Project:	Action #: Metcalfe-2 Work with the County Emergency Management Department and PDD to develop a comprehensive education and outreach communications plan that uses the County web site as the focus and allows municipal web sites to link and share posted information. Plan would include communications options for those who do not have digital access.	
5. Action or Project Description:	Led by the Washington Emergency Management Director and North Central PDD, outreach would: • Include jurisdictional representatives appointed by the Mayor or governing body. • Include citizens that represent hard-to-reach populations to secure their input. • Discuss natural and manmade hazards of concern to local residents. • Develop "base" web site at the County level, to which all jurisdictions, churches, civic groups, and others could link. • Present recommendation to the Board of Supervisors and Town/City Legislative Bodies for consideration and approval.	
6. Summary of Evaluation1 Benefits (losses avoided) Estimated Cost Other Factors Considered (see STAPLEE Worksheet)	BENEFIT Help residents, the business community, and other stakeholders mitigate against all natural and manmade hazards. Save lives/property.	COST Estimated $5,000 for web site design and production of hard copy materials designed to reach all community groups.
Plan for Implementation		
7. Responsible Organization:	Mayor's Office, Board of Aldermen, County Emergency Management Department, PDD	
8. Action/Project Priority (STAPLEE Score):	20 – High	
9. Timeline for Completion:	Two years	
10. Useful Life:	Five years – revisit as local needs require	
11. Potential Fund Sources:	County and local budgets, PDD	
12. Local Planning Mechanisms to be Used in Implementation, if any:	Town of Metcalfe Operations Plan, Washington County Emergency Management Plan	
Progress Report		
13. Date of Status Report: Report of Progress: Evaluation of Effectiveness:	Project first discussed during the planning phase of the District 3 Hazard Mitigation Plan Update. Discussion with affected jurisdictions required to secure local approval and support.	