Bamberg County

AP photo/Mic Smith

Hazard Mitigation Plan 2021

Prepared on behalf of Bamberg County
By Lower Savannah Council of Governments

Part One:
Introduction and Process

1.1 Introduction: Natural Hazard Mitigation Plan

After review by the Task Force Committee, this section of the plan has remained the same for the update process.

The Natural Hazard Mitigation Plan is required by the Federal Emergency Management Agency (FEMA) for all counties in the State of South Carolina. The initiation of hazard planning by local governments came into effect after the signing of the Disaster Mitigation Act of 2000 (DMA 2000). This document is the Natural Hazard Mitigation Plan for Bamberg County and its incorporated municipalities.

Following the passage of the DMA 200, states and local governments are now required to develop and adopt a hazard mitigation plan in order to remain eligible for FEMA mitigation grant funding. Communities with an adopted plan will become "pre-positioned" and potentially more apt to receive available mitigation funds.

Natural hazards, including floods, hurricanes, earthquakes and severe winter storms, are a part of the world around us. Their occurrence is natural and inevitable, and there is little we can do to control their force and intensity. Bamberg County faces a variety of these hazards, each of which is discussed in Part Two: Risk Assessment.

Through the adoption of hazard mitigation planning practices, we can minimize the impact of hazards on people and the built environment. The Bamberg County Natural Hazard Mitigation Plan is designed to be a logical, information-driven plan that systematically identifies and guides the implementation of mitigation actions, including policies or site-specific projects designed to make Bamberg County and its incorporated municipalities safer from the threat of natural hazards.

Hazard mitigation involves the use of specific measures to reduce the impact of hazards on people and the built environment. Measures may include both structural and non-structural techniques, such as protecting buildings and infrastructure from the forces of nature or wise floodplain management practices. Actions may be taken to protect both existing and/or future development. It is widely accepted that the most effective mitigation measures are implemented before an event at the local government level, where decisions on the regulation and control of development are ultimately made.

Hazard mitigation planning is the first of the four "phases of emergency management," followed by preparedness, response, and recovery. This prevention-related concept of emergency management often gets the least attention, yet it is one of the most important steps in creating a disaster-resistant community.

Figure 1: Phases of Emergency Management

1.2 Area Background

After review by the Task Force Committee, this section has been revised as part of the update process to include updated population and median household incomes for the County and it's incorporated municipalities, per the US Census information. Additionally, an update to the annual average temperature, rainfall and snowfall rate was included, as well as a listing of updated maps.

Bamberg County is centrally located in the southern part of the state and characterizes the Lowcountry lifestyle. Bamberg County is located in the southwestern coastal plains of South Carolina and is bordered by Allendale, Barnwell, Colleton, Dorchester, Hampton and Orangeburg Counties. Bamberg County is considerably a more rural environment compared to that of its neighboring counties. The Edisto River is Bamberg County's boundary on the northeast, the Salkehatchie River on the southwest, with the Little Salkehatchie River running through the middle of the county.

Bamberg County's population is estimated at 14,066 per the US Census Bureau Vintage 2019 estimates. The mean temperature is 65.1°F. Rainfall averages at approximately 47.33 inches with a mean snowfall rate of 1 inch *(South Carolina State Climatology Office).*

The County contains five municipalities: Bamberg, Denmark, Ehrhardt, Govan, and Olar. Bamberg serves as the County Seat. The Town of Bamberg is situated in the northern part of Bamberg County, and is in the southern region of South Carolina, known as the Coastal Plains.

Figure 2 below illustrates the area demographic background of Bamberg County and its incorporated municipalities.

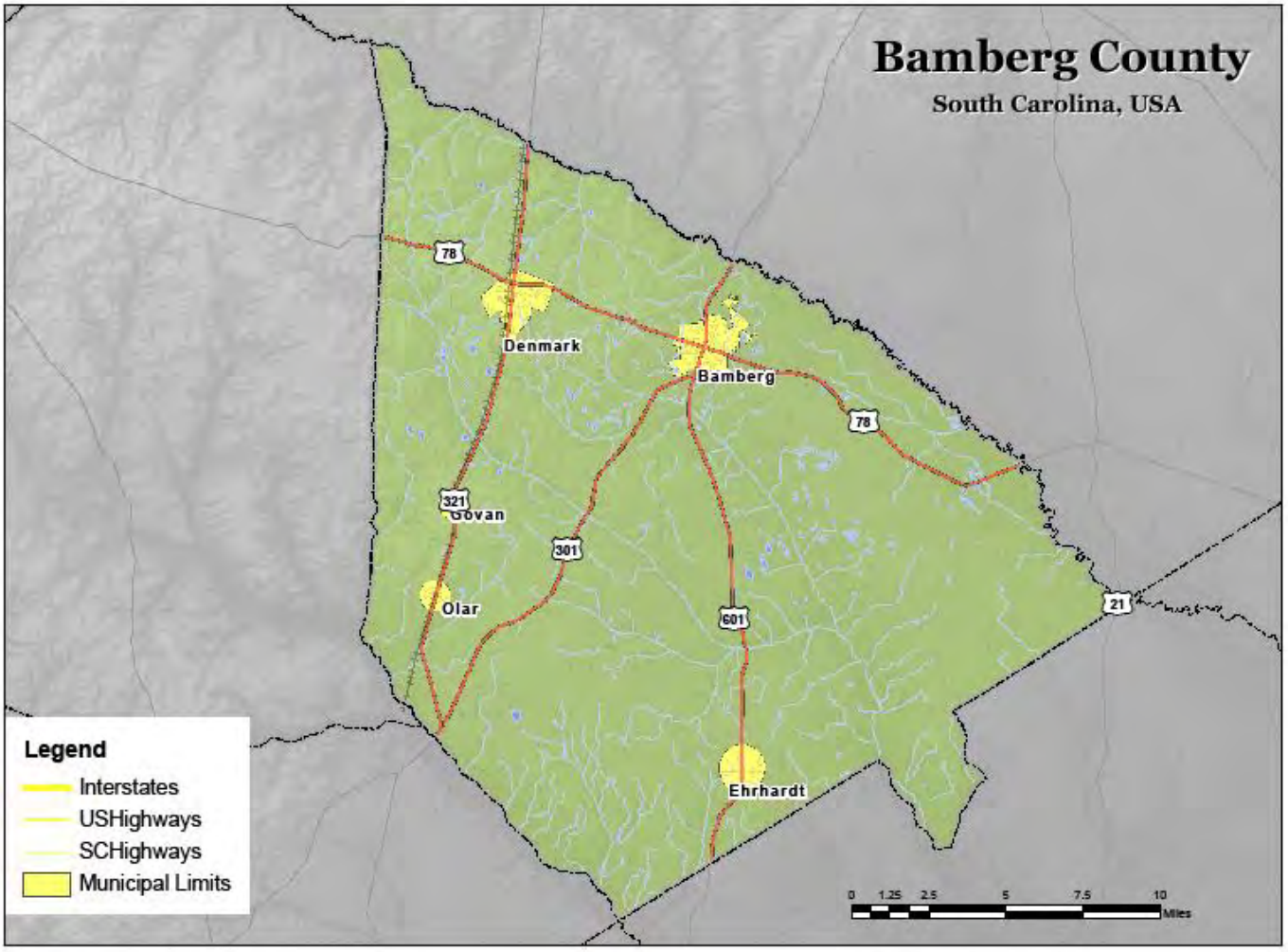
Figure 2. Area Demographic Background

	2019 Population Projection	**2019 Median Household Income Projection**
Bamberg County	14,066	$32,229
City of Bamberg	3,189	$38,093
City of Denmark	2,934	$25,250
Town of Ehrhardt	482	$31.458
Town of Govan	56	NA
Town of Olar	228	$28,125

Source – U.S. Census – V 2019 Population Estimate / 2014-2018 ACS 5 Yr. Est.

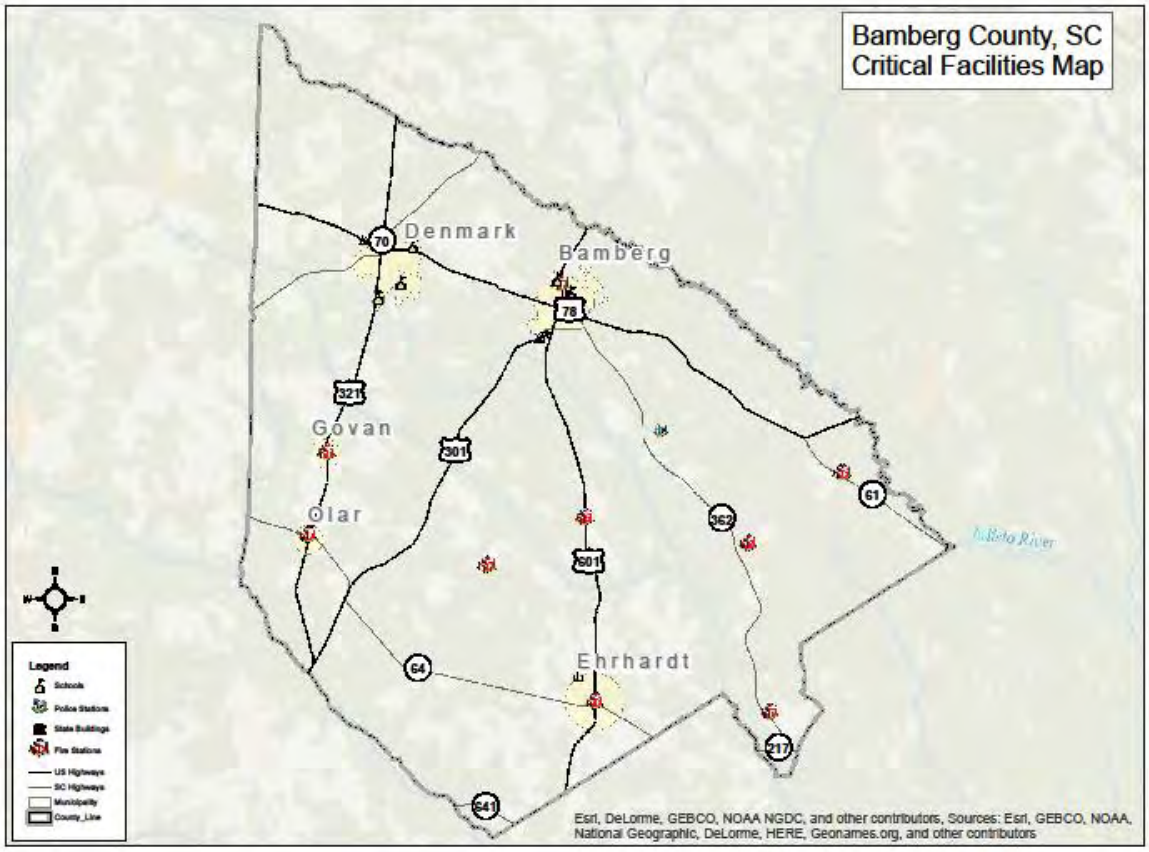
The following map reveals the area of Bamberg County, which is the focus of this plan.

Map 1: Location Map



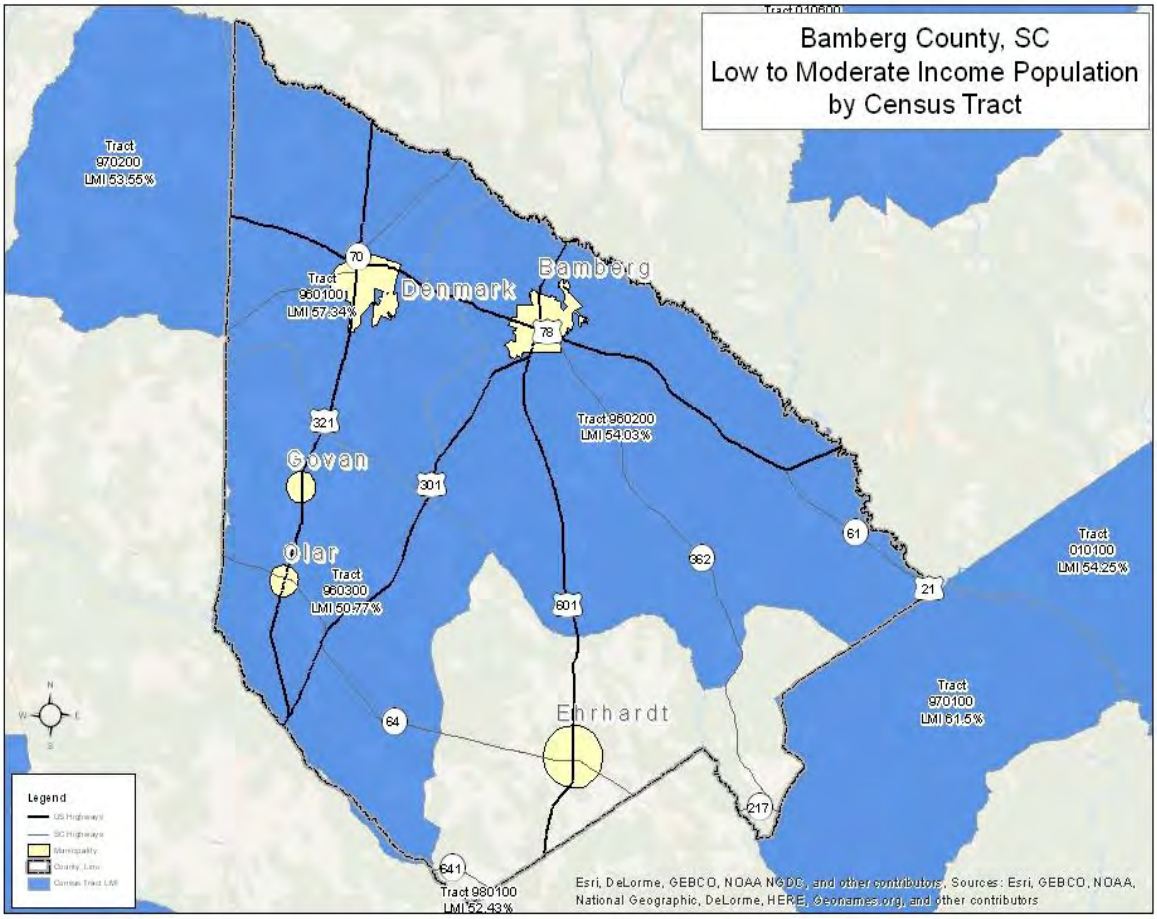
The following map includes critical facilities within Bamberg County.

Map 2: Critical Facilities Map



The following map includes low to moderate income population concentrations by Census Tract within Bamberg County.

Map 3: LMI Map



1.3 Purpose

After review by the Task Force Committee, this section of the plan was updated to reflect consistency with the State 2018 HMP to include the seven (7) principles of the South Carolina mission for mitigation, as well as an overview of goals. (Found on page 13 of the SC State 2018 HMP)

This plan is designed to be both strategic as well as comprehensive in nature, providing a long-term vision of how the county will address hazards over time. The concept of multi-objective planning is emphasized throughout this document, identifying ways to link hazard mitigation policies and programs with complimentary goals of the county related to housing, economic development, recreational opportunities, transportation improvements, environmental quality, and public health and safety.

Mitigation planning offers many benefits, including:

- Saving lives and property;
- Saving money;
- Speeding recovery following disasters;
- Reducing future vulnerability through wise development and post-disaster recovery and reconstruction;
- Expediting the receipt of pre-disaster and post-disaster grant funding; and
- Demonstrating a firm commitment to improving community health and safety.

More importantly, mitigation planning has the potential to produce long-term benefits by breaking the repetitive cycle of disaster damages, injuries and loss of life. A core assumption of hazard mitigation is that a pre-disaster investment can significantly reduce the demand for post-disaster assistance. Further, the adoption of mitigation actions enables local residents, businesses and industries to more quickly recover from a disaster, getting the economy back on track sooner and with less interruption.

The benefits of mitigation planning go beyond reducing hazard vulnerability. Measures such as the acquisition or regulation of land in known hazard areas can help achieve multiple community goals, such as preserving open space, maintaining environmental health and enhancing recreational opportunities.

The purpose of this Plan and mission for mitigation as described in the SC State HMP 2018 is to:

1. To protect life, safety and property by reducing the potential for future damages and economic losses that result from natural hazards;

2. Meet the requirements of the DMA 2000, and therefore qualify for additional grant funding in the following programs: Hazard Mitigation Grant Program, and Pre-Disaster Mitigation Program;

3. To speed recovery and redevelopment following future disaster events;

4. Enhance the capability of all counties and municipalities to address identified hazards by providing technical support and training;

5. Establish an effective forum for state agencies and statewide organizations to discuss and coordinate existing and future plans, programs and data, rules and regulations and expertise addressing hazard-related issue;

6. Increase the effectiveness and efficiency of hazard mitigation programs and projects sponsored, finances or managed by state agencies or statewide organizations; and

7. To demonstrate a firm local commitment to hazard mitigation planning principles.

Once adopted, the mitigation plan will help the communities of Bamberg County to take greater advantage of State and Federal funding opportunities for eligible hazard mitigation projects. For instance, to qualify for Federal aid for technical assistance and post-disaster funding, local jurisdiction must comply with the Disaster Mitigation Act of 2000 (DMA 2000) and its implementing regulations based on the *Hazard Mitigation Assistance Unified Guidance*, published by FEMA July 12, 2013.. The Bamberg County Natural Hazard Mitigation Plan has been prepared to address these hazard mitigation planning requirements. The FEMA Review Criteria in the preface of the document describes each of the major planning requirements and identifies where in the plan document they are addressed.

Another key purpose of the planning process is to ensure that proposals for mitigation actions are reviewed and coordinated among the participating jurisdictions within the County, and supported by technical assistance from appropriated regional, State and Federal agencies. In this way there is a high level of confidence that mitigation actions proposed by one jurisdiction, when implemented, will be compatible with the interests of adjacent jurisdictions and unlikely to duplicate or interfere with mitigation initiatives proposed by others. The last but not the least purpose of the Bamberg County Plan is to provide each participating local jurisdiction with a plan of action that can be adopted and implemented pursuant to its own authorities and responsibilities.

1.4 The Planning Process

After review by the Task Force Committee, the following changes were made to this section as part of the update process: changes necessary as part of the 2021 update to include the dates listed in Figure 3 to reflect more current documents and plans.

FEDERAL REQUIREMENTS FOR LOCAL HAZARD MITIGATION PLANS

Requirement 201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process **shall** include:

(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and

(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information

Requirement 201.6(c)(1): The plan **shall** document the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

This plan is designed to provide a blueprint for hazard mitigation activities in the general sense of the program and is structured to serve as a basis for specific hazard mitigation efforts for any disaster. It is recognized, however, that updates may be required to address specific issues arising from a given disaster.

This plan is currently being updated to comply with State and Federal mandates. As a result of the update, new elements will be included as necessary to meet FEMA regulations.

This plan identifies hazards and considers ways to reduce vulnerability to natural hazards in Bamberg County. It encompasses a range of life- and property-saving hazard mitigation initiatives in the categories of mitigation coordination, acquisition/relocation/retrofitting, floodplain management, public safety, emergency preparedness, earthquake, tornado, drought, etc. Both short-term and long-term hazard mitigation measures are identified in order to help all state and local agencies allocate resources in a responsible manner in order to provide for the public safety, public health, and general welfare of all the people in Bamberg County.

This plan has taken into account the mitigation experience, and a variety of mitigation projects, from other counties near or surrounding Bamberg County and the State of South Carolina.

It has taken advantage of the collective mitigation knowledge of many State, Federal, and Local officials, as well as representatives from both the public and private sectors, and is designed as one

component to help safeguard the citizens of Bamberg County. As such, it should significantly contribute to the mitigation of future disasters.

Bamberg County utilized federal and state guidance documents, existing local plans and studies, and data to develop this plan. More specifically, the Bamberg County Comprehensive Plan provided demographical statistics that were incorporated into this plan; the Bamberg County Land Development Regulations provided specific no-build scenarios in the floodplains and building codes enforcement; and the SC HMP 2018 provided a framework and was used as a guide to updating this plan. Other specific examples include:

Figure 3. Existing Plans/Studies/Guides

Plans/Studies/Guides	Author
Bamberg County Multi-Jurisdictional HMP	Bamberg County/LSCOG
Hazard Mitigation Assistance FY 2013 Unified Guidance	FEMA
FY 2013 PDM Program Guidance	FEMA
SC Floodplain Management Quick Guide 2008	SCDNR
Hazard Mitigation Planning	FEMA
Bamberg County Comprehensive Plan	Bamberg County/LSCOG
Bamberg County Zoning Ordinance	Bamberg County/LSCOG
Bamberg County LDR	Bamberg County/LSCOG
Bamberg County EOP	Bamberg County
National Flood Insurance Program	FEMA
SC HMP 2018	SCEMD
SC Emergency Operations Plan	SCEMD

This plan utilized the process required by the Federal Emergency Management Agency to develop the plan. A Hazard Mitigation Planning Crosswalk is found in Appendix D and provides a summary of plan requirements, including where they are located. The hazard mitigation planning process included the following steps, listed in the order in which they were undertaken and will be described in greater detail throughout the plan:

- Step 1: Establish a Core Planning Team (Task Force)
- Step 2: Data collection, Risk Assessment
- Step 3: Hazard Identification
- Step 4: Create Hazard Mitigation Plan
- Step 5: Develop Goals and Mitigation Strategies
- Step 6: Adopt and Implement Plan

The planning process followed in Bamberg County was intended to enhance public awareness and understanding about how the community could become safer from the impacts of future disasters. The plan provides a decision tool for management by department staff in local governments, local elected and appointed officials, business and industry, community associations and other key institutions and organizations to take actions to address vulnerabilities to future disasters. It provides proposals for specific projects and programs that are needed to eliminate or minimize the vulnerability of the County. One component of the hazard mitigation planning process was a capability assessment of existing policies, programs and regulations for managing growth and development within the County. The study contractors reviewed relevant County and local government comprehensive plans, zoning ordinances, floodplain regulations, and building codes to gain an understanding as to how current development regulations and practices either hinder or support hazard mitigation initiatives.

This process also involved reviewing current mitigation-related policies of local and county government and comparing them to the hazards that threaten the jurisdiction and the relative risks they pose to the community. This comparison supports and justifies efforts to propose enhancement to policies, programs, and regulations that should be implemented to create a more disaster-resistant future for Bamberg County. This process was led by the Bamberg County Hazard Mitigation Task Force members and supported by the Lower Savannah Council of Governments staff.

1.5 Planning Process Documentation

As part of the update process, the Task Force Committee reviewed this section and made the necessary member additions to the committee, participating municipality additions, and meeting dates and times.

The following is documentation of the various steps of the planning process. The preparation of the plan required a series of meetings and workshops for facilitating discussion and initiating data collection efforts. More importantly, the meetings and workshops prompted continuous input and feedback throughout the planning and update process. Sign-in sheets, letters, agendas, surveys, and news releases are included in the appendix of this document.

Bamberg County Natural Hazard Mitigation Plan Task Force Committee

The plan was developed through a Task Force Committee comprised of LSCOG staff, the heads of the county emergency service offices, representatives from the incorporated municipalities, and private entities. The committee helped to guide the creation and development of the plan, and participated in the five-year update process of the plan. These committee members were chosen as a result of their expertise in hazard preparation and planning within their respective county and municipalities.

The Task Force Committee includes:

Mayor Nancy Foster	City of Bamberg, Mayor
Robin Chavis, City Clerk	City of Bamberg, Clerk
Mayor Gerald Wright	City of Denmark, Mayor
Heyward Robinson, City Administrator	City of Denmark, Administrator
Mayor William Stanley	Town of Ehrhardt, Mayor
Katie Stroman	Town of Ehrhardt Administrator
Mayor Wilam Edmonds	Town of Govan, Mayor
Mayor Walter O'Rear	Town of Olar, Mayor
Sharon Hammond, County Council Chair	Bamberg County Council
Joey Preston, County Administrator	Bamberg County
Thomas Thomas, Finance Director	Bamberg County
Bill Johnson	Bamberg County
Doretta Elliott, County Assessor	Bamberg County Tax Assessor
Paul Eubanks, Fire Coordinator	Bamberg County Emergency Services
Tiffany Kemmerlin	Bamberg County Emergency Services Director

Lower Savannah Council of Governments

Emory Langston, Planning, Community and Economic Development Administrator
Matthew Abney, Intern Planner
Leslie Crawford, GIS Planner

Participating Municipalities:

City of Bamberg
City of Denmark
Town of Ehrhardt
Town of Govan
Town of Olar

Meetings, Workshops, Training, Correspondence:

Memorandum of Agreement from County: November 8th, 2018
A MOA was received from the County indicating their approval of the 25% match requirement totaling $5,208.34.

SCEMD Meeting – August 5, 2019, 10:00 a.m.
LSCOG staff met with SCEMD staff to discuss the needs of the Hazardous Mitigation Plan updates for five counties in the LSCOG region.

HMP Update Kick-off Meeting County Emergency Management Directors and SCEMD Staff September 3, 2019, 10:00 – Had to be postponed due to activation of SCEMD for Dorian.

HMP Update Kick-off Meeting for County Emergency Management Directors and SCEMD Staff
October 7, 2019, 10:00 am
Kick-off meeting to discuss upcoming update process, requirements, timelines, needs from the County Directors

November 13, 2019 - Bamberg County HMP Task Force Committee Meeting – November 13th, 2019 – Met with Brittany Barnwell, EMD, Director for Bamberg County. No other members attended the meeting.

December 2019 – February 2020 – LSCOG staff updated data and other information in the Bamberg County HMP.

February 11, 2020 – Email correspondence with Brittany Barnwell, Bamberg County EMD requesting meeting regarding next steps in process.

March 6, 2020 – LSCOG staff met with Brittany Barnwell, Bamberg County EMD, for review and updates, goals and objectives.

IT SHOULD BE NOTED AT THIS POINT IN THE TIMELINE, DUE TO COVID 19, MOST ALL CORRESPONDANCE WITH THE TASKFORCE HAS BEEN DONE BY TELEPHONE, CONFERNECE CALL OR EMAIL. THIS HAS MADE THE PROCESS VERY CHALLENGING.

June 2020 – Reached out to Brittany Barnwell, Bamberg County EMD to set up taskforce meeting for mid-July.

September 2020 – SCEMD informed LSCOG staff that Ms. Barnwell was no longer with Bamberg County and passed along the person fulfilling the EMD duties.

September – October 2020 – Attempts to reach the EMD with Bamberg County.

November 19, 2020 – Meet with Ms. Tiffany Kemmerlin, Interim Director for Bamberg County EMD to review HMP and what needed to be done going forward.

December 2, 2020 – Email invitation to all Task Force members regarding conference call on December 9, 2020

December 7, 2020 Packets of information regarding municipal specific information sent out to all taskforce members.

December 9, 2020 – 2:00 Conference Call for all Bamberg County Task Force members for review and updates for the HMP. Request that any changes, updates, additions be done by December 18, 2020.

January 4, 2020 – No edits received to LSCOG or Bamberg County – proceeding as prescribed from conference call.

1.6 Participants Involved in the Planning Process

After review by the Task Force Committee, this section remains largely unchanged.

The plan is intended to serve as a coordinative tool through which local agencies and organizations identify complimentary objectives that systematically reduce the impact of hazards in Bamberg County. The plan also serves to coordinate and integrate the responsibilities, authorities and programs of the "participating" and "cooperating" agencies and organizations.

County and Municipality Participation

County, city, and town participation must be defined in order to create a standard for participation in order for the entities to be considered as participants in the Natural Hazard Mitigation Plan process. Invitations (by phone and letter) were extended to mayors, administrators, and managers to attend the County Hazard Mitigation Meetings. Officials were informed through email, phone calls and letters that LSCOG needed their input and comments in order to be considered active participants in the plan.

In order for the county to approve the plan and be an official participant of this planning process, they must satisfy the following consideration:

- The county Emergency Management Director must be a member of the Natural Hazard Plan Task Force Committee and provide input and comments to the plan.

In order for cities and towns to be official participants of the planning process, they must satisfy one of the following considerations:

- The mayor, administrator, or manager attends a county or public meeting and provides input and comments concerning the Natural Hazard Mitigation Plan.
- The mayor, administrator, or manager appoints a city or town employee to attend a county or public meeting and provides input and comments concerning the Natural Hazard Mitigation Plan.
- A LSCOG Planning staff member personally discusses the Natural Hazard Mitigation Plan with a mayor, administrator, manager, or appointed municipal representative and receives input and comments from that individual.

Bamberg County Local Government Participation

City of Bamberg

City of Denmark

Town of Ehrhardt

Town of Govan

Town of Olar

Non-Participating Municipalities

Bamberg County was successful in achieving 100% participation from all incorporated municipalities in the planning and update process of the Natural Hazard Mitigation Plan.

1.7 Public Participation

Due to Covid-19, adjustments had to be made in regards to Public Participation.

Throughout the planning and update process, there have been opportunities for public input. The process provided neighboring communities, other agencies, the private sector, and academia an opportunity to participate in the planning process. To engage the community in the hazard mitigation planning process, the Task Force Committee held public input meetings designed to inform the participants about hazard mitigation, generate discussion, and receive feedback on the HMP; letters were sent to communities; news releases in area newspapers and other media outlets informed area residents; etc.

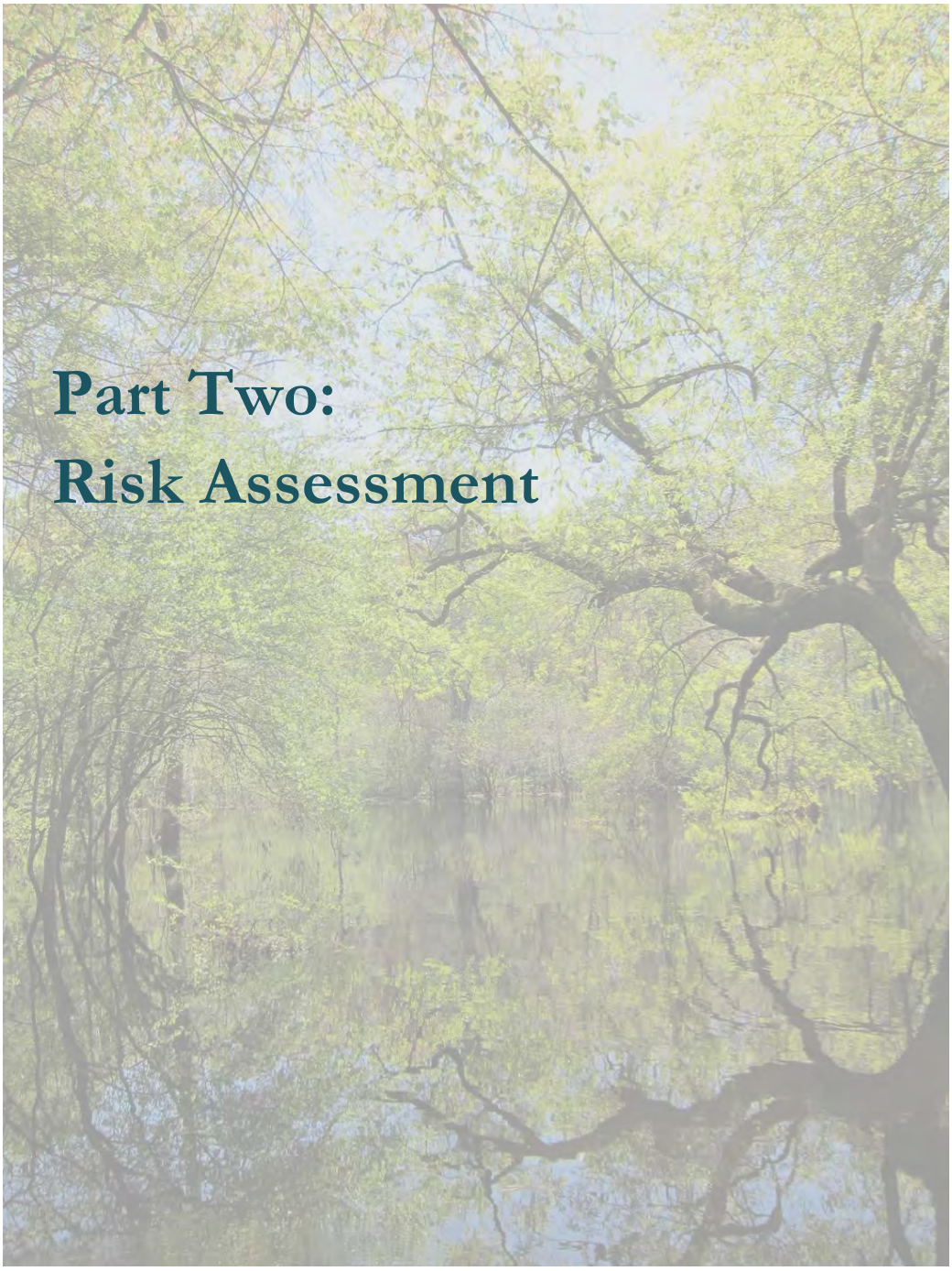
Public meetings were held during the drafting stage and prior to plan adoption. During the project kick-off meeting the planning process was described and initial findings of the risk assessment presented for review and comment. Each of the meetings was advertised through various types of notices, including notices in the local newspaper. In addition, copies of the risk assessment and final draft plan were made available for the public at various viewing locations in the county and the municipalities. An email address and the telephone number of Lower Savannah COG were provided with the draft plan to provide a mechanism for the public to provide comments back to plan development facilitators. The public was informed of the final draft availability and the opportunity for comment through notices placed in local newspapers. All comments that were received to date from the public were reviewed and incorporated into the final version of the plan as appropriate.

1. Public Meeting during the Drafting Stage of the Plan

The public was invited to review the Bamberg County HMP update on several websites and social media platforms from _____and to comment on the drafting stage of the Hazard Mitigation Plan. The public had the opportunity to comment on the plan during its drafting stage throughout the process. In addition to the draft stage of the plan, the public was invited to make comments on the final draft plan on _____ in the Bamberg County Council Chambers.

2. Public Notice of Adoption of Plan

In addition, the public will be invited to provide input prior to Plan adoption. This will include plan adoption hearings of the governing bodies of the participating jurisdictions. A public notice of the adoption hearing will be inserted in local newspapers available within all participating jurisdictions. The public notice prior to plan adoption will take place once FEMA has formally approved the plan pending adoption.



Part Two:
Risk Assessment

2.1 Types of Risks

As part of the plan update process, the Task Force Committee reviewed and analyzed this section. Each hazard description was reassessed and updated to include most current data and all participating jurisdictions. This section also included the requirements below:

FEDERAL REQUIREMENTS FOR LOCAL HAZARD MITIGATION PLANS

Requirement 201.6(c)(2): The plan **shall** include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identifies hazards.

Requirement 201.6(c)(2)(i): The risk assessment **shall** include a description of the type of all natural hazards that can affect the jurisdiction.

Risk Assessment

The Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from natural or man-made hazards. The results of this risk assessment assist Bamberg County and its incorporated municipalities and unincorporated areas in identifying and understanding their risks from natural hazards. This information also serves as the foundation for the development of the mitigation plan and strategies to help reduce risks from future hazard events. The Risk Assessment section answers the fundamental question that fuels the hazard mitigation planning process: *What would happen if a hazardous event occurred in Bamberg County or its incorporated municipalities*?

Risk Assessment Approach

- Determine which hazards pose a serious risk to Bamberg County.
- Describe what these hazards can do to physical, social, and economic assets of Bamberg County.
- Identify which areas of the County are most vulnerable to damage from these hazards.
- Determine damages that may result from the identified hazards.
- Use the Risk Assessment section to identify mitigation actions and set priorities for implementation.

FEMA Requirements Addressed

The Task Force Committee used a risk assessment process consistent with the procedures and steps presented in the FEMA How-To-Guide "Understanding Your Risks: Identifying Hazards and Estimating Losses." The committee used the four-step risk assessment process shown in Figure 4.

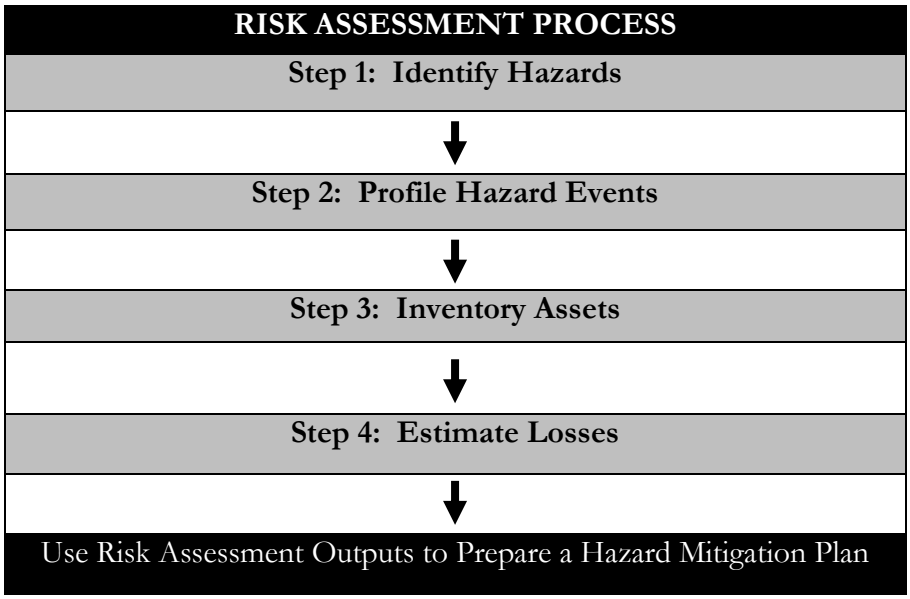


Figure 4: Risk Assessment Process

Hazard Identification

The first step in the risk assessment process was to identify each of the hazards that can occur within Bamberg County and its incorporated municipalities. This hazard identification process began with a review of previous hazard events based on historical data. Also, information was collected through general discussion at Task Force Meetings concerning hazard identification and prioritization of these risks. The USC Hazards Lab provided historical findings as well. The findings from these sources were utilized to determine the priority hazards for Bamberg County and its incorporated municipalities and unincorporated areas, which will become the focus of the mitigation strategies developed in the remainder of this plan.

The following will provide a factual basis for mitigation project proposals described later in this plan. The following points will be addressed for each natural hazard in this section:

Type

A brief description is provided for each hazard addressed in this section.

Location

The location of past events is mapped or listed in this section.

Extent

The effect and impact of past events is examined in this section for each hazard type.

Probability

To determine the probability of a natural hazard event, the number of events, total number of years those events have been recorded, and the frequency of events must be determined. The recurrence interval is also helpful in portraying how common a certain type of hazard is. Dividing the number of years by the number of events produces the recurrence interval, or how often the event will occur per year. The percentage frequency of events is determined by dividing the number of events by the total number of years and multiplying by 100. This gives a reliable sense of the chance a hazard will occur per year.

Vulnerability

The overall vulnerability of each individual hazard is discussed and analyzed for Bamberg County and its municipalities. A rating of high, mid level, and low vulnerability is given to each hazard. Vulnerability is determined by assessing the probability and extent of the hazards that affect the specific area.

Of the many types of hazards that threaten the United States, there are some that have never occurred in South Carolina. Those hazards that have threatened the Lower Savannah Region of South Carolina will be addressed. The hazards that have been examined in this plan were decided on by LSCOG staff and the Task Force Committee.

The following are the specific hazards that will be examined in this section of the Natural Hazard Mitigation Plan, in no particular order.

1. Tornadoes/Severe Windstorm
2. Hurricanes
3. Hail
4. Drought
5. Earthquakes
6. Wildfires
7. Flood
8. Winter Storms

Figure 5. Jurisdictions Affected by Hazard Type	
Hazard	**Jurisdictions Affected**
Tornadoes/Severe Windstorms	Specific Jurisdictions
Hurricanes	Countywide
Hail	Specific Jurisdictions
Drought	Countywide
Earthquakes	Specific Jurisdictions
Wildfires	Countywide
Flood	Countywide
Winter Storms	Countywide

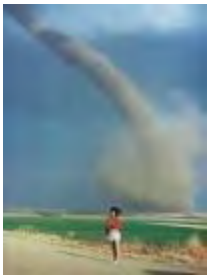
Profiling Hazards

FEDERAL REQUIREMENTS FOR LOCAL HAZARD MITIGATION PLANS

Requirement 201.6(c)(2)(i): The risk assessment **shall** include a description of the location and extent of all natural hazards that can affect the jurisdiction. The plan **shall** include information on previous occurrences of hazard events and on the probability of future hazard events.

It is important to understand the types of hazards that affect Bamberg County and its municipalities. Projects and actions will be discussed in further detail to address these natural hazards which threaten this region. The extent of the hazard and its future probability are important considerations to take when preparing for an event.

Tornado/Severe Windstorm Analysis



Hazard Description

A tornado is a violent storm with winds up to 300 miles per hour. It appears as a rotating funnel-shaped cloud, gray to black in color, extending toward the ground from the base of a thundercloud. The average tornado moves southwest to northeast at a forward speed of 30 miles per hour, but tornadoes can move in any direction and may vary from stationary to 70 miles per hour. Tornadoes are most frequent east of the Rocky Mountains during spring and summer months between the hours of 3 PM and 9 PM. In the South, tornadoes touch down most frequently from the month of March through June. Tornadoes may also accompany hurricanes. Tornadoes are especially dangerous because they appear transparent until they begin to pick up debris and dust. These short-lived storms are most violent of all atmospheric phenomena, and over a small area, are the most destructive. Approximately 1,253 tornadoes occur across the nation each year (1991-2010), resulting in nearly 563 deaths. Damage paths can exceed one mile wide and 50 miles long. Based on NOAA's *Average Annual Number of Tornadoes per State Map* (1991-2010), South Carolina has an average of 27 tornadoes per year.
Source: NOAA

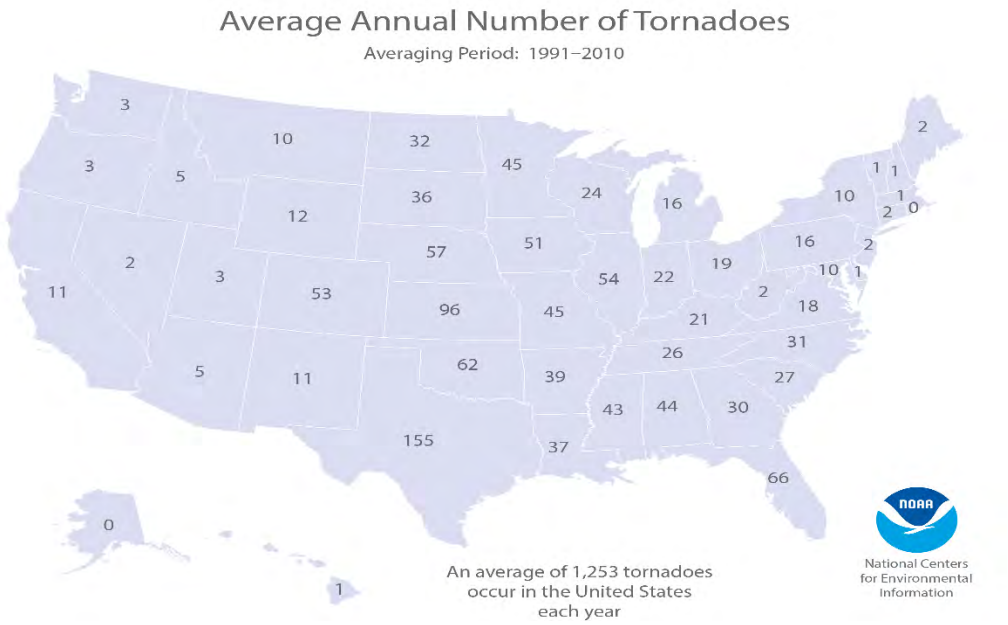


Figure 6: Average Number of Tornadoes per State Map (1991-2010)

Tornadoes are most often generated by thunderstorm activity or any situation of severe weather with high winds. High winds can cause downed trees and power lines, flying debris, and building collapses, all of which may lead to power outages, transportation disruptions, damage to buildings and vehicles, and injury or death. Flying debris is the primary cause of damage during a windstorm.

Severity

The Fujita Scale (F-Scale) is the standard measurement for rating the strength of a tornado. The National Weather Service (NWS) bases this scale on an analysis of damage after a tornado to infer wind speeds. On February 1, 2007, the NWS transitioned from the F-Scale to the Enhanced Fujita Scale (EF-Scale). The EF-Scale is considerably more complex and enables surveyors to assess tornado severity with greater precision. Figure 7 details both scales below.

F-Scale and EF-Scale				
F-Scale	**3-sec. gust speed (mph)**	**EF-Scale**	**3-sec. gust speed (mph)**	**TYPICAL DAMAGE**
F0	45-78	**EF0**	65-85	Light damage. Some damage to chimneys. Branches broken off trees. Shallow-rooted trees pushed over; signboards damaged.
F1	79-117	**EF1**	86-109	Moderate damage. Peels surface off roofs. Mobile homes pushed off foundations or overturned. Moving autos blow off roads.
F2	118-161	**EF2**	110-137	Considerable damage. Roofs torn off frame houses. Mobile homes demolished. Boxcars overturned. Large trees snapped or uprooted. Light-object missiles generated. Cars lifted off ground.
F3	162-209	**EF3**	138-167	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.
F4	210-261	**EF4**	168-199	Devastating damage. Well-constructed houses leveled. Structures with weak foundations blown away some distance. Cars thrown and large missiles generated.
F5	262-327	**EF5**	200-234	Incredible damage. Strong frame houses leveled off foundations and swept away. Automobile-sized missiles fly through the air in excess of 100 meters. Trees debarked. Incredible phenomena will occur.

Figure 7: F-Scale and EF-Scale

The Beaufort Wind Scale is a simplified scale to aid in the estimation of wind speed and corresponding typical effects. Figure 8 below illustrates the wind scale.

Beaufort Wind Scale		
Wind Speed (mph)	**Name**	**Damage**
25-31	Strong Breeze	Large branches in motion; whistling in telephone wires; umbrellas used with difficulty
32-38	Near Gale	Whole trees in motion; resistance felt while walking against the wind
39-46	Gale	Twigs break off of trees; wind impedes walking
47-54	Strong Gale	Slight structural damage to chimneys and slate roofs
55-63	Storm	Seldom felt inland; trees uprooted; considerable structural damage
64-72	Violent Storm	Very rarely experienced; widespread structural damage; roofing peels off buildings; windows broken; mobile homes overturned
73+	Hurricane	Widespread structural damage; roofs torn off homes; weak buildings and mobile homes destroyed; large trees uprooted

Figure 8: Beaufort Wind Scale

Location

The tornado touchdowns for Bamberg County and its incorporated municipalities, and all unincorporated areas of the County, can be seen on the tornado map. There have been 18 recorded touchdowns in Bamberg County over the past 68 (1951-2019) recorded years. Most often, tornadoes have touched down in the southwestern portion of the county's unincorporated territory. These areas border the towns of Govan and Olar. The risk assessment is based on reported tornado events. Therefore, the occurrence of events seems to be highest in areas with higher population densities. Tornado touchdowns in rural areas frequently occur without report simply because no one is around to witness the event. The largest recorded tornado, an F3 magnitude, occurred in the far eastern region of the county along Highway 79. Most other tornadoes occurring in Bamberg County have been fairly weak except for the singular F3 reported in 1983. All other tornadoes have been either an F0 or F1 causing minimal damage.

Extent

Figure 9 below illustrates the historic occurrences and locations of tornadoes that have affected Bamberg County and its incorporated municipalities. A tornado can occur anywhere in the County. Bamberg County has experienced 20 noted tornadoes in the past 68 (1951-2019) years.

These tornadoes have caused a total of five (5) injuries and no fatalities. The tornadoes that have touched down in Bamberg County have ranged from F0 to F3 magnitudes. Of the tornadoes, thirteen (13) were F0, six (6) were F1, and one (1) was a F3. According to Figure 7, the wind speeds of these tornadoes have ranged from 45 miles per hour to 209 miles per hour, and had the potential to cause severe damage.

Figure 9. Tornado Events in Bamberg County

Date	Location	Description
9/11/2017	Olar	F0 Magnitude
1/21/2017	County	F1 Magnitude
06/06/2014	County	F0 Magnitude
05/20/2008	Govan	F1 Magnitude
03/15/2008	Bamberg	F1 Magnitude
03/15/2008	Denmark	F1 Magnitude
04/15/2007	Ehrhardt	F0 Magnitude
04/15/2007	Springtown/County	F0 Magnitude Property damage recorded at $1K
02/13/2007	Olar	F0 Magnitude
05/07/2006	Bamberg	F0 Magnitude
01/13/2006	Bamberg	F0 Magnitude
09/07/2004	Ehrhardt	F0 Magnitude
06/12/2001	Ehrhardt	F0 Magnitude
09/23/2000	Denmark	F0 Magnitude
04/15/1999	Midway/County	F0 Magnitude Property damage recorded at $0.5K
03/08/1998	Govan	F0 Magnitude
08/16/1994	Govan	F1 Magnitude Property damage recorded at $50K 1 injury reported
04/23/1983	County	F3 Magnitude Property damage recorded at $2.5M 4 injuries reported
11/23/1961	County	F0 Magnitude Property damage recorded at $0.3K
06/24/1951	County	F1 Magnitude Property damage recorded at $25K

Probability

Figure 10. Tornado Probability for Bamberg County

Municipality	# of Events	Years in Record	Recurrence Interval	Hazard Frequency %
Bamberg	3	68	22.7	4.4%
Denmark	2	68	34	2.9%
Ehrhardt	3	68	22.7	4.4%
Govan	3	68	22.7	4.4%
Olar	2	68	34	2.9%
Unincorporated	7	68	9.7	10.3%
County	20	68	3.4	29.4

Source: NCDC

Though infrequent, tornadoes are not unprecedented in Bamberg County. Over the past 68 years, 20 tornadoes have touched down within the County. Based on the historic frequency, an estimate of one tornado will touchdown in the unincorporated area every 9 to 10 years. The frequency of which a tornado could hit each year in the County is approximately 10%.

The incorporated municipalities have experienced a range of one to three tornadoes over the past 68 years. The Town of Bamberg, Town of Ehrhardt, and Town of Govan are estimated to have one tornado every 21 to 23 years; with a frequency of 4.4% per year. The City of Denmark is estimated to have one tornado every 34 years, with a frequency of 2.9% per year. The Town of Olar has experienced two tornados in the past 68 years, and has a frequency of 2.9%.

Vulnerability

High wind events can pose a serious threat to people and infrastructure. Bamberg County, in particular its incorporated municipalities (urban core), provides an environment where numerous objects can become flying debris and severely injure people and damage structures.

Structural vulnerability to wind is related to the building's construction type. Wood structures and manufactured homes are more susceptible to wind damage, while steel and concrete buildings are most resistant.

Based on the results from Figure 9, Bamberg County has a low vulnerability to tornadoes. The percent chance a tornado will touch down in the unincorporated area of the county is 10.3% in a year time frame.

From the past 68 years, there was only one F3 category tornado that reported major damage for the unincorporated county ($2.5M in property damage and four injuries). The other 19 past events did not exceed the F1 category storm and minimal damage occurred. The impact of tornado events on each participating jurisdiction varies, and from the tornado extent section one can see that the impact of past tornadoes on the county as a whole has been low.

Additionally, as of November 30, 2020, the values on the County tax rolls shows an assessed market value of $200,551,240 for residential, $39,213,090 for commercial, and $515,143,574 for agricultural. The total number of Parcels in Bamberg County is 14,132.

Hurricane/Tropical Storm Analysis

Hazard Description

Hurricanes, including coastal storms and tropical storms can have affects on inland areas and not just coastal areas. Bamberg County has been affected by hurricanes/tropical storms in the past.

Tropical Storms and Hurricanes

A hurricane is a type of tropical cyclone, which is a generic term for a low-pressure system that generally forms in the tropics. Thunderstorms and, in the Northern Hemisphere, a counterclockwise circulation of winds near the earth's surface accompany the cyclone. Tropical cyclones are classified as follows:

- A tropical depression is an organized system of clouds and thunderstorms, with a defined surface circulation, and maximum sustained winds of 38 miles per hour or less.
- A tropical storm is an organized system of strong thunderstorms, with a defined surface circulation, and maximum sustained winds of 39 to 73 miles per hour.
- A hurricane is an intense tropical weather system of strong thunderstorms, with a well-defined surface circulation, and maximum sustained winds of 74 miles per hour or higher.

Atlantic hurricane season lasts from June to November, averaging eleven (11) tropical storms each year, six (6) of which turn into hurricanes. According to the National Hurricane Center, the Atlantic hurricane season is currently in a period of heightened activity that began around 1995, and could last at least another decade.

Heavy rain, coastal flooding, and powerful winds are commonly associated with hurricanes. Storm surge is often the greatest hurricane-related hazard. Storm surge is water that is pushed toward the shore by the force of the winds swirling around the storm. This advancing surge combines with the normal tides to create the hurricane storm tide, which can increase the mean water level fifteen (15) feet or more. In addition, wind driven waves are superimposed on the storm tide. This rise in water level can cause severe inundation in coastal areas, particularly when the storm tide coincides with the normal high tides.

Severity

The NWS uses the Saffir-Simpson Scale to classify hurricane severity. The scale categorizes a hurricane's present intensity on a one (1) to five (5) rating and provides an estimate of property damage and coastal flooding upon landfall. Wind speed determines a hurricane's Saffir-Simpson Scale rating since storm surge is greatly dependent on the coastline shape and slope of the continental shelf. Figure 11 below illustrates the Saffir-Simpson Hurricane Scale.

Saffir-Simpson Hurricane Scale				
Category	**Storm Surge (ft)**	**Winds (mph)**	**Damage**	**Damage Description**
1	6.1 – 10.5	74 – 95	Moderate	• Damage primarily to trees and unanchored homes • Some damage to poorly constructed signs • Coastal road flooding
2	13.0 – 10.5	96 – 110	Moderate-Severe	• Some roofing material, door, and window damage to buildings • Considerable damage to shrubbery and trees • Flooding of low-lying areas
3	14.8 – 25	111 – 130	Extensive	• Some structural damage to residences and utility buildings • Foliage blown off trees and large trees blown down • Structures close to the coast will have structural damage by floating debris
4	24.6 – 31.3	131 – 155	Extreme	• Curtainwall failures with utilities and roof structures on residential buildings • Shrubs, trees, and signs all blown down • Extensive damage to doors and windows • Major damage to lower floors of structures near the shore
5	Not predicted	>155	Catastrophic	• Complete roof failure on many residences and industrial buildings • Some complete building and utility failures • Severe, extensive window and door damage • Major damage to lower floors of all structures close to shore

Figure 11: Saffir-Simpson Hurricane Scale

Hurricane winds can cause widespread destruction; even tropical storm-force winds can be very dangerous. Such high winds can pick up debris and turn them into dangerous airborne objects, knock down trees and buildings, and destroy manufactured homes. The Saffir-Simpson Scale categorizes

hurricane intensity based on sustained wind speeds and correlated potential property damage.

Hurricanes are capable of generating great amounts of rainfall. Rainfall rates are related to the size and strength of the hurricane; slower moving and large storms tend to generate more rain.
Hurricanes and tropical storms may spawn tornadoes that are typically further out from the center of the system; generally embedded in the rain bands. Hurricane-spawned tornadoes also generally have a shorter lifespan but can still cause damage.

Location
Although hurricanes make landfall in the coastal areas, all counties in South Carolina have experienced damage from hurricanes. Some of the most destructive hurricanes and tropical storms have originated in the Gulf of Mexico or traveled around the tip of Florida. Identification of hurricane tracks/tropical storms was based on the most recent data available from NOAA Coastal Services Center. The map below shows hurricane and tropical storm tracks in Bamberg County and its incorporated municipalities. On the following page, Map 5 reflects hurricane evacuation routes for Bamberg County.

Map 5: Hurricane/Tropical Storm Map

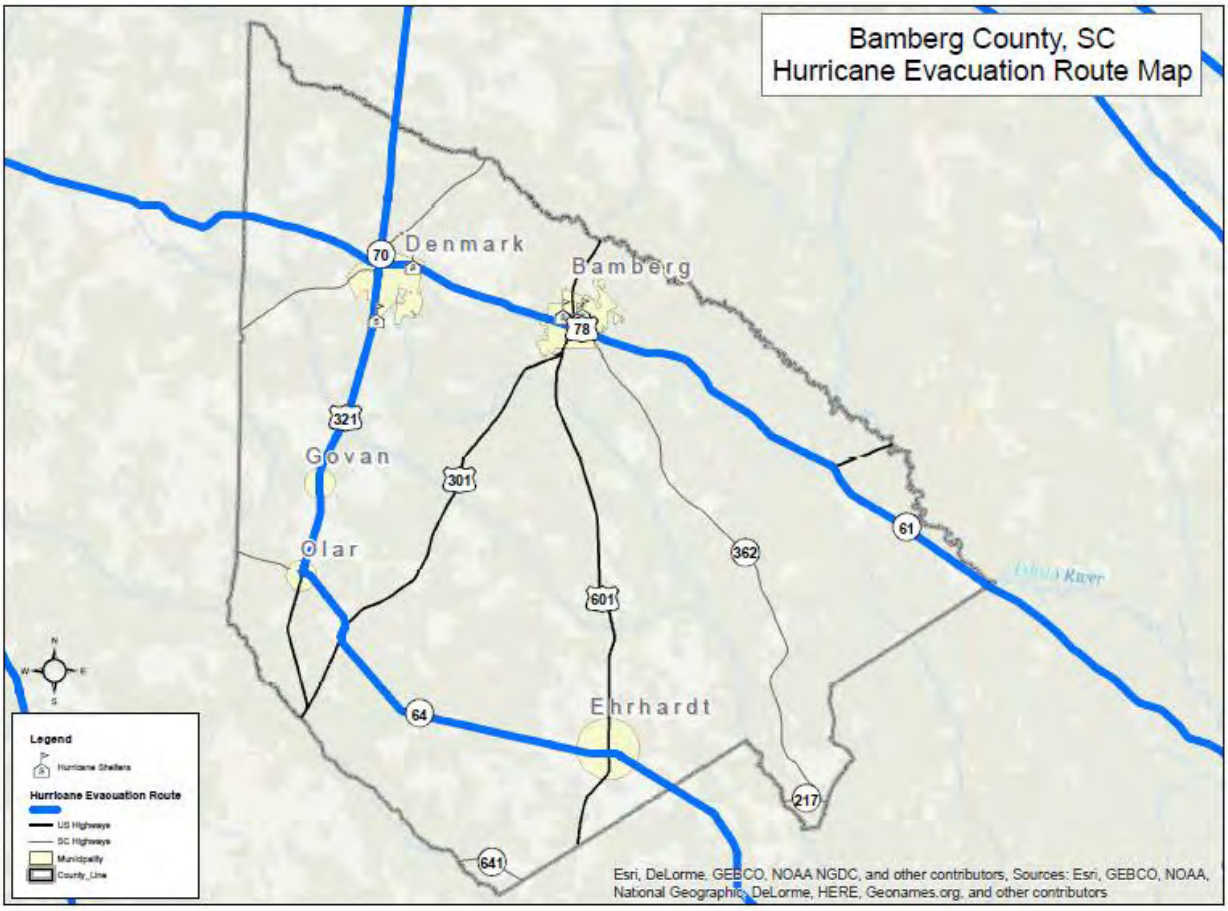
Historical Hurricane Tracks

National Oceanic and Atmospheric Administration

Summary of Search

Location: 33.2168,-81.0332
Buffer: 92600 Meters (50 Nautical Miles)
Search was not refined

Map 6: Hurricane Evacuation Route Map



Extent

The hurricane map on the previous page illustrates the travel patterns of the recorded hurricane tracks and tropical storms. Actual hurricane landings have not posed a true threat to Bamberg County, however, the storms aftermath have been identified as an event risk. The hurricane track map has identified 3 named and unnamed hurricane events that have been tracked through the county dating back to 1852 through 2019. Of these recorded events, all 3 measured within the aforementioned Hurricane Scale, ranging from a category 1 to a category 3. This equated to moderate to extreme damage, including damage to trees and shrubbery, damage to buildings, and flooding.

In the past 167 (1852-2019) years there have been a recorded 13 tropical storms in the county ranging in wind speeds of 35 mph to 60 mph. The aftermath affects of these tropical storms produces unusually heavy rains and some flash flooding in the area. Since the previous update, there have been zero (0) tropical storm events reported between 7/01/2010 and 7/31/2015 as reported by NOAA.

Because no tropical storm events occurred, there was no impact to the County, and as a result of no tropical weather, no damage to property or crops was reported.

Probability

The following figures show hurricane/tropical storm probability in Bamberg County. However, because actual landings of hurricanes have not occurred in this particular area, the data is an estimate of the unusual occurrence of excessive winds, heavy rainfall, and flooding.

Figure 12. Hurricane Probability for Bamberg County

	# of Events	Years in Record	Recurrence Interval (Years)	Hazard Frequency (% Chance per Year)
Countywide	3	167	55.6	1.8%

Source: NOAA

Figure 13. Tropical Storm Probability for Bamberg County

	# of Events	Years in Record	Recurrence Interval (Years)	Hazard Frequency (% Chance per Year)
Countywide	13	167	12.8	7.8%

Source: NOAA

According to the most reliable hurricane/tropical storm data, there is a 1.2% chance a hurricane will impact the Bamberg County area during any given hurricane season, and a 8.4% chance a tropical storm will impact the county. During the recorded 167-year period, a recurrence interval of approximately every forty-one years was calculated that a hurricane event could occur. During the same time period, a recurrence interval of 12.8 years was calculated for a tropical storm event.

Vulnerability

Based on the results from figure 12, Bamberg County has a low vulnerability to hurricanes. Minor occurrences of unusually heavy rainfall, flooding, and excessive winds have affected the area due to the impact of a coastal hurricane. However, a hurricane landing pattern is unpredictable until the formation of the storm and until it is within a short time frame from landing. Therefore, it is not reasonable to assume that hurricane occurrences are not a foreseen threat in the future based solely on past events.

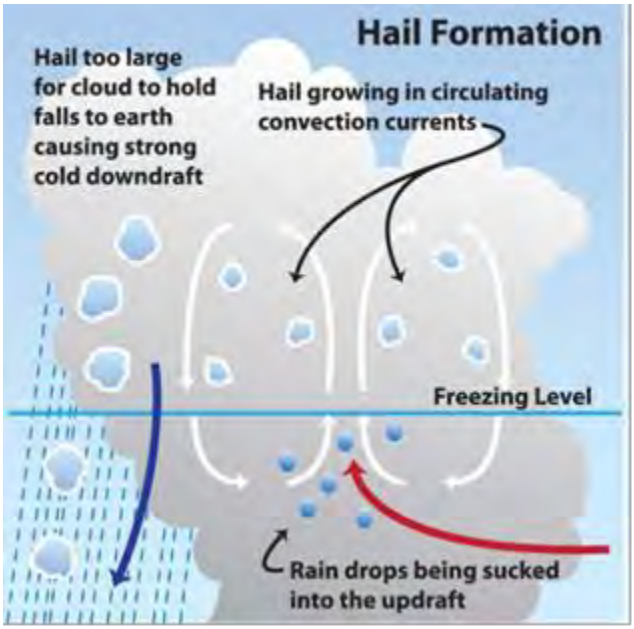
As far as tropical storm occurrences, it can be concluded that Bamberg County has a low vulnerability based on the results from figure 13 (7.8% hazard frequency per year).

Additionally, as of November 30, 2020, the values on the County tax rolls shows an assessed market value of $200,551,240 for residential, $39,213,090 for commercial, and $515,143,574 for agricultural. The total number of Parcels in Bamberg County is 14,132.

Hail Storm Analysis

Hazard Description

Hailstorms are a result of severe thunderstorms. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until, having developed sufficient weight, fall as precipitation, as balls or irregularly shaped masses of ice greater than 0.75 inches in diameter. The size of hailstones is a direct function of the size and severity of the storm. High velocity updraft winds are required to keep hail in suspension in thunderclouds. The strength of the updraft is a function of the intensity of heating at the Earth's surface. Higher temperature gradients relative to elevation above the surface result in increased suspension time and hailstone size. *(Source: SC State 2018 HMP).*



Severity

Bamberg County has experienced a total of 66 hailstorm events that have been documented in the past 44 years (1975 -2019). Of that, the City of Bamberg has experienced 17 hail events, the City of Denmark has a recorded 16 events in the same timeframe, the Town of Ehrhardt has had nine (9) events, the Town of Govan has had two (2) events, the Town of Olar has eight (8) recorded events, and the unincorporated area of the County has experienced 14 hail events.

Hail can cause serious damage, notably to automobiles, aircraft, skylights, glass-roofed structures, livestock, and most commonly, agricultural crops. Rarely, massive hailstones have been known to cause concussions or fatal head trauma.

According to the National Climatic Data Center, the State of South Carolina has experienced 5,917 hail events from 1950 to 2019. During this time span, all the counties in the state experienced hailstorms of varying sizes, up to four inches in diameter. These events total an estimated $84,317,100 in property damage, $4,299,000 in crop damage, caused 46 reported injuries, and no reported fatalities.

Hailstone size is often reported as compared to known objects rather than reporting the actual diameter. Below in figure 14 is a list of commonly used objects for this purpose.

Hailstone Size to Object Comparison	
Object/Coin	**Hailstone size (inches)**
Pea	0.25 in
Marble	0.50 in
Penny	0.75 in
Nickel	0.88 in
Ping-pong ball	1.50 in
Golf ball	1.75 in
Tennis ball	2.50 in
Baseball	2.75 in
Grapefruit	4.00 in
Softball	4.50 in

Figure 14: Hailstone Size to Object Comparison

Location

There have been a recorded 66 hail events since 1975 in Bamberg County. Hail size recorded in the county ranges from 0.75 inches to 2.75 inches. Bamberg County experiences a fair number of hail events with most being centered around the towns of Bamberg and Denmark. Bamberg and Denmark have experienced sixteen (16) events each over the last 44 years. However, the unincorporated areas experience a large number of hail events as well totaling fifteen (15) in the last 44 years. As usual, the reporting of hail occurrences tends to be higher in areas with larger populations. the Town of Ehrhardt has had nine (9) events in 24 years (1994-2019), the Town of Govan has had one (2) recorded hail events (2011, 2016), the Town of Olar has eight (8) recorded events in a 22 year timeframe (1997-2019).

Extent

Bamberg County has experienced 66 hail events that have been documented in the past 44 years (1975-2019). Since the last 5-year plan update, Bamberg County has had a recorded 19 events between 07/01/2010 and 02/11/2019 as reported by NOAA. The extent of the impact from hail during this 9-year period included 30 injuries, $28K in property damage and $24K in crop damage. A list of the events and dates they occurred in each municipality and unincorporated areas of the County is shown in Figure 15 below.

Figure 15. Historic Occurrences of Hailstorms in Bamberg County

Date(s)	Event	Location	Description(s)
1975-2019	Hail	County	· 0.75 to 2.75 inches in diameter (penny to baseball size hail) · $8K in property damage · $24K in crop damage
1994-2014	Hail	Bamberg	· 0.75 to 1.75 inches in diameter (penny to golf ball size hail)
1995-2012	Hail	Denmark	· 0.75 to 1.50 inches in diameter (penny to ping pong ball size hail)
1994-2014	Hail	Ehrhardt	· 0.75 to 1.75 inches in diameter (penny to golf ball size hail)
2011, 2016	Hail	Govan	· 0.75 inches in diameter (penny size hail), 1.00 Inches in diameter (Quarter size hail)
1997-2012	Hail	Olar	· 0.75 to 2.00 inches in diameter (penny to between golf ball and tennis ball size hail) · 31 reported injuries · $20K in property damage

Source: NOAA

The recorded hailstorms over the past 44 years (1975-2019) have caused 31 recorded injuries and no fatalities in the county. On May 20th, 2008, in the Town of Olar, one individual was injured due to

flying glass in her vehicle. Along with monetary estimates reported for property damage and crop damage, storm surveys in the County reported homes with damaged siding, windows, and roofs; vehicles with broken windows and vehicles being badly dented; and crops flattened.

Bamberg County has experienced a total of 66 hailstorm events that have been documented in the past 44 years (1975 -2019). Hail size ranged from 0.75 inches (penny) to 2.75 inches (baseball) for the County and its incorporated municipalities.

Probability

Based on the recorded hailstorm events for Bamberg County, there is a probability that a hailstorm will occur at least once, if not more every year in the County (0.7). A hailstorm event has more than a 100% likelihood of occurring every year in the County (135.2%).

Figure 16. Hailstorm Probability for Bamberg County

Municipality	# of Events	Years in Record	Recurrence Interval (Years)	Hazard Frequency (% Chance per Year)
Bamberg	16	44	2.75	36.4%
Denmark	16	44	2.75	36.4%
Ehrhardt	9	44	4.8	20.5%
Govan	2	44	22	4.5%
Olar	8	44	5.5	18.2%
Unincorporated	15	44	2.9	34.1%
County	*66*	*44*	*0.6*	*150%*

Source: NCDC

* Unable to calculate (cannot divide by zero)

** Percent is greater than 100.00, therefore hazard can be expected to occur more than once per year

Vulnerability

Overall, Bamberg County has a moderate vulnerability to hail. The majority of hail events occurred in Bamberg, Denmark, and the unincorporated areas of the county. Since hail reports Hail reports are often the observations of citizens, so the number events tend to be concentrated where there are more people to report. There is over a 100% chance that a hail event may occur in Bamberg County each year. The Cities of Bamberg and of Denmark have a 36.4% chance that hail may occur each year; the unincorporated areas of the county have a 34.1% chance that hail may occur each year.

A range of 0.75 to 2.75 inches in hail size is common for Bamberg County and its incorporated municipalities. There have been no fatalities in Bamberg County due to hail; however, there have been 31 reported injuries. Property damage has been reported to be about $28K, and crop damage has been roughly $24K. The degree of damage to property and crop is dependent on the hail size. Hailstorms can cause damage to roofs, automobiles, power lines, trees, gardens, agricultural crop, and other structural damage.

Additionally, as of November 30, 2020, the values on the County tax rolls shows an assessed market value of $200,551,240 for residential, $39,213,090 for commercial, and $515,143,574 for agricultural. The total number of Parcels in Bamberg County is 14,132.

Drought Analysis

Grant Blankenship for the New York Times

Hazard Description

The NWS describes four types of drought: meteorological, agricultural, hydrological, and socioeconomic.

Meteorological drought is defined in terms of the departure from a normal precipitation pattern and the duration of the drought hazard. Meteorological drought has a slow-onset that usually takes at least three months to develop and may last for several seasons or years.

Agricultural drought links the various characteristics of meteorological drought to agricultural impacts. The focus is on precipitation shortages and soil-water deficits. A plant's demand for water is dependent on prevailing weather conditions, biological characteristics of the specific plant, its stage of growth, and the physical and biological properties of the soil.

Hydrological drought refers to deficiencies in surface water and sub-surface water supplies. The frequency and severity of hydrological drought is often defined on a watershed basin scale. Although climate is a primary contributor, other factors such as changes in land use, land degradation, and the construction of dams all affect the hydrological characteristics of the basin. Hydrological droughts often lag behind meteorological and agricultural droughts.

Socioeconomic drought occurs when physical water shortage begins to affect the population, individually and collectively. Most socioeconomic definitions of drought associate it with supply, demand, and economic good.

Drought differs from other hazards in many ways. First, the effects of drought take a considerable amount of time to accumulate and the extent of the hazard can linger for prolonged periods after the drought itself had ceased. Second, the absence of a definitive and universally accepted definition of drought complicates the determination of whether a drought is occurring and the level of its severity. Third, compared to other natural hazards, the geographical area, impacts, and duration of drought are difficult to quantify.

Severity

The Palmer Drought Severity Index was developed in the 1960's and uses temperature and rainfall information in a formula to determine dryness. It has become the semi-official drought index. The Palmer Index is most effective in determining long term drought. It uses a zero (0) as normal, and drought is shown in terms of minus numbers; (i.e. minus 2 is moderate drought, minus 3 is severe drought, and minus 4 is extreme drought).

The different levels of drought as assigned by the SCDNR uses seven different indicators to measure the varying stages of drought throughout the state. Incipient means that the first stages of drought are beginning to appear according to the indices that measure rain level, stream level, crop moisture, and others. The levels following incipient are upgrades in drought status based on dynamic data. (SCDNR Climatology Office)

The South Carolina State Climatology Office measures drought intensity using a scale of D0 through D4; D0 being abnormally dry, D1-moderate, D2-severe, D3-extreme, D4-exceptional. Below is the South Carolina Drought Status, effective July 16, 2015.

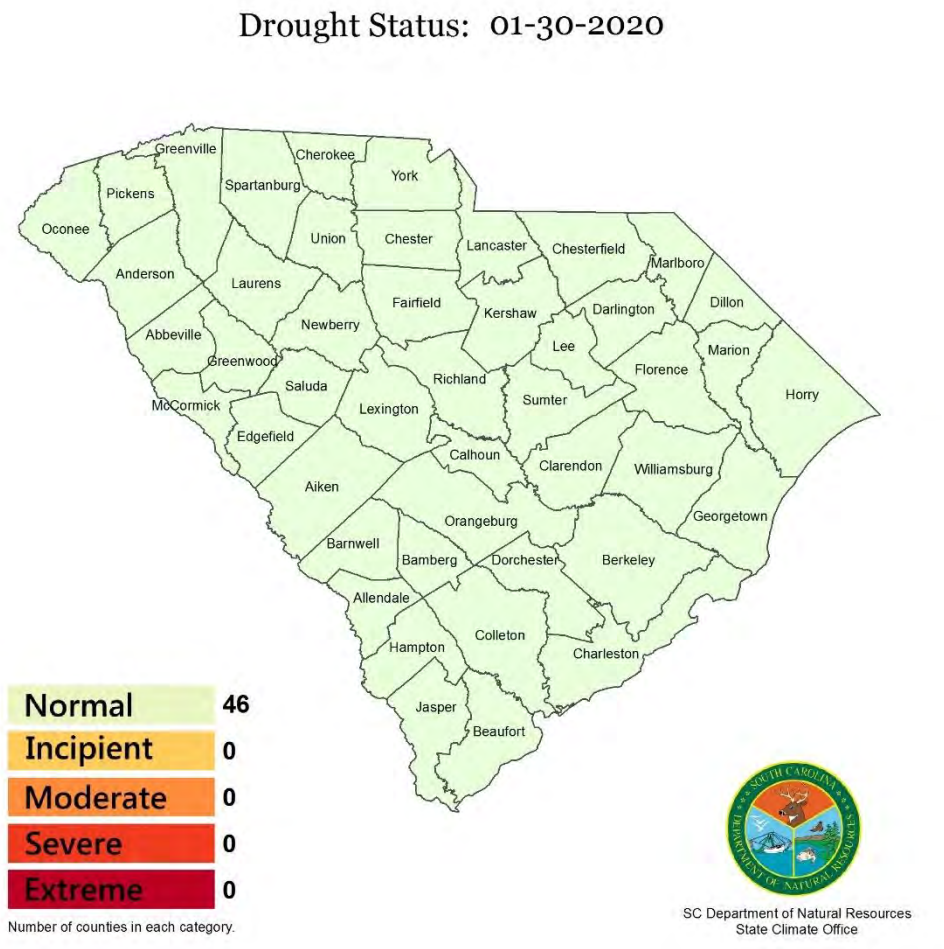


Figure 17. SC Drought Status by County

Due to above average rainfall totals statewide during December and January, it was a quick decision and a unanimous vote to remove the drought status of 27 counties.

"South Carolina has been dealing with drought since May 2019," said S.C. State Climatologist Hope Mizzell. "Last year's drought brought significant impacts to agriculture, low streamflows and increased wildfires. It is good news to see all drought indicators return to normal."

Conditions across much of the state had already improved somewhat during the fall, and heavy rains beginning in December brought relief to the remaining 27 counties. In fact, December's statewide rainfall totals placed it among the top ten wettest Decembers on record in South Carolina. December's statewide total was 6.74 inches, which is 3.13 inches above normal and makes it the 118th wettest December in the 125 years that records have been kept. Individual station totals for December ranged from 13.75" at the Charleston 5.4 SSE (CoCoRaHS station) to 4.67" at Anderson FAA Airport. The majority of the State has received normal to above normal rainfall also in January. (SC Drought Response Committee)

Over the past fifteen years (July 2005 – January 2020) Bamberg County has ranged in drought status from normal to severe. Below in figure 18 a list of Bamberg County's drought status can be seen for the past fifteen years.

Figure 18. Drought Status for Bamberg County

Month/Year	Status
January 2020	Normal
May 2019 – December 2019	Incipient – Normal
August 2017 – April 2018	Normal – Incipient
July 2016 – February 2017	Incipient – Normal
July 2015 – October 2015	Moderate – Normal
June 2015 – July 2015	Incipient
January 2015 – June 2015	Normal
September 2014 – January 2015	Incipient
April 2013 – September 2014	Normal
December 2012 – March 2013	Moderate
June 2012 – November 2012	Incipient
June 2011 – May 2012	Moderate
July 2010 – June 2011	Incipient
April 2009 – June 2010	Normal
September 2008 – April 2009	Incipient
April 2008 – August 2008	Moderate
September 2007 – March 2008	Severe
June 2007 – August 2007	Moderate
May 2007 – June 2007	Incipient
July 2005 – May 2007	Normal

Source: South Carolina State Climatology Office

Location

Droughts are region-wide natural disasters and will be addressed in that way. There is no specific location mapping for droughts in the Bamberg County region.

Extent

In the Bamberg County region, declarations of drought occur frequently. Statistics from the USC Hazards and Vulnerability Research Institute show that from the years 1950 to 2015 there have been a recorded 42 declared droughts. During 2000 to 2003, average precipitation was low, making the area especially dry. Agricultural production was affected by the lack of rain and extremely high temperatures. In the summer months the range for drought is abnormally dry to severely dry. From figure 18 above it can be assumed that Bamberg County experiences periods of moderate to severe drought.

The following is a list of impacts associated with drought. Each one can directly or indirectly impact Bamberg County's economy, environment, and people.

Drought Impacts		
Economy	**Environment**	**People**
• Damage to crops • Increase in food prices • Increased transportation costs for food • Reduced dairy and livestock production • Increased fire hazard • Loss to recreational and tourism industry • Revenue loss to water reliant businesses • Loss of navigability of rivers and canals • Reduction of economic development	• Reduction and degradation of fish and wildlife habitat • Wind and water erosion of soils • Loss of wetlands • Increased number and severity of fires • Air quality effects • Damage to plant species • Lower water levels in reservoirs, lakes, and ponds • Water quality effects (i.e., salt concentration, increased water temperature, pH, dissolved oxygen, turbidty)	• Food shortages • Public dissatisfaction with government • Loss of aesthetic values • Reduction or modification of recreational activities • Health issues related to use restrictions • Increased fire hazard • Mental and physical stress • Decrease in quality of life • Increased poverty • Population migrations

Figure 19: Drought Impacts

Probability

It should be noted that droughts are region-wide natural disasters and will be addressed in that way. There is no location mapping for droughts in the Bamberg County region. In the Bamberg County region, declarations of drought occur frequently. Historical data reports that there have been 42 drought declarations over the last 65 years (1950 to 2015). Supplemented with the declarations of drought are drought impacts according to the University of Lincoln Nebraska's National Drought

Mitigation Center. These impacts are compiled from multiple sources varying from news articles to government agencies. Historical data for drought declarations is not current, so the current drought impact data will complement the historical data. Since January 1, 2016 there have been 16 recorded drought impacts for Bamberg County.

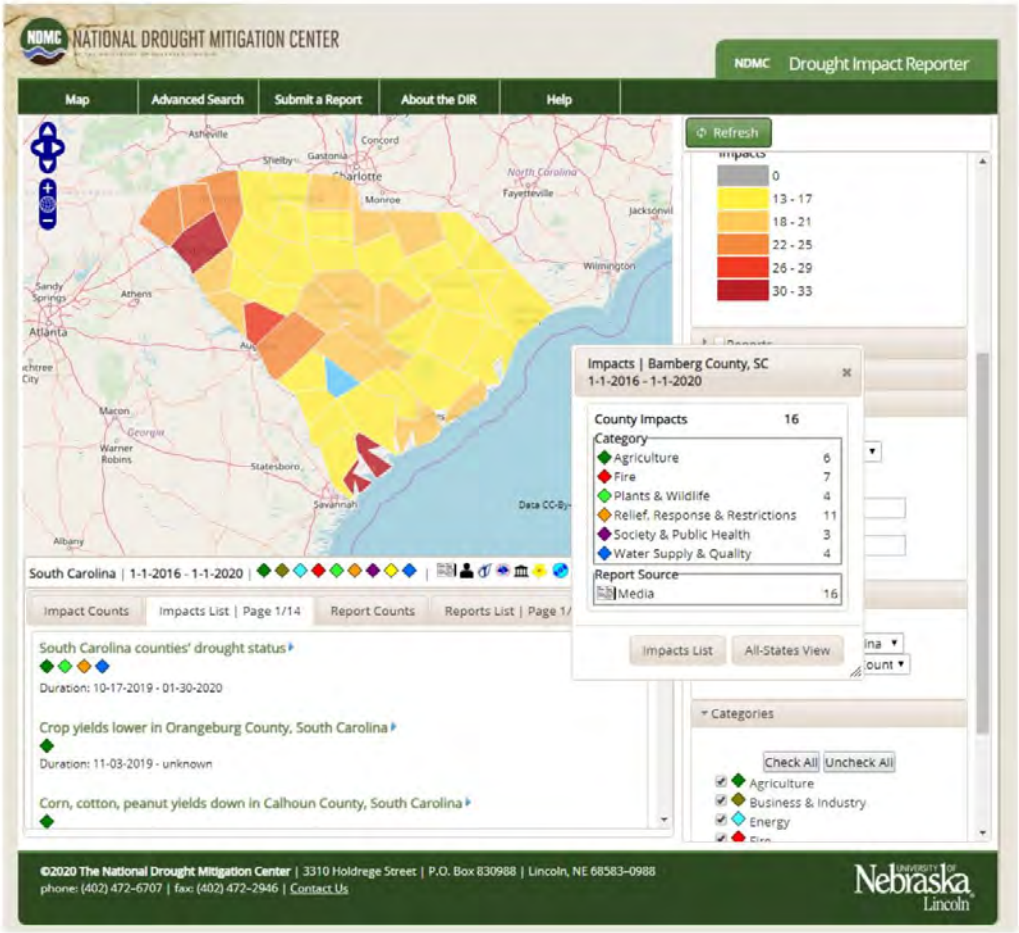


Figure 20. Drought Probability for Bamberg County

# of Events	Years in Record	Recurrence Interval (Years)	Hazard Frequency (% Chance per Year)
58	69	1.2	84.1%

Source: South Carolina State Climatology Office

From the above figure 20 it can be expected that the Bamberg County region will have either a drought declaration or impact approximately every one (1.2) year, with an 84.1% chance of a drought impact or declaration occurring every year.

Vulnerability

Overall, the Bamberg County region is moderately affected by abnormal to severe levels of drought. Droughts cause devastating affects to agricultural production. The vulnerability of the Bamberg County region to instances of drought is moderate.

Each drought produces a unique set of impacts, depending not only on its severity, duration, and spatial extent, but also on ever-changing social conditions. A wide-range of factors, both physical and social, determines society's vulnerability to drought.

Understanding both direct and indirect impacts (see Figure 19) is one of the most significant challenges in preparing for drought. The direct impacts include loss of revenue from businesses reliant on water, such as car washes, landscapers, and manufacturers. In a drought, water use restrictions may force businesses to suspend all or a portion of their activities. The indirect impacts associated with drought may be far-reaching. The more removed the impact from the cause, the more complex the link to the cause. Indirect impacts are diffused, making it very difficult to determine financial estimates of damages.

It should be mentioned that all incorporated municipalities in Bamberg County have a Drought Management Plan and Response Policy in place as required by the South Carolina Drought Response Act 2000. The purpose of the plan is to establish procedures for managing water demand and evaluating supply options before and during a drought-related water shortage.

Additionally, as of November 30, 2020, the values on the County tax rolls shows an assessed market value of $200,551,240 for residential, $39,213,090 for commercial, and $515,143,574 for agricultural. The total number of Parcels in Bamberg County is 14,132.

Earthquake Analysis

Hazard Description

An earthquake is a sudden, rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. Stress built up in the Earth's crust causes rocks near the surface to break and slip, and when this occurs, an earthquake results. This region along which the slip occurs at the Earth's surface is called a fault. There are three types of faults: strike-slip (rock blocks move horizontally), normal (rock moves down relative to the other side), and thrust (rock moves up relative to the other side). The earthquake faults can be seen in the illustration below:

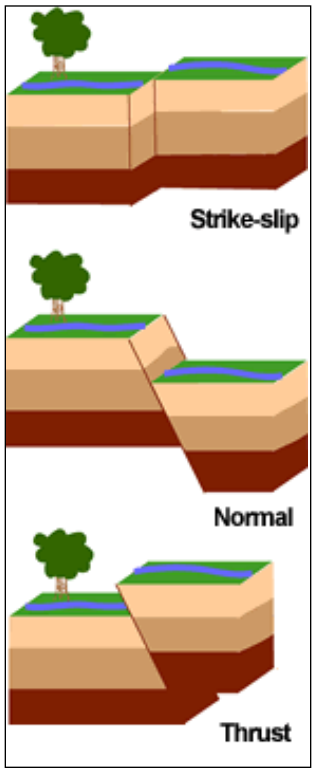


Figure 21. Types of Earthquake Faults
Source: USGS/SC HMP 2018

Annually in South Carolina, there are about 10 to 15 earthquakes recorded, with only 3-5 actually noticed by people. Because of this low frequency of noticeable events, many people are unaware of the earthquake risk in South Carolina. However, all 46 counties in the state are susceptible to efforts of earthquakes. About 70 percent of earthquake activity in the state is located in the Middleton Place-Summerville Seismic Zone. This zone is located about 12 miles northwest of Charleston and is the most active zone in South Carolina, experiencing 10 to 15 earthquakes a year. *(Source: SC HMP 2018)*

Energy is released when an earthquake occurs, which results in the shaking people feel and that which is detectable by seismic instruments. The point below the surface, within the Earth's crust where an earthquake begins is called the hypocenter or focus, and the point directly above this depth on the Earth's surface is the epicenter.

Ground acceleration caused by earthquakes has the potential to destroy buildings and infrastructure and cause loss of life. Aftershocks are typically smaller than the main shock, and can continue over a period of weeks, months, or years after the initial earthquake is felt. In addition to the effects of ground acceleration, earthquakes can also cause landslides, and liquefaction under certain conditions. Liquefaction occurs when unconsolidated, saturated soils exhibit fluid-like properties due to intense shaking and vibrations experienced during an earthquake. Together, ground shaking, landslides, and liquefaction can damage and destroy buildings, disrupt utilities (i.e. gas, electric, phone, water), and trigger fires.

According to the U.S. Geological Survey (USGS) Earthquake Hazards Program, most earthquakes occur at the boundaries where the earth's tectonic plates meet, although it is possible for earthquakes to occur entirely within plates. Bamberg County and its incorporated municipalities are located well within the North American plate, far from the plate boundary located east in the Atlantic Ocean. Seismic research is ongoing with regard to causes of earthquakes in regions far from plate margins. Regardless of where they are centered, earthquakes can affect locations beyond their point of origin.

Severity

The terms magnitude and intensity are used to describe the overall severity of an earthquake. The severity of an earthquake depends on the amount of energy released at the epicenter, the distance from the epicenter, and the underlying soil type.

All these factors affect how much the ground shakes, known as Peak Ground Acceleration (PGA) and what a building experiences, known as Spectral Acceleration (SA) during an earthquake.

An earthquake's magnitude is a measurement of the total amount of energy and is expressed in terms of the Richter scale. Intensity measures the effects of an earthquake at a particular place and is expressed in terms of the Modified Mercalli scale. Figure 22 on the following page shows the approximate comparison between Richter scale magnitude and Modified Mercalli Intensity (MMI).

Magnitude and Intensity Comparison	
Richter Magnitude Scale	**Typical Maximum MMI**
1.0 to 3.0	I
3.0 to 3.9	II to III
4.0 to 4.9	IV to V
5.0 to 5.9	VI to VII
6.0 to 6.9	VII to IX
7.0 and Higher	VIII or Higher

Figure 22: Magnitude and Intensity Comparison

Figure 23 describes the effects of the various intensity ratings.

MMI Scale Rating	
MMI	**Damage/Perception**
I	• Not felt except by a very few under especially favorable conditions
II	• Felt only by a few people at rest, especially on upper floors of buildings
III	• Felt quite noticeably by people indoors, especially on upper floors of buildings • Many people do not recognize it as an earthquake • Standing motor cars may rock slightly • Vibrations similar to the passing of a truck
IV	• Felt indoors by many, outdoors by few during the day • At night, many awakened • Dishes, windows, doors, disturbed; walls make cracking sound • Sensation like 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

	• Few instances of fallen plaster • Damage slight
VII	• Damage negligible in buildings of good design and construction • Slight to moderate damage 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 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 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 or frame structures remain standing • Bridges destroyed • Rails bent greatly
XII	• Total damage • Lines of sight and level are distorted • Objects thrown into the air

Figure 23: MMI Scale

Figure 24 below illustrates a projected earthquake intensity map produced by SCDNR. This intensity is based on the Modified Mercalli Intensity Scale and shows likely intensities under a combined condition of the 1886 Charleston earthquake and then January 1913 Union County earthquake.

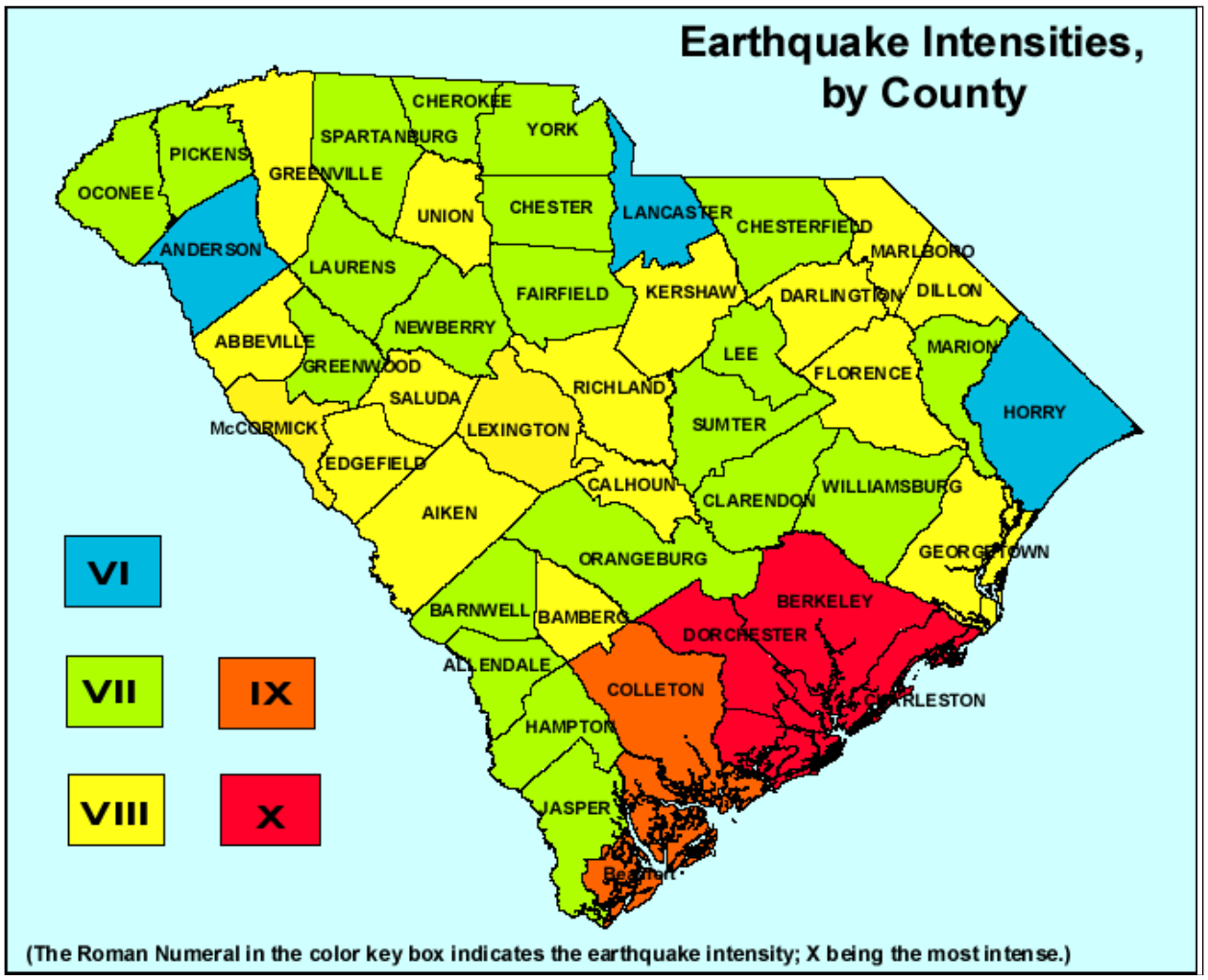
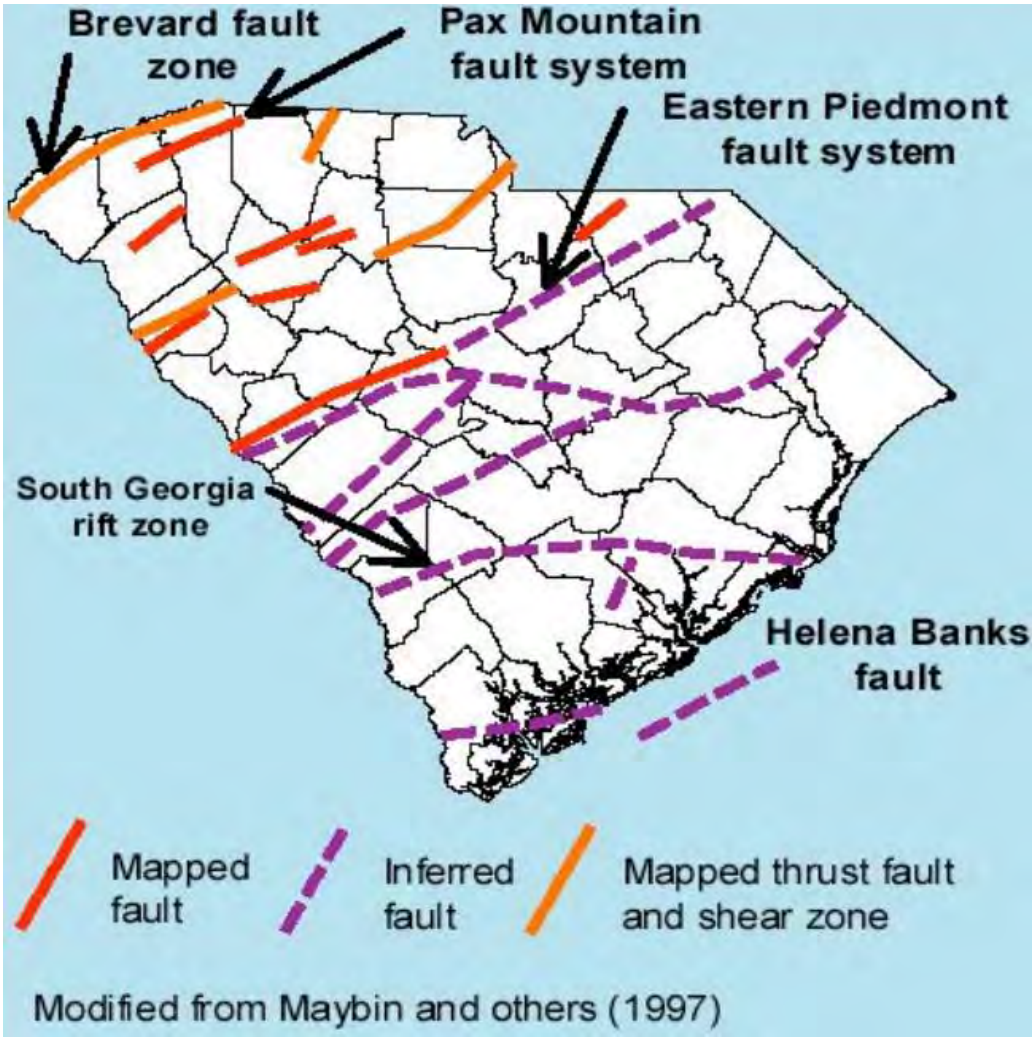


Figure 24. Estimated Earthquake Intensities by County
Source: SCDNR

Location

South Carolina is located in the interior of the North American plate, and earthquakes that occur within a plate are called intraplate earthquakes. Earthquake activity in South Carolina fall under three main causes: fault activity, reservoir induced seismicity, and Appalachian rise. A map showing the fault system in South Carolina is shown below. All three of the earthquakes in Bamberg County occurred around May 1897 causing no damage and not being felt. The most recent, in 2018, occurred just southeast of Bamberg City, and it was only a 2.1 on the Richter scale. The effects were felt by very few under specific circumstances.

Map 8: SC Fault System Map



Source: SC HMP 2018/SCDNR

Earthquakes are possible in Bamberg County and its incorporated municipalities. Approximately four earthquakes, three measuring on the Richter scale (Magnitude of 0), were recorded in the County all within the same year and month (May, 1897). The most recent, occurring in September of 2018 just southeast of the city of Bamberg, was a 2.1 on the Richter scale. Figure 25 gives the timeframe, location, and magnitude of the four events.

Figure 25. Historic Occurrences of Earthquakes in Bamberg County

Date	Location	Richter Magnitude	Damage Perception
May 6, 1897	County	0	Not Felt
May 24, 1897	County	0	Not Felt
May 27, 1897	County	0	Not Felt
September 22, 2018	County	2.1	Felt Slightly, no damage

Source: USC Hazards and Vulnerability Research Institute & Earthquake Track

Extent

Bamberg County has experienced four recorded earthquakes over a 122 year timeframe (1897-2019). Three of the events were in the unincorporated area; southwest of the City of Denmark and appear to have occurred all in the same area and during the same month and year (May, 1897). The most recent occurred just southeast of the city of Bamberg and registered a 2.1 on the Richter scale. Of the three earlier earthquakes, none measured on the Richter scale.

Probability

Figure 26. Earthquake Probability for Bamberg County

Location	# of Events	Years in Record	Recurrence Interval (Years)	Hazards Frequency (% Chance per Year)
County	4	122	30.5	3.3%

Source: USC Hazard and Vulnerability Research Institute

In the past recorded 122 years, four earthquake events have occurred in the unincorporated area of Bamberg County. Of these events, one of them measured on the Richter scale. Based on the above figure, Bamberg County has a 3.3% probability of an earthquake occurring every year, and a recurrence interval of every 30.5 years.

Vulnerability

The infrequency of major earthquakes, coupled with low magnitude events in the past can led one to perceive that Bamberg County and its incorporated municipalities are not vulnerable to a damaging earthquake. While the towns and county do not sit on a major fault system, they are nonetheless susceptible to earthquakes. A high-magnitude earthquake could cause significant financial losses,

casualties, and disruptions in critical facilities and services. Dams, bridges, and other infrastructure are also a concern and could incur serious damage from an earthquake.

A building's construction is a key factor in how well it can withstand the forces produced by earthquakes. Unreinforced masonry buildings are most at risk in an earthquake because the walls are prone to collapse outward. Steel and wood buildings have more ability to absorb the energy from an earthquake. Wood buildings with proper foundation ties have rarely collapsed in earthquakes.

Currently there is no reliable method for predicting the time, place, and size of an earthquake. Earthquakes typically occur with little or no warning. Based on the previous events and potential for great losses, Bamberg County and its incorporated municipalities has a low vulnerability to earthquakes.

Additionally, as of November 30, 2020, the values on the County tax rolls shows an assessed market value of $200,551,240 for residential, $39,213,090 for commercial, and $515,143,574 for agricultural. The total number of Parcels in Bamberg County is 14,132.

Wildfire Analysis

Hazard Description

Any forest fire, brush fire, grass fire, or any other outdoor fire that is not controlled and supervised is called a wildfire. These fires cause damage to the forest resource as well as wildlife habitat, water quality, and air quality. Wildfires are the most common natural hazard in South Carolina.

According to the South Carolina Forestry Commission (SCFC), over a 20 year span, an average of 2,700 fires occurred annually and were handled by the SCFC, burning an average of 17,500 acres each year. The SCFC reports that the forest fire danger is usually highest in late winter and early spring (January through mid-April) when the vegetation is dead or dormant. March is usually the busiest month for SCFC firefighters.

According to the SCFC, nearly 98 percent of all the wildfires in the state are human caused. The leading cause of wildfires, which accounts for between 40 and 45 percent of all wildfires reported, are the result of someone intentionally setting fire to someone else's property. Burning debris, such as trash, yard waste, construction waste, and agricultural fields often burns out of control, causing 30 to 35 percent of wildfires annually. Equipment use causes about 5 percent of wildfires, usually due to faulty equipment such as farm equipment or hot catalytic converters on automobiles. Between 4 and 5 percent of wildfires are caused by careless smoking. Between 3 and 5 percent of the state's wildfires are caused by children playing with matches, lighters and fireworks. Wildfires caused by campfires account for 1 to 3 percent of fires, occurring mainly during the summer months. Fires that are started by sparks resulting from carbon build-up on railroad tracks cause 1 to 2 percent of the annually reported wildfires. Miscellaneous fires such as those caused by negligence of adults using fireworks, structural fires that ignite nearby wooded areas, or unattended warming fires account for four to six percent of wildfires. Lightning only causes about 2 percent of the annually reported fires in the state. (Source: SCEMD State HMP)

Severity

The severity of a wildfire is based on the damage to the forest resource, wildlife, water and air quality, and the number of acres damaged. There are three classes of wild fires: surface fire, ground fire, and crown fire. A surface fire is the most common of these three classes, moving slowly and burning along a forest floor. A ground fire is usually started by lightning or human carelessness and burns on or below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the

tops of trees. For this section, wildfire will be discussed on a county wide level. There is no particular event of wildfire that is illustrated on an individual jurisdiction basis.

Location

Particular events of wildfire will not be discussed on an individual jurisdiction basis, events will be understood to be county wide and presented as such.

The areas within the county that are at a greater risk of wildfires are those areas that have a higher density of vegetation and forests. The land coverage map in the Appendix shows forested and scrub/shrub areas, largely within the unincorporated county, that are at risk due to wildfire events. Smaller county jurisdictions; Govan and Olar, with close proximity to high risk rural areas face a higher risk than the more urbanized jurisdictions of Bamberg, Denmark, and Ehrhardt. Though the outskirts of urban areas are at risk due to the proximity of forested and vegetated areas, the risk in the urban core is comparatively lower. Historic wildfire occurrences validate this claim as the vast majority start in the forested areas of the county.

Extent

The South Carolina Forestry Commission has historical data for wildfires in Bamberg County dating back to 1946 through 2019. During this 73 year period 4,359 wildfires have been documented in the county. In this 69 year timeframe approximately 35,820 acres have been destroyed in the county. Recorded property damage as a result of the wildfire events has been reported in the amount of $97,714. Yearly averages have been calculated to give an estimate of how many wildfires occur in the county and how much damage was caused. Figure 27 below depicts a 5, 15, 25, 40, and 50 year average for the county.

Figure 27. Bamberg County Wildfire Averages

	5 Year	15 Year	25 Year	40 Year	50 Year
Wildfires	26	33	44	59	60
Acres	148.4	172.0	191.0	266.1	361.4

Source: SC Forestry Commission

Probability

From 1946 to 2019 there have been a recorded 4,359 wildfire events in Bamberg County. The total number of acres affected was 35,820. Figure 28 below depicts the wildfire probability for Bamberg County.

Figure 28. Wildfire Probability for Bamberg County

# of Events	Years in Record	Recurrence Interval (Years)	Hazard Frequency (% Chance per Year)
4,359	73	<0.1	5971.23%*

*Percent is greater than 100.00, therefore hazard can be expected to occur more than once per year

Source: SC Forestry Commission

The areas within the county that are at a greater risk of wildfires are those areas that have a higher density of vegetation and forests. Though the outskirts of urban areas area at risk due to the proximity of forested and vegetated areas, the risk in the urban core is comparatively lower.

Vulnerability

Overall, Bamberg County has a moderate vulnerability to wildfires. The probability of one or more wildfires in the county per year is highly likely (greater than 100%). Unincorporated areas within the county are at an even greater risk and vulnerability to wildfires due to the fact that there is more wooded acreage compared to that of the urbanized towns. By law, the South Carolina Forestry Commission is responsible for wild land fire protection outside of corporate town or city limits. South Carolina law regulates outdoor burning in unincorporated areas. Except within town or city limits, anyone planning to burn outdoors must:

1. Notify the Forestry Commission before starting the fire
2. Clear a firebreak around the area to be burned
3. Have adequate tools, equipment, and personnel on hand to control the fire
4. Stay with the fire until it is completely safe.

After examining past events, wildfires have not caused a great amount of significant reported damage within the county. Therefore, when taking into consideration the high probability of wildfire in the county, and the past history of the event, Bamberg County has a moderate level vulnerability to wildfire.

Additionally, as of November 30, 2020, the values on the County tax rolls shows an assessed market value of $200,551,240 for residential, $39,213,090 for commercial, and $515,143,574 for agricultural. The total number of Parcels in Bamberg County is 14,132.

Flood Analysis

Hazard Description

Flooding is the most frequent and costly natural hazard in the United States. About 75% of presidential disaster declarations are related to flooding. The National Flood Insurance Program defines a flood as a general and temporary condition of partial or complete inundation of normally dry land areas. South Carolina is especially vulnerable to flooding because of its low elevation and frequency of storms.

The terms used to classify floods are diverse, as are the number of subtypes. Floods may be broadly classified into two categories, as either general or flash floods.

General Floods
These floods are usually long-term events that may last for several days; riverine and coastal flooding fall under general flood types.

Flash Floods
Floods are caused by locally heavy rains in areas where water runs off quickly, moving at very high speeds. Flash floods can cause severe damage; it is able to pick up great debris, uproot trees, roll boulders, destroy buildings, and damage bridges and roads. Urban flooding, dam/levee failure, and debris or ice jam water fall under flash flooding type.
South Carolina has five major river basins and one coastal region. The State's rivers generally start in the northwest and flow southeasterly to the Atlantic Ocean, passing through three physiographic areas:

1. The Blue Ridge Mountains in the far northwestern corner of the State
2. The Piedmont Plateau
3. The Coastal Plain

There are five distinctive types of flooding in South Carolina. Flash, riverine, and coastal related to the three physiographic areas listed above.

1. **Flash flooding**: rapid onset of events which occur from short, heavy rainfall, accumulating in areas faster than the ground is able to absorb it.
2. **Riverine flooding**: this occurs when an increase in water volume within a river channel causes an overflow onto the surrounding floodplain. Also known as

"overbank flooding."

3. **Coastal flooding:** water pushed inland as a result of storm surge, wind-driven waves, and heavy rainfall produced by hurricanes, tropical storms, nor'easters, and other coastal storms.
4. **Local drainage problems:** can occur anywhere in the State where the ground is flat, where the drainage pattern had been disrupted, or where channels or culverts have not been maintained.
5. **Dam/levee failure:** each dam in the State has the potential to fail and suddenly release its water, flooding the land downstream.

(Source: SC HMP 2018)

Figure 29. Flood Classifications	
General Flood	**Flash Flood**
Riverine Coastal Local drainage	Urban Dam/levee failure Debris/ice jam

Severity

The National Weather Service (NWS) categorizes flooding as major, moderate, and minor. Figure 30 below gives a description of the three flooding categories.

NWS Flood Categories	
Category	**Description**
Major	• Extensive inundation and property damage • Often involves the evacuation of people and the closure of both primary and secondary roads
Moderate	• Inundation of secondary roads • Transfer to higher elevation necessary to save property • Some evacuation may be required
Minor	• Minimal or no property damage • Possibly some public inconvenience

Figure 30: NWS Flood Categories

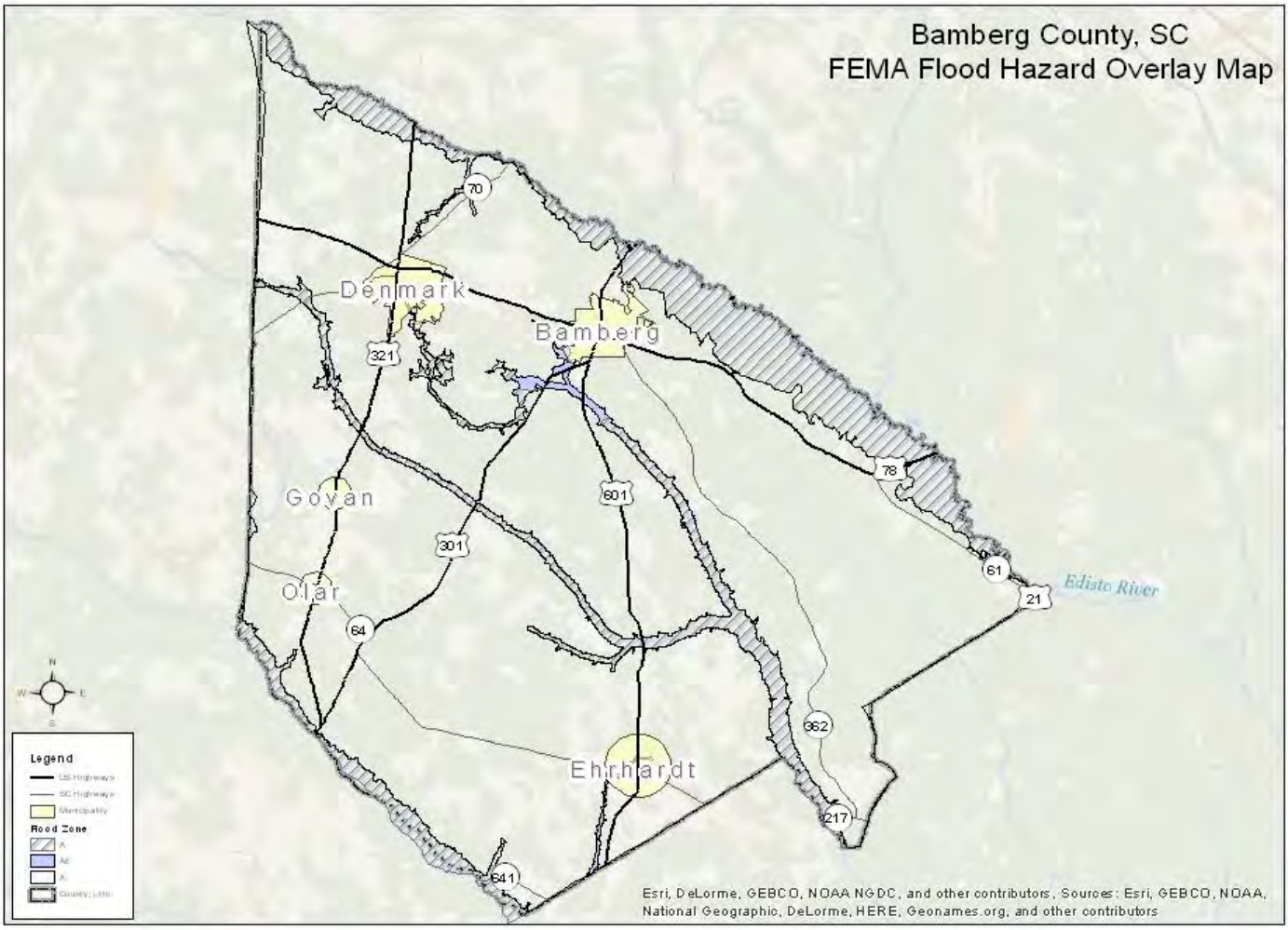
Location

Identification of floodplain areas within the county and the incorporated municipalities was based on the most recent Flood Insurance Rate Maps (FIRM) produced by FEMA. These maps display the locations of all of the major water bodies in the county and delineate the 100-year floodplain boundaries (Zone A). These are areas that have a one percent (1%) chance of equaling or exceeding the recorded base flood elevation during any year. Mandatory flood insurance is required to be purchased within Zone A and flood management standards apply. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance is a requirement. Zone X is an area of moderate to low-risk flood hazard. These properties are outside of the high-risk zones. Although this flood risk is reduced, it is not removed. Flood insurance is not required in this zone, but is available.

With accurate, up-to-date flood mapping, communities can obtain a firm grasp of the flood risk they face. This allows for sounder floodplain management decisions. Due to the significant percentage of FIRM panels that are over ten years old in South Carolina, the South Carolina Department of Natural Resources (SCDNR) Flood Mitigation Program has been a Cooperating Technical Partner (CTP) with the FEMA Map Modernization Program since 1999.

The goals of FEMA's program include; providing current, accurate data for responsible growth; better floodplain management to reduce long-term flood losses; updated data to alert at-risk property owners of the need for flood insurance; and faster, less expensive future updates of FIRM panels.

Map 11 below identifies flood prone areas within Bamberg County.



Extent

Based on Map 11 above, Bamberg County has low to high risk flood zone areas. Flood zones are geographic areas that FEMA has defined according to varying levels of flood risk. These zones are depicted on a community's FIRM. Each zone reflects the severity or type of flooding in the area.

Bamberg County's Flood Hazard map depicts two flood zones: Zone X and Zone A. The extent of these zones can be expressed by flood depth. Zone X is categorized in the moderate to low risk areas, and is described as the area determined to be outside the 500- year flood and protected by levee from 100- year flood. Zone X for Bamberg County can be quantified as areas of 0.2% annual chance of flood, areas of 1% annual chance of flood with average flood depths of less than one foot or with drainage areas less than one square mile.

Zone A is categorized in the high risk areas, and is described as areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.

The following figure 31 gives specific information concerning flooding events and their location within Bamberg County.

Figure 31. Historic Occurrences of Flooding in Bamberg County

Date	Location	Type	Description
October 8, 2016	County Between Lodge and Smoaks	Flash Flood	-SCDOT reported Hickory Hill Road closed due to washout in the vicinity of Harrison Road. -$5K in property damage
May 19,2016	Denmark	Flood	-Sheriff office reported minor street flooding with ditches full in Denmark.
July 22, 2014	County Just outside Town of Bamberg	Flood	-Main Highway, Third Street, and North Street closed by law enforcement -vehicles submerged
July 11, 2013	County	Flash Flood	-$4K in damages
May 25, 2009	Bamberg	Flash Flood	-Sheriff reported several roads flooded with 1-3 feet of water in Bamberg and the surrounding area -Reported $4K in property damage and $4K in crop damage
August 24, 2006	Ehrhardt	Flash Flood	-SCDOT reported flooding along Long Branch and Colston Branch streams, flooding Bethel Road and Colston Road
August 3, 2003	Bamberg, Olar	Flash Flood	-Police and Sheriff reported roads flooded in Olar and on US 301 near Bamberg
September 23, 2000	County	Flash Flood	-EPD reported flooded streams, roadways with washouts, and several flooded homes
August 26, 1995	County	Flood, Flash Flood	-Heavy rains washed out bridges in Bamberg County -$125K in damages to roads -Estimated $30K in property damage -$5K in damages to businesses
January 7, 1995	County	Flood	-Street flooding especially on US 78 -Estimated $1K property damage for Bamberg County
October 13, 1994	Statewide	Flash Flood	-All counties within South Carolina were given flash flood warnings followed by coastal flooding in the 10 counties in the Charleston National Weather Service Office area

			-Total property damage for state: $25M -Total crop damage for state: $50K
October 13, 1994	Statewide	Flash Flood	-All counties within South Carolina were given flash flood warnings -Total property damage for state: $2M -Total crop damage for state: $8K
Source: NCDC; The Times and Democrat			

Probability

FEMA Flood Insurance Rate Maps (FIRM's) delineate special flood-hazard areas and the risk zones in a community. These special flood-hazard areas identify locations that have a chance of experiencing coastal or river flooding in any given year. The 100-year flood designation means the area has a 1% chance of flooding in any given year.

Based on analysis of records from the National Climatic Data Center, and FEMA's FIRMs, Bamberg County and its incorporated municipalities have a history of experiencing flooding. Bamberg County had 12 reported floods/flash floods over a 69 year period (1950 to 2019), two (2) being within the Town of Bamberg, one (1) in the Town of Olar, one (1) in the Town of Ehrhardt, one (1) in the town of Denmark, and seven (7) that occurred across the whole county and one (1) that occurred in the unincorporated area of Embree. One of the floods affected areas in both Olar and the City of Bamberg. Bamberg County has a 18.8% chance of a flood event to occur each year within the county, and a risk of at least one flood to occur every 5.3 years based on the documented history of flooding.

The City of Denmark has had one reported flood in 2016. The Town of Govan have no recorded flood event in the past 69 years. However, FEMA FIRM's do indicted special flood hazard areas (SFHAs) subject to inundation by the 1% annual chance of flood in Zone A.

The City of Bamberg has had two flood events to be recorded in the past 69 years. This equates to a yearly flood frequency of 2.9% and a recurrence interval of every 34.5 years. FEMA FIRM's illustrate SFHAs, Zones A and AE, in the southwest portion of the town near US 301. Flooding would primarily be caused by excessive rains which could potentially overflow Halfmoon Branch and Tributary. Base flood elevations in Zone AE range from 141 to 150 feet.

The Town of Ehrhardt has one (1) flood event to be recorded in the past 69 years. SFHAs are illustrated on the FIRM's along Savannah Creek and show Zone AE with base flood elevations of 95 to 132 feet.

Countywide, seven (7) events have been recorded in the past 69 years. Two (2) of these events also occurred across the state. There is a 10.1% frequency per year that a flood will occur, with one flood occurring every 9.9 years. However, there are numerous SFHAs indicated on the FEMA FIRM's subject to inundation by the 1% annual chance of flood in Zone A and Zone AE. Bamberg County has many creeks, rivers, and streams (i.e. Edisto River, Salkehatchie River, Lemon Creek, Colston Branch). These water bodies could cause damage should overflowing occur during unusual rainfall.

Figure 32. Flood Probability for Bamberg County

Location	# of Events	Years in Record	Recurrence Interval (Years)	Hazard Frequency (% Chance per Year)
Bamberg	2	69	34.5	2.9%
Denmark	1	69	69	1.4%
Ehrhardt	1	69	69	1.4%
Govan	0	69	*	*
Olar	1	69	69	1.4%
Unincorporated	1	69	69	1.4%
County- or Statewide	7	69	9.9	10.1%
Total	13	69	5.3	18.8%

Source: NCDC; The Times and Democrat
*Unable to calculate (cannot divide by zero)

Vulnerability

Severe rainstorms can cause area drainage systems to overflow, resulting in flooded roads. This excessive flooding of the highway network can eventually cause permanent damage to the road infrastructure. Also, there were reports of flooding to homes. Bamberg County has reported over a 65 year period $49K in property damage, $125K in road damage, and $4K in damage to crops. In addition, the two statewide floods that affected Bamberg County cost the state $27M in property damage and $58M in crop damage. Overall, Bamberg County has a high vulnerability to flooding.

Additionally, as of November 30, 2020, the values on the County tax rolls shows an assessed market value of $200,551,240 for residential, $39,213,090 for commercial, and $515,143,574 for agricultural. The total number of Parcels in Bamberg County is 14,132.

FEDERAL REQUIREMENTS FOR LOCAL HAZARD MITIGATION PLANS

Requirement 201.6(c)(2)(ii): The risk assessment **must** also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged by floods.

Repetitive Loss Properties

Repetitive loss properties are those for which two or more losses of at least $1,000 each have been paid under the National Flood Insurance Program within any 10-year period since 1978. After reviewing such properties and structures within the plan area of Bamberg County and its incorporated municipalities, one such property has been identified. In the City of Bamberg, one single family dwelling has been identified as a repetitive loss property.

NFIP Participation

The National Flood Insurance Program (NFIP) enables property owners in participating communities to purchase insurance protection from the government against losses from flooding. Participation in the NFIP is based on an agreement between local communities and the federal government which

states that if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in SFHAs, the federal government will make flood insurance available within the community as a financial protection against flood losses. After reviewing FEMA's "Community Status Book Report for Communities Participating in the National Flood Program," Bamberg County is an active participant in the National Flood Insurance Program (NFIP) and has continued compliance with NFIP requirements and objectives. The City of Bamberg, City of Denmark, and Town of Ehrhardt are active participants as well. The Town of Govan and Town of Olar are not listed and therefore are considered not mapped.

One of the primary objectives of the NFIP is to guide development away from high-flood risk areas. NFIP regulations minimize the impact of structures that are built in SFHAs by requiring them not to cause obstructions to the natural flow of floodwaters. As a condition of Bamberg County's participation in the NFIP, those structures built within SFHAs must adhere to strict floodplain management regulations enforced by the community.

Bamberg County's floodplain management program ensures compliance of the NFIP by enforcing regulations and policies that require pre-construction site approval prior to any structure being built within a floodplain or zone. An application with the County's Building Inspector, who is also the Floodplain Manager, is required to identify the property being developed and to determine if it is within an existing flood zone. According to the Building Inspector, there have been little new residential or commercial development, and some limited industrial development within the past five (5) years in all of Bamberg County. Should any new development occur, Bamberg County will utilize the revised flood maps adopted in 2007.

It should be mentioned that at the time of the submission and review of the previous 5-year update, a massive storm, referred to as a 1,000-year storm, occurred in early October, 2015, and brought catastrophic flooding to South Carolina. The death toll rose to 14 and damage has been estimated at more than $1 billion across the state. Hundreds of roads and bridges were closed, dams breached and/or failed completely, many roads and bridges collapsed, homes and businesses flooded and were without power.

In Bamberg County, the Sherriff's Office informed citizens residing along the South Fork of the Edisto River of potential rising water levels, recommending those residents who live in the known to flood or low lying areas to voluntarily evacuate their homes. Bamberg County Emergency Services, Bamberg County Public Works, and local SCDOT officials kept citizens informed about road closures, and school and office closings.

Winter Storm Analysis

Hazard Description

Winter storms are often thought of as a snowstorm. While this can be true, there are also other types of weather associated with winter storms that can be extremely hazardous.

Storms and Strong Winds

Sometimes winter storms are accompanied by strong winds creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chill. Strong winds with these intense storms and cold fronts can knock down trees, utility poles, and power lines.

Extreme Cold

Extreme cold often accompanies a winter storm or is left in its wake. Prolonged exposure to the cold can cause frostbite or hypothermia and become life-threatening. In areas unaccustomed to winter weather, near freezing temperatures are considered "extreme cold." Freezing temperatures can cause severe damage to citrus fruit crops and other vegetation. Pipes may freeze and burst in homes that are poorly insulated or without heat.

Ice Storms

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days while utility companies work to repair the extensive damage. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Heavy Snow Storms

Heavy snow can immobilize a region and paralyze a city, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. In rural areas, homes and farms bay be isolated for days, and unprotected livestock may be lost. The cost of snow removal, repairing damages, and loss of business can have large economic impacts on cities and towns.

A winter storm develops from three basic elements: cold air, moisture, and lift. Below freezing temperatures in the clouds and near the ground are necessary to make snow and/or ice; moisture is needed to form clouds and precipitation; and something to raise the moist air to form the clouds and cause precipitation is required (i.e. warm air colliding with cold air and being forced to rise over the cold dome).

Severity

The severity of a winter storm depends on several factors including temperature, wind speed, type of precipitation, rate of deposition, and time of day and/or year the storm occurs. Everyone is potentially at risk during winter storms. The actual threat to the individual depends on the specific situation. Recent observations indicate the following:

- Related to ice and snow:
  - About 70% occur in automobiles
  - About 25% are people caught out in the storm
  - Majority are males over 40 years old
- Related to exposure to cold:
  - 50% are people over 60 years old
  - Over 75% are males
  - About 20% occur in the home

Dangers associated with exposure to cold include frostbite, hypothermia, and wind chill.

Location

There have been eight (8) significant winter storms recorded in Bamberg County within the past 69 (1950-2019) years. The most recent storm took place on February 12, 2014. The following figure 32 details the eight (8) storms that affected the County. Individual jurisdictions are not discussed in detail because the events were part of a county wide and statewide disaster. The participating jurisdictions are assumed to be incorporated in the winter event report.

Figure 33. Historic Occurrences of Winter Storms in Bamberg County

Date	Location	Type	Description
February 12, 2014	Statewide	Ice Storm	-Property damage in county totaled over $166K - Forestry damage about 68,699 acres and $16,024,200 in losses
January 28, 2014	Countywide	Winter Storm	-Winter storm produced freezing rain, sleet, and snow across Bamberg County causing hazardous traveling conditions. Many trees and several power lines came down causing power outages in areas of the County. -$12K in property damage & one (1) injury
January 10, 2011	Countywide	Winter Storm	-EM reported snow accumulations of 1 inch in the north portion of the county. Freezing rain followed the snow with ice

			accumulations of 1/2 inch causing many power outages.
February 12, 2010	Countywide	Winter Storm	-EM reported 5-7 inches of snow across the county.
January 29, 2005	Statewide	Ice Storm	-Ice accumulations of ¼" to ½" on trees and other structures -Numerous auto accidents -Driving conditions were treacherous -Several power outages reported
December 26, 2004	Statewide	Ice Storm	-Ice accumulation of ¼" to ¾" -Sleet accumulation of up to 1" -Trees and power lines down -Numerous auto accidents -Driving conditions were treacherous -Several power outages reported
January 25, 2004	Statewide	Ice Storm	-Ice accumulations of ½" to ¾" -Driving conditions were treacherous -Numerous auto accidents -Six (6) people were injured in traffic related accidents -Trees and power lines down -Total damage estimates were $28.5M statewide
January 2, 2002	Statewide	Winter Storm	--Ice accumulation of ¼" to 1" -Snow accumulations of 2" to 8" -Driving conditions were treacherous -Numerous auto accidents -Trees and power lines down
Source: NCDC; The Times and Democrat			

Extent

The eight (8) significant winter storms/ice storms that affected Bamberg County as part of a statewide event caused minor damages; auto accidents, downed power lines and trees, power outages, ice accumulations.

Probability

Figure 34. Winter Storm Probability for Bamberg County				
Location	**# of Events**	**Years in Record**	**Recurrence Interval (Years)**	**Hazard Frequency (% Chance per Year)**
County- Statewide	8	69	8.6	11.6%
Source: NCDC				

Based on the data from the above figure, it is estimated that a winter storm event may occur every 14.7 years, with a 6.7% chance of a storm occurring every year in Bamberg County. However, mild winter storm events are common in this region of the State. Typically Bamberg County experiences some ice, sleet, or snow event annually. During the months of December to March these events are more likely to occur.

Vulnerability

Heavy accumulations of snow can distress a community; standing commuters, closing vital businesses and facilities, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can also result in downed trees and power lines. The cost of snow removal, repairing damages, and the loss of business can have a severe economic impact on Bamberg County and its communities.

Ice storms can also have a significant impact on the County. Heavy accumulations of ice can bring down trees and topple utility poles and communication towers. Ice can disrupt communication and power for days while utility companies repair extensive damage. Even small accumulations of ice can be extremely dangerous to motorists and pedestrians. Bridges and overpasses are particularly dangerous because they freeze before other surfaces.

Based on frequency and actual severity alone, Bamberg County has a low vulnerability to major winter storms. However, it is perhaps because of the infrequency of winter weather that Bamberg County is highly vulnerable to its effects. In examining these eight (8) documented events, in particular the storm that occurred in 2014, it is evident that such winter storms can cause much damage to a community that is not prepared for such hazardous conditions involving heavy ice, sleet, and snow.

Additionally, as of November 30, 2020, the values on the County tax rolls shows an assessed market value of $200,551,240 for residential, $39,213,090 for commercial, and $515,143,574 for agricultural. The total number of Parcels in Bamberg County is 14,132.

2.2 Overall Risk Probability and Frequency

The Task Force Committee reviewed this section for the update process and made the necessary changes to Figure 35 to reflect the updated statistics described in Section 2.1.

To determine the probability of a natural hazard event, the number of events, total number of years those events have been recorded, and the frequency of events must be determined. The recurrence interval is also helpful in portraying how common a certain type of hazard is. Dividing the number of years by the number of events produces the recurrence interval, or how often the event will occur per year. The percentage frequency of events is determined by dividing the number of events by the total number of years and multiplying by 100. This gives a reliable sense of the chance a hazard will occur per year.

Figure 35 below is necessary in determining overall hazard vulnerability. The figure also helps to define what types of events are more frequent in Bamberg County.

Figure 35. All Hazards Probability for Bamberg County

Hazard	# of Events	Years in Record	Recurrence Interval (in years)	Hazard Frequency (% Chance per Year)
Tornado	20	68	3.4	29.4%
Hurricane/ Tropical Storm	16	167	9.6	10.4%
Hail	66	44	0.6	150%
Drought	58	69	1.2	84.1%
Earthquake	4	122	30.5	3.3%
Wildfire	4,359	73	<0.1	5971.23%
Flood	13	69	5.3	18.8%
Winter Storm	8	69	8.6	11.6%

Data Sources: National Climatic Data Center, USC Hazards and Vulnerability Research Institute, SC State Climate Office, SC Forestry Commission

*unable to calculate (cannot divide by zero)
**percent is greater than 100%, therefore hazard can be expected to occur more than once per year

2.3 Overall Vulnerability Assessment

No changes were made to the mathematical methodology for prioritizing hazards, after review by the Task Force Committee. The overall vulnerability summary figures on the following pages remain largely unchanged with only minor adjustments from the last updated process. The updated hazard data has been reviewed as part of the update process.

Prioritization of Hazards for Bamberg County

Based on these findings and the results of technical research the following hazards were selected as priority hazards for Bamberg County: Tornadoes, Hurricanes/Tropical Storms, Hail, Drought, Earthquakes, Wildfires, Flooding, and Winter Storms.

To assess and evaluate hazards, four criteria have been established by the task force committee and each has been given a rating of low, medium, or high risk.

1. History – A record of occurrences
2. Vulnerability – The number of people and the value of property that could be affected
3. Impact – Assuming the greatest event possible and the worst case scenario.
4. Probability – The likelihood an event will occur (chances per year)
5. Priority Score- Composite score value for each hazard weighing priority attention to planning

In the scoring system, each of the four criteria identified for describing and analyzing potential hazards is assigned a rating and their respective number.

Low	1 point
Medium	5 points
High	10 points

Since some criteria are judged to be more important than others, a weighting factor was established to balance out the total scoring. The following weights are used:

History	2
Vulnerability	5
Impact	10
Probability	7

A composite score for each hazard is arrived at by multiplying the score value assigned to each criterion by its weight and then summing the four totals. For example:

Hazard: Flood

History	Medium	5pts x 2 (weighting factor) = 10 pts
Vulnerability	Medium	5pts x 5 (weighting factor) = 25 pts
Impact	High	10pts x 10 (weighting factor) = 100 pts
Probability	Medium	5pts x 7 (weighting factor) = 35 pts

Total = 160 pts

All information has been compiled and created as to the various hazards in the County. Those hazards with the highest numerical scores will receive priority attention for planning and mitigation purposes. The methods used for determining the rating of High, Medium, and Low risks are as follows:

Probability: Determined by hazard frequency percentage located in the previous section of overall risk probability and frequency.

Vulnerability: Based on the total population from the jurisdiction and an estimated projection on property values and facilities within the jurisdiction.

Impact: Risk determination was established by taking into account the vulnerability of the jurisdiction/county as well as past history of occurrence. Determination was also based on the extent of the event located in previous hazard profile section of the plan.

History: Risk determined by past occurrences in each participating jurisdiction, where available, and by county wide occurrences.

The following figures 36 and 37 are the overall vulnerability summary for hazards within Bamberg County and its incorporated jurisdictions. Plan goals and objectives are prioritized according to this figure.

Figure 36. Bamberg County Hazard Identification and Analysis Worksheet

Type of Hazard	Probability	Vulnerability	Impact	History	Total Score
Tornado	Medium	Low	Medium	Medium	
Priority Score:	35	5	50	10	**100**
Hurricane/Tropical Storm	Low	Low	Low	Low	
Priority Score:	7	5	10	2	**24**
Hail	High	Medium	Medium	High	
Priority Score:	70	25	50	20	**165**
Drought	High	Medium	Medium	High	
Priority Score:	70	25	50	20	**165**
Earthquake	Low	Low	Low	Low	
Priority Score:	7	5	10	2	**24**
Flood	Medium	High	High	Medium	
Priority Score:	35	50	100	10	**195**
Wildfire	High	High	Medium	High	
Priority Score:	70	50	50	20	**190**
Winter Storm	Low	High	High	Low	

Priority Score:	7	50	100	2	**159**

Figure 37. Bamberg County: Incorporated Jurisdictions Hazard Identification and Analysis Worksheet

Municipality	Type of Hazard	Probability	Vulnerability	Impact	History	Total Score
Bamberg	Tornado	Low	Low	Medium	Low	
	Priority Score:	7	5	50	2	**64**
	Hurricane/Tropical Storm	COUNTYWIDE				
	Priority Score:					
	Hail	Medium	Medium	Medium	Medium	
	Priority Score:	35	25	50	10	**120**
	Drought	COUNTYWIDE				
	Priority Score:					
	Earthquake	COUNTYWIDE				
	Priority Score:					
	Wildfire	COUNTYWIDE				
	Priority Score:					
	Flood	Low	High	High	Low	
	Priority Score:	7	50	100	2	**159**
	Winter Storms	COUNTYWIDE				
	Priority Score:					
Denmark	Tornado	Low	Low	Medium	Low	
	Priority Score:	7	5	50	2	**64**
	Hurricane/Tropical Storm	COUNTYWIDE				
	Priority Score:					
	Hail	Medium	Medium	Medium	Medium	
	Priority Score:	35	25	50	10	**120**
	Drought	COUNTYWIDE				
	Priority Score:					
	Earthquake	COUNTYWIDE				
	Priority Score:					
	Wildfire	COUNTYWIDE				
	Priority Score:					
	Flood	Low	High	High	Low	
	Priority Score:	7	50	100	2	**159**
	Winter Storms	COUNTYWIDE				
	Priority Score:					
Ehrhardt	Tornado	Low	Low	Medium	Low	
	Priority Score:	7	5	50	2	**64**
	Hurricane/Tropical Storm	COUNTYWIDE				
	Priority Score:					
	Hail	Low	Medium	Medium	Medium	
	Priority Score:	7	25	50	10	**192**
	Drought	COUNTYWIDE				
	Priority Score:					
	Earthquake	COUNTYWIDE				
	Priority Score:					
	Wildfire	COUNTYWIDE				
	Priority Score:					

	Flood	Low	High	High	Low	
	Priority Score:	7	50	100	2	**159**
	Winter Storms	COUNTYWIDE				
	Priority Score:					
Govan	Tornado	Low	Low	Medium	Low	
	Priority Score:	7	5	50	2	**64**
	Hurricane/Tropical Storm	COUNTYWIDE				
	Priority Score:					
	Hail	Low	Medium	Medium	Low	
	Priority Score:	7	25	50	2	**84**
	Drought	COUNTYWIDE				
	Priority Score:					
	Earthquake	COUNTYWIDE				
	Priority Score:					
	Wildfire	COUNTYWIDE				
	Priority Score:					
	Flood	Low	High	High	Low	
	Priority Score:	7	50	100	10	**167**
	Winter Storms	COUNTYWIDE				
	Priority Score:					
Olar	Tornado	Low	Low	Medium	Low	
	Priority Score:	7	5	50	2	**64**
	Hurricane/Tropical Storm	COUNTYWIDE				
	Priority Score:					
	Hail	Low	Medium	Medium	Medium	
	Priority Score:	7	25	50	10	**92**
	Drought	COUNTYWIDE				
	Priority Score:					
	Earthquake	COUNTYWIDE				
	Priority Score:					
	Wildfire	COUNTYWIDE				
	Priority Score:					
	Flood	Low	High	High	Low	
	Priority Score:	7	50	100	2	**159**
	Winter Storms	COUNTYWIDE				
	Priority Score:					

Bamberg County Property Assessment

As reported from the County Tax Assessors office, Bamberg County properties have been assessed as following:

Residential:	$ 200,551,240
All Other:	$ 90,426,950
Agricultural:	$ 51,322,230
Commercial:	$ 39,213,090
Mobile Home:	$ 26,802,000
Multiple Lot Value:	$ 335,000

There are a recorded 14,132 total parcels within Bamberg County. When determining the vulnerability and impact for each jurisdiction, these numbers were taken into consideration and used to calculate the priority score.

2.4 Community Mitigation Capability Assessment

No changes were made to this section after the Task Force Committee reviewed and analyzed during the update process.

Purpose

The main purpose of this section is to examine the policies, ordinances, and codes that have been put in place to reduce the impacts of natural hazards. In some instances, especially in the more rural jurisdictions, such existing plans do not exist. In these cases, the town is typically covered underneath the county's plans. The following is a collection of policies concerning natural hazards, mitigation, and emergency preparedness, reviewed by the Lower Savannah Council of Governments. This section is essential for the examination of current natural hazard mitigation. The review of the following plans aided the development of this hazard mitigation by allowing the plan developers to see what is already in place to deal with natural hazards.

Bamberg County's Emergency Management Division provides overall coordination during major emergencies, such as hurricanes, tornados, and other natural and manmade disasters. The EMD is responsible for all hazards planning, natural and technological, hazard mitigation, preparedness for, response to, and recovery from disasters, and the coordination of the Emergency Preparedness Committee.

Bamberg County has an Emergency Operations Plan that was developed for use by Bamberg County Government Officials to ensure mitigation and preparedness, appropriated response, and timely recovery from hazards that may affect Bamberg County. The plan has three major parts: letter of promulgation approves the plan and assigns responsibilities, basic plan outlines polices and general procedures that provide a common basis for joint county and municipal governments operations in a natural, technological, or purposeful harm disaster, and Emergency Support Functions (ESFs) providing guidelines for the development of appropriate mechanisms to facilitate the prompt and efficient application of resources in any emergency or disaster situation.

Comprehensive plans and zoning ordinances exist in Bamberg County and the City of Bamberg and Denmark. Integrating mitigation concepts and policies with existing comprehensive plans provides and expanded means for implementing initiatives through established, legal frameworks. The foundation of these plans lies in the promotion of health, safety, efficiency, and well being for all segments of the population. Some of the primary plan objectives include preservation of the County's unique natural environment and historic heritage, creation of a stable and diverse economy, and promoting sustainable developments. A local hazard mitigation initiative can be strengthened by finding opportunities where the implementation of other County goals and policies also supports the mitigation recommendations presented in this plan.

Zoning ordinances cover the unincorporated areas of the county and some municipalities. Zoning can be used to restrict growth in high risk areas, allow low density development or designate only certain uses in hazard prone areas. All the zoning ordinances require erosion control practices for ground disturbing activities, protection of existing waterways, and revegetation. These practices and others promote best management practices and reduce the risk of flooding hazard in particular.

Bamberg County has land development regulations that provide policy for infrastructure for new development. Like zoning regulations, these regulations provide best management practices to reduce the risk of flooding hazards. Over the last five years, Bamberg County growth and development has remained relatively unchanged. After reviewing the County's current land use map and future land use map, it is evident that little new development has occurred since the previous update to the Plan. After reviewing the County's existing policies, land development regulations and growth projections, the existing policies are deemed sufficient, and portray an accurate reflection of Bamberg County's land use growth and development.

Building codes are important in mitigation because codes are developed for areas of the state in consideration of types, frequency and intensity of hazards present in that geographic region. Consequently, structures that are built to applicable codes are inherently resistant to many hazards like strong wind, floods, and earthquakes. Additionally, Bamberg County has a mobile and manufactured home ordinance that provides separate standards for those types of housing

Intergovernmental cooperation is a great asset to the implementation of hazard mitigation actions. This way local, county, and State agencies can act as resources for each other. Interaction between the County, towns, and regional planning organizations occurs in areas such as plan development and grant writing.

The major conclusion reached after conducting the capability assessment is that Bamberg County will need to rely on technical and financial assistance from various resources to effectively implement hazard mitigation actions over the next five years. The constraints facing the County and especially the municipalities include both limited staff resources and extremely limited funding.

During this planning process, it is apparent that the County has a strong capability to bring together various groups to work together in crafting better communities of the future. The same cooperative effort, if joined with the appropriate technical and financial assistance from regional, state, and federal resources, can be harnessed to implement the priority hazard mitigation actions. A sustained effort by citizens, staff, and local officials can create a more sustainable and disaster resistant future.

Each of the local governments has the capacity to handle mitigation issues, but are limited due to funding and limited staff. The results of the capability assessment help to provide the framework for developing recommendation for specific mitigation actions. It also helps to identify shortfalls in the local government capabilities as well as draw attention to existing successes. The capability assessment was analyzed then used to rank the mitigation strategies according to the capability of the county or the municipalities to implement the actions.

Incorporation of the requirements of the mitigation plan into existing planning mechanisms

Existing Planning Mechanisms

Figure 38. Existing Planning Mechanisms

Jurisdiction	Comprehensive Plan	Capital Improvement Plan	Building Code	Flood Hazard Ordinance	Zoning Ordinance	Emergency Operations Plan**
Bamberg County	Yes	Yes	Yes	Yes	Yes	Yes
Bamberg	Yes	No	Yes*	Yes	Yes	Yes
Denmark	Yes	No	Yes*	Yes	Yes	Yes
Ehrhardt	No	No	Yes*	Yes	No	Yes
Govan	No	No	Yes*	No	No	Yes
Olar	No	No	Yes*	No	No	Yes

*Enforced by County **Municipalities covered by County EOP

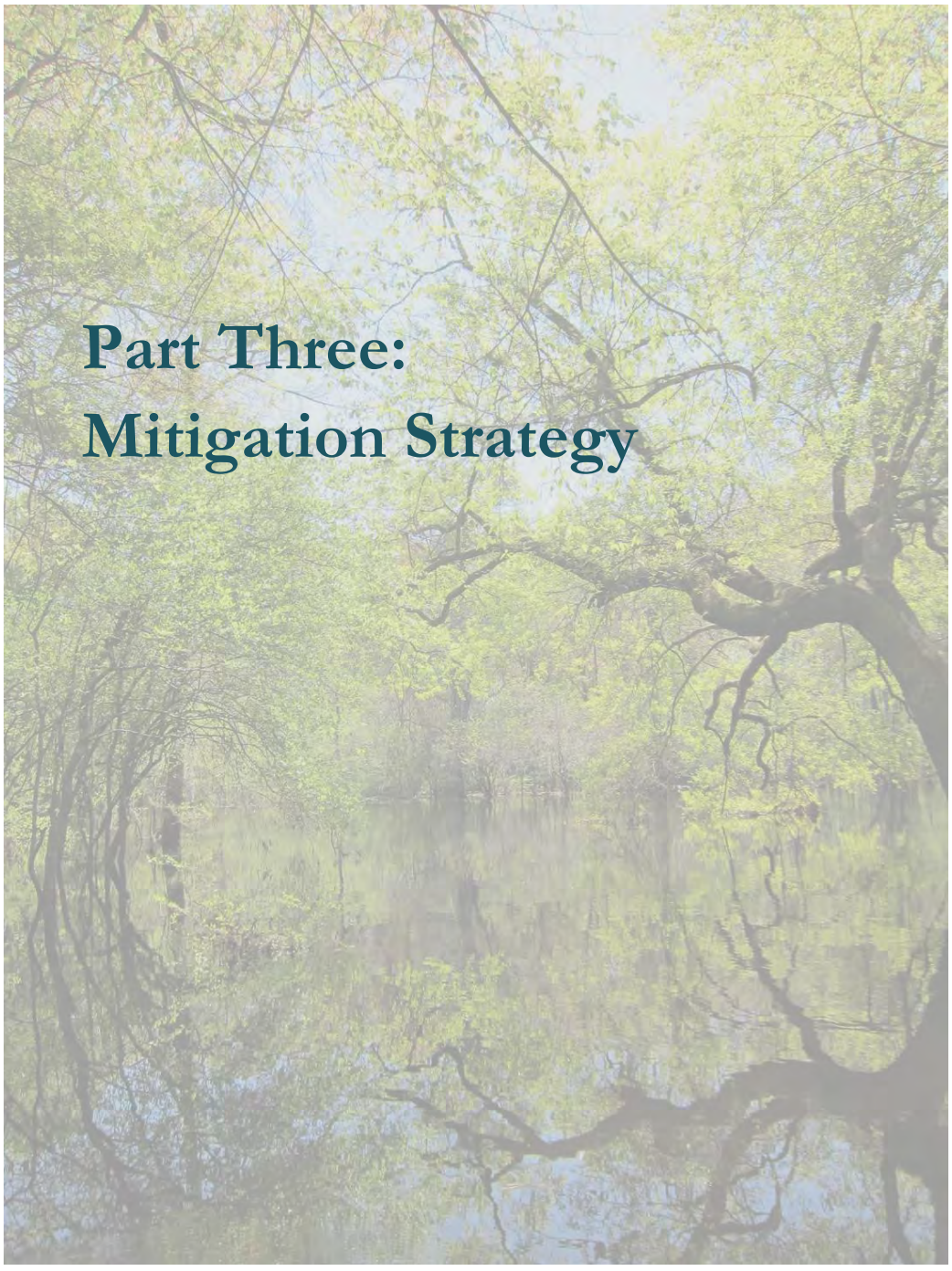
There are several ways to incorporate the hazard mitigation plan requirements into the existing planning processes. First, the comprehensive plans are updated every five years and cover features of the jurisdictions such as natural resources and community facilities. Planning commissions within each jurisdiction revise the plans then recommend the revised plan to the local governing bodies for approval. Using this process, hazard mitigation elements can be included in plan updates.

None of the jurisdictions have capital improvement plans, however, capital improvement activities are usually included as part of the comprehensive plans. The zoning ordinances are built from the findings of the comprehensive plan, so changes to the zoning ordinances can be made after the comprehensive plan is updated.

Updating the comprehensive plan would cover areas such as economic development, land use, natural resources, road construction and community facilities. From that, the zoning ordinance could reflect needed changes for issues such as development, land uses, storm water retention or road grading activities.

Building codes are standard across the county and can be updated with hazard mitigation findings by the governing body of each local government. In addition, the state has adopted the Southern Building Code. As changes are made to the state building code by the state legislature local jurisdictions may adopt those changes and incorporate them into local building codes.

Public hearings, which provide an opportunity for public comment, are required prior to adoption of any of the above planning mechanisms.



Part Three: Mitigation Strategy

3.1 Mitigation Strategy

After review and analysis from the Task Force Committee, the Mitigation Strategy section has remained unchanged for the update process.

The Mitigation Strategy section describes how Bamberg County and its incorporated municipalities will reduce or eliminate potential losses from hazards identified in the Natural Hazard Risk Assessment section. The strategy focuses on existing and potential mitigation actions that will mitigate the effects of a natural hazard event on Bamberg County's population, economy, and property. The Mitigation Strategy is a coordinated effort by various agencies and partners to develop and implement a comprehensive range of inventive and effective natural hazard mitigation actions.

Mitigation Strategy Approach

- Establish mitigation goals and objectives that aim to reduce or eliminate Bamberg County's long-term vulnerability to natural-hazard events
- Identify and analyze a comprehensive range of hazard-specific mitigation actions that aim to achieve the goals and objectives of the Mitigation Strategy
- Describe how Bamberg County will prioritize, implement, and administer mitigation actions

FEMA Requirements

The Task Force Committee developed the mitigation strategy consistent with the process and steps presented in the Federal Emergency Management Agency's (FEMA) How-To-Guide: Developing the Mitigation Plan. This section satisfies the following requirements:

- **Requirement §201.6(c)(3)(i):** The hazard mitigation strategy ***shall*** include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.
- **Requirement §201.6(c)(3)(ii):** The mitigation strategy ***shall*** include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. The mitigation strategy must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.
- **Requirement §201.6(c)(3)(iii):** The mitigation strategy ***shall*** include an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization ***shall*** include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

Process

Using the findings from the risk assessment and the capabilities assessment as a guide the task force developed the following mitigation goals, objectives, and strategies for implementation. Goals and objectives were developed by the Task Force, Lower Savannah Council of Government representatives, and FEMA representatives and included a period provided for comment and revision. Once the final goals and objectives were determined the Task Force developed the mitigation strategies that would aid the county and participating jurisdictions in meeting the goals and objectives identified in the plan. Strategies were selected using the information obtained from the capabilities assessment, which identified existing programs and shortfalls related to mitigation activities.

The first step in the mitigation actions and prioritization process was the county Task Force reviewed a broad range of potential mitigation actions. From these proposed actions, the Task Force developed a prioritization method based on a number of different factors. The projects were ranked based on a cost-benefit review that showed which projects were most needed, which of these projects was the most likely to be accomplished, and which would most effectively address mitigation needs. Those projects that required minimal funds were considered higher in priority because of the high likelihood that they could be accomplished as well as having a maximum cost-benefit ratio.

In addition to reviewing potential monetary costs, the team considered the social impact of each potential project, the technical capabilities of the local government to carry through the project, impact on the environment, ability of the local government to maintain the project, and any political or legal effects of the decision. Actions that can immediately aid in the mitigation of the most likely and dangerous natural hazards are higher in priority under each of the goals for Bamberg County and the participating municipalities. This cost-benefit review was the basis for each of the project feasibility rankings.

Each action and project includes the following: a priority rank, project name, description, responsible party, and timeframe. The participating municipalities will rely on grants and other sources in order to fund mitigation projects.

Based on the recommendations of the Task Force the following implementation schedule has been developed. Projects have been listed by priority according to the ranking assigned by the Task Force (High, Medium, or Low). Feasibility to implement the projects is also ranked High, Medium or Low based on the results of the capability assessment.

Cost Benefit Review

A key criterion for mitigation projects to be eligible for funding is that they must be cost-effective. If the project benefits are higher than the project costs, then the project is cost-effective. In order to ensure a consistent approach in determining the cost-effectiveness of all mitigation projects, Bamberg County and its participating municipalities will use the FEMA Benefit Cost Analysis (BCA) module and process. A Benefit-Cost Analysis (BCA) is a method for determining the potential positive effects of a specific mitigation action and comparing them to the cost of the action. To assess and

demonstrate the cost-effectiveness of mitigation actions, FEMA has developed a suite of BCA software, including hazard-specific modules. Agencies seeking funding under one of FEMA's mitigation grant programs will perform a detailed BCA using this software prior to the submission of the grant application. Bamberg County and its participating municipalities will weigh the effectiveness of the mitigation actions based on the implementation timeframe, the history of occurrences for specific hazards, and the cost of the project.

Implementation and Administration

The following categories have been identified as information for each action that will guide Bamberg County and its participating municipalities in the implementation and administration of the actions: description, agencies, timeframe, cost, funding source, and priority. It also serves to coordinate the various agencies involved to avoid duplicating or conflicting efforts. The mitigation strategies contain a wide variety of actions that mitigate the effects of natural hazards on the population, economy, and property of Bamberg County.

Implementation Key	
Column Header	**Description**
Mitigation Action & Description	Contains the title and description of the action
Agency	Lists the agency that has primary jurisdiction over the mitigation action and any supporting entities that will assist in the implementation, funding, or maintenance of the mitigation action
Project Timeframe/Duration	Estimates when the project will begin and approximately how long it will take to complete. "Ongoing" refers to actions that are either underway or have no definitive end date
Estimated Project Cost	Estimates costs associated with implementing each mitigation action
Possible Funding Source(s)	Identifies possible sources of funding including capital funding, grants, bonds, and other types of funding
FEMA Category	Identifies the associated FEMA mitigation action category (Prevention, Property Protection, Public Education and Awareness, Natural Resource Protection, Emergency Services, and Structural Projects)
Goals and Objectives	Identifies the hazard mitigation goals and objectives addressed by the mitigation action
Priority	Lists the results of the mitigation action prioritization

Figure 39. Implementation Key

3.2 Bamberg County Goals and Objectives

The Task Force Committee reviewed and analyzed the County's goals and objectives in Figure 40 as part of the update process.

Developing Goals and Objectives

The first step in developing a hazard mitigation strategy is to establish goals and objectives that aim to reduce or eliminate Bamberg County's long-term vulnerability to natural hazard events. Mitigation goals are general guidelines explaining what the County and its participating municipalities want to achieve in terms of hazard and loss prevention. Objectives are specific, measurable strategies or implementation steps used to achieve the identified goals. Developing clear goals and objectives helped reinforce Bamberg County's overall purpose and mission for undertaking a mitigation planning process.

The goals and objectives set forth below provide the necessary framework to develop a mitigation strategy. Bamberg County will re-evaluate its hazard mitigation goals and objectives each plan maintenance cycle to ensure they continue to represent the hazard mitigation priorities.

Hazard Mitigation Goals and Objectives	
Goal 1: Protect public health and safety	
Objective 1.1	Improve systems that provide warning and emergency communications.
Objective 1.2	Reduce the impacts of hazards on vulnerable populations.
Objective 1.3	Train emergency responders.
Objective 1.4	Strengthen local building code enforcement.
Goal 2: Increase public preparedness and awareness for natural disasters	
Objective 2.1	Enhance understanding of natural hazards and the risks they pose.
Objective 2.2	Improve hazard information, including databases, maps, articles in local media, instructional web site, pamphlets, information packets, etc.
Objective 2.3	Improve public knowledge of hazards and protective measures allowing individuals to appropriately prepare for and respond to hazard events.
Goal 3: Protect property	
Objective 3.1	Implement mitigation programs that protect critical facilities and services, and promote reliability of lifeline systems to minimize impacts from hazards, maintain operations, and expedite recovery in an emergency.
Objective 3.2	Consider known hazards when identifying a site for new facilities and systems.
Objective 3.3	Adopt and enforce public policies to minimize hazard impacts on buildings, infrastructure, and neighborhoods and enhance safe construction in high hazard areas.
Objective 3.4	Integrate new hazard and risk information into building codes and land use planning mechanisms.
Objective 3.5	Educate public officials, developers, realtors, contractors, building owners, and the public about hazard risks and building requirements.
Goal 4: Emergency Services	
Objective 4.1	Immediate actions taken in response to a hazard event can minimize the impact of hazard incidents on people and property.

Goal 5: Reduce the potential effects of flooding on homes and buildings in Bamberg County	
Objective 5.1	Continue the implementation of zoning codes.
Objective 5.2	Study flood areas to implement needed changes in development and storm drainage.
Goal 6: Ensure protection and emergency shelters	
Objective 6.1	Shelters must be identified to provide protection to the public.
Objective 6.2	Identify buildings approved for occupancy during natural hazards.
Objective 6.3	The number of shelters should be adequate and safe for the amount of people that may potentially need them.

Figure 40: Bamberg County Hazard Mitigation Goals and Objectives

3.3 Bamberg County Mitigation Actions

The Task Force Committee reviewed and analyzed the County's mitigation actions in Figure 41 as part of the update process.

Mitigation actions include programs, plans, projects, or policies that help reduce or eliminate the long-term risk to human life and property from natural hazards. The Task Force Committee identified and analyzed a comprehensive range of hazard-specific mitigation actions with particular emphasis on actions that affect new and existing buildings and infrastructure within Bamberg County, and also the protection of the citizens.

Identification

The Task Force Committee identified both existing and potential mitigation actions within their respective agencies that have the following criteria:

- Reduce or eliminate the long-term risk to human life and property from at least one of the eight natural hazards identified in the Risk Assessment Section
- Fall under one or more of the six FEMA mitigation action categories
- Achieve one or more of the hazard mitigation goals and objectives

Mitigation Action Categories

FEMA organizes mitigation actions into six broad categories. These categories allow similar types of mitigation actions to be compared, and provides a standardized method for eliminating unsuitable actions. All mitigation actions identified in this strategy fall within one of the FEMA mitigation action categories below:

1. **Prevention:** Government administrative or regulatory actions or processes that influence the way land buildings are developed and built. These actions also include public activities that reduce hazard losses. Examples from this strategy include building and construction code revisions, zoning regulation changes, and computer-hazard modeling.

2. **Property Protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples from this strategy include seismic retrofits, roadway elevations, and floodproofing.

3. **Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Examples from this strategy include programs that target severe repetitive loss properties and vulnerable populations.

4. **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples from this strategy include projects creating open space or wetlands.

5. **Emergency Services:** Actions that protect people and property during and immediately after a disaster or hazard event. Examples from this strategy include enhancements that provide advanced warning and redundant communications.

6. **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Examples from this strategy include projects that control floodwater, reconstruct dams and seawalls, and construct green roofs.

Summary of Mitigation Actions

The final list of Bamberg County's mitigation actions is in the figure below. Many of the actions protect public health and safety, promote a sustainable economy, protect the environment, and increase public preparedness for disasters. The mitigation actions are the County's programs, plans, projects, or policies that the county may implement to help reduce or eliminate the long-term risk to human life and property from natural hazards. The Task Force identified, analyzed, and prioritized all actions based on the hazard vulnerability, historical occurrence of the hazard, cost effectiveness, and compliance with NFIP. They prioritized the actions on a high, medium and low scale defined as the following:

- *High Priority*: A project that meets multiple plan objectives, benefits exceed cost, is grant-eligible, can be completed in a short-term period once project is funded.
- *Medium Priority*: A project that meets at least one plan objective, benefits exceed costs, funding not secured, grant eligibility is questionable, and can be completed within 1 to 5 years once project is funded
- *Low Priority*: A project that will mitigate the risk of a hazard, benefits may exceed costs, funding is not secured, project may not be grant-eligible and/or timeline for completion is considered long-term

As a side note, it should be mentioned that these priority definitions are considered to be dynamic and can change from one category to another based on changes to a parameter such as availability of funding. For example, a project might be assigned a medium priority because of the uncertainty of a funding source. This priority could be changed to high once a funding source has been identified such as a grant. The prioritization schedule for this plan will be reviewed and updated as needed through the plan maintenance strategy described in section 4.1 of this Plan

Status on Strategies

After reevaluating and reviewing the mitigation actions for the plan update, it was evident that some of the previous strategies for Bamberg County were not implemented due to the lack of funding sources. *Note some mitigation actions identified in the plan update may not ultimately be implemented due to prohibitive costs, scale, low benefit/cost analysis rations, or other concerns*

Bamberg County Hazard Mitigation Actions											
Mitigation Action and Description	**Agency**	**Timeframe**	**Hazard**	**Estimated Project Cost**	**Possible Funding Source**	**FEMA Category**	**Goals and Objectives**	**Prioritization**	**Implemen -tation Status**	**Implemen-tation Schedule**	**Milestones Achieved, Impediments to Implementation**
Develop a continuing communications and education program including instructional web-site, pamphlets, information packets and articles in the local media.	Bamberg County/ Emergency Management	*Ongoing	ALL	N/A	PDM, HMGP	Public Education and Awareness	2.1,2.2,2.3	Medium	Depending on funding	5 years	Depending on funding
Implement and enforce zoning codes and building codes to ensure no new structures are built within the floodplains.	Bamberg County/ Building and Planning	Completed	Flood	N/A	N/A	Prevention	3.2,3.6,5.1, 5.2	High	Complete	Continuous process	Enforcement is necessary
Establishment and identification of emergency shelters during times of natural hazards.	Emergency Management	Completed	ALL	N/A	N/A	Emergency Services/ Property Protection	1.2, 6.1, 6.2, 6.3	Medium	Complete/ Ongoing	In place/ongoing as needed	Achieved but ongoing review
Identify flood prone areas and determine appropriate improvements to drainage	Bamberg County/ SCDNR/SCDOT	*Ongoing	Flood	N/A	Federal and State Grants	Property Protection	3.2,3.5,3.6, 5.1,5.2	Medium	Depending on funding	5 years	Depending on funding

services and levels of flood protection.											
Develop an enhanced notification system for the citizens using a variety of communication media to simultaneously notify, alert, and/or instruct citizens prior to and during an emergency.	Bamberg County /Emergency Management	Completed	ALL	N/A	PDM/HMGP	Emergency Services/ Public Education and Awareness	1.1,1.2,1.3, 2.1	Medium	Complete	In place	Emergency telephone notification system, National Weather Service transmitter, Alert FM System
Retro Fit Critical Facilities and install backup generators in select governmental buildings to provide power during blackouts and emergency operations	Emergency Management	*Ongoing	ALL	N/A	PDM/HMGP	Emergency Services/ Property Protection	3.1,3.2,3.3, 3.4,3.5,3.6	High	Depending on funding	5 years	This strategy will depend on funding
Continue to regularly inspect roads and bridges throughout the county to ensure they are ready for extra	Bamberg County/SCDOT/ Emergency Management	*Ongoing	ALL	N/A	General Fund/Local or Federal grants	Emergency Services/ Prevention	1.2,2.3,4.1	High	This will be an on-going project that will continue to be implement	Continuous	Ongoing and depending on funding

service if a disaster strikes. *US 78 to be widened									ed and developed over time		
Continue to regularly review local government comprehensive plans and ordinances to ensure that they include provisions for pre- and post-disaster planning.	Bamberg County Planning and Development	*Ongoing	ALL	N/A	Local or Federal grants	Prevention/ Property Protection	1.4,2.2,3.2. 3.3,3.4,3.5, 5.1,5.2	High	Continuou s process	In place; continuous	Achieved; done on a regular basis
Installation of new roofs and windows at Bamberg-Ehrhardt High School and Denmark-Olar High School. Both locations serve as disaster shelters	Bamberg County/Emergen cy Management	*Ongoing	ALL	$0.5M-$1M	PDM/H MGP	Property Protection	2.1,2.2,5.2	High	Depending on funding	5 years	This strategy will depend on funding
Expansion of Bamberg County Emergency Operations Center	Bamberg County/Emergen cy Management	*Ongoing	ALL	N/A	PDM/H MGP	Emergency Services/Pu blic Education and Awareness	2.1,2.2,2.3, 1.2,4.1	Medium	Depending on funding	5 years	This strategy will depend on funding

Purchase new required FCC radios that are 25 megahertz – 12.5 megahertz for County Emergency Management	Bamberg County/Emergency Management	Immediate	ALL	N/A	PDM/HMGP	Emergency Services/Public Education and Awareness	1.1,2.3	High	Depending on funding	5 years	This strategy will depend on funding

Figure 41: Bamberg County Hazard Mitigation Actions

*Ongoing is defined as continuing without termination or interruption

3.4 City of Bamberg Goals and Objectives

The Task Force Committee reviewed and analyzed the City of Bamberg's goals and objectives in Figure 42 as part of the update process.

Developing Goals and Objectives

The first step in developing a hazard mitigation strategy is to establish goals and objectives that aim to reduce or eliminate the City of Bamberg's long-term vulnerability to natural hazard events. Mitigation goals are general guidelines explaining what the Town wants to achieve in terms of hazard and loss prevention. Objectives are specific, measurable strategies or implementation steps used to achieve the identified goals. Developing clear goals and objectives helped reinforce Bamberg's overall purpose and mission for undertaking a mitigation planning process.

The goals and objectives set forth below provide the necessary framework to develop a mitigation strategy. The City of Bamberg will re-evaluate its hazard mitigation goals and objectives each plan maintenance cycle to ensure they continue to represent the hazard mitigation priorities.

Hazard Mitigation Goals and Objectives	
Goal 1: Protect public health and safety	
Objective 1.1	Improve systems that provide warning and emergency communications.
Objective 1.2	Reduce the impacts of hazards on vulnerable populations.
Objective 1.3	Train emergency responders.
Objective 1.4	Strengthen local building code enforcement.
Goal 2: Increase public preparedness and awareness for natural disasters	
Objective 2.1	Enhance understanding of natural hazards and the risks they pose.
Objective 2.2	Improve hazard information, including databases, maps, articles in local media, instructional web site, pamphlets, information packets, etc.
Objective 2.3	Improve public knowledge of hazards and protective measures allowing individuals to appropriately prepare for and respond to hazard events.
Goal 3: Protect property	
Objective 3.1	Implement mitigation programs that protect critical facilities and services, and promote reliability of lifeline systems to minimize impacts from hazards, maintain operations, and expedite recovery in an emergency.
Objective 3.2	Consider known hazards when identifying a site for new facilities and systems.
Objective 3.3	Adopt and enforce public policies to minimize hazard impacts on buildings, infrastructure, and neighborhoods and enhance safe construction in high hazard areas.
Objective 3.4	Integrate new hazard and risk information into building codes and land use planning mechanisms.
Objective 3.5	Educate public officials, developers, realtors, contractors, building owners, and the public about hazard risks and building requirements.
Goal 4: Emergency Services	
Objective 4.1	Immediate actions taken in response to a hazard event can minimize the impact of hazard incidents on people and property.

Goal 5: Reduce the potential effects of flooding on homes and buildings in the Town of Bamberg	
Objective 5.1	Continue the implementation of zoning codes.
Objective 5.2	Study flood areas to implement needed changes in development and storm drainage.
Goal 6: Ensure protection and emergency shelters	
Objective 6.1	Shelters must be identified to provide protection to the public.
Objective 6.2	Identify buildings approved for occupancy during natural hazards.
Objective 6.3	The number of shelters should be adequate and safe for the amount of people that may potentially need them.

Figure 42: City of Bamberg Hazard Mitigation Goals and Objectives

3.5 City of Bamberg Mitigation Actions

The Task Force Committee reviewed and analyzed the City's mitigation action in figure 43 as part of the update process.

Mitigation actions include programs, plans, projects, or policies that help reduce or eliminate the long-term risk to human life and property from natural hazards. The Task Force Committee identified and analyzed a comprehensive range of hazard-specific mitigation actions with particular emphasis on actions that affect new and existing buildings and infrastructure within the Town of Bamberg, and also the protection of the citizens.

Identification

The Task Force Committee identified both existing and potential mitigation actions within their respective agencies that have the following criteria:

- Reduce or eliminate the long-term risk to human life and property from at least one of the eight natural hazards identified in the Risk Assessment Section
- Fall under one or more of the six FEMA mitigation action categories
- Achieve one or more of the hazard mitigation goals and objectives

Mitigation Action Categories

FEMA organizes mitigation actions into six broad categories. These categories allow similar types of mitigation actions to be compared, and provides a standardized method for eliminating unsuitable actions. All mitigation actions identified in this strategy fall within one of the FEMA mitigation action categories below:

1. **Prevention:** Government administrative or regulatory actions or processes that influence the way land buildings are developed and built. These actions also include public activities that reduce hazard losses. Examples from this strategy include building and construction code revisions, zoning regulation changes, and computer-hazard modeling.

2. **Property Protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples from this strategy include seismic retrofits, roadway elevations, and floodproofing.

3. **Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Examples from this strategy include programs that target severe repetitive loss properties and vulnerable populations.

4. **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples from this strategy include projects creating open space or wetlands.

5. **Emergency Services:** Actions that protect people and property during and immediately after a disaster or hazard event. Examples from this strategy include enhancements that provide advanced warning and redundant communications.

6. **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Examples from this strategy include projects that control floodwater, reconstruct dams and seawalls, and construct green roofs.

Summary of Mitigation Actions

The final list of the City of Bamberg's mitigation actions is in the figure below. Many of the actions protect public health and safety, promote a sustainable economy, protect the environment, and increase public preparedness for disasters. The mitigation actions are the town's programs, plans, projects, or policies that the town may implement to help reduce or eliminate the long-term risk to human life and property from natural hazards. The Task Force identified, analyzed, and prioritized all actions. They prioritized the actions on a high, medium and low scale defined as the following:

- *High Priority*: A project that meets multiple plan objectives, benefits exceed cost, is grant-eligible, can be completed in a short-term period once project is funded.
- *Medium Priority*: A project that meets at least one plan objective, benefits exceed costs, funding not secured, grant eligibility is questionable, and can be completed within 1 to 5 years once project is funded
- *Low Priority*: A project that will mitigate the risk of a hazard, benefits may exceed costs, funding is not secured, project may not be grant-eligible and/or timeline for completion is considered long-term

As a side note, it should be mentioned that these priority definitions are considered to be dynamic and can change from one category to another based on changes to a parameter such as availability of funding. For example, a project might be assigned a medium priority because of the uncertainty of a funding source. This priority could be changed to high once a funding source has been identified such as a grant. The prioritization schedule for this plan will be reviewed and updated as needed through the plan maintenance strategy described in section 4.1 of this Plan.

Status on Strategies

After reevaluating and reviewing the mitigation actions for the plan update, it was evident that none of the previous strategies for the City of Bamberg were implemented due to the lack of funding sources. *Note some mitigation actions identified in the plan update may not ultimately be implemented due to prohibitive costs, scale, low benefit/cost analysis rations, or other concerns*

Town of Bamberg Hazard Mitigation Actions											
Mitigation Action and Description	**Agency**	**Hazard**	**Timeframe**	**Estimated Project Cost**	**Possible Funding Source**	**FEMA Category**	**Goals and Objective**	**Prioritization**	**Imple-mentation Status**	**Implementation Schedule**	**Milestones Achieved, Impediments to Implementation**
Develop a continuing communications and education program including instructional web-site, pamphlets, information packets and articles in the local media.	County/ Emergency Management	ALL	Immediate	N/A	PDM, HMGP	Public Education and Awareness	2.1, 2.2, 2.3	High	Depending on funding	Over a 5-year term	Identify funding source - Depending on funding
Implement and enforce zoning codes and building codes to ensure no new structures are built within the floodplains.	Town of Bamberg /Building and Planning	Flood	*Ongoing	N/A	N/A	Prevention	1.4, 3.2, 3.3	Medium	Completed	Currently in place /Ongoing	Continuous process that requires enforcement
Establishment and identification of emergency shelters during times of natural hazards.	County /Emergency Management	ALL	Complete	N/A	N/A	Emergency Services/ Property Protection	1.2, 2.3, 6.1, 6.2, 6.3	Low	Completed /Ongoing	Currently in place /ongoing as needed	Achieved but ongoing review

Identify flood prone areas and determine appropriate improvements to drainage services and levels of flood protection.	Emergency Management / SCDNR	Flood	*Ongoing	N/A	Federal and State Grants	Property Protection	2.1, 2.2, 5.2	Low	Depending on funding	5 years	Depending on funding
Develop an enhanced notification system for the citizens using a variety of communication media to simultaneously notify, alert, and/or instruct citizens prior to and during an emergency	County/ Emergency Management	ALL	*Ongoing	N/A	PDM/HMGP	Emergency Services/ Public Education and Awareness	1.1, 2.3, 4.1	Medium	Complete	In Place	Emergency telephone notification system, National Weather Service transmitter, Alert FM System
Retrofit Critical Facilities and install backup generators where necessary	State Emergency Management	ALL	*Ongoing	N/A	PDM/HMGP	Emergency Services/Property Protection	1.1,1.3,2.3,3.1,3.3,3.4,3.5,4.1,6.1, 6.2	High	Depending on funding	5 Years	Depending on funding

Figure 43: Town of Bamberg Hazard Mitigation Actions

*Ongoing is defined as continuing without termination or interruption

3.6 City of Denmark Goals and Objectives

The Task Force Committee reviewed and analyzed the City of Denmark's goals and objectives in Figure 44 as part of the update process.

Developing Goals and Objectives

The first step in developing a hazard mitigation strategy is to establish goals and objectives that aim to reduce or eliminate the City of Denmark's long-term vulnerability to natural hazard events. Mitigation goals are general guidelines explaining what the City wants to achieve in terms of hazard and loss prevention. Objectives are specific, measurable strategies or implementation steps used to achieve the identified goals. Developing clear goals and objectives helped reinforce Denmark's overall purpose and mission for undertaking a mitigation planning process.

The goals and objectives set forth below provide the necessary framework to develop a mitigation strategy. The City of Denmark will re-evaluate its hazard mitigation goals and objectives each plan maintenance cycle to ensure they continue to represent the hazard mitigation priorities.

Hazard Mitigation Goals and Objectives	
Goal 1: Protect public health and safety	
Objective 1.1	Improve systems that provide warning and emergency communications.
Objective 1.2	Reduce the impacts of hazards on vulnerable populations.
Objective 1.3	Train emergency responders.
Objective 1.4	Strengthen local building code enforcement.
Goal 2: Increase public preparedness and awareness for natural disasters	
Objective 2.1	Enhance understanding of natural hazards and the risks they pose.
Objective 2.2	Improve hazard information, including databases, maps, articles in local media, instructional web site, pamphlets, information packets, etc.
Objective 2.3	Improve public knowledge of hazards and protective measures allowing individuals to appropriately prepare for and respond to hazard events.
Objective 2.4	Educate residents on meaning of warning systems and scheduled testing of systems.
Objective 2.5	Provide maps for evacuation and distribute pamphlet "Things to Know: In case of a hurricane in Bamberg County."
Goal 3: Protect property	
Objective 3.1	Implement mitigation programs that protect critical facilities and services, and promote reliability of lifeline systems to minimize impacts from hazards, maintain operations, and expedite recovery in an emergency.
Objective 3.2	Consider known hazards when identifying a site for new facilities and systems.
Objective 3.3	Adopt and enforce public policies to minimize hazard impacts on buildings, infrastructure, and neighborhoods and enhance safe construction in high hazard areas.
Objective 3.4	Integrate new hazard and risk information into building codes and land use planning mechanisms.
Objective 3.5	Educate public officials, developers, realtors, contractors, building owners, and the public about hazard risks and building requirements.

Objective 3.6	Cutting of dead trees along roadsides.
Goal 4: Emergency Services	
Objective 4.1	Immediate actions taken in response to a hazard event can minimize the impact of hazard incidents on people and property.
Objective 4.2	Sound warning systems located in Denmark City Hall to be used for notifying public during cases of emergency.
Goal 5: Reduce the potential effects of flooding on homes and buildings in the City of Denmark	
Objective 5.1	Continue the implementation of zoning codes.
Objective 5.2	Study flood areas to implement needed changes in development and storm drainage.
Goal 6: Ensure protection and emergency shelters	
Objective 6.1	Shelters must be identified to provide protection to the public.
Objective 6.2	Identify buildings approved for occupancy during natural hazards.
Objective 6.3	The number of shelters should be adequate and safe for the amount of people that may potentially need them.
Goal 7: Natural Resource Protection	
Objective 7.1	Continue agreement with Bamberg and City of Denmark for use of water in emergency or drought.

Figure 44: City of Denmark Hazard Mitigation Goals and Objectives

3.7 City of Denmark Mitigation Actions

The Task Force Committee reviewed and analyzed the City's mitigation action in figure 45 as part of the update process.

Mitigation actions include programs, plans, projects, or policies that help reduce or eliminate the long-term risk to human life and property from natural hazards. The Task Force Committee identified and analyzed a comprehensive range of hazard-specific mitigation actions with particular emphasis on actions that affect new and existing buildings and infrastructure within the City of Denmark, and also the protection of the citizens.

Identification

The Task Force Committee identified both existing and potential mitigation actions within their respective agencies that have the following criteria:

- Reduce or eliminate the long-term risk to human life and property from at least one of the eight natural hazards identified in the Risk Assessment Section
- Fall under one or more of the six FEMA mitigation action categories
- Achieve one or more of the hazard mitigation goals and objectives

Mitigation Action Categories

FEMA organizes mitigation actions into six broad categories. These categories allow similar types of mitigation actions to be compared, and provides a standardized method for eliminating unsuitable actions. All mitigation actions identified in this strategy fall within one of the FEMA mitigation action categories below:

1. **Prevention:** Government administrative or regulatory actions or processes that influence the way land buildings are developed and built. These actions also include public activities that reduce hazard losses. Examples from this strategy include building and construction code revisions, zoning regulation changes, and computer-hazard modeling.

2. **Property Protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples from this strategy include seismic retrofits, roadway elevations, and floodproofing.

3. **Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Examples from this strategy include programs that target severe repetitive loss properties and vulnerable populations.
4. **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses,

also preserve or restore the functions of natural systems. Examples from this strategy include projects creating open space or wetlands.

5. **Emergency Services:** Actions that protect people and property during and immediately after a disaster or hazard event. Examples from this strategy include enhancements that provide advanced warning and redundant communications.

6. **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Examples from this strategy include projects that control floodwater, reconstruct dams and seawalls, and construct green roofs.

Summary of Mitigation Actions

The final list of the City of Denmark's mitigation actions is in the figure below. Many of the actions protect public health and safety, promote a sustainable economy, protect the environment, and increase public preparedness for disasters. The mitigation actions are the town's programs, plans, projects, or policies that the town may implement to help reduce or eliminate the long-term risk to human life and property from natural hazards. The Task Force identified, analyzed, and prioritized all actions. They prioritized the actions on a high, medium and low scale defined as the following:

- *High Priority*: A project that meets multiple plan objectives, benefits exceed cost, is grant-eligible, can be completed in a short-term period once project is funded.
- *Medium Priority*: A project that meets at least one plan objective, benefits exceed costs, funding not secured, grant eligibility is questionable, and can be completed within 1 to 5 years once project is funded
- *Low Priority*: A project that will mitigate the risk of a hazard, benefits may exceed costs, funding is not secured, project may not be grant-eligible and/or timeline for completion is considered long-term

As a side note, it should be mentioned that these priority definitions are considered to be dynamic and can change from one category to another based on changes to a parameter such as availability of funding. For example, a project might be assigned a medium priority because of the uncertainty of a funding source. This priority could be changed to high once a funding source has been identified such as a grant. The prioritization schedule for this plan will be reviewed and updated as needed through the plan maintenance strategy described in section 4.1 of this Plan.

Status on Strategies

After reevaluating and reviewing the mitigation actions for the plan update, it was evident that none of the previous strategies for the City of Denmark were implemented due to the lack of funding sources. *Note some mitigation actions identified in the plan update may not ultimately be implemented due to prohibitive costs, scale, low benefit/cost analysis rations, or other concerns*

City of Denmark Hazard Mitigation Actions											
Mitigation Action and Description	**Agency**	**Hazard**	**Timeframe**	**Estimated Project Cost**	**Possible Funding Source(s)**	**FEMA Category**	**Goals and Objectives**	**Prioritiz-ation**	**Implement-ation Status**	**Imple-mentation Schedule**	**Milestones Achieved, Impediments to Implementation**
Develop a continuing communications and education program including instructional web-site, pamphlets, information packets and articles in the local media.	County/ Emergency Management	ALL	Immediate	N/A	PDM, HMGP	Public Education and Awareness	2.1, 2.2, 2.3	High	Depending on funding	5 Years	Identify funding source – Depending on funding
Implement and enforce zoning codes and building codes to ensure no new structures are built within the floodplains.	City of Denmark/ Building and Planning	Flood	*Ongoing	N/A	N/A	Prevention	1.4, 3.2, 3.3	Medium	Completed	Currently in place / Ongoing	Continuous process that requires enforcement
Establishment and identification of emergency shelters during times of natural hazards.	County/ Emergency Management	ALL	Complete	N/A	N/A	Emergency Services/ Property Protection	1.2, 2.3, 6.1, 6.2, 6.3	Low	Completed/ Ongoing	Currently in place/ ongoing as needed	Achieved but ongoing review
Identify flood prone areas and determine appropriate improvements to drainage services and levels of flood protection.	Emergency Management / SCDNR	Flood	*Ongoing	N/A	Federal and State Grants	Property Protection	2.1, 2.2, 5.2	Low	Depending on funding	5 years	Depending on funding
Notification of the public in cases of emergency. Sound warning system located in Denmark City Hall.	Denmark/ Emergency Management	ALL	*Ongoing	N/A	PDM/HMGP	Emergency Services/ Public Education and Awareness	1.1, 2.3, 4.1	Medium	Depending on funding	5 years	Depending on funding

Retrofit Critical Facilities	Emergency Management	ALL	*Ongoing	N/A	PDM/HMGP	Emergency Services/Property Protection	1.1,1.3,2.3,3.1,3.3,3.4,3.5,4.1,6.1,6.2	High	Depending on funding	5 years	Depending on funding
The City of Denmark has an extensive grass cutting program. Continue the practice of cutting grass on the side of roads.	City of Denmark	ALL	*Ongoing	N/A	Local funds, PDM, HMGP	Property Protection	3.1,6.3	Medium	Depending on funding	5 years	Depending on funding
Maintain agreement between Bamberg and Denmark for the use of water in emergency or drought.	Denmark/ Bamberg	Drought	*Ongoing	N/A	PDM, HMGP	Natural Resource Protection	7.1	Medium	Depending on funding	5 years	Depending on funding

Figure 45: City of Denmark Hazard Mitigation Actions

*Ongoing is defined as continuing without termination or interruption

3.8 Town of Ehrhardt Goals and Objectives

The Task Force Committee reviewed and analyzed the Town of Ehrhardt's goals and objectives in Figure 46 as part of the update process.

Developing Goals and Objectives

The first step in developing a hazard mitigation strategy is to establish goals and objectives that aim to reduce or eliminate the Town of Ehrhardt's long-term vulnerability to natural hazard events. Mitigation goals are general guidelines explaining what the Town wants to achieve in terms of hazard and loss prevention. Objectives are specific, measurable strategies or implementation steps used to achieve the identified goals. Developing clear goals and objectives helped reinforce Ehrhardt's overall purpose and mission for undertaking a mitigation planning process.

The goals and objectives set forth below provide the necessary framework to develop a mitigation strategy. The Town of Ehrhardt will re-evaluate its hazard mitigation goals and objectives each plan maintenance cycle to ensure they continue to represent the hazard mitigation priorities.

Hazard Mitigation Goals and Objectives	
Goal 1: Protect public health and safety	
Objective 1.1	Improve systems that provide warning and emergency communications.
Objective 1.2	Reduce the impacts of hazards on vulnerable populations.
Goal 2: Increase public preparedness and awareness for natural disasters	
Objective 2.1	Enhance understanding of natural hazards and the risks they pose.
Objective 2.2	Improve hazard information, including databases, maps, articles in local media, instructional web site, pamphlets, information packets, etc.
Objective 2.3	Improve public knowledge of hazards and protective measures allowing individuals to appropriately prepare for and respond to hazard events.
Goal 3: Protect property	
Objective 3.1	Implement mitigation programs that protect critical facilities and services, and promote reliability of lifeline systems to minimize impacts from hazards, maintain operations, and expedite recovery in an emergency.
Objective 3.2	Consider known hazards when identifying a site for new facilities and systems.
Objective 3.3	Adopt and enforce public policies to minimize hazard impacts on buildings, infrastructure, and neighborhoods and enhance safe construction in high hazard areas.
Objective 3.4	Integrate new hazard and risk information into building codes and land use planning mechanisms.
Goal 4: Emergency Services	
Objective 4.1	Immediate actions taken in response to a hazard event can minimize the impact of hazard incidents on people and property
Goal 5: Reduce the potential effects of flooding on homes and buildings in the town of Ehrhardt	
Objective 5.1	Consider the implementation of zoning codes, to be enforced by the County
Objective 5.2	Study flood areas to implement needed changes in development and storm drainage

Goal 6: Ensure protection and emergency shelters	
Objective 6.1	Shelters must be identified to provide protection to the public
Objective 6.2	Identity buildings approved for occupancy during natural hazards
Objective 6.3	The number of shelters should be adequate and safe for the amount of people that may potentially need them

Figure 46: Town of Ehrhardt Hazard Mitigation Goals and Objectives

3.9 Town of Ehrhardt Mitigation Actions

The Task Force Committee reviewed and analyzed the City's mitigation action in figure 47 as part of the update process.

Mitigation actions include programs, plans, projects, or policies that help reduce or eliminate the long-term risk to human life and property from natural hazards. The Task Force Committee identified and analyzed a comprehensive range of hazard-specific mitigation actions with particular emphasis on actions that affect new and existing buildings and infrastructure within the Town of Ehrhardt, and also the protection of the citizens.

Identification

The Task Force Committee identified both existing and potential mitigation actions within their respective agencies that have the following criteria:

- Reduce or eliminate the long-term risk to human life and property from at least one of the eight natural hazards identified in the Risk Assessment Section
- Fall under one or more of the six FEMA mitigation action categories
- Achieve one or more of the hazard mitigation goals and objectives

Mitigation Action Categories

FEMA organizes mitigation actions into six broad categories. These categories allow similar types of mitigation actions to be compared, and provides a standardized method for eliminating unsuitable actions. All mitigation actions identified in this strategy fall within one of the FEMA mitigation action categories below:

1. **Prevention:** Government administrative or regulatory actions or processes that influence the way land buildings are developed and built. These actions also include public activities that reduce hazard losses. Examples from this strategy include building and construction code revisions, zoning regulation changes, and computer-hazard modeling.
2. **Property Protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples from this strategy include seismic retrofits, roadway elevations, and floodproofing.
3. **Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Examples from this strategy include programs that target severe repetitive loss properties and vulnerable populations.
4. **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples from this strategy include projects creating open space or wetlands.
5. **Emergency Services:** Actions that protect people and property during and immediately

after a disaster or hazard event. Examples from this strategy include enhancements that provide advanced warning and redundant communications.

6. **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Examples from this strategy include projects that control floodwater, reconstruct dams and seawalls, and construct green roofs.

Summary of Mitigation Actions

The final list of the Town of Ehrhardt's mitigation actions is in the figure below. Many of the actions protect public health and safety, promote a sustainable economy, protect the environment, and increase public preparedness for disasters. The mitigation actions are the town's programs, plans, projects, or policies that the town may implement to help reduce or eliminate the long-term risk to human life and property from natural hazards. The Task Force identified, analyzed, and prioritized all actions. They prioritized the actions on a high, medium and low scale defined as the following:

- *High Priority*: A project that meets multiple plan objectives, benefits exceed cost, is grant-eligible, can be completed in a short-term period once project is funded.
- *Medium Priority*: A project that meets at least one plan objective, benefits exceed costs, funding not secured, grant eligibility is questionable, and can be completed within 1 to 5 years once project is funded
- *Low Priority*: A project that will mitigate the risk of a hazard, benefits may exceed costs, funding is not secured, project may not be grant-eligible and/or timeline for completion is considered long-term

As a side note, it should be mentioned that these priority definitions are considered to be dynamic and can change from one category to another based on changes to a parameter such as availability of funding. For example, a project might be assigned a medium priority because of the uncertainty of a funding source. This priority could be changed to high once a funding source has been identified such as a grant. The prioritization schedule for this plan will be reviewed and updated as needed through the plan maintenance strategy described in section 4.1 of this Plan.

Status on Strategies

The Town of Ehrhardt did not participate in the original HMP process. The following mitigation actions are new and have been identified for this update, as the Town of Ehrhardt is now a participating municipality in Bamberg County's HMP. *Note some mitigation actions identified in the plan update may not ultimately be implemented due to prohibitive costs, scale, low benefit/cost analysis rations, or other concerns*

Town of Ehrhardt Hazard Mitigation Actions											
Mitigation Action and Description	**Agency**	**Hazard (s)**	**Timeframe**	**Estimated Project Cost**	**Possible Funding Source**	**FEMA Category**	**Goals and Objectives**	**Prioritization**	**Implementation Status**	**Implementation Schedule**	**Milestones Achieved, Impediments to Implementation**
Develop a continuing communications and education program including instructional web-site, pamphlets, information packets and articles in the local media.	County/ Emergency Management	ALL	Immediate	N/A	PDM, HMGP	Public Education and Awareness	2.1, 2.2, 2.3	High	Depending on funding	5 Years	Identify funding source/ Depending on funding
Consider the implementation of zoning codes and building codes to ensure no new structures are built within the floodplains.	Town of Ehrhardt/ County	Flood	*Ongoing	N/A	N/A	Prevention	1.4, 3.2, 3.3	Medium	Depending on funding	5 years	Continuous process that requires enforcement
Establishment and identification of emergency shelters during times of natural hazards.	County/ Emergency Management	ALL	Complete	N/A	N/A	Emergency Services/ Property Protection	1.2, 2.3, 6.1, 6.2, 6.3	Low	Completed /Ongoing	Currently in place /ongoing as needed	Achieved but ongoing review

Identify flood prone areas and determine appropriate improvements to drainage services and levels of flood protection.	Emergency Management/ SCDNR	Flood	*Ongoing	N/A	Federal and State Grants	Property Protection	2.1, 2.2, 5.2	Low	Depending on funding	5 years	New identified action
Notification of the public in cases of emergency.	County/ Emergency Management	ALL	*Ongoing	N/A	PDM/HMGP	Emergency Services/ Public Education and Awareness	1.1, 2.3, 4.1	Medium	Depending on funding	5 years	Depending on funding
Retrofit Critical Facilities	Emergency Management	ALL	*Ongoing	N/A	PDM/HMGP	Emergency Services/Property Protection	1.1,1.3,2.3, 3.1,3.3,3.4, 3.5,4.1,6.1, 6.2	High	Depending on funding	5 years	Depending on funding

Figure 47: Town of Ehrhardt Hazard Mitigation Actions

*Ongoing is defined as continuing without termination or interruption

3.10 Town of Govan Goals and Objectives *The Task Force Committee reviewed and analyzed the Town of Govan's goals and objectives in Figure 48 as part of the update process.*

Developing Goals and Objectives

The first step in developing a hazard mitigation strategy is to establish goals and objectives that aim to reduce or eliminate the Town of Govan's long-term vulnerability to natural hazard events. Mitigation goals are general guidelines explaining what the Town wants to achieve in terms of hazard and loss prevention. Objectives are specific, measurable strategies or implementation steps used to achieve the identified goals. Developing clear goals and objectives helped reinforce Govan's overall purpose and mission for undertaking a mitigation planning process.

The goals and objectives set forth below provide the necessary framework to develop a mitigation strategy. The Town of Govan will re-evaluate its hazard mitigation goals and objectives each plan maintenance cycle to ensure they continue to represent the hazard mitigation priorities.

Hazard Mitigation Goals and Objectives	
Goal 1: Protect public health and safety	
Objective 1.1	Improve systems that provide warning and emergency communications.
Objective 1.2	Reduce the impacts of hazards on vulnerable populations.
Goal 2: Increase public preparedness and awareness for natural disasters	
Objective 2.1	Enhance understanding of natural hazards and the risks they pose.
Objective 2.2	Improve hazard information, including databases, maps, articles in local media, instructional web site, pamphlets, information packets, etc.
Objective 2.3	Improve public knowledge of hazards and protective measures allowing individuals to appropriately prepare for and respond to hazard events.
Goal 3: Protect property	
Objective 3.1	Implement mitigation programs that protect critical facilities and services, and promote reliability of lifeline systems to minimize impacts from hazards, maintain operations, and expedite recovery in an emergency.
Objective 3.2	Consider known hazards when identifying a site for new facilities and systems.
Objective 3.3	Adopt and enforce public policies to minimize hazard impacts on buildings, infrastructure, and neighborhoods and enhance safe construction in high hazard areas.
Objective 3.4	Integrate new hazard and risk information into building codes and land use planning mechanisms.
Goal 4: Emergency Services	
Objective 4.1	Immediate actions taken in response to a hazard event can minimize the impact of hazard incidents on people and property
Goal 5: Reduce the potential effects of flooding on homes and buildings in the Town of Govan	
Objective 5.1	Consider the implementation of zoning codes, to be enforced by the County
Objective 5.2	Study flood areas to implement needed changes in development and storm drainage
Goal 6: Ensure protection and emergency shelters	
Objective 6.1	Shelters must be identified to provide protection to the public
Objective 6.2	Identify buildings approved for occupancy during natural hazards
Objective 6.3	The number of shelters should be adequate and safe for the amount of people that may potentially need them

Figure 48: Town of Govan Hazard Mitigation Goals and Objectives

3.11 Town of Govan Mitigation Actions

The Task Force Committee reviewed and analyzed the Town's mitigation action in figure 49 as part of the update process

Mitigation actions include programs, plans, projects, or policies that help reduce or eliminate the long-term risk to human life and property from natural hazards. The Task Force Committee identified and analyzed a comprehensive range of hazard-specific mitigation actions with particular emphasis on actions that affect new and existing buildings and infrastructure within the Town of Govan, and also the protection of the citizens.

Identification

The Task Force Committee identified both existing and potential mitigation actions within their respective agencies that have the following criteria:

- Reduce or eliminate the long-term risk to human life and property from at least one of the eight natural hazards identified in the Risk Assessment Section
- Fall under one or more of the six FEMA mitigation action categories
- Achieve one or more of the hazard mitigation goals and objectives

Mitigation Action Categories

FEMA organizes mitigation actions into six broad categories. These categories allow similar types of mitigation actions to be compared, and provides a standardized method for eliminating unsuitable actions. All mitigation actions identified in this strategy fall within one of the FEMA mitigation action categories below:

1. **Prevention:** Government administrative or regulatory actions or processes that influence the way land buildings are developed and built. These actions also include public activities that reduce hazard losses. Examples from this strategy include building and construction code revisions, zoning regulation changes, and computer-hazard modeling.
2. **Property Protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples from this strategy include seismic retrofits, roadway elevations, and floodproofing.
3. **Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Examples from this strategy include programs that target severe repetitive loss properties and vulnerable populations.
4. **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples from this strategy include projects creating open space or wetlands.
5. **Emergency Services:** Actions that protect people and property during and immediately after a disaster or hazard event. Examples from this strategy include enhancements that provide advanced warning and redundant communications.
6. **Structural Projects:** Actions that involve the construction of structures to reduce the

impact of a hazard. Examples from this strategy include projects that control floodwater, reconstruct dams and seawalls, and construct green roofs.

Summary of Mitigation Actions

The final list of the Town of Govan's mitigation actions is in the figure below. Many of the actions protect public health and safety, promote a sustainable economy, protect the environment, and increase public preparedness for disasters. The mitigation actions are the town's programs, plans, projects, or policies that the town may implement to help reduce or eliminate the long-term risk to human life and property from natural hazards. The Task Force identified, analyzed, and prioritized all actions. They prioritized the actions on a high, medium and low scale defined as the following:

- *High Priority*: A project that meets multiple plan objectives, benefits exceed cost, is grant-eligible, can be completed in a short-term period once project is funded.
- *Medium Priority*: A project that meets at least one plan objective, benefits exceed costs, funding not secured, grant eligibility is questionable, and can be completed within 1 to 5 years once project is funded
- *Low Priority*: A project that will mitigate the risk of a hazard, benefits may exceed costs, funding is not secured, project may not be grant-eligible and/or timeline for completion is considered long-term

As a side note, it should be mentioned that these priority definitions are considered to be dynamic and can change from one category to another based on changes to a parameter such as availability of funding. For example, a project might be assigned a medium priority because of the uncertainty of a funding source. This priority could be changed to high once a funding source has been identified such as a grant. The prioritization schedule for this plan will be reviewed and updated as needed through the plan maintenance strategy described in section 4.1 of this Plan.

Status on Strategies

After reevaluating and reviewing the mitigation actions for the plan update, it was evident that none of the previous strategies for the Town of Govan were implemented due to the lack of funding sources. *Note some mitigation actions identified in the plan update may not ultimately be implemented due to prohibitive costs, scale, low benefit/cost analysis rations, or other concerns*

Town of Govan Hazard Mitigation Actions											
Mitigation Action and Description	**Agency**	**Hazard**	**Timeframe**	**Estimated Project Cost**	**Possible Funding Source(s)**	**FEMA Category**	**Goals and Objectives**	**Prioritization**	**Implementation Status**	**Implementation Schedule**	**Milestones Achieved, Impediments to Implementation**
Develop a continuing communications and education program including instructional web-site, pamphlets, information packets and articles in the local media.	County/Emergency Management	ALL	Immediate	N/A	PDM, HMGP	Public Education and Awareness	2.1, 2.2, 2.3	High	Depending on funding	5 years	Depending on funding
Consider the implementation of zoning codes and building codes to ensure no new structures are built within the floodplains.	Town of Govan/County	Flood	*Ongoing	N/A	N/A	Prevention	1.4, 3.2, 3.3	Medium	Depending on funding	5 years	Continuous process that requires enforcement
Establishment and identification of emergency shelters during times of natural hazards.	County/Emergency Management	ALL	Complete	N/A	N/A	Emergency Services/ Property Protection	1.2, 2.3, 6.1, 6.2, 6.3	Low	Completed /Ongoing	Currently in place/ongoing as needed	Achieved but ongoing review

Identify flood prone areas and determine appropriate improvements to drainage services and levels of flood protection.	Emergency Management/ SCDNR	Flood	*Ongoing	N/A	Federal and State Grants	Property Protection	2.1, 2.2, 5.2	Low	Depending on funding	5 years	Depending on funding
Notification of the public in cases of emergency.	County/Emergency Management	ALL	*Ongoing	N/A	PDM/HMGP	Emergency Services/ Public Education and Awareness	1.1, 2.3, 4.1	Medium	Depending on funding	5 years	Per County EMD-Emergency telephone notification system, National Weather Service transmitter, Alert FM System
Retrofit Critical Facilities	Emergency Management	ALL	*Ongoing	N/A	PDM/HMGP	Emergency Services/Property Protection	1.1,1.3,2.3,3.1,3.3,3.4,3.5, 4.1,6.1,6.2	High	Depending on funding	5 years	Depending on funding

Figure 49: Town of Govan Hazard Mitigation Actions

*Ongoing is defined as continuing without termination or interruption

3.12 Town of Olar Goals and Objectives

The Task Force Committee reviewed and analyzed the Town of Olar's goals and objectives in Figure 50 as part of the update process.

Developing Goals and Objectives

The first step in developing a hazard mitigation strategy is to establish goals and objectives that aim to reduce or eliminate the Town of Olar's long-term vulnerability to natural hazard events. Mitigation goals are general guidelines explaining what the Town wants to achieve in terms of hazard and loss prevention. Objectives are specific, measurable strategies or implementation steps used to achieve the identified goals. Developing clear goals and objectives helped reinforce Olar's overall purpose and mission for undertaking a mitigation planning process.

The goals and objectives set forth below provide the necessary framework to develop a mitigation strategy. The Town of Olar will re-evaluate its hazard mitigation goals and objectives each plan maintenance cycle to ensure they continue to represent the hazard mitigation priorities.

Hazard Mitigation Goals and Objectives	
Goal 1: Protect public health and safety	
Objective 1.1	Improve systems that provide warning and emergency communications.
Objective 1.2	Reduce the impacts of hazards on vulnerable populations.
Goal 2: Increase public preparedness and awareness for natural disasters	
Objective 2.1	Enhance understanding of natural hazards and the risks they pose.
Objective 2.2	Improve hazard information, including databases, maps, articles in local media, instructional web site, pamphlets, information packets, etc.
Objective 2.3	Improve public knowledge of hazards and protective measures allowing individuals to appropriately prepare for and respond to hazard events.
Goal 3: Protect property	
Objective 3.1	Implement mitigation programs that protect critical facilities and services, and promote reliability of lifeline systems to minimize impacts from hazards, maintain operations, and expedite recovery in an emergency.
Objective 3.2	Consider known hazards when identifying a site for new facilities and systems.
Objective 3.3	Adopt and enforce public policies to minimize hazard impacts on buildings, infrastructure, and neighborhoods and enhance safe construction in high hazard areas.
Objective 3.4	Integrate new hazard and risk information into building codes and land use planning mechanisms.
Goal 4: Emergency Services	
Objective 4.1	Immediate actions taken in response to a hazard event can minimize the impact of hazard incidents on people and property
Goal 5: Reduce the potential effects of flooding on homes and buildings in the Town of Olar	
Objective 5.1	Consider the implementation of zoning codes, to be enforced by the County
Objective 5.2	Study flood areas to implement needed changes in development and storm drainage
Goal 6: Ensure protection and emergency shelters	
Objective 6.1	Shelters must be identified to provide protection to the public
Objective 6.2	Identify buildings approved for occupancy during natural hazards
Objective 6.3	The number of shelters should be adequate and safe for the amount of people that may potentially need them

Figure 50: Town of Olar Hazard Mitigation Goals and Objectives

3.13 Town of Olar Mitigation Actions

The Task Force Committee reviewed and analyzed the City's mitigation action in figure 51 as part of the update process.

Mitigation actions include programs, plans, projects, or policies that help reduce or eliminate the long-term risk to human life and property from natural hazards. The Task Force Committee identified and analyzed a comprehensive range of hazard-specific mitigation actions with particular emphasis on actions that affect new and existing buildings and infrastructure within the Town of Olar, and also the protection of the citizens.

Identification

The Task Force Committee identified both existing and potential mitigation actions within their respective agencies that have the following criteria:

- Reduce or eliminate the long-term risk to human life and property from at least one of the eight natural hazards identified in the Risk Assessment Section
- Fall under one or more of the six FEMA mitigation action categories
- Achieve one or more of the hazard mitigation goals and objectives

Mitigation Action Categories

FEMA organizes mitigation actions into six broad categories. These categories allow similar types of mitigation actions to be compared, and provides a standardized method for eliminating unsuitable actions. All mitigation actions identified in this strategy fall within one of the FEMA mitigation action categories below:

1. **Prevention:** Government administrative or regulatory actions or processes that influence the way land buildings are developed and built. These actions also include public activities that reduce hazard losses. Examples from this strategy include building and construction code revisions, zoning regulation changes, and computer-hazard modeling.

2. **Property Protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples from this strategy include seismic retrofits, roadway elevations, and floodproofing.

3. **Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Examples from this strategy include programs that target severe repetitive loss properties and vulnerable populations.
4. **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples from this strategy include projects creating open space or wetlands.

5. **Emergency Services:** Actions that protect people and property during and immediately

after a disaster or hazard event. Examples from this strategy include enhancements that provide advanced warning and redundant communications.

6. **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Examples from this strategy include projects that control floodwater, reconstruct dams and seawalls, and construct green roofs.

Summary of Mitigation Actions

The final list of the Town of Olar's mitigation actions is in the figure below. Many of the actions protect public health and safety, promote a sustainable economy, protect the environment, and increase public preparedness for disasters. The mitigation actions are the town's programs, plans, projects, or policies that the town may implement to help reduce or eliminate the long-term risk to human life and property from natural hazards. The Task Force identified, analyzed, and prioritized all actions. They prioritized the actions on a high, medium and low scale defined as the following:

- *High Priority*: A project that meets multiple plan objectives, benefits exceed cost, is grant-eligible, can be completed in a short-term period once project is funded.
- *Medium Priority*: A project that meets at least one plan objective, benefits exceed costs, funding not secured, grant eligibility is questionable, and can be completed within 1 to 5 years once project is funded
- *Low Priority*: A project that will mitigate the risk of a hazard, benefits may exceed costs, funding is not secured, project may not be grant-eligible and/or timeline for completion is considered long-term

As a side note, it should be mentioned that these priority definitions are considered to be dynamic and can change from one category to another based on changes to a parameter such as availability of funding. For example, a project might be assigned a medium priority because of the uncertainty of a funding source. This priority could be changed to high once a funding source has been identified such as a grant. The prioritization schedule for this plan will be reviewed and updated as needed through the plan maintenance strategy described in section 4.1 of this Plan.

Status on Strategies

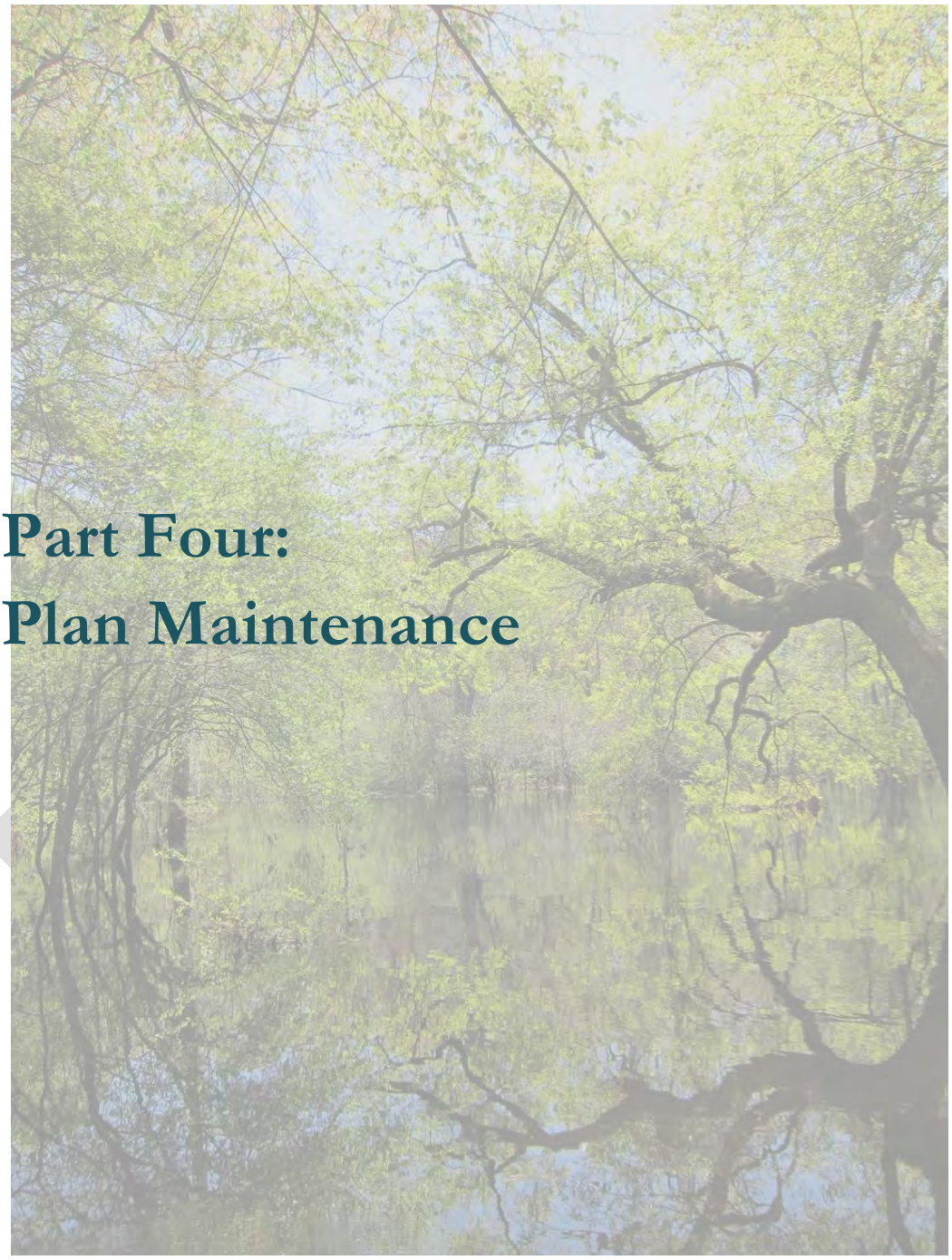
The Town of Olar did not participate in the original HMP process. The following mitigation actions are new and have been identified for this update, as the Town of Olar is now a participating municipality in Bamberg County's HMP. *Note some mitigation actions identified in the plan update may not ultimately be implemented due to prohibitive costs, scale, low benefit/cost analysis rations, or other concerns.*

Town of Olar Hazard Mitigation Actions											
Mitigation Action and Description	**Agency**	**Hazard**	**Time-frame**	**Estimated Project Cost**	**Possible Funding Source**	**FEMA Category**	**Goals and Objectives**	**Prioritization**	**Implemen-tation Status**	**Implemen-tation Schedule**	**Milestones Achieved, Impediments to Implementation**
Develop a continuing communications and education program including instructional web-site, pamphlets, information packets and articles in the local media.	County/ Emergency Management	ALL	Immediate	N/A	PDM, HMGP	Public Education and Awareness	2.1, 2.2, 2.3	High	Depending on funding	End of 2012- over a 3-year term	Identify funding source
Consider the implementation of zoning codes and building codes to ensure no new structures are built within the floodplains.	Town of Olar/County	Flood	*Ongoing	N/A	N/A	Prevention	1.4, 3.2, 3.3	Medium	Depending on funding	5 years	Continuous process that requires enforcement
Establishment and identification of emergency shelters during times of natural hazards.	County/ Emergency Management	ALL	Complete	N/A	N/A	Emergency Services/ Property Protection	1.2, 2.3, 6.1, 6.2, 6.3	Low	Completed	Currently in place	Completed at this date
Identify flood prone areas and determine appropriate improvements to drainage services and	Emergency Management / SCDNR	Flood	*Ongoing	N/A	Federal and State Grants	Property Protection	2.1, 2.2, 5.2	Low	Depending on funding	5 years	New identified action

levels of flood protection.											
Notification of the public in cases of emergency.	County/ Emergency Management	ALL	*Ongoing	N/A	PDM/HMGP	Emergency Services/ Public Education and Awareness	1.1, 2.3, 4.1	Medium	Depending on funding	5 years	Would be based on funding
Retrofit Critical Facilities	Emergency Management	ALL	*Ongoing	N/A	PDM/HMGP	Emergency Services/Property Protection	1.1,1.3,2.3,3.1,3.3,3.4,3.5,4.1,6.1,6.2	High	Depending on funding	5 years	New identified action

Figure 51: Town of Olar Hazard Mitigation Actions

*Ongoing is defined as continuing without termination or interruption



Part Four:
Plan Maintenance

4.1 Plan Maintenance and Update

As part of the update process, the Task Force Committee reviewed and analyzed this section and made the following changes: the monitoring initiatives were added, Figure 52 on page 116 gives a new plan update timeframe, incorporation of the plan into existing planning mechanisms, and the continued public involvement.

The Plan Maintenance section of Bamberg County's Natural Hazard Mitigation Plan (HMP) describes the formal process that will ensure the Plan remains an effective and relevant document. This section establishes the method and schedule for monitoring, evaluating, and updating the HMP during a five-year plan-update cycle. It also established how Bamberg County will maintain community involvement in the Plan.

Plan Maintenance Approach

- Incorporate hazard mitigation actions into existing planning mechanisms
- Determine how mitigation projects and actions will be monitored
- Establish indicators of effectiveness or success
- Develop an evaluation and revision schedule to ensure the Plan is up-to-date at the end of the five-year cycle
- Establish a process for public input and community involvement during the planning cycle

FEMA Requirements Addressed

The Task Force Committee created a plan maintenance strategy consistent with the process and steps presented in the FEMA How-To-Guide: Bringing the Plan to Life (FEMA 386-4). The following FEMA requirements are addressed in this section:

- **Requirement §201.6(c)(4)(i):** The plan maintenance process ***shall*** include a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.
- **Requirement §201.6(c)(4)(ii):** The plan ***shall*** include a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, where appropriate.
- **Requirement §201.6(c)(4)(iii):** The plan maintenance process ***shall*** include a discussion on how the community will continue public participation in the plan maintenance process.

Monitoring

Bamberg County will monitor the implementation of mitigation actions identified in the Plan. During the five-year planning cycle, the following initiatives will be undertaken.

- Collect reports from the agencies involved in implementing mitigation projects or activities identified in the Mitigation Strategy section of this Plan
- Maintain and update the mitigation action table
- Conduct site visits and obtain reports of completed or initiated mitigation actions to incorporate in the plan revision as needed
- Research and document new natural disaster information pertaining to Bamberg County and its incorporated municipalities during the planning cycle and incorporate into a revised Risk Assessment section as needed

- Organize meetings on an as needed basis with the Task Force Committee to discuss relevant hazard mitigation issues, provide status updates, and discuss available grant opportunities
- Coordinate, compile, and disseminate hazard mitigation funding information and applications
- Convene a meeting of the Task Force Committee following a natural disaster or when funding is announced to prioritize and submit potential mitigation actions for funding

The above activities outline plan maintenance during the four years leading up to the fifth year of the planning cycle. The Task Force Committee will be responsible for compiling, documenting, and incorporating all changes derived from the activities listed above into a revised plan document.

Evaluation

The Bamberg County HMP will be evaluated on an as needed basis to determine the effectiveness of its projects, programs, and policies. The Task Force Committee will be responsible for scheduling and organizing the meetings, collecting, analyzing and incorporating reports, and providing revised drafts. The Task Force Committee members will assess the current version of the Plan and determine the improvements necessary for the plan update.

A thorough examination of the Plan will take place during the fifth year of the process to ensure Bamberg County has an updated HMP at the end of the planning cycle. The Task Force Committee will review the goals and action items to determine their relevance to changing situations in the County and incorporated municipalities, as well as changes in State or Federal policy, and to ensure they are addressing current and expected conditions. The Committee will look at any changes in County resources that may influence the plan implementation (such as funding) and program changes to determine need for reassignment. The Committee will also review all portions of the Plan to determine if this information should be updated or modified, given any new available data. The Committee will evaluate the content of the Plan using the following criteria:

- Are the mitigation actions effective?
- Are there any changes in land development that affect mitigation priorities?
- Are the goals, objectives, and mitigation actions relevant given any changes in the County?
- Are the goals, objectives, and mitigation actions relevant given any changes to State or Federal regulations or policy?
- Is there any new data that affects the Risk Assessment portion of the Plan?

Update

The Task Force Committee, under the direction of the Bamberg County Emergency Manager, will update the HMP every five years to reflect the results of the reports and on-going plan evaluation. Throughout the planning cycle, the Committee will compile new information and incorporate it into the Plan. The Committee will also assess and incorporate recommended comments expressed by FEMA in the initial review into the plan revision. At the end of the planning cycle, the Committee will submit the updated Plan to the State Emergency Management Office (SCEMD) and FEMA for review. After FEMA has approved the Bamberg County HMP, the County and its incorporated municipalities will formally adopt the Plan. The following figure is an outline of how the Plan will be updated after the 2021 FEMA approval.

Plan Update Schedule		
Timeframe	**Participants**	**Outcome**
Third quarter 2021	Task Force Committee	Discuss mitigation action progress and possible plan improvements
First quarter 2022	Task Force Committee	Reconvene to discuss mitigation action progress and plan improvements
First quarter 2023	Bamberg County	Apply for plan update grant funding
First quarter 2024	Task Force Committee	Reconvene and begin plan update
Third quarter 2024	Task Force Committee, SCEMD	Submit draft plan update to SCEMD for review and comments
Fourth quarter 2024	FEMA, Task Force Committee, SCEMD	Submit plan to FEMA for final approval
First quarter 2025	Bamberg County, participating municipalities	Re-adopt the FEMA-approved HMP

Figure 52: Plan Update Schedule

Incorporation into Existing Planning Mechanisms

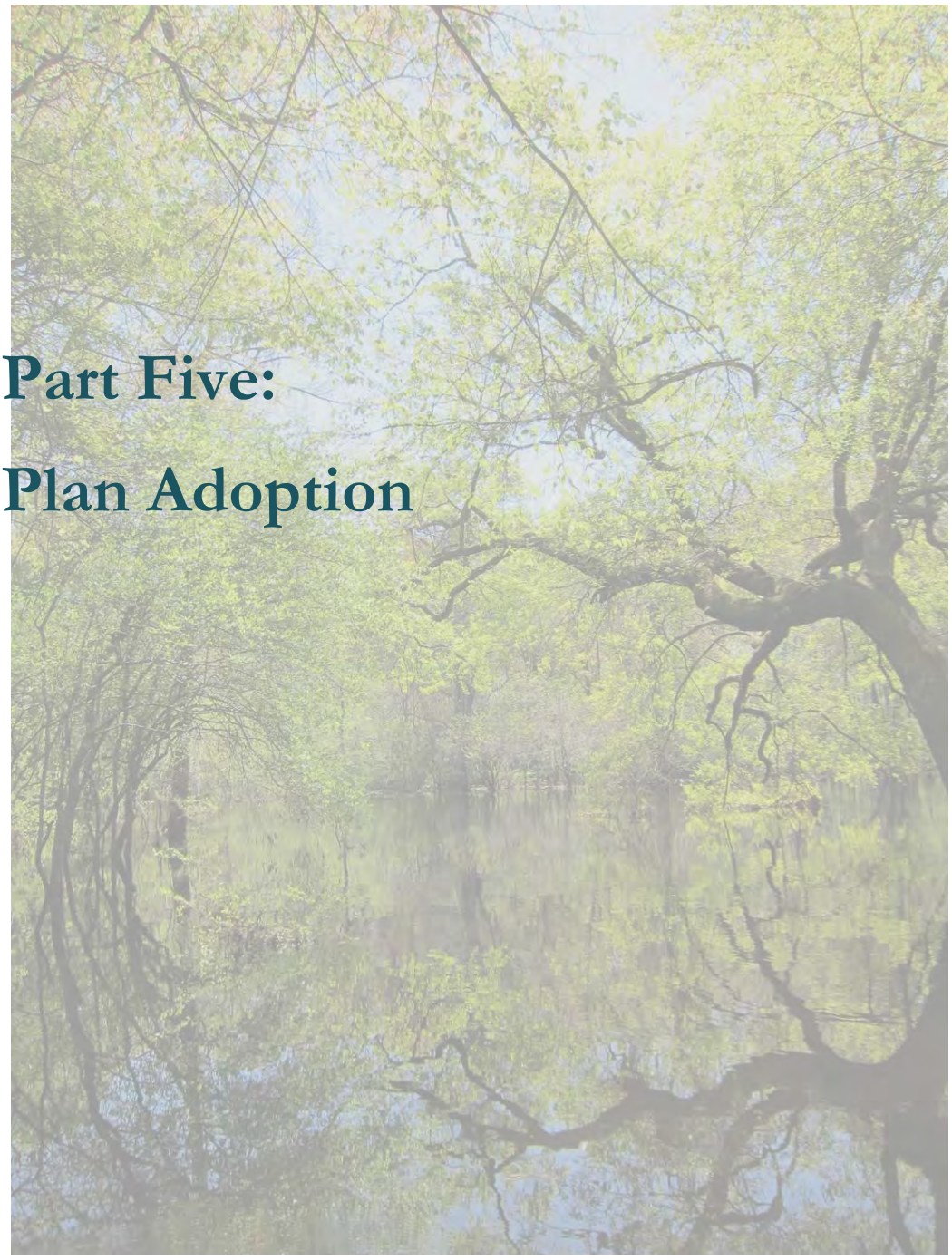
As part of the local capability assessment conducted during the planning process, the Task Force Committee identified current plans, programs, policies/ordinances, and studies/reports that will augment or help support mitigation planning efforts. The Committee, which will meet on an as needed basis, will be the mechanism for ensuring the County and the participating municipalities integrates hazard mitigation into their future planning activities. Following the HMP approval and adoption, the Committee will work to incorporate, where applicable, the HMP into the planning mechanisms identified on page 77 under Section 2.4: Community Mitigation Capability Assessment. Incorporating the hazard mitigation strategies into these identified planning mechanisms is a fairly simple process. For example, the comprehensive plans include natural resources, land usage, and community facilities information that could easily include hazard mitigation elements into the plans.

Throughout the plan maintenance cycle, the Committee will work to integrate hazard mitigation goals and actions into the general operations of Bamberg County agencies and the participating municipalities. The Committee will work with agencies to identify opportunities as outlined below:

- Update work plans, policies, or procedures to include hazard mitigation concepts
- Establish mitigation funding within capital and operational budgets
- Issue plans, policies, executive orders, regulations, or other directives to carry out mitigation actions
- Add hazard mitigation elements to all applicable plans

Continued Public Involvement

Bamberg County is dedicated to continued public involvement in the hazard mitigation planning and review process. During all phases of plan maintenance, the public will have the opportunity to provide feedback. The 2021 Plan will be maintained and available for review through 2025. Individuals will have an opportunity to submit comments for the Plan update at any time. The Task Force Committee will compile all comments and present them at the meetings where members will consider them for incorporation into the revision. To help publicize the revised plan, a notice will be posted requesting feedback on an updated draft HMP. The Committee will hold community involvement meetings with representatives from various agencies.



Part Five:

Plan Adoption

5.1 Overview

Formal plan adoption is a required part of the planning process and demonstrates Bamberg County, the City of Bamberg, City of Denmark, Town of Ehrhardt, Town of Govan, and Town of Olar's commitment to fulfilling the mitigation goals and objectives outlined in the Plan. In addition to fulfilling the requirements of the Disaster Mitigation Act of 2000, the County Council and Town/City Council adoption of the Hazard Mitigation Plan (HMP) will establish the Plan as a policy for Bamberg County and the participating municipalities, which will define the actions the various agencies should take to comply with or implement the HMP.

Following a formal plan review by the Federal Emergency Management Agency (FEMA) and the South Carolina Emergency Management Division (SCEMD), FEMA will issue an "Approval Pending Adoption" to Bamberg County. Upon review and approval of the HMP, Bamberg County Council, Bamberg City Council, Denmark City Council, Ehrhardt Town Council, Govan Town Council, and Olar Town Council will then formally adopt the HMP.

Plan Adoption Process

- Obtain "Approval Pending Adoption" status from FEMA
- Draft an adoption resolution or an ordinance to meet plan requirements and demonstrate Bamberg County's, Bamberg's, Denmark's, Ehrhardt's, Govan's, and Olar's commitment to protect its residents and built environment from the effects of natural hazards
- Adopt HMP

FEMA Requirements Addressed

Bamberg County and the Task Force Committee created a plan adoption strategy consistent with the process steps presented in FEMA's How-To-Guide: Bringing the Plan to Life (FEMA 386-4). This section satisfies the following FEMA requirement:

- **Requirement §201.6(c)(5):** The local hazard mitigation plan ***shall*** include documentation that the plan had been formally adopted by the governing body of the jurisdiction requesting approval of the plan.

5.2 Adoption Resolution/Ordinance

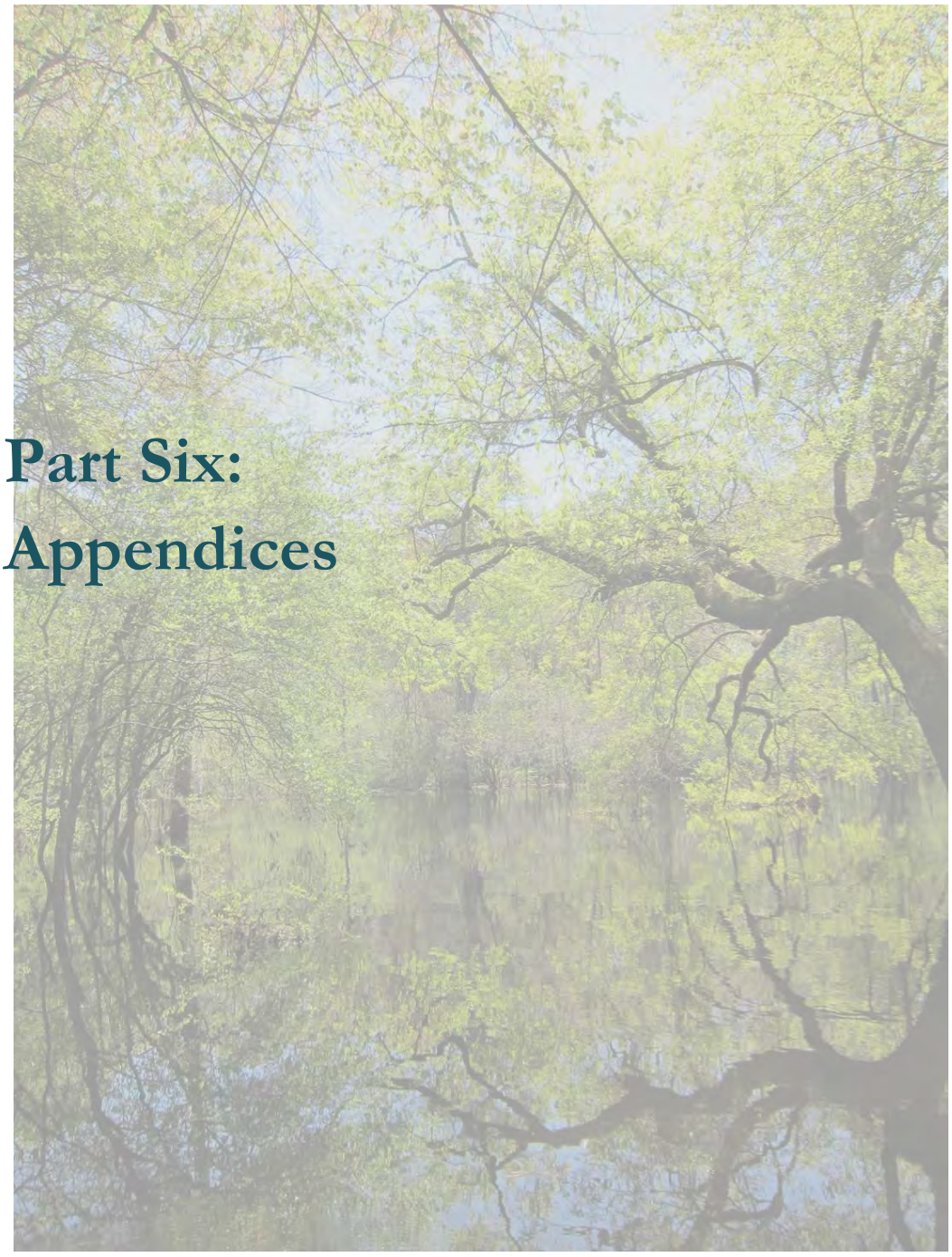
RESOLUTION TO BE INSERTED UPON ADOPTION

5.3 SCEMD Approval Letter

SCEMD APPROVAL LETTER TO BE INSERTED

5.4 FEMA Approval Letter

FEMA APPROVAL LETTER TO BE INSERTED



Part Six: Appendices

Appendix A: Acronym List

Acronym List	
Acronym	**Definition**
BCA	Benefic-Cost Analysis
BFE	Base Flood Elevation
BMP	Best Management Practices
DMA 2000	Disaster Mitigation Act of 2000
DOT	Department of Transportation
EF-Scale	Enhanced Fujita Scale
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance
F-Scale	Fujita Scale
Ft	Feet
FTA	Federal Transit Administration
FY	Fiscal Year
GIS	Geographic Information System
HAZUS-MH	Hazards U.S. Multi-Hazard
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
MMI	Modified Mercalli Intensity
Mph	Miles Per Hour
N/A	Not Applicable
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
PDM	Pre-Disaster Mitigation
SRL	Severe Repetitive Loss
STAPLEE	Social, Technical, Administrative, Political, Legal, Economical, Environmental
TBD	To Be Determined

Appendix B: Glossary

Glossary	
Term	**Definition**
100-Year Flood	The term "100-year flood" can be misleading. The 100-year flood does not necessarily occur once every 100 years. Rather, it is the flood that has a 1 % chance of being equaled or exceeded in any given year. Thus, the 100-year flood could occur more than once in a relatively short period of time. The Federal Emergency Management Agency (FEMA) defines it as the 1 % annual chance flood, which is now the standard definition used by most federal and state agencies and by the National Flood Insurance Program (NFIP).
Agricultural Drought	Links the various characteristics of meteorological drought to agricultural impacts, while focusing on precipitation shortages and soil-water deficits.
Annualized Capital Stock Losses	Long-term average losses in a given year
Base Flood Elevation (BFE)	The water surface elevation of a 100-year flood event (a flood that has a 1 % chance of occurring in any given year as defined by the NFIP). The base flood is a statistical concept used to ensure that all properties
Beaufort Wind Scale	A simplified scale to aid in the estimation of wind speed and corresponding typical effects.
Benefit-Cost Analysis	A systematic, quantitative method of comparing projected benefits to projected costs of a project or policy. It is used as a measure of cost
Capability Assessment	Provides a description and analysis of a community's current capacity to address threats associated with hazards. The assessment includes two components: an inventory of an agency's mission, programs, and policies, and an analysis of its capacity to carry them out. A capability assessment is an integral part of the planning process in which a community's actions to reduce losses are identified, reviewed, and analyzed, and the framework for implementation is identified.
Coastal Storms	Tropical cyclones formed in the atmosphere over warm ocean areas. Wind speeds reach 74 miles per hour or more and blow in a large spiral around a relatively calm center or "eye. Circulation is counterclockwise in the Northern Hemisphere.
Community Rating System	A voluntary program under the NFIP that rewards participating communities (provides incentives) for exceeding the minimum requirements of the NFIP and completing activities that reduce flood hazard risk by providing flood insurance premium discounts.
Cultural Facilities	A critical facility is vital to the City's ability to provide essential services and protect life and property. Loss of a critical facility would result in a severe economic or catastrophic impact.

Dam Failure	An uncontrolled release of impounded water resulting in downstream flooding.
Debris	The scattered remains of assets broken or destroyed during the occurrence of a hazard. Debris caused by wind or water hazards can cause additional damage to other assets.
Disaster Mitigation Act of 2000 (DMA 2000)	The latest federal legislation enacted to encourage and promote proactive, pre-disaster planning as a condition of receiving financial assistance under the Robert T. Stafford Act. The DMA emphasizes planning for disasters before they occur. Under the DMA, a pre-disaster hazard mitigation program and new requirements for the national post-disaster hazard mitigation grant program (HMGP) were established.
Drought	A prolonged period with no rain. Limited winter precipitation accompanied by moderately dry periods during the spring and summer months can also lead to drought conditions.
Earthquakes	The sudden motion or trembling of the ground produced by abrupt displacement of rock masses, usually within the upper 10–20 miles of the earth's surface.
Enhanced Fujita Scale	National Weather Service's revised Fujita-scale, which is a complex, systematic approach to measuring the strength of a tornado.
Federal Emergency Management Agency (FEMA)	An independent federal agency (now part of the Department of Homeland Security) created in 1978 to provide a single point of accountability for all federal activities related to disaster mitigation and emergency preparedness, response, and recovery.
Flash Flooding	Caused by short-term, high-intensity rainfall that occurs in inland areas
Flood Insurance Rate Map (FIRM)	The official map of a community for which FEMA has delineated the special flood hazard area (SFHA) and the risk premium zones applicable to the community.
Floodplain	Any land area that becomes inundated with water during a flood
Floods	A general and temporary condition of partial or complete inundation on normally dry land. Flooding can be categorized as coastal, riverine, or flash.
Fujita Scale (F-Scale)	Standard measurement for rating the strength of a tornado.
Geographic Information Systems (GIS)	A computer software application that relates data regarding physical and other features on the earth to a database for mapping and analysis.
Goal	A general guideline that explains what is to be achieved. Goals are usually broad-based, long-term, policy-type statements and represent global visions. Goals help define the benefits that a plan is trying to
Ground Acceleration	Shaking of the ground resulting from seismic waves caused by an earthquake.
Hailstorms	Shower-like precipitation in the form of irregular pellets, or balls of ice more than five millimeters in diameter, falling from a cumulonimbus
Hazard	A source of potential danger or adverse condition that could harm people and/or cause property damage.

Hazard Mitigation	Reduction or alleviation of the loss of life, personal injury, and property damage that could result from a disaster through long- and short-term strategies. Hazard mitigation involves strategies such as planning, policy changes, programs, projects, and other activities that could mitigate the impacts of hazards.
Hazard Mitigation Grant Program (HMGP)	Authorized under Section 202 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, the HMGP is administered by FEMA and provides grants to states, tribes, and local governments to implement hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to disasters and to enable mitigation activities to be implemented as a community recovers from a disaster.
Hazard Mitigation Plan (HMP)	A collaborative document that identifies hazards that could affect a community, assesses vulnerability to hazards, and represents consensus decisions reached on how to minimize or eliminate the
Hazards U.S. Multi-Hazard (HAZUS-MH)	A nationally applicable standardized methodology and software program, developed by FEMA, which is under contract with the National Institute of Building Sciences. The program estimates potential losses from earthquakes, hurricane winds, and floods. In HAZUS-MH, current scientific and engineering knowledge is coupled with Geographic Information Systems (GIS) technology to produce estimates of hazard-
Hurricane	A tropical storm with winds that have reached a constant speed of 74
Intensity (earthquakes)	Measures the effects of an earthquake at a particular place and is
Magnitude (earthquakes)	Measurement of the total amount of energy and is expressed in terms of the Richter scale
Mitigation Actions	Specific projects, plans, or policies that achieve goals and objectives that minimize the effects from a disaster and reduce the loss of life and
Mitigation Strategy	A systematic process for analyzing, prioritizing, and implementing the identified mitigation actions in the Hazard Mitigation Plan.
Modified Mercalli Intensity	A scale used for measuring the intensity of an earthquake. The scale quantifies the effects of an earthquake on the Earth's surface, humans, objects of nature, and man-made structures on a scale of I through XII
National Flood Insurance Program (NFIP)	The three components of the NFIP are flood insurance, floodplain management, and flood hazard mapping. Nearly 20,000 communities across the United States and its territories participate in the NFIP by adopting and enforcing floodplain management ordinances to reduce future flood damage. In exchange, the NFIP makes Federally backed flood insurance available to homeowners, renters, and business owners in these communities. Community participation in the NFIP is voluntary
Objective	A short-term aim that, when combined with other objectives, forms a strategy or course of action to meet a goal. Unlike goals, objectives are specific and measurable.

Peak Ground Acceleration (PGA)	Measures the rate of change in motion of the earth's surface and expresses it as a percent of the established rate of acceleration due to
Preparedness	Actions that strengthen the capability of government, citizens, and communities to respond to disasters.
Presidential Disaster Declaration	Typically made for events that cause more damage than state and local governments and resources can handle without federal government assistance. Generally, no specific dollar loss threshold has been established for such declarations. A Presidential Disaster Declaration puts into motion long-term federal recovery programs, some of which are matched by state programs, designed to help disaster victims, businesses, and public entities.
Recovery	Recovery refers to actions taken by an individual or community after a catastrophic event to restore order and community lifelines.
Repetitive Loss Property	Any NFIP-insured property that, since 1978 and regardless of any change(s) of ownership during that period, has experienced any of the following:1) Four or more paid flood losses exceeding $1,000 each 2) Two paid flood losses exceeding $1,000 each within any 10-year period since 1978 3)Three or more paid losses that equal or exceed the current value of the insured property
Richter Scale	A logarithmic scale used to express the total amount of energy released by an earthquake. Its values typically fall between 0 and 9, with each increase of 1 representing a 10-fold increase in energy.
Risk	The estimated impact that a hazard would have on people, services, facilities, and structures in a community. Risk measures the likelihood of a hazard occurring and resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate, or low hazard. Risk also can be expressed in terms of potential monetary losses associated with the intensity of likelihood of sustaining damage above a particular threshold due to occurrence of a specific type of the hazard.
Risk Assessment	The process of measuring potential loss of life, personal injury, economic injury, and property damage resulting from hazards. This process assesses the vulnerability of people, buildings, and infrastructure to hazards and focuses on 1) hazard description 2) severity 3) probability 4) location 5) historic occurrences 6) impact to NYC 7) structural vulnerability and 8) potential loss estimates.
River Flooding	Caused when rivers and streams overflow their banks.
Saffir-Simpson Scale	Use by the National Weather Service, this scale uses wind speed to determine the category strength of a hurricane on a scale of 1 to 5.
STAPLEE	A set of criteria used to examine the Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) opportunities and constraints of implementing a particular mitigation measure using a consistent framework.
Storm Surge	An offshore rise of water associated with a low-pressure weather system, typically a tropical cyclone. Storm surge is caused primarily by high winds pushing on the ocean's surface. The wind causes the water to pile up higher than the ordinary sea level.

Tornadoes	A local atmospheric storm, generally of short duration, formed by winds rotating at very high speeds, usually in a counterclockwise direction. The vortex, up to several hundred yards wide, is visible to the observer as a whirlpool-like column of winds rotating about a hollow cavity or funnel.
Tropical Depression	An organized system of clouds and thunderstorms, with a defined surface circulation, and maximum sustained winds of 38 miles per hour or less.
Tropical Storms	An organized system of strong thunderstorms, with a defined surface circulation, and maximum sustained winds of 39 to 73 miles per hour.
Wildfires	Any instance of uncontrolled burning in grasslands, brush, or woodlands.
Windstorms	Short-duration events involving straight-line winds or gusts exceeding 50 mph. These gusts can produce winds of sufficient strength to cause property damage. Windstorms are especially dangerous in areas with significant tree stands, exposed property, poorly constructed buildings, mobile homes (manufactured housing units), major infrastructure, and aboveground utility lines. A windstorm can topple trees and power lines; cause damage to residential, commercial, critical facilities; and leave tons of debris in its wake.
Winter Storms	Includes ice storms and blizzards. Extreme cold often accompanies winter storms. The National Weather Service (NWS) characterizes blizzards as being combinations of winds in excess of 35 mph with considerable falling or blowing snow, which frequently reduces visibility.

Appendix C: Meetings, Notices, Sign-in Sheets

Emory Langston

From: McCoy, Lindsey <lmccoy@emd.sc.gov>
Sent: Wednesday, August 07, 2019 10:43 AM
To: Emory Langston; Albertina Young
Cc: Foster, Charlotte
Subject: Lower Savannah COG HMP Update
Attachments: Hazard Mitigation Assistance Guidance.pdf; Local Plan Review Tool updated with Optional HHPD.docx; LSCOG Contact Information Sheet.docx; LHMP Detailed Regulation Checklist.pdf; Plan Review Guide.pdf; LSCOG LHMP Update Timeline.xls

Emory and Tina,

It was great to meet you both on Monday! We're looking forward to working with you both to update LSCOG Hazard Mitigation Plan.

I've uploaded the most current versions of each County's plan and associated Plan Review Tools to our FTP site for your review and download. You may access it here:

URL: https://ftp.emd.sc.gov
Username: ftpuser
Password: 3arth-Qu@ke
Folder: Lower Savannah COG HMP

If you have any trouble accessing the site or finding the files, let me know and I can provide some more detailed instructions.

I've also attached electronic copies of the documents we discussed, including the Update Timeline, Regulation Checklist, and Local Plan Review Tool. A couple of others as well that we briefly discussed – the Hazard Mitigation Assistance (HMA) Guidance, which will cover specifics of the PDM grant as well as the other potential grant funding options available; and the full version of the FEMA Local Mitigation Plan Review Guide.

One more attachment: I compiled all of the contact information for each County's Emergency Manager, along with their corresponding State Regional Emergency Managers (REM).

Please don't hesitate to reach out to myself for Charlotte for any questions or concerns you have going forward regarding either the Plan or the PDM grant. Hopefully you will be hearing from us soon regarding a grant award, and we can get started on the update process.

Have a great day!

Lindsey McCoy, SC CEM
Hazard Mitigation Planning Coordinator
South Carolina Emergency Management Division

2779 Fish Hatchery Road
West Columbia, SC 29172
Mobile: (803) 367-8095
lmccoy@emc.sc.gov

Emory Langston

From: McCoy, Lindsey <lmccoy@emd.sc.gov>
Sent: Friday, August 30, 2019 11:42 AM
To: Emory Langston
Subject: RE: Back-up date

Hi Emory,

I know that you are out of the office for the holiday weekend, but I wanted to let you know that I am going to postpone our meeting. Once things calm down, we'll establish a new date and time.

Stay safe!

Lindsey McCoy, SC CEM
Hazard Mitigation Planning Coordinator
South Carolina Emergency Management Division

2779 Fish Hatchery Road
West Columbia, SC 29172
Mobile: (803) 367-8095
lmccoy@emd.sc.gov

From: Emory Langston <elangston@lscog.org>
Sent: Thursday, August 29, 2019 8:33 AM
To: McCoy, Lindsey <lmccoy@emd.sc.gov>
Subject: RE: Back-up date

Sounds good ☺

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

From: McCoy, Lindsey <lmccoy@emd.sc.gov>
Sent: Wednesday, August 28, 2019 3:08 PM
To: Emory Langston <elangston@lscog.org>
Subject: RE: Back-up date

Hi Emory,

As of right now, there hasn't been any definitive update as to whether or not we'll be activating the SEOC in response to Dorian. If we do, it will be for an indefinite amount of time with potentially an indefinite recovery period. If we activate we can cancel the meeting, and then find a new date once things settle back down. But again, as of right now, no worries. ☺ I'll keep you updated!

Lindsey McCoy, SC CEM
Hazard Mitigation Planning Coordinator
South Carolina Emergency Management Division

2779 Fish Hatchery Road
West Columbia, SC 29172
Mobile: (803) 367-8095
lmccoy@emd.sc.gov

From: Emory Langston <elangston@lscog.org>
Sent: Wednesday, August 28, 2019 2:49 PM
To: McCoy, Lindsey <lmccoy@emd.sc.gov>
Subject: Back-up date

Hi Lindsey-

Just touching base to see if we need to come up with a back-up date for Tuesday just in case (?). I know this may be premature but I will be off Friday and with Monday being Labor Day and with you being SCEMD... I just wanted to throw that out.

Thanks!

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

Emory Langston

From: McCoy, Lindsey <lmccoy@emd.sc.gov>
Sent: Thursday, October 03, 2019 2:35 PM
To: Emory Langston
Subject: RE: LSCOG HMP Meeting Monday

No problem! I'll put something together and have it ready to go for Monday. If there's anything special included I will keep you in the loop.

Thanks again! Have a great weekend.

Lindsey McCoy, SC CEM
Hazard Mitigation Planning Coordinator
South Carolina Emergency Management Division

2779 Fish Hatchery Road
West Columbia, SC 29172
Mobile: (803) 367-8095
lmccoy@emd.sc.gov

From: Emory Langston <elangston@lscog.org>
Sent: Thursday, October 03, 2019 10:08 AM
To: McCoy, Lindsey <lmccoy@emd.sc.gov>
Subject: Re: LSCOG HMP Meeting Monday

Hi Lindsey,

I am ready to go for Monday in the sense I have timelines for all the Counties and want to loosely discuss them and getting their committees together so we can meet soon to get started.

If you don't mind facilitating since this is my first rodeo, I would greatly appreciate. Go over expectations and things of that nature.

Let me know if there is anything I need to say or know :)

Thanks,
Emory

Sent from my iPhone

On Oct 3, 2019, at 9:57 AM, McCoy, Lindsey <lmccoy@emd.sc.gov> wrote:

> Good Morning Emory,
>
> Hope all is well!

I just wanted to check in ahead of our meeting this coming Monday, and see what, if anything, you need from me to facilitate and/or support our discussions?

Thank you!

Lindsey McCoy, SC CEM
Hazard Mitigation Planning Coordinator
South Carolina Emergency Management Division

2779 Fish Hatchery Road
West Columbia, SC 29172
Mobile: (803) 367-8095
lmccoy@emd.sc.gov

2

LOWER SAVANNAH COG
Council of Governments

LOWER SAVANNAH REGION
NATURAL HAZARD MITIGATION PLAN UPDATE

SIGN-IN SHEET

Date: October 7, 2019 **Place:** Lower Savannah Council of Governments

Time: 10:00 AM

Name	Agency	Phone	Email
1. Roger Riley	Barnwell EMA	803-541-1001	rriley@barnwellsc.com
2. PAUL MATTHEWS	Aiken EMD	803 642 - 1620	PMatthews@aikencountysc.gov
3. Emory Langston	LSCOG	803-649-7981	elangston@lscog.org
4. Deanna Coffey	SCEMD	803 429 0620	dcoffey@emd.sc.gov
5. David Chojnacki	Calhoun EMA	803-874-3042	dchojnacki@calhouncounty.sc.gov
6. Rocky Tuckson	SCEMD	803-317-1845	rtucker@emd.sc.gov
7. Nathaniel Fowler	LSCOG	803-528-7069	nfowler@lscog.org
8. Lindsey McCoy	SCEMD	803 317 8095	lmccoy@emd.sc.gov
9. Brittany Barnwell	Bamberg	803-596-2743	barnwellbm@bambergcounty.sc.gov
10.			
11.			
12.			

Emory Langston

From: Brittany M. Barnwell <barnwellbm@bambergcounty.sc.gov>
Sent: Thursday, October 31, 2019 12:01 PM
To: Emory Langston
Subject: RE: Hazardous Mitigation Meeting Monday

Emory,

Let's schedule it for the 13TH. I will be out of town on the 15th.

Thank You,
BB

From: Emory Langston [mailto:elangston@lscog.org]
Sent: Thursday, October 31, 2019 10:26 AM
To: Brittany M. Barnwell <barnwellbm@bambergcounty.sc.gov>
Subject: RE: Hazardous Mitigation Meeting Monday

Hi Brittany,

That would probably work better for the taskforce members with more lead time. I have availability the 13th or 15th (I prefer the 15th but can do either). Let me know if either of those work for you.

Thanks!

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

From: Brittany M. Barnwell <barnwellbm@bambergcounty.sc.gov>
Sent: Thursday, October 31, 2019 10:22 AM
To: Emory Langston <elangston@lscog.org>
Subject: RE: Hazardous Mitigation Meeting Monday

Emory,

Would you like to reschedule another week out to November 12th?

Thanks,
BB

From: Emory Langston [mailto:elangston@lscog.org]
Sent: Wednesday, October 30, 2019 2:53 PM

To: Brittany M. Barnwell <barnwellbm@bambergcounty.sc.gov>
Subject: Hazardous Mitigation Meeting Monday

Hi Brittany,

Please see the attached agenda for the Hazardous Mitigation Meeting for Monday, November 4th. I have not receive a list of Bamberg County taskforce member names and emails, so please be sure to send the attached to all members. Please let me know how many people you will be expecting so that I can bring the appropriate numbers of copies.

Let me know if you need any additional information.

Much thanks!
Emory

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

Emory Langston

From: Brittany M. Barnwell <barnwellbm@bambergcounty.sc.gov>
Sent: Wednesday, November 06, 2019 10:24 AM
To: Emory Langston; Joey Preston; Trent Kinard; Larry Haynes; Larry Haynes; Isaiah Odom; Evert Comer, Jr.; Clinton M. Carter; Paul H. Eubanks; John E. Darnell; Thomas B. Hay; David Smith; wttaylor1248@hotmail.com; govan512@yahoo.com; jshore@medshore.com; pclarke@medshore.com; Bill Johnson; Phylis Schwarting; Thelma Sojourner; Kathie Stroman; Gerald Wright; 'admin@denmarksc.com'; 'wilmaedmonds@ymail.com'; Nancy Foster; Sharon Hammond; Chad Dilling; Kathie Stroman; William Stanley
Cc: Tiffany Bryant; Rose R. Shepherd
Subject: RE: Bamberg County Hazardous Mitigation Taskforce Meeting

Good Morning Everyone,

The Bamberg County Hazardous Mitigation Taskforce Meeting that is scheduled for **Wednesday, November 13th at 3:00** has been relocated to **1234 North St, Bamberg SC 29003**. My apologizes for any inconvenience this may have caused.

Warm Regards,

Brittany M. Barnwell. M.S., SC CEM
Director of Emergency Services
barnwellbm@bambergcounty.sc.gov
(803)245-4313 Office
(803)245-3109 Fax

From: Emory Langston [mailto:elangston@lscog.org]
Sent: Thursday, October 31, 2019 2:03 PM
To: Brittany M. Barnwell <barnwellbm@bambergcounty.sc.gov>; Tiffany Bryant <bryantt@bambergcounty.sc.gov>; Joey Preston <joeypreston@gmail.com>; Rose R. Shepherd <shepherdrr@bambergcounty.sc.gov>; Trent Kinard <tkinard@mailbox.sc.edu>; bamberg9@bellsouth.net; Larry Haynes <haynesl@bambergcounty.sc.gov>; Larry Haynes <haynesl@bambergcounty.sc.gov>; Isaiah Odom <odomi@bambergcounty.sc.gov>; Evert Comer, Jr. <comerejr@bambergcounty.sc.gov>; Clinton M. Carter <cartercm@bambergcounty.sc.gov>; Paul H. Eubanks <eubanksph@bambergcounty.sc.gov>; John E. Darnell <darnellje@bambergcounty.sc.gov>; Thomas B. Hay <haytb@bambergcounty.sc.gov>; David Smith <davidsmith@scdps.gov>; wttaylor1248@hotmail.com; govan512@yahoo.com; jshore@medshore.com; pclarke@medshore.com; Bill Johnson <johnsonb@bambergcounty.sc.gov>
Subject: Bamberg County Hazardous Mitigation Taskforce Meeting

Good afternoon,

Lower Savannah Council of Governments is working with the Bamberg County Department of Emergency Management on the Bamberg County Hazard Mitigation Plan five-year updates. In order to develop the plan and fulfill the FEMA requirements, your input and participation is very important.

We have scheduled a meeting for **Wednesday, November 13th at 3:00**. This meeting will be held in the EOC of the Bamberg County. We will be discussing the timeline, update process and other relevant information.

Let me know if you have any questions or if I can provide additional information.

Best regards-

Emory

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

LOWER SAVANNAH COG
Council of Governments

Bamberg County Hazard Mitigation Plan Update Meeting

Monday, November 13th, 2019

3:00 p.m.

Bamberg County EOC

Agenda

Welcome and Introductions	*Emory Langston, PCED Administrator, LSCOG /All*
Hazardous Mitigation Plan Background	*Emory Langston, PCED Administrator, LSCOG Brittany Barnwell – Bamberg County EMA, Director*
Current Status and Timeframe for Plan	*Emory Langston, PCED Administrator, LSCOG*
Plan Update Process	*Emory Langston, PCED Administrator, LSCOG*
General Discussion	*All*
Adjourn	

LOWER SAVANNAH REGION
NATURAL HAZARD MITIGATION PLAN UPDATE

SIGN-IN SHEET

Date: November 13, 2019 **Place:** 1234 North Street – Bamberg, SC

Time: 3:00 PM

Name	Agency	Phone	Email
[signature]	LSCOG		

Emory Langston

From: Emory Langston
Sent: Tuesday, February 11, 2020 10:51 AM
To: Roger Riley (rriley@barnwellsc.com); Paul Matthews; Chojnacki, David (dchojnacki@calhouncounty.sc.gov); Brittany M. Barnwell; Gidget Stanley-Banks (gstanley@allendalecounty.com); David Myers (dmyers@aikencountysc.gov)
Cc: Matthew Abney
Subject: LSCOG -Hazardous Mitigation Grant Update Meetings

Good morning,

Hope this finds everyone doing well☺. Since we last met, at your county meetings to kick-off the HMP, we have been busy working on the risk assessments for each plan. We should have these wrapped up by the end of the month. We would like to set up a meeting, with each of you individually, to go over this information, begin looking at what is involved with the mitigation strategies, and forming next steps for getting together with your county taskforces. Please let me know your availability to meet Wednesday, March 4, Thursday, March 5 or Friday, March 6. I anticipate the meeting lasting about an hour and we will be glad to come you in your county.

Please let me know your availability as soon as possible so we can schedule these meetings. Let me know if you have any questions.

Best regards-
Emory

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

Emory Langston

From: Emory Langston
Sent: Thursday, March 05, 2020 9:05 AM
To: Tiffany Bryant; Brittany M. Barnwell
Subject: FW: LSCOG -Hazardous Mitigation Grant Update Meetings

Good morning,

Just confirming that we are still on for tomorrow at 2:00. Will we be meeting at the Courthouse Annex?

Thanks!

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

From: Emory Langston
Sent: Wednesday, February 12, 2020 8:41 AM
To: Tiffany Bryant <bryantt@bambergcounty.sc.gov>
Cc: Brittany M. Barnwell <barnwellbm@bambergcounty.sc.gov>
Subject: RE: LSCOG -Hazardous Mitigation Grant Update Meetings

Good morning,

Yes, 2:00 on Friday, March 6th works well. See you then!

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

From: Tiffany Bryant <bryantt@bambergcounty.sc.gov>
Sent: Tuesday, February 11, 2020 1:10 PM
To: Emory Langston <elangston@lscog.org>
Cc: Brittany M. Barnwell <barnwellbm@bambergcounty.sc.gov>
Subject: LSCOG -Hazardous Mitigation Grant Update Meetings

Good afternoon,
On behalf of Ms. Brittany Barnwell, I would like to schedule the LSCOG -Hazardous Mitigation Grant Update Meeting for March 6 at 2:00pm. Please let me know if this date/time fits in your schedule. Ms. Barnwell looks forward to meeting with you.

Thank you,

Mrs. Tiffany Kemmerlin, SC CEM
Administrative Assistant
Bamberg County Emergency Services
2893 Main Hwy
Post Office 119 (M)
Bamberg, SC 29003
(Office) 803-245-4313 Ext: 1
(Fax) 803-245-3109

Brittany M. Barnwell
Bamberg County Emergency Services Director
barnwellbm@bambergcounty.sc.gov
803-245-4313

On Jun 15, 2020, at 3:48 PM, Emory Langston <elangston@lscog.org> wrote:

Good afternoon,

Hoping this finds you both well ☺

We all have had some set-backs in our usual work load thanks to COVID 19. We have been working on the data set for the HMP in Sections 2 and 3 over the past few months. Slowly but surely.

Wanted to see how you wanted to tackle the next phase with the taskforce. At this point, staff at LSCOG is attending in-person meetings sparingly, especially as we are seeing a rise in COVID cases; however we do have some meetings scheduled at the month. We could try for an in-person meeting later part of June or mid-to late July or I can send out all the information via email, or we could try an email with documents and a follow up conference call. Those are just my suggestions. I am open to any ideas you may have.

We are running a little behind, per the timeline, and I have been in contact with SCEMD. At this point I think we are still doing fine, may push out a month or two.
As far as public comment goes for when the draft documents is ready, SCEMD has advised the following.

Public meetings/hearings can be held online. You can choose to host a conference call or WebEx type event, or simply post documents for review to social media and document any input received. As long as proof is provided for whichever you choose, the requirement will be met.

Let me know your thoughts going forward.

Best-
Emory

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

From: Emory Langston
Sent: Tuesday, June 16, 2020 8:05 AM
To: Brittany M. Barnwell <barnwellbm@bambergcounty.sc.gov>
Cc: Tiffany Bryant <bryantt@bambergcounty.sc.gov>
Subject: RE: LSCOG -Hazardous Mitigation Plan -

Brittany-

What does Thursday, July 16 or Monday, July 20th look for you? I can send out all the documents to the taskforce members prior to the meeting and we can go over them in a conference call. If you could send me emails for the municipal contacts for the City of Bamberg, Denmark, Ehrhardt, Govan and Olar, I would great appreciate it and any other person or entity that would need to be on the call.

Also, see below. Could you reach out to your Assessor and get the updated figures for the following?

As reported from the County Tax Assessors office, Bamberg County properties have been assessed as following:

Residential:	$198,429,123
All Other:	$76,078,873
Agricultural:	$47,041,701
Commercial:	$34,985,366
Mobile Home:	$26,675,600
Multiple Lot Value:	$359,000

There are a recorded 14,027 total parcels within Bamberg County.

Much thanks!

Emory

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

From: Brittany M. Barnwell <barnwellbm@bambergcounty.sc.gov>
Sent: Monday, June 15, 2020 4:59 PM
To: Emory Langston <elangston@lscog.org>
Cc: Tiffany Bryant <bryantt@bambergcounty.sc.gov>
Subject: Re: LSCOG -Hazardous Mitigation Plan -

Emory,

Thank you for the update. I would prefer to do a conference call, and to scan over my documents. The middle part of July works just fine for me. Please provide me with dates, and I will confirm them once I review my calendar.

Thank You,

Emory Langston

From: Emory Langston
Sent: Wednesday, September 09, 2020 11:14 AM
To: Brittany M. Barnwell
Subject: FW: LSCOG -Hazardous Mitigation Plan -

Hi Brittany,

Hope this finds you well. It has been a while since we talked. Would like to set up a call in the next few weeks with the local municipalities on the call as well. Let me know so dates that look for you.

Thanks!
Emory

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

From: Emory Langston
Sent: Tuesday, June 30, 2020 1:48 PM
To: 'Brittany M. Barnwell' <barnwellbm@bambergcounty.sc.gov>
Cc: Tiffany Bryant <bryantt@bambergcounty.sc.gov>
Subject: FW: LSCOG -Hazardous Mitigation Plan -

Hi Brittany,

Please forgive me if you have responded, I may have accidentally deleted. I am trying to get organized before I leave for vacation July 2- 12 and want to make sure that I am preparing the tasks for the week I get back accordingly.

Let me know about the dates below and if you can get this information from the Assessor.

Much thanks and I hope you have a great 4th of July.

Best-
Emory

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

From: Emory Langston <elangston@lscog.org>
Sent: Friday, September 18, 2020 9:15 AM
To: McCoy, Lindsey <lmccoy@emd.sc.gov>
Subject: RE: HMP Draft Questions

Hi Lindsey,

Just checking in. The Calhoun County HMP public hearing/posting will come down this afternoon. Calhoun County, St. Matthews and Cameron were great to work with. I was hoping I could forward onto you on Monday.

As a side note, I am having a difficult time with the municipalities and some counties not getting information back to me. I also have reached out to Brittany Barnwell in Bamberg County EMD via email and phone, with no response. I am sure that COVID, not being able to meet in person, and weather events are all playing apart in lack of communication. Just wanted to keep you apprised of our difficulties. We continue to plow along with all the plans.

Hope you are doing well. Much thanks!

Best-
Emory

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

From: McCoy, Lindsey <lmccoy@emd.sc.gov>
Sent: Wednesday, August 26, 2020 12:54 PM
To: Emory Langston <elangston@lscog.org>
Subject: RE: HMP Draft Questions

Thank you, Emory! We will begin the review shortly, and get back to you as soon as it is completed.

Have a great afternoon!

Lindsey McCoy
Hazard Mitigation Planning Coordinator
South Carolina Emergency Management Division

2779 Fish Hatchery Road
West Columbia, SC 29172
Mobile: (803) 367-8095
lmccoy@emd.sc.gov

Emory Langston

From: Emory Langston
Sent: Monday, September 21, 2020 2:24 PM
To: McCoy, Lindsey
Subject: RE: HMP Draft Questions

Thanks Lindsey!

I appreciated the information! Will contact her asap!

Best-
Emory

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

From: McCoy, Lindsey <lmccoy@emd.sc.gov>
Sent: Monday, September 21, 2020 2:08 PM
To: Emory Langston <elangston@lscog.org>
Subject: RE: HMP Draft Questions

Hi Emory,

I received the Calhoun County HMP draft this morning – thank you so much! We will add that to our review queue and get back to you with notes as soon as we have them.

I just heard through the grapevine last week that Brittany Barnwell is no longer with Bamberg County. It looks like her replacement is Ms. Tiffany Kemmerlin – her email address is bryantt@bambergcounty.sc.gov. Hopefully she will be responsive, but if not, please let me know and I can reach out to our REMs and see if they can help us out, along with any others you might be having trouble getting a hold of.

Have a great day!

Lindsey McCoy
Hazard Mitigation Planning Coordinator
South Carolina Emergency Management Division

2779 Fish Hatchery Road
West Columbia, SC 29172
Mobile: (803) 367-8095
lmccoy@emd.sc.gov

1

Emory Langston

From: Emory Langston
Sent: Monday, September 21, 2020 2:30 PM
To: bryantt@bambergcounty.sc.gov
Subject: Bamberg County HMP

Good afternoon,

My name is Emory Langston and I work with Lower Savannah Council of Governments. Brittany Barnwell and I were working together on the Bamberg County Hazardous Mitigation Plan updates for 2021. My contact at SCEMD gave me your information as the new contact. I have been emailing Brittany and phone leaving messages for a few months with no answer. If you could, please confirm that you are my new contact. I would love to speak by phone at earliest convenience to get you up to speed. You can email me at elangston@lscog.org or phone 803-645-5467.

Best regards,
Emory

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

1

Emory Langston

From: Emory Langston
Sent: Thursday, October 29, 2020 10:20 AM
To: Brittany M. Barnwell
Subject: FW: Bamberg County Hazardous Mitigation Plan

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

From: Emory Langston
Sent: Thursday, October 29, 2020 10:20 AM
To: tkemmerlin@bambergcounty.sc
Subject: Bamberg County Hazardous Mitigation Plan

Good morning Tiffany,

We talked a few weeks back regarding the Hazardous Mitigation Plan for Bamberg County and the updates that LSCOG is doing for the County to submit to SCEMD and FEMA. Wanted to get back with one regarding this process. I am hoping that we can talk about a plan to move this forward over the next several months. I will be happy to discuss over the phone, on a Zoom call or I can even come to Bamberg and discuss with you in person (depending on your COVID policy). I know that we are still in a COVID world making it difficult for certain in-person meetings. Please let me know, at your soonest convenience, your availability.

Best regards-
Emory

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-508-7046

Emory Langston

From: Emory Langston
Sent: Tuesday, November 03, 2020 3:20 PM
To: Mary K. Tilton
Subject: RE: Bamberg County Comp. Plan Document

Hey Mary –

Just checking in on the CP 😊 I have another question..... I have been trying to reach out to via email and phone to Tiffany Kemmerlin regarding the Bamberg County Hazardous Mitigation Plan that we are working on updated for Bamber g County. I had been working with Brittany Barnwell and was informed a month or so ago that she is no longer in that position and Ms. Kemmerlin was her replacement. Is Ms. Kemmerlin the correct contact and if so, how can I get in touch with her .

Much thanks for any help!

Emory

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

From: Mary K. Tilton <tiltonmk@bambergcounty.sc.gov>
Sent: Tuesday, October 20, 2020 12:18 PM
To: Emory Langston <elangston@lscog.org>
Subject: RE: Bamberg County Comp. Plan Document

Thanks, Emory! Joey is in the office today, so I'll ask him to review. It looks great to me. Thanks for making those changes.

Mary

From: Emory Langston [mailto:elangston@lscog.org]
Sent: Tuesday, October 20, 2020 11:07 AM
To: Mary K. Tilton <tiltonmk@bambergcounty.sc.gov>
Subject: RE: Bamberg County Comp. Plan Document

Hi Mary-

Please review and let me know what you think. Because I inserted a bolder header, it did throw off the page numbers slightly. The total pages were 139 and now 142. Please review to ensure the format is ok or let me know any changes.

Thanks!

Emory M. Langston

1

Emory Langston

From: Emory Langston
Sent: Thursday, November 19, 2020 1:45 PM
To: 'bryantt@bambergcounty.sc.gov'
Subject: HMP Information
Attachments: BambergHMP(2016).doc; Bamberg County Hazard Mitigation Actions(Fig34).doc; Bamberg Hazard Mitigation Actions(Fig36).doc; Denmark Hazard Mitigation Actions(Fig38).doc; Ehrhardt Hazard Mitigation Actions(Fig40).doc; Govan Hazard Mitigation Actions(Fig42).doc; Municipal Mitigation Actions.7z; Olar Hazard Mitigation Actions(Fig44).doc; BambergHMP Part 2 Risk Assessment.pdf

Hi Tiffany,

Please see the attachments. I am fairly certain that I have included all that we spoke about this morning. I did not include the full 2020 draft, but did include the Risk Assessment part we spoke about. If I am missing anything that we discussed and you need, please let me know!

Best-
Emory

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

1

Emory Langston

From: Emory Langston
Sent: Tuesday, November 24, 2020 8:40 AM
To: bryantt@bambergcounty.sc.gov
Subject: Draft email for HMP call

Good morning Tiffany,

Below is a draft of the email to send to the taskforce members. Let me know if you feel it concisely explains what we trying to accomplish. 😊 Please let me know also if we need to add or delete any information.

Hope you and yours have a great Thanksgiving and I will touch base with you next week.

Best-
Emory

Good morning all –

Hope this finds everyone doing well staying safe and health! Lower Savannah Council of Governments (LSCOG) has taken on the role to update the Bamberg County Hazardous Mitigation Plan (HMP). The HMP covers natural hazards (tornados, hail storms, drought, earthquakes, etc....) and mitigation measures for the County and the municipalities in the County. Per FEMA and SCEMD, the Bamberg County plan needs to be updated every five years. Over the past months, LSOCG has been working to update data, statistics, maps and more. We are emailing, as a partner/taskforce member, who has a part in the Bamberg County HMP as a County or municipal stakeholder. Participation in the HMP will allow for better preparations in events of natural hazards but will also allow for participation in future grant opportunities for your towns/cities and the County.

We are at the point where we need your review and input of information to move forward. We are scheduling a conference call for our taskforce members on December 9 at 2:00. During the conference call we will briefly review the HMP, data collected, how it pertains to the County and municipalities and needed mitigation actions. Please let us know if you will be able to participate in the call. Additional information will be sent, for your review, prior to the call.

Please let me know if you have any questions or concerns.

Best regards,

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

Emory Langston

From: Tiffany Bryant <bryantt@bambergcounty.sc.gov>
Sent: Tuesday, December 01, 2020 10:18 AM
To: Emory Langston
Subject: RE: Draft email for HMP call

You're right! Time is flying by!

See below for the email addresses. If I missed someone, please let me know!

County Administrator Joey Preston - joeypreston@gmail.com
Add Deputy Administrator/Finance Director Thomas Thomas - thomastm@bambergcounty.sc.gov
Mayor Nancy Foster- fostercompanyrea@bellsouth.net
Mayor Gerald Wright- bwilliams524@yahoo.com
Heyward Robinson- admin@denmarksc.com
William Stanley- townofehrhardt@gmail.com
Katie Stroman- kathiestroman@yahoo.com
Wilma Edmonds- townofolar@frontier.com
Walter O'Rear- townofolar@frontier.com
Sharon Hammond- hammonds@bambergcounty.sc.gov
Doretta Elliott- elliottdh@bambergcounty.sc.gov
Paul Eubanks- eubanksph@bambergcounty.sc.gov
Bill Johnson- johnsonb@bambergcounty.sc.gov

There is one edit that needs to be changed on our Task Force Committee.
Bruce Watson- *REMOVE*
REPLACE with Robin Chavis, City of Bamberg Clerk Treasurer- cityofbamberg@bambergsc.com

If you have any questions, please let me know!

Thank you!

Tiffany Kemmerlin, SC CEM
Interim Director of Emergency Services, Bamberg County
Office 803.245.3087 | Cell 803.824.3003
2893 Main Hwy Bamberg, SC 29003

From: Emory Langston [mailto:elangston@lscog.org]
Sent: Tuesday, December 1, 2020 8:42 AM
To: Tiffany Bryant <bryantt@bambergcounty.sc.gov>
Subject: RE: Draft email for HMP call

Hi Tiffany,

We did have a nice Thanksgiving and hoping you and yours did as well. Can't believe we are official in December!

Glad things with the HMP make sense. IF you have any questions, don't hesitate to let me know.

1

Either way with the conference call line is fine with me too. I will be happy to do that, if you want me to. If you would like for me to do that, I would just need either the emails for the participants or you could forward the information to the participants once I set it up.

Have a great Tuesday!

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

From: Tiffany Bryant <bryantt@bambergcounty.sc.gov>
Sent: Monday, November 30, 2020 4:34 PM
To: Emory Langston <elangston@lscog.org>
Subject: RE: Draft email for HMP call

Happy Monday! Hope you and your family had a great Thanksgiving holiday!

I have been reviewing all the documents regarding our Hazard Mitigation plan. Yes, it was a little overwhelming, but I think I understand everything. I am still waiting for the information requested from the assessor's office. I sent an email earlier to touch base, so hopefully we will have that information soon.

Also, I think the email sounds great. I will be delivering the action sheets to each municipality this week, so they can review them also.

Question, will you be setting up the conference call, or do I need to do that. Either way is fine, I just need to know.

If you have any questions, please feel free to call me.

Thank you,

Tiffany Kemmerlin, SC CEM
Interim Director of Emergency Services, Bamberg County
Office 803.245.3087 | Cell 803.824.3003
2893 Main Hwy Bamberg, SC 29003

From: Emory Langston [mailto:elangston@lscog.org]
Sent: Tuesday, November 24, 2020 8:40 AM
To: Tiffany Bryant <bryantt@bambergcounty.sc.gov>
Subject: Draft email for HMP call

Good morning Tiffany,

Below is a draft of the email to send to the taskforce members. Let me know if you feel it concisely explains what we trying to accomplish. 😊 Please let me know also if we need to add or delete any information.

Hope you and yours have a great Thanksgiving and I will touch base with you next week.

Best-
Emory

Good morning all –

Hope this finds everyone doing well staying safe and health! Lower Savannah Council of Governments (LSCOG) has taken on the role to update the Bamberg County Hazardous Mitigation Plan (HMP). The HMP covers natural hazards (tornados, hail storms, drought, earthquakes, etc....) and mitigation measures for the County and the municipalities in the County. Per FEMA and SCEMD, the Bamberg County plan needs to be updated every five years. Over the past months, LSOCG has been working to update data, statistics, maps and more. We are emailing, as a partner/taskforce member, who has a part in the Bamberg County HMP as a County or municipal stakeholder. Participation in the HMP will allow for better preparations in events of natural hazards but will also allow for participation in future grant opportunities for your towns/cities and the County.

We are at the point where we need your review and input of information to move forward. We are scheduling a conference call for our taskforce members on December 9 at 2:00. During the conference call we will briefly review the HMP, data collected, how it pertains to the County and municipalities and needed mitigation actions. Please let us know if you will be able to participate in the call. Additional information will be sent, for your review, prior to the call.

Please let me know if you have any questions or concerns.

Best regards,

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

_____ START OF DISCLAIMER ********** This message can contain confidential information and is intended only for the individual named. If you are not the named addressee you should not disseminate, distribute or copy this e-mail. Please notify the sender immediately by e-mail if you have received this e-mail by mistake and delete it from your system. E-mail transmission cannot be guaranteed to be secured or error-free as information could be intercepted, corrupted, lost, destroyed, arrive late, incomplete, or contain viruses. The sender therefore does not accept liability for any errors or omissions in the contents of this message, which arise as a result of e-mail transmission.

Emory Langston

From: Tiffany Bryant <bryantt@bambergcounty.sc.gov>
Sent: Monday, December 07, 2020 11:08 AM
To: Emory Langston
Subject: RE: Checking in

I haven't. I sent out all the packages on Friday.

Tiffany Kemmerlin, SC CEM
Interim Director of Emergency Services, Bamberg County
Office 803.245.3087 | Cell 803.824.3003
2893 Main Hwy Bamberg, SC 29003

From: Emory Langston [mailto:elangston@lscog.org]
Sent: Monday, December 7, 2020 11:07 AM
To: Tiffany Bryant <bryantt@bambergcounty.sc.gov>
Subject: Checking in

Hi Tiffany,

Just checking in before I set up the conference call information. Have you heard from anyone regarding the information that went out last week?

Thanks!
Emory

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

Emory Langston

From: Tiffany Bryant <bryantt@bambergcounty.sc.gov>
Sent: Wednesday, December 09, 2020 11:34 AM
To: Emory Langston; Joey Preston; Thomas M. Thomas; Nancy Foster; bwilliams524 @yahoo.com; admin@denmarksc.com; townofehrhardt@gmail.com; Kathie Stroman; Walter ORear; Walter ORear; Sharon Hammond; Doretta H. Elliott; Paul H. Eubanks; Paul H. Eubanks; Bill Johnson; Robin Chavis (cityofbamberg@bambergsc.com)
Subject: Reminder: Bamberg County Hazardous Mitigation Plan Information Conference Call
Attachments: invite.ics

Good morning all,

This is a reminder of our conference call today, December 9 at 2pm regarding our Hazard Mitigation plan information. If you have any questions, please give me a call.

Join Lower Savannah Council of Governments Conference:
https://lower-savannah-council-of-governments-pced.freeconferencepro.com/conf/call/2542748

One tap mobile:
+1 480-297-0773 2542748#

Join using your phone:
United States - Phoenix: +1 480-297-0773

Access code: 254 2748

Find a local dial-in number:
http://lower-savannah-council-of-governments-pced.freeconferencepro.com/participant_call_in_numbers?id=14117851

Test your device before the conference:
https://lower-savannah-council-of-governments-pced.freeconferencepro.com/system/test

Conference Agenda:
Discussion Bamberg County 5 year HMP update process and actions.

Tiffany Kemmerlin, SC CEM
Interim Director of Emergency Services, Bamberg County
Office 803.245.3087 | Cell 803.824.3003
2893 Main Hwy Bamberg, SC 29003

From: Emory Langston [mailto:elangston@lscog.org]
Sent: Wednesday, December 2, 2020 1:36 PM
To: Joey R. Preston <prestonjr@bambergcounty.sc.gov>; Joey Preston <joeypreston@gmail.com>; Thomas M. Thomas <thomastm@bambergcounty.sc.gov>; Nancy Foster <fostercompanyrea@bellsouth.net>; bwilliams524@yahoo.com; admin@denmarksc.com; townofehrhardt@gmail.com; Kathie Stroman <kathiestroman@yahoo.com>; Walter ORear <townofolar@frontier.com>; Walter ORear <townofolar@frontier.com>; Sharon Hammond <hammonds@bambergcounty.sc.gov>; Doretta H. Elliott <elliottdh@bambergcounty.sc.gov>; Paul H. Eubanks <eubanksph@bambergcounty.sc.gov>; Paul H. Eubanks <eubanksph@bambergcounty.sc.gov>; Bill Johnson

<johnsonb@bambergcounty.sc.gov>; Robin Chavis (cityofbamberg@bambergsc.com) <cityofbamberg@bambergsc.com>
Cc: Tiffany Bryant <bryantt@bambergcounty.sc.gov>
Subject: Bamberg County Hazardous Mitigation Plan Information

Good afternoon all –

Hope this finds everyone doing well and staying safe and healthy! This may be the second time you are receiving this email; my apologies if that is the case. I had several bounce back the first time around.

Lower Savannah Council of Governments (LSCOG) has taken on the role to update the Bamberg County Hazardous Mitigation Plan (HMP). The HMP covers natural hazards (tornados, hail storms, drought, earthquakes, etc....) and mitigation measures for the County and the municipalities in the County. Per FEMA and SCEMD, the Bamberg County plan needs to be updated every five years. Over the past months, LSOCG has been working to update data, statistics, maps and more. We are emailing, as a partner/taskforce member, who has a part in the Bamberg County HMP as a County or municipal stakeholder. Participation in the HMP will allow for better preparations in events of natural hazards but will also allow for participation in future grant opportunities for your towns/cities and the County.

We are at the point where we need your review and input of information to move forward. We are scheduling a conference call for our taskforce members on **December 9 at 2:00.** During the conference call we will briefly review the HMP, data collected, how it pertains to the County and municipalities and needed mitigation actions. Please let us know if you will be able to participate in the call. Additional information will be sent, for your review, prior to the call.

Please let me know if you have any questions or concerns.

Best regards,

Emory

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

Emory Langston

From: Tiffany Bryant <bryantt@bambergcounty.sc.gov>
Sent: Monday, January 04, 2021 10:51 AM
To: Emory Langston
Subject: RE: Bamberg County Hazardous Mitigation Plan Information

There were no edits reported. Thank you!

Tiffany Kemmerlin, SC CEM
Interim Director of Emergency Services, Bamberg County
Office 803.245.3087 | Cell 803.824.3003
2893 Main Hwy Bamberg, SC 29003

From: Emory Langston [mailto:elangston@lscog.org]
Sent: Monday, January 4, 2021 10:50 AM
To: Tiffany Bryant <bryantt@bambergcounty.sc.gov>
Subject: RE: Bamberg County Hazardous Mitigation Plan Information

Hi Tiffany,

Happy New Year! Just touching base to see if you have heard back from anyone regarding the actions. Please let me know of any up dates or changes to the County's plan asap.

Thanks!

Emory M. Langston
Planning, Community and Economic Development Administrator
Lower Savannah Council of Governments
2748 Wagener Rd.
Aiken, SC 29802
803-649-7981

From: Tiffany Bryant <bryantt@bambergcounty.sc.gov>
Sent: Tuesday, December 15, 2020 1:35 PM
To: Emory Langston <elangston@lscog.org>; Joey R. Preston <prestonjr@bambergcounty.sc.gov>; Joey Preston <joeypreston@gmail.com>; Thomas M. Thomas <thomastm@bambergcounty.sc.gov>; Nancy Foster <fostercompanyrea@bellsouth.net>; bwilliams524@yahoo.com; admin@denmarksc.com; townofehrhardt@gmail.com; Kathie Stroman <kathiestroman@yahoo.com>; Walter ORear <townofolar@frontier.com>; Walter ORear <townofolar@frontier.com>; Sharon Hammond <hammonds@bambergcounty.sc.gov>; Doretta H. Elliott <elliottdh@bambergcounty.sc.gov>; Paul H. Eubanks <eubanksph@bambergcounty.sc.gov>; Paul H. Eubanks <eubanksph@bambergcounty.sc.gov>; Bill Johnson <johnsonb@bambergcounty.sc.gov>; Robin Chavis (cityofbamberg@bambergsc.com) <cityofbamberg@bambergsc.com>; Mary K. Tilton <tiltonmk@bambergcounty.sc.gov>
Subject: Bamberg County Hazardous Mitigation Plan Information

Good afternoon all, Hope everyone is having a great week! As we discussed on the conference call last week, all updated and reviewed Hazard Mitigation Actions need to be completed and submitted by Friday, December

18th. If you have any questions, please reach out to Mrs. Emory Langston with Lower Savannah Council of Governments (LSCOG) at (803) 649-7981 or myself at (803) 245-4313 x2501 or by email. Thank you so much for taking time out to assist us with updating the Bamberg County Hazardous Mitigation Plan.

Also, Happy Holiday to all! I wish each of you a Merry Christmas!

Thank you!

Tiffany Kemmerlin, SC CEM
Interim Director of Emergency Services, Bamberg County
Office 803.245.3087 | Cell 803.824.3003
2893 Main Hwy Bamberg, SC 29003

From: Emory Langston [mailto:elangston@lscog.org]
Sent: Wednesday, December 2, 2020 1:36 PM
To: Joey R. Preston <prestonjr@bambergcounty.sc.gov>; Joey Preston <joeypreston@gmail.com>; Thomas M. Thomas <thomastm@bambergcounty.sc.gov>; Nancy Foster <fostercompanyrea@bellsouth.net>; bwilliams524@yahoo.com; admin@denmarksc.com; townofehrhardt@gmail.com; Kathie Stroman <kathiestroman@yahoo.com>; Walter ORear <townofolar@frontier.com>; Walter ORear <townofolar@frontier.com>; Sharon Hammond <hammonds@bambergcounty.sc.gov>; Doretta H. Elliott <elliottdh@bambergcounty.sc.gov>; Paul H. Eubanks <eubanksph@bambergcounty.sc.gov>; Paul H. Eubanks <eubanksph@bambergcounty.sc.gov>; Bill Johnson <johnsonb@bambergcounty.sc.gov>; Robin Chavis (cityofbamberg@bambergsc.com) <cityofbamberg@bambergsc.com>
Cc: Tiffany Bryant <bryantt@bambergcounty.sc.gov>
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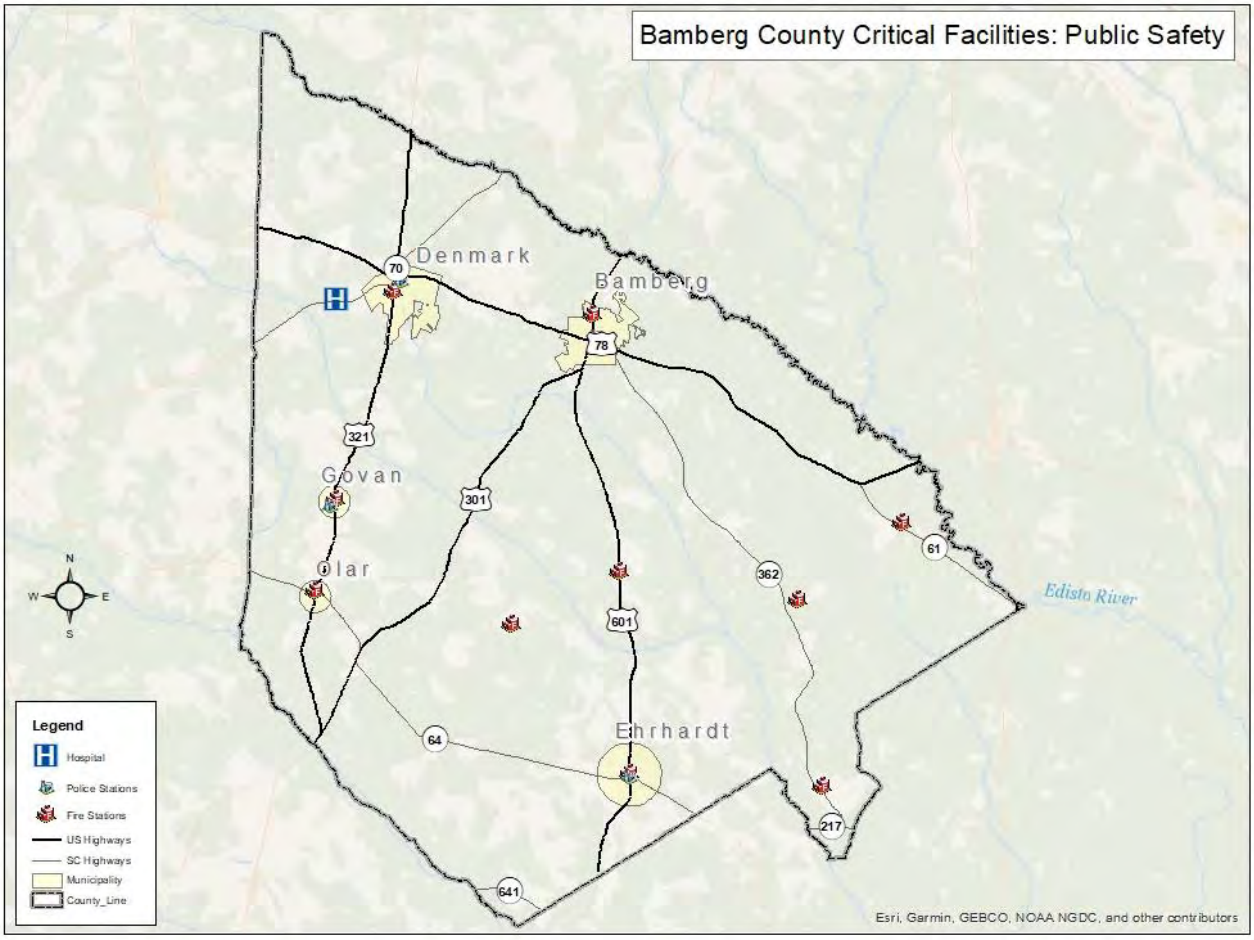
Best regards,

Emory

Appendix D: Maps

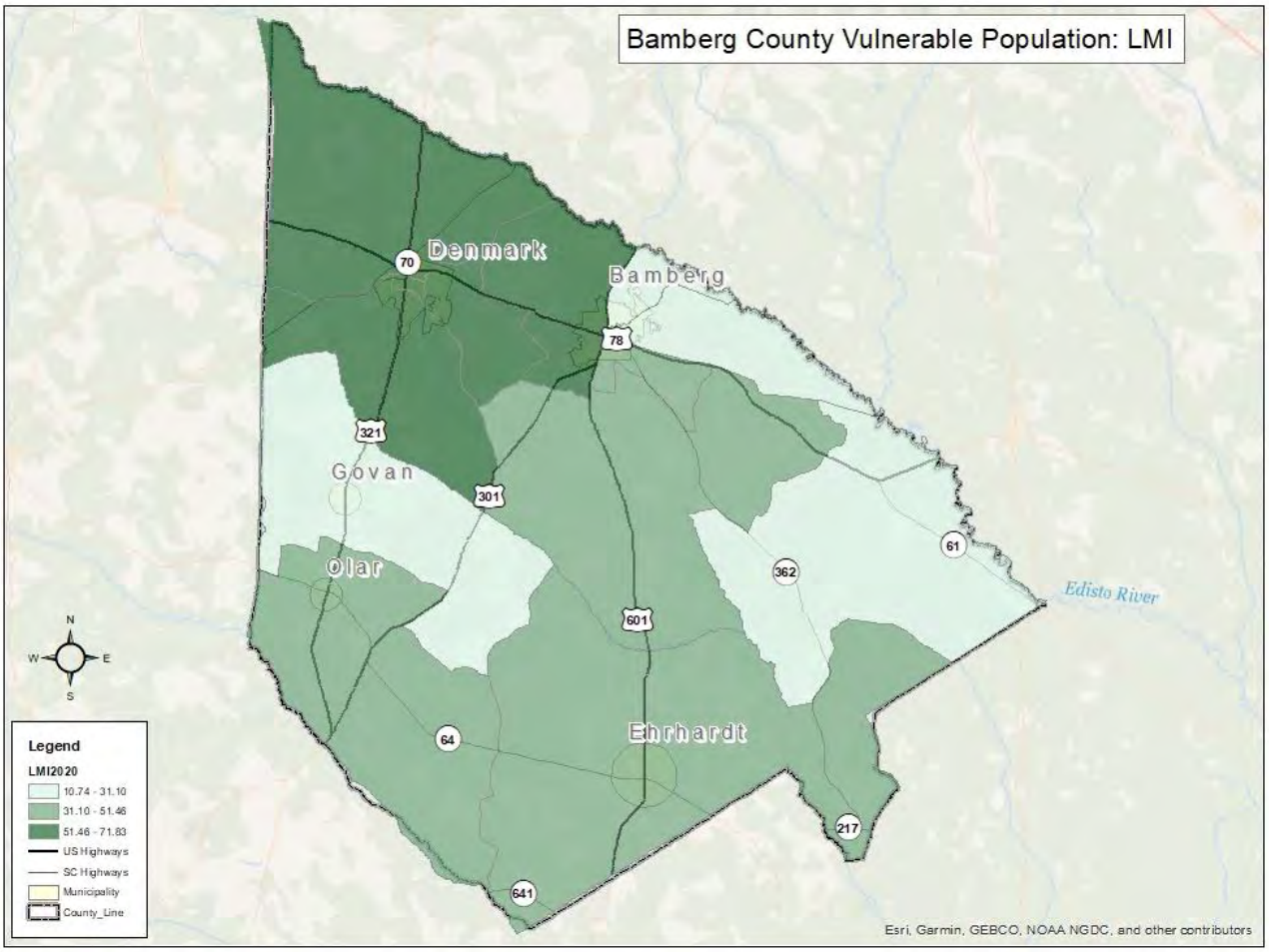
Map 1: Bamberg County Base Map

Map 2: Critical Facilities: Public Safety



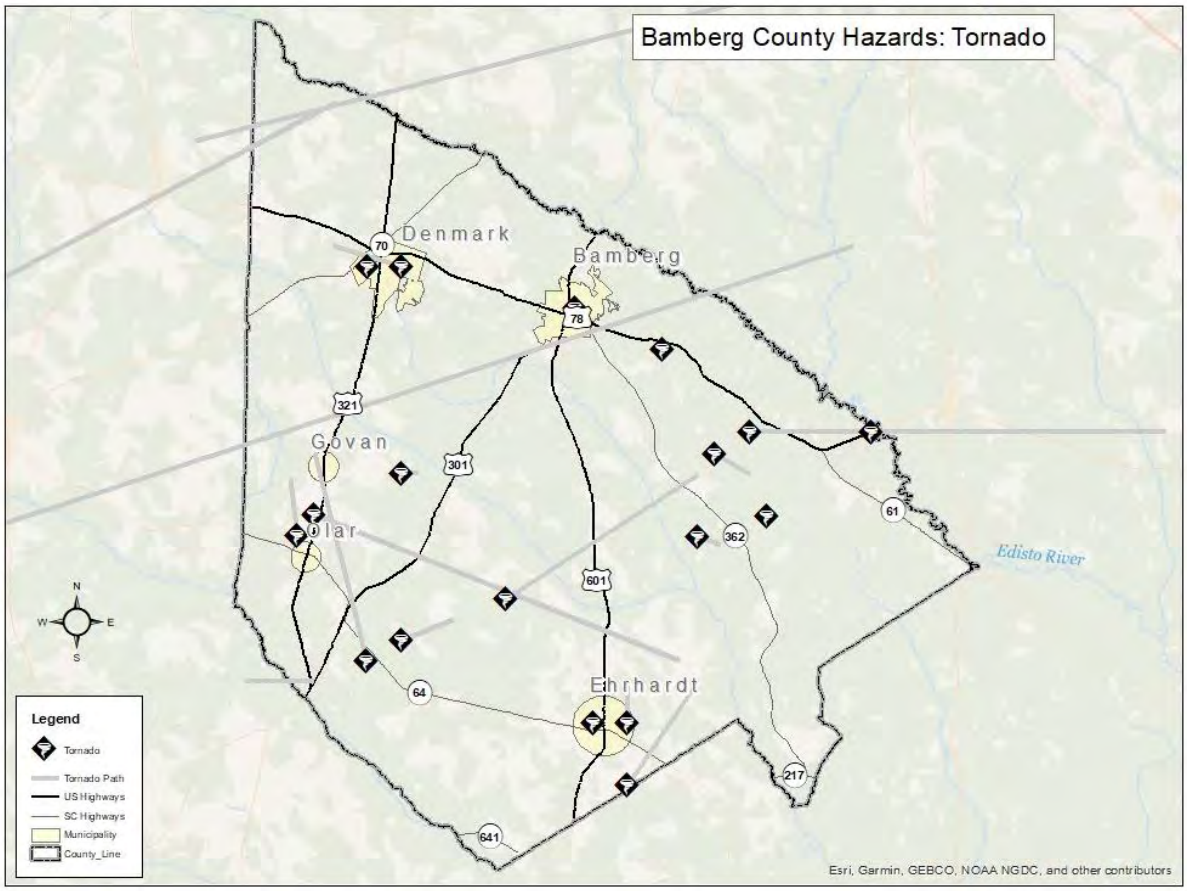
Map 3: Critical Facilities: Government Buildings and Schools

Map 4: Vulnerable Population: Low to Moderate Income

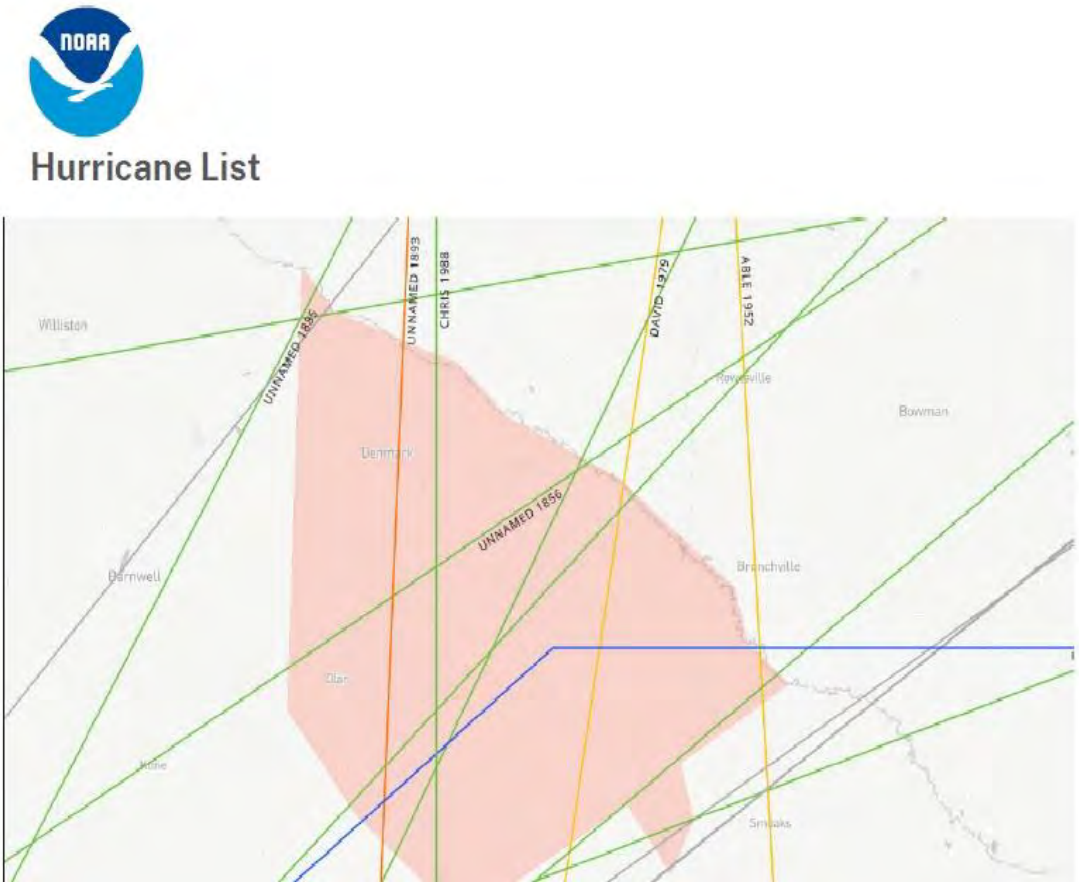


Map 5: Vulnerable Population: Nursing Facilities

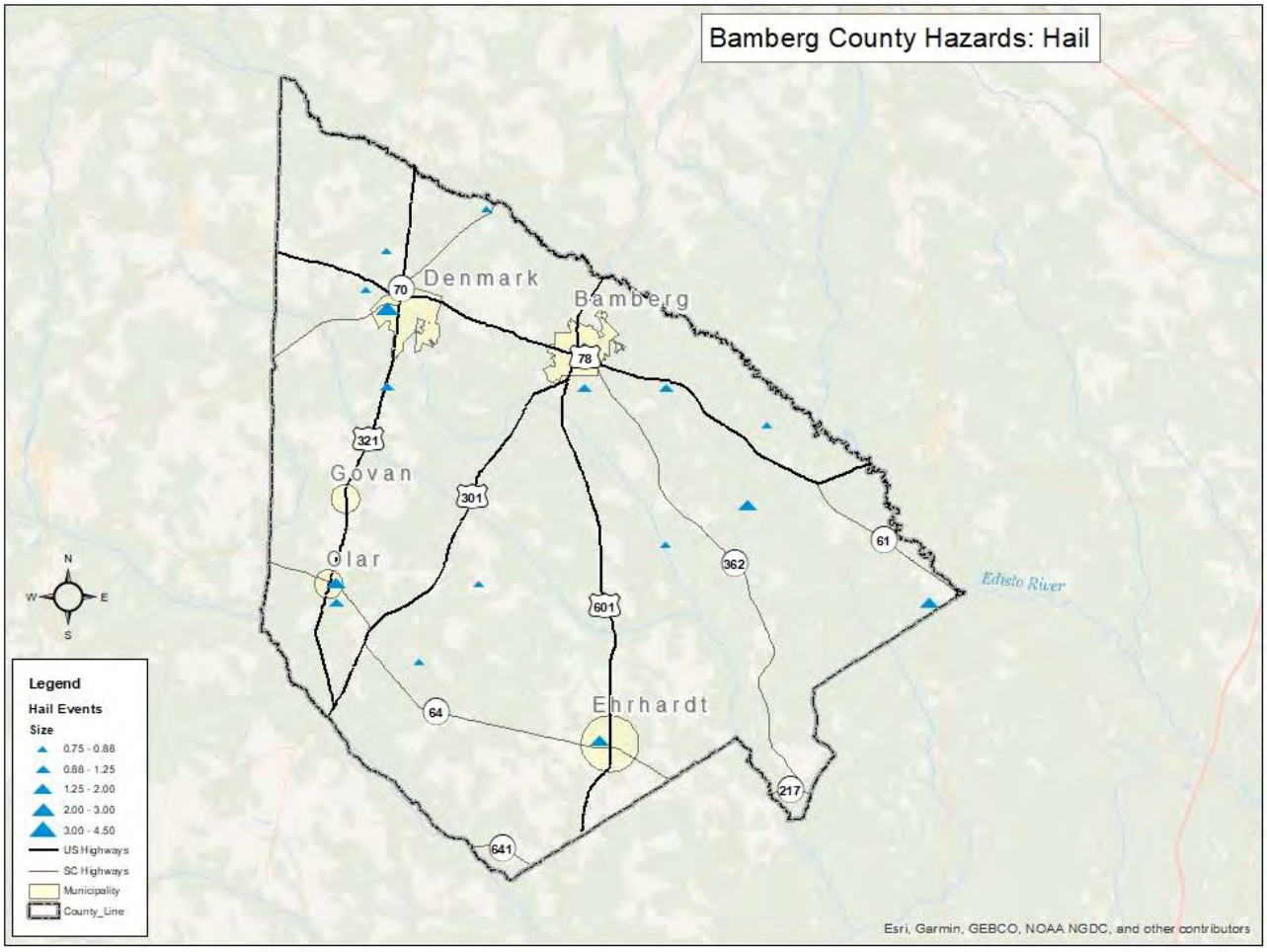
Map 6: Hazards: Tornado



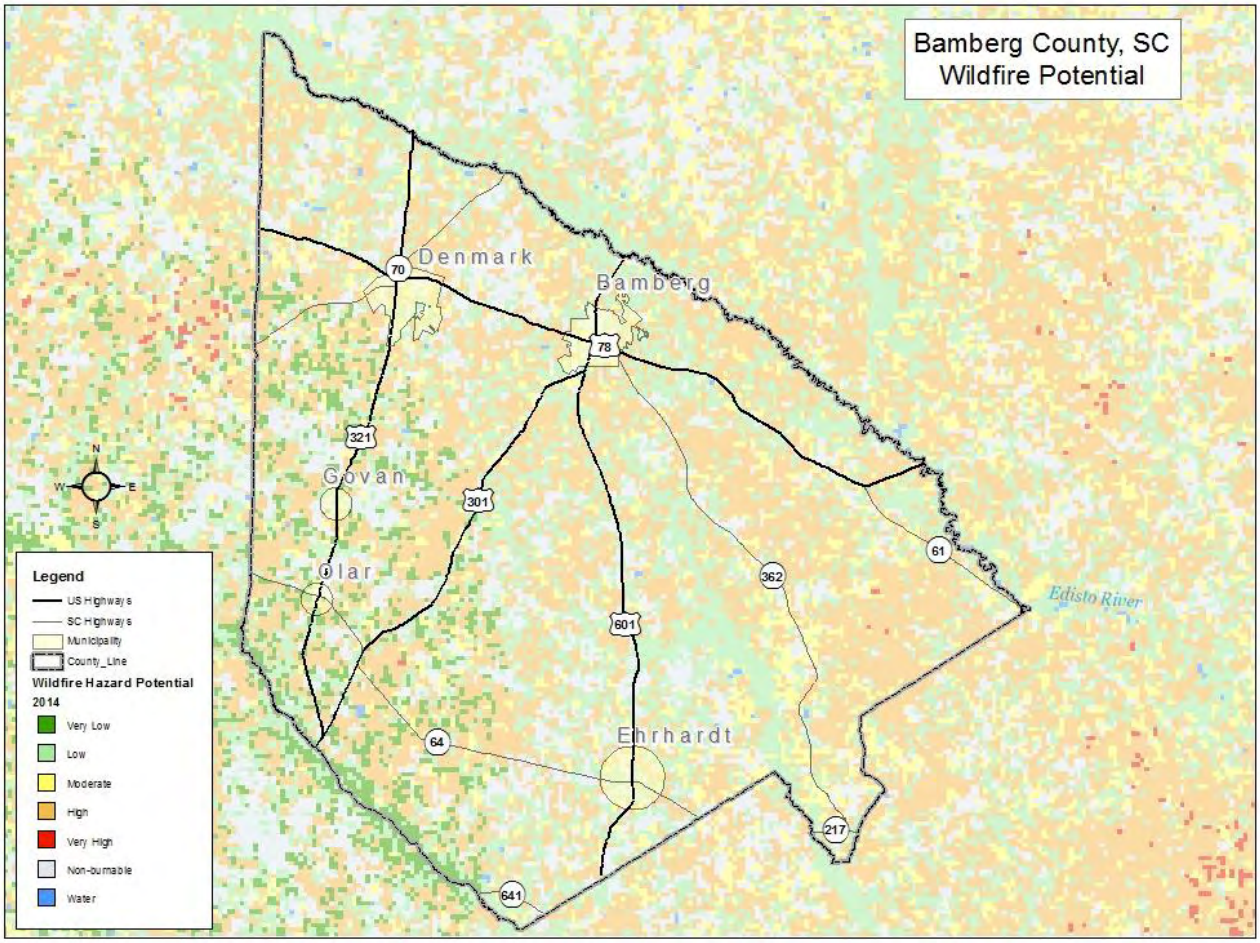
Map 7: Hazards: Hurricane/Tropical Storms



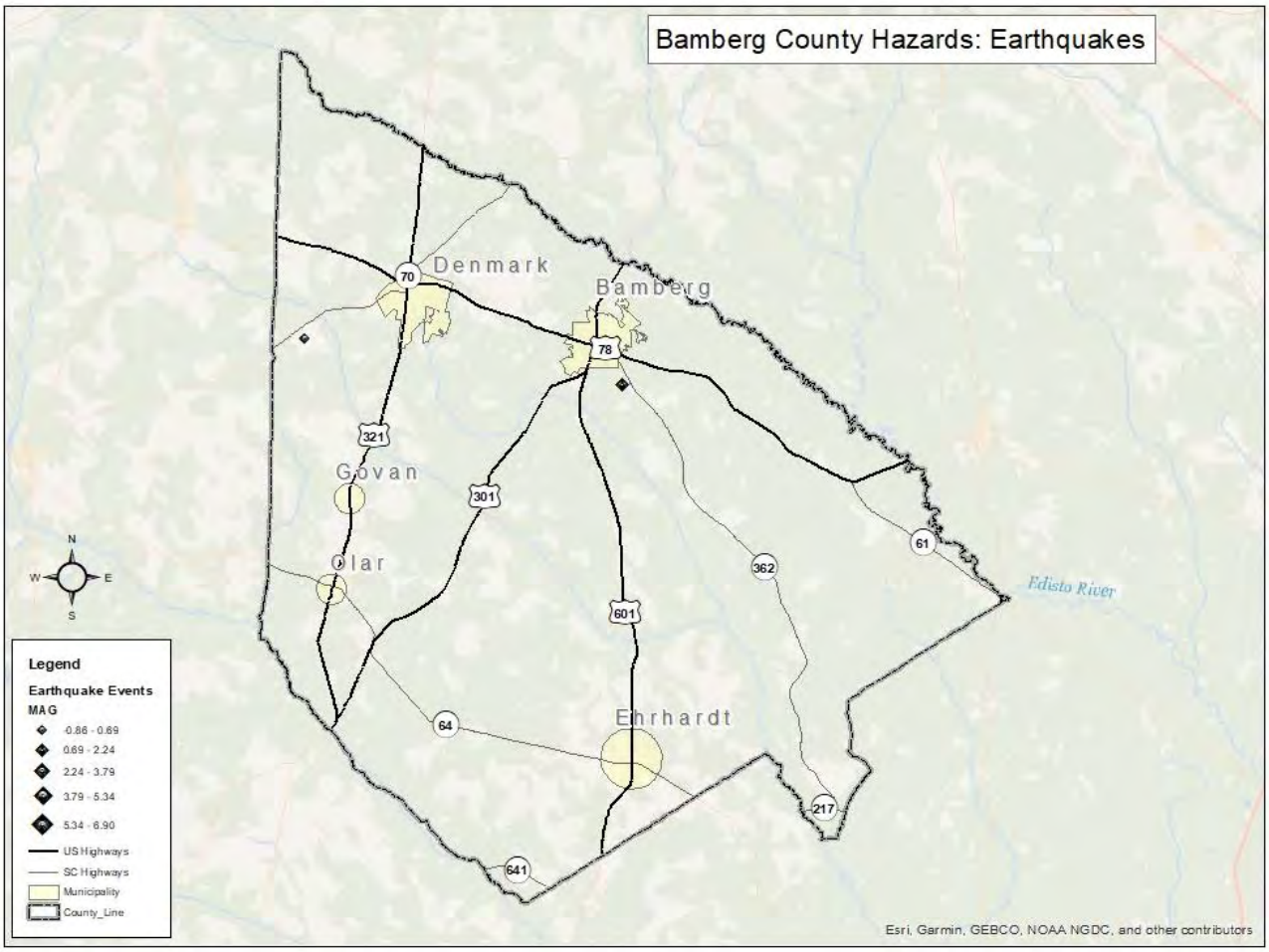
Map 8: Hazards: Hail



Map 9: Hazards: Wildfire Potential



Map 10: Earthquakes



Map 11: Hazards: Flood