

Randolph County, NC Multi-Jurisdictional Hazard Mitigation Plan

DRAFT – March 2016

ATKINS



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SECTION 1

INTRODUCTION

This section provides a general introduction to the *Randolph County Multi-Jurisdictional Hazard Mitigation Plan*. It consists of the following five subsections:

- ❖ 1.1 Background;
- ❖ 1.2 Purpose;
- ❖ 1.3 Scope;
- ❖ 1.4 Authority; and
- ❖ 1.5 Summary of Plan Contents.

1.1 BACKGROUND

Natural and man-made hazards, such as floods, hurricanes, and fires, are a part of the world around us. In some cases, their occurrence is natural and inevitable, and there is little we can do to control their force and intensity. In others, we have more power to control the intensity and probability but can never truly eliminate the threat entirely. In either case, we must consider these hazards to be legitimate and significant threats to human life, safety, and property.

Randolph County is located in the Piedmont area of North Carolina. The County encompasses the City of Archdale, City of Asheboro, Town of Franklinville, Town of Liberty, Town of Ramseur, City of Randleman, Town of Seagrove, Town of Staley, City of Trinity, and all unincorporated areas within the County. This area is vulnerable to a wide range of natural hazards such as hurricanes, floods, severe thunderstorms, winter storms, and tornados. It is also vulnerable to man-made hazards, including nuclear accidents. These hazards threaten the life and safety of residents in Randolph County and have the potential to damage or destroy both public and private property, disrupt the local economy, and impact the overall quality of life of individuals who live, work, and vacation in Randolph County.

While the threat from hazardous events may never be fully eliminated, there is much we can do to lessen their potential impact upon our community and our citizens. By minimizing the impact of hazards upon our built environment, we can prevent such events from resulting in disasters. The concept and practice of reducing risks to people and property from known hazards is generally referred to as *hazard mitigation*.



FEMA Definition of Hazard Mitigation:

“Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.”

Hazard mitigation techniques include both structural measures (such as strengthening or protecting buildings and infrastructure from the destructive forces of potential hazards) and non-structural measures (such as the adoption of sound land use policies and the creation of public awareness programs). It is widely accepted that the most effective mitigation measures are implemented at the

local government level, where decisions on the regulation and control of development are ultimately made. A comprehensive mitigation approach addresses hazard vulnerabilities that exist today and in the foreseeable future. Therefore, it is essential that projected patterns of future development are evaluated and considered in terms of how that growth will increase or decrease a community's overall hazard vulnerability.

A key component in the formulation of a comprehensive approach to hazard mitigation is to develop, adopt, and update a local hazard mitigation plan as needed. A hazard mitigation plan establishes the broad community vision and guiding principles for reducing hazard risk and, further, proposes specific mitigation actions to eliminate or reduce identified vulnerabilities.

The County and nine municipalities participating in the *Randolph County Multi-Jurisdictional Hazard Mitigation Plan*, also referred to as the *Plan*, have an existing hazard mitigation plan that has evolved over the years, as described in Section 2: *Planning Process*. This update of the *Plan* draws from the previous plan to document the efforts of each jurisdiction to incorporate hazard mitigation principles and practices into routine government activities and functions. At its core, the *Plan* recommends specific actions to minimize hazard vulnerability and protect residents from losses to those hazards that pose the greatest risk. These mitigation actions go beyond simply recommending structural solutions to reduce existing vulnerability, such as elevation, retrofitting, and acquisition projects. Local policies on community growth and development, incentives for natural resource protection, and public awareness and outreach activities are examples of other actions considered to reduce Randolph County's vulnerability to identified hazards. The *Plan* remains a living document with implementation and evaluation procedures established to help achieve meaningful objectives and successful outcomes over time.

1.1.1 The Disaster Mitigation Act and the Flood Insurance Reform Acts

In an effort to reduce the Nation's mounting natural disaster losses, the U.S. Congress passed the Disaster Mitigation Act of 2000¹ (DMA 2000) in order to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act.² Section 322 of DMA 2000 emphasizes the need for state, local, and Tribal government entities to closely coordinate on mitigation planning activities and makes the development of a hazard mitigation plan a specific eligibility requirement for any local or Tribal government applying for federal mitigation grant funds. In short, if a jurisdiction is not covered by an approved mitigation plan, it will not be eligible for mitigation grant funds. These funds include the Hazard Mitigation Grant Program (HMGP) and the Pre-Disaster Mitigation (PDM) program, both of which are administered by the Federal Emergency Management Agency (FEMA) under the Department of Homeland Security. Communities with an adopted and federally-approved hazard mitigation plan thereby become pre-positioned and more apt to receive available mitigation funds before and after the next disaster strikes.

In addition to federal requirements for hazard mitigation planning, the State of North Carolina also requires a hazard mitigation plan be in place for jurisdictions to receive mitigation and public assistance funds after a State-declared disaster. This requirement is codified in NC Senate Bill 300,³ which lays out the need for mitigation planning and ties it to disaster funding at the State level.

¹ Disaster Mitigation Act of 2000. U.S. Code, Title 42, Chapter 68, § 5121.

² The Robert T. Stafford Disaster Relief and Emergency Assistance Act. U.S. Code, Title 42, Chapter 68, §§ 5121 – 5208.

³ Senate Bill 300, N.C. General Statute, § 166-A.

Additionally, the Flood Insurance Reform Act of 2004⁴ (P.L. 108-264) created two new grant programs, Severe Repetitive Loss (SRL) and Repetitive Flood Claim (RFC), and modified the existing Flood Mitigation Assistance (FMA) program. One of the requirements of the Flood Insurance Reform Act of 2004 is that a FEMA-approved Hazard Mitigation Plan is now required if communities wish to be eligible for these FEMA mitigation programs. However, as of early 2014, these programs have been folded into a single Flood Mitigation Assistance (FMA) program.

This change was brought on by new, major federal flood insurance legislation that was passed in 2012 under the Biggert-Waters Flood Insurance Reform Act (P.L. 112-141)⁵ and the subsequent Homeowner Flood Insurance Affordability Act in 2014 that revised Biggert-Waters.⁶ These acts made several changes to the way the National Flood Insurance Program is to be run, including raises in rates to reflect true flood risk and changes in how Flood Insurance Rate Map (FIRM) updates impact policyholders. These acts further emphasize Congress' focus on mitigating vulnerable structures.

The *Randolph County Multi-Jurisdictional Hazard Mitigation Plan* has been prepared in coordination with FEMA Region IV and the North Carolina Division of Emergency Management (NCEM) to ensure that the *Plan* meets all applicable FEMA and State requirements for hazard mitigation plans. A *Local Mitigation Plan Review Tool*, found in Appendix C, provides a summary of federal and State minimum standards and notes the location where each requirement is met within the *Plan*.

1.2 PURPOSE

The purpose of the *Randolph County Multi-Jurisdictional Hazard Mitigation Plan* is to:

- ❖ Reduce risk to people, property, and the critical infrastructure;
- ❖ Increase public awareness and education about the plan and the planning process;
- ❖ Maintain grant eligibility for participating jurisdictions; and
- ❖ Maintain compliance with State and federal legislative requirements for local hazard mitigation plans.

1.3 SCOPE

The focus of the *Randolph County Multi-Jurisdictional Hazard Mitigation Plan* is on those hazards determined to be “high” or “moderate” risks to Randolph County, as determined through a detailed hazard risk assessment. Other hazards that pose a “low” or “negligible” risk will continue to be evaluated during future updates to the *Plan*, but they may not be fully addressed until they are determined to be of high or moderate risk. This enables the participating jurisdictions to prioritize mitigation actions based on those hazards which are understood to present the greatest risk to lives and property.

The geographic scope (i.e., the planning area) for the *Plan* includes all of Randolph County including all of its incorporated jurisdictions (see below) and unincorporated areas. **Table 1.1** indicates the participating jurisdictions.

⁴ Flood Insurance Reform Act of 2004. U.S. Code, Title 42, Chapter 50, § 4001.

⁵ Biggert-Waters Flood Insurance Reform Act of 2012. U.S. Code, Title 42, Chapter 50, § 4004.

⁶ Homeowner Flood Insurance Affordability Act of 2014. U.S. Code, Title 42, Chapter 50, § 4005.

TABLE 1.1: PARTICIPATING JURISDICTIONS IN THE *RANDOLPH COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN*

Randolph County	
City of Archdale	City of Randleman
City of Asheboro	Town of Seagrove
Town of Franklinville	Town of Staley
Town of Liberty	City of Trinity
Town of Ramseur	

1.4 AUTHORITY

The *Randolph County Multi-Jurisdictional Hazard Mitigation Plan* has been developed in accordance with current State and Federal rules and regulations governing local hazard mitigation plans and has been adopted by each participating jurisdiction in accordance with standard local procedures. Copies of the adoption resolutions for each participating jurisdiction are provided in Appendix A. The *Plan* shall be routinely monitored and revised to maintain compliance with the following provisions, rules, and legislation:

- ❖ Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390);⁷
- ❖ FEMA's Final Rule published in the Federal Register, at 44 CFR Part 201 (201.6 for local mitigation planning requirements and 201.7 for Tribal planning requirements);⁸ and
- ❖ Flood Insurance Reform Act of 2004 (P.L. 108-264), Biggert-Waters Flood Insurance Reform Act of 2012 (P.L. 112-141), and the Homeowner Flood Insurance Affordability Act.⁹

1.5 SUMMARY OF PLAN CONTENTS

The contents of this Plan are designed and organized to be as reader-friendly and functional as possible. While significant background information is included on the processes used and studies completed (i.e., risk assessment, capability assessment), this information is separated from the more meaningful planning outcomes or actions (i.e., mitigation strategy, mitigation action plan).

Section 2, ***Planning Process***, provides a complete narrative description of the process used to prepare the *Plan*. This includes the identification of participants on the planning team and describes how the public and other stakeholders were involved. It also includes a detailed summary for each of the key meetings held, along with any associated outcomes.

The ***Community Profile***, located in Section 3, provides a general overview of Randolph County, including prevalent geographic, demographic, and economic characteristics. In addition, building characteristics and land use patterns are discussed. This baseline information provides a snapshot of the planning area

⁷ Disaster Mitigation Act of 2000. U.S. Code, Title 42. Chapter 68. § 5121. Section 322.

⁸ Mitigation Planning. Code of Federal Regulations. Title 44. Part 201.

⁹ U.S. Code. Title 42. Chapter 50. §§ 4001, 4004, 4005.

and helps local officials recognize those social, environmental, and economic factors that ultimately play a role in determining the County's vulnerability to hazards.

The Risk Assessment is presented in three sections: Section 4, **Hazard Identification**; Section 5, **Hazard Profiles**; and Section 6, **Vulnerability Assessment**. Together, these sections serve to identify, analyze, and assess hazards that pose a threat to Randolph County. The risk assessment also attempts to define any hazard risks that may uniquely or exclusively affect specific areas of Randolph County.

The Risk Assessment begins by identifying hazards that threaten Randolph County. Next, detailed profiles are established for each hazard, building on available historical data from past hazard occurrences, spatial extent, and probability of future occurrence. This section culminates in a hazard risk ranking based on conclusions regarding the frequency of occurrence, spatial extent, and potential impact highlighted in each of the hazard profiles. In the vulnerability assessment, FEMA's Hazus-MH[®] loss estimation methodology is used in conjunction with GIS analysis to evaluate known hazard risks by their relative long-term cost in expected damages. In essence, the information generated through the risk assessment serves a critical function as the participating jurisdictions in Randolph County seek to determine the most appropriate mitigation actions to pursue and implement—enabling them to prioritize and focus their efforts on those hazards of greatest concern and those structures or planning areas facing the greatest risk(s).

The **Capability Assessment**, found in Section 7, provides a comprehensive examination of Randolph County's capacity to implement meaningful mitigation strategies and identifies opportunities to increase and enhance that capacity. Specific capabilities addressed in this section include planning and regulatory capability, staff and organizational (administrative) capability, technical capability, fiscal capability, and political capability. Information was obtained through the use of a detailed survey questionnaire and an inventory and analysis of existing plans, ordinances, and relevant documents. The purpose of this assessment is to identify any existing gaps, weaknesses, or conflicts in programs or activities that may hinder mitigation efforts and to identify those activities that should be built upon in establishing a successful and sustainable local hazard mitigation program.

The *Risk Assessment* and *Capability Assessment* collectively serve as a basis for determining the goals for the *Randolph County Multi-Jurisdictional Hazard Mitigation Plan*, each contributing to the development, adoption, and implementation of a meaningful and manageable *Mitigation Strategy* that is based on accurate background information.

The **Mitigation Strategy**, found in Section 8, consists of broad goal statements as well as an analysis of hazard mitigation techniques for the jurisdictions participating in the *Randolph County Multi-Jurisdictional Hazard Mitigation Plan* to consider in reducing hazard vulnerabilities. The strategy provides the foundation for a detailed **Mitigation Action Plan**, found in Section 9, which links specific mitigation actions for each jurisdiction to locally-assigned implementation mechanisms and target completion dates. Together, these sections are designed to make the *Plan* both strategic, through the identification of long-term goals, and functional, through the identification of immediate and short-term actions that will guide day-to-day decision-making and project implementation.

In addition to the identification and prioritization of possible mitigation projects, emphasis is placed on the use of program and policy alternatives to help make Randolph County less vulnerable to the damaging forces of hazards while improving the economic, social, and environmental health of the community. The concept of multi-objective planning was emphasized throughout the planning process,

particularly in identifying ways to link, where possible, hazard mitigation policies and programs with complimentary community goals related to disaster recovery, housing, economic development, recreational opportunities, transportation improvements, environmental quality, land development, and public health and safety.

Plan Maintenance, found in Section 10, includes the measures that the jurisdictions participating in the *Plan* will take to ensure the *Plan's* continuous long-term implementation. The procedures also include the manner in which the *Plan* will be regularly evaluated and updated to remain a current and meaningful planning document.

SECTION 2

PLANNING PROCESS

This section describes the planning process undertaken to develop the *Randolph County Multi-Jurisdictional Hazard Mitigation Plan*. It consists of the following eight subsections:

- ❖ 2.1 Overview of Hazard Mitigation Planning;
- ❖ 2.2 History of Hazard Mitigation Planning in Randolph County;
- ❖ 2.3 Preparing the 2016 Plan;
- ❖ 2.4 The Randolph County Hazard Mitigation Planning Team;
- ❖ 2.5 Community Meetings and Workshops;
- ❖ 2.6 Involving the Public;
- ❖ 2.7 Involving the Stakeholders; and
- ❖ 2.8 Documentation of Plan Progress.

44 CFR Requirement

44 CFR Part 201.6(c)(1): The plan shall include documentation of 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.

2.1 OVERVIEW OF HAZARD MITIGATION PLANNING

Local hazard mitigation planning is the process of organizing community resources, identifying and assessing hazard risks, and determining how to best minimize or manage those risks. This process culminates in a hazard mitigation plan that identifies specific mitigation actions, each designed to achieve both short-term planning objectives and a long-term community vision.

To ensure the functionality of a hazard mitigation plan, responsibility is assigned for each proposed mitigation action to a specific individual, department, or agency along with a schedule or target completion date for its implementation (see Section 10: *Plan Maintenance*). Plan maintenance procedures are established for the routine monitoring of implementation progress as well as the evaluation and enhancement of the mitigation plan itself. These plan maintenance procedures ensure that the *Plan* remains a current, dynamic, and effective planning document over time that becomes integrated into the routine local decision making process.

Communities that participate in hazard mitigation planning have the potential to accomplish 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.

Typically, communities that participate in mitigation planning are described as having the potential to produce long-term and recurring benefits by breaking the repetitive cycle of disaster loss. A core assumption of hazard mitigation is that the investments made before a hazard event will significantly reduce the demand for post-disaster assistance by lessening the need for emergency response, repair, recovery, and reconstruction. Furthermore, mitigation practices will enable local residents, businesses, and industries to re-establish themselves in the wake of a disaster, getting the community economy back on track sooner and with less interruption.

The benefits of mitigation planning go beyond solely reducing hazard vulnerability. Mitigation 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. Thus, it is vitally important that any local mitigation planning process be integrated with other concurrent local planning efforts, and any proposed mitigation strategies must take into account other existing community goals or initiatives that will help complement or hinder their future implementation.

2.2 HISTORY OF HAZARD MITIGATION PLANNING IN RANDOLPH COUNTY

Each of the ten participating jurisdictions has a previously adopted hazard mitigation plan. The FEMA approval dates for each of these plans are listed below:

- ❖ *Randolph County Hazard Mitigation Plan (8/5/2011)*
 - ❖ City of Archdale;
 - ❖ City of Asheboro;
 - ❖ Town of Franklinville;
 - ❖ Town of Liberty;
 - ❖ Town of Ramseur;
 - ❖ City of Randleman;
 - ❖ Town of Seagrove;
 - ❖ Town of Staley;
 - ❖ City of Trinity; and
 - ❖ Unincorporated Randolph County.

The *Plan* was developed using the multi-jurisdictional planning process recommended by FEMA.

2.3 PREPARING THE 2016 PLAN

Hazard mitigation plans are required to be updated every five years to remain eligible for federal mitigation funding. To simplify planning efforts, the jurisdictions in Randolph County decided to join together to create the *Randolph County Multi-Jurisdictional Hazard Mitigation Plan*. This allows

resources to be shared amongst the participating jurisdictions and eases the administrative duties of all of the participants.

To prepare the *Plan*, a team led by the consulting firm called Atkins was hired to provide professional mitigation planning services. The County ensured that the planning process was facilitated under the direction of a professional planner. Ryan Wiedenman from Atkins served as the lead planner for this project and is a member of the American Institute of Certified Planners (AICP).

Per the contractual scope of work, the consultant team followed the mitigation planning process recommended by FEMA (Publication Series 386¹ and Local Mitigation Plan Review Guide²) and recommendations provided by North Carolina Division of Emergency Management (NCEM) mitigation planning staff.³ The Local Mitigation Plan Review Tool, found in Appendix C, provides a detailed summary of FEMA's current minimum standards of acceptability for compliance with DMA 2000 and notes the location where each requirement is met within this Plan. These standards are based upon FEMA's Final Rule as published in the Federal Register in Part 201 of the Code of Federal Regulations (CFR).⁴ The Planning Team used FEMA's Local Mitigation Plan Review Guide (October 2011)² for reference as they completed the *Plan*.

Additionally, the Planning Team determined that it was important to include and analyze some man-made hazards in the *Plan* to provide a more comprehensive approach to hazard management within the County. Although this is not a requirement as per regulations regarding hazard mitigation planning at the State or Federal level, it is a noteworthy step in the direction of an all-hazards approach to risk analysis and management.

Key elements from the previously approved plan are referenced throughout the document (e.g., existing actions) and required a discussion of changes made. For example, all of the *Risk Assessment* elements needed to be updated to include most recent information. It was also necessary to review the goals for the County. The *Capability Assessment* section includes updated information for all of the participating jurisdictions and the *Mitigation Action Plan* provides implementation status updates for all of the actions identified in the previous plans.

The process used to prepare this Plan included twelve major steps that were completed over the course of approximately five months beginning in November 2015. Each of these planning steps (illustrated in **Figure 2.1**) resulted in critical work products and outcomes that collectively make up the *Plan*. Specific plan sections are further described in Section 1: *Introduction*.

Over the past five years, each participating jurisdiction has been actively working to implement the existing plan. This is documented in the *Mitigation Action Plan* through the implementation status updates for each of the Mitigation Actions. The *Capability Assessment* also documents changes and improvements in the capabilities of each participating jurisdiction to implement the *Mitigation Strategy*.

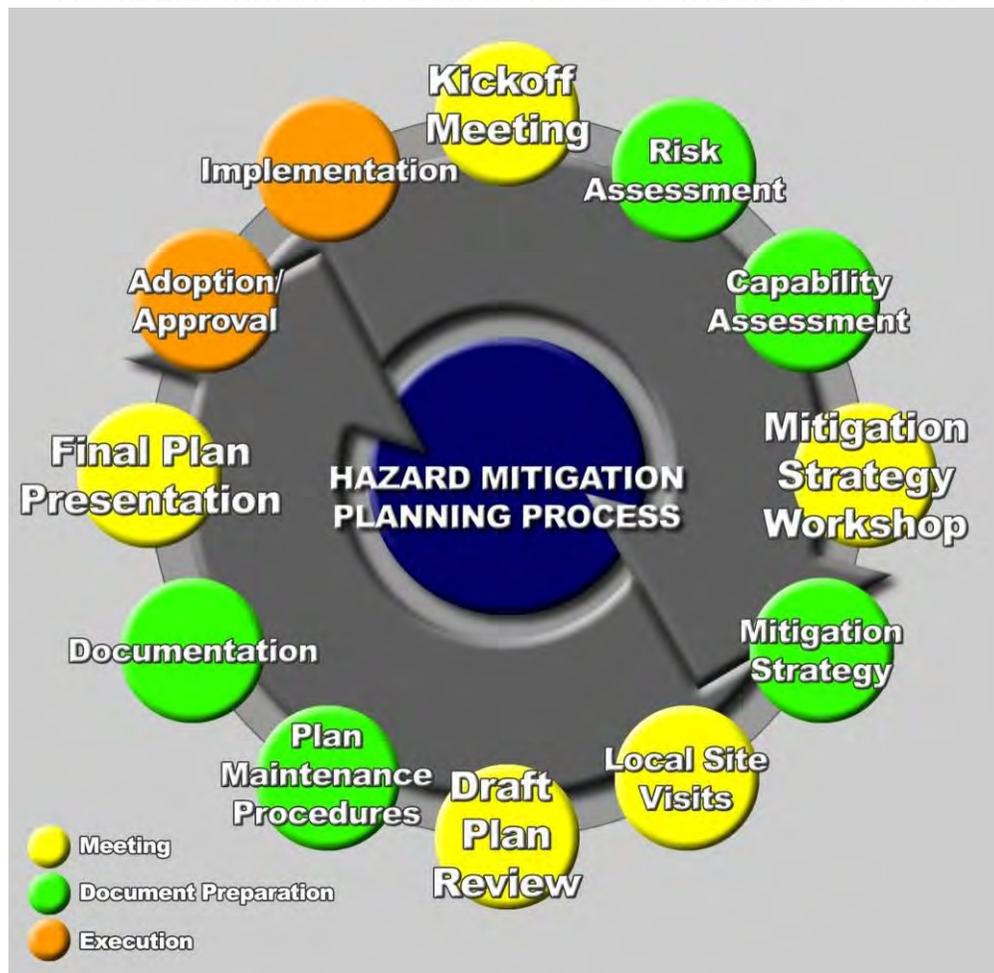
¹ Federal Emergency Management Agency (2002). *State and Local Mitigation Planning How-To Series*.

² Federal Emergency Management Agency (2011). *Local Mitigation Plan Review Guide*.

³ A copy of the negotiated contractual scope of work between Randolph County and Atkins is available through Randolph County upon request.

⁴ Mitigation Planning, Code of Federal Regulations. Title 44. Part 201.

FIGURE 2.1: MITIGATION PLANNING PROCESS FOR RANDOLPH COUNTY



As is further detailed below, the planning process was conducted through Hazard Mitigation Planning Team meetings comprised primarily of local government staff from each of the participating jurisdictions and advisory stakeholders.

2.4 THE RANDOLPH COUNTY HAZARD MITIGATION PLANNING TEAM

In order to guide the development of this Plan, Randolph County and its jurisdictions created the Randolph County Hazard Mitigation Planning Team (Hazard Mitigation Planning Team or Planning Team). The Hazard Mitigation Planning Team represents a community-based planning team made up of representatives from various County and municipal departments and other key stakeholders identified to serve as critical partners in the planning process.

Beginning in November 2015, the Hazard Mitigation Planning Team members engaged in regular discussions as well as local meetings and planning workshops to discuss and complete tasks associated with preparing the *Plan*. This working group coordinated on all aspects of plan preparation and provided valuable input to the process. In addition to regular meetings, team members routinely communicated and were kept informed through an e-mail distribution list.

Specifically, the tasks assigned to the Hazard Mitigation Planning Team members included:

- ❖ Participate in Hazard Mitigation Planning Team meetings and workshops;
- ❖ Provide best available data as required for the *Risk Assessment* portion of the *Plan*;
- ❖ Provide information that will help complete the *Capability Assessment* section of the *Plan* and provide copies of any mitigation or hazard-related documents for review and incorporation into the *Plan*;
- ❖ Support the development of the *Mitigation Strategy*, including the design and adoption of Countywide goal statements;
- ❖ Help design and propose appropriate mitigation actions for their department/agency for incorporation into the *Mitigation Action Plan*;
- ❖ Review and provide timely comments on all study findings and draft plan deliverables; and
- ❖ Support the adoption of the 2016 *Randolph County Hazard Mitigation Plan*.

Table 2.1 lists the members of the Hazard Mitigation Planning Team who were responsible for participating in the development of the *Plan*. Team members are listed in alphabetical order by first name.

TABLE 2.1: MEMBERS OF THE RANDOLPH COUNTY HAZARD MITIGATION PLANNING TEAM

NAME	POSITION	DEPARTMENT/AGENCY
Amanda Varner	Clerk to the Board	Randolph County Administration
Brad Rice	Assistant Superintendent	Asheboro City Schools
Cathryn Davis	Risk Manager	Randolph County Administration
D.J. Seneres	Engineer	Archdale Engineering
Debra Hill	Administrator	Randolph County Tax
Donovan Davis	Chief	Randolph County Emergency Services
Erik Beard	Fire Marshal	Randolph County Emergency Services
Evan Grady	Preparedness Coordinator	Randolph County Public Health
Fred de Friess	Security Chief	NC Zoological Park
Jared Byrd	Emergency Management Coordinator	Randolph County Emergency Services
John Evans	Assistant Director	City of Asheboro Community Development
John Ogburn	City Manager	City of Asheboro Administration
John Reid	Lt. Colonel	Randolph County Sheriff's Office
Karen Auman	Safety Officer	NC Zoological Park
Lewis Schirloff	Deputy Chief	Randolph County Emergency Services
Linda Smith	GIS Analyst Programmer	Randolph County Information Technology
Marty Trotter	Assistant Superintendent of Operations	Randolph County Schools
Matt Talbott	Chief	Town of Liberty Fire Department

NAME	POSITION	DEPARTMENT/AGENCY
Matthew Needham	Director of Safety	Randolph Community College
Michael Rowland	Director	Randolph County Information Technology
Michael Smith	Fire Marshal	City of Randleman Fire Department
Nick Holcomb	City Manager	City of Randleman Administration
Paxton Arthurs	Director	Randolph County Public Works
Perry Conner	Mayor	Town of Franklinville Administration
Reid Rich	County Maintenance Engineer	NC Department of Transportation
Robert A. Graves	Sheriff	Randolph County Sheriff's Office
Roy Lynch	Town Manager	Town of Liberty Administration
Susan Hayes	Director	Randolph County Public Health
Tara Aker	Assistant Director	Randolph County Public Health
Terry Van Vliet	Director	Randolph County Veteran Services
Tim Mangum	Planning Information Specialist	Randolph County Planning
Zeb Holden	Director	City of Archdale Planning

Table 2.2 lists points of contact for municipalities who elected to designate their respective County officials to represent their jurisdiction on the Planning Team, generally because they did not have the time or staff to be able to attend on their own. Moreover, County officials noted early in the planning process that it would be much more effective to engage the smaller municipalities that are present throughout the County through municipal-level meetings. Although these representatives were not present at the HMPT meetings, each was involved throughout the planning process and participated by providing suggestions and comments on the *Plan* via municipal-level review meetings, email, and phone conversations. Documentation of these meetings with the County representative is provided in Appendix D in the form of sign-in sheets.

TABLE 2.2: REPRESENTATIVES WHO PARTICIPATED IN PLAN VIA MUNICIPAL-LEVEL MEETINGS WITH A MEMBER OF THE HAZARD MITIGATION PLANNING TEAM

NAME	POSITION	DEPARTMENT/AGENCY
Karen Scotten	Mayor	Town of Staley
Faye Cobb	Mayor Pro Tem	Town of Staley
Janet Lambeet	Commissioner	Town of Staley
Lori Lynn Langley Hankins	Commissioner	Town of Staley
Steve Rollins	Commissioner	Town of Staley
Marlene Jones	Commissioner	Town of Staley
Timothy York	Public Works Director	Town of Ramseur
Bobbie Hatley	Water Billing Clerk	Town of Ramseur
Morganne Kirkman	Clerk/Finance Officer	Town of Ramseur
Mark Grose	Water Plant Operator	Town of Ramseur
Robert Hesselmeyer	Commissioner	Town of Ramseur

NAME	POSITION	DEPARTMENT/AGENCY
Rich Baker	Public Works Director	City of Trinity
Eleanor Roberts	Town Clerk	Town of Seagrove

2.4.1 Multi-Jurisdictional Participation

The *Randolph County Multi-Jurisdictional Hazard Mitigation Plan* includes Randolph County and its nine incorporated municipalities. To satisfy multi-jurisdictional participation requirements, the County and its participating jurisdictions were required to perform the following tasks:

- ❖ Participate in mitigation planning workshops;
- ❖ Identify completed mitigation projects, if applicable; and
- ❖ Develop and adopt (or update) their local *Mitigation Action Plan*.

Each jurisdiction participated in the planning process and has developed a local *Mitigation Action Plan* unique to their jurisdiction. Each jurisdiction will adopt the *Plan* which includes the individual *Mitigation Action Plan* that provides the means for jurisdictions to monitor and update their *Plan* on a regular basis.

2.5 COMMUNITY MEETINGS AND WORKSHOPS

The preparation of this *Plan* required a series of meetings and workshops for facilitating discussion, gaining consensus and initiating data collection efforts with local government staff, community officials, and other identified stakeholders. More importantly, the meetings and workshops prompted continuous input and feedback from relevant participants throughout the drafting stages of the *Plan*. The following is a summary of the key meetings and community workshops held during the development of the *Plan* update.⁵ In many cases, routine discussions and additional meetings were held by local staff to accomplish planning tasks specific to their department or agency, such as the approval of specific mitigation actions for their department or agency to undertake and include in the *Mitigation Action Plan*.



November 12, 2015 Randolph County HMPC Meeting

November 12, 2015 First Hazard Mitigation Planning Team Meeting – Randolph County Office Building

Ryan Wiedenman, the project consultant, started the meeting by welcoming the representatives from the County, participating municipal jurisdictions, and other stakeholders. He introduced himself and explained that he works with Atkins, a firm that has developed hazard mitigation plans in many areas throughout the country.

⁵ Copies of agendas, sign-in sheets, and minutes for all meetings and workshops can be found in Appendix D.

Mr. Wiedenman led the kickoff meeting and began by providing an overview of the items to be discussed at the meeting and briefly reviewed each of the handouts that were distributed in the meeting packets (agenda, project description, and presentation slides). He then provided a brief overview of mitigation and discussed the Disaster Mitigation Act of 2000⁶ and NC Senate Bill 300⁷.

He gave a list of the participating jurisdictions for the multi-jurisdictional plan, noting all local governments in the County are participating in the existing County-level hazard mitigation plan. This plan expires in the summer of 2016, so the Planning Team will plan to develop a draft to submit to FEMA by February of 2016.

Mr. Wiedenman then explained the six different categories of mitigation techniques (emergency services, prevention, natural resource protection, structural projects, public education and awareness, and property protection) and gave examples of each. This explanation culminated with an Ice Breaker Exercise for the attendees.

Mr. Wiedenman instructed attendees on how to complete the exercise. Attendees were given an equal amount of fictitious FEMA money and asked to spend it in the various mitigation categories. Money could be thought of as grant money that communities received towards mitigation. Attendees were asked to target their money towards areas of mitigation that are of greatest concern for their community. Ideally, the exercise helps pinpoint areas of mitigation that the community may want to focus on when developing mitigation grants. Once completed, Mr. Wiedenman presented the Ice Breaker Exercise results which were:

- ❖ Prevention- \$155;
- ❖ Emergency Services- \$130;
- ❖ Public Education and Awareness- \$67;
- ❖ Property Protection- \$64;
- ❖ Natural Resource Protection- \$36; and
- ❖ Structural Projects- \$23.

Mr. Wiedenman then discussed the key objectives and structure of the planning process and explained the specific tasks to be accomplished for this project, including the planning process, risk assessment, vulnerability assessment, capability assessment, mitigation strategy and action plan, plan maintenance procedures, and documentation. The project schedule was presented along with the project staffing chart, which demonstrates the number of experienced individuals that will be working on this project. The data collection needs and public outreach efforts were also discussed.

Mr. Wiedenman then reviewed the roles and responsibilities of Atkins, participating jurisdictions, and stakeholders. The presentation concluded with a discussion of the next steps to be taken in the project development, which included discussing data collection efforts, continuing public outreach, and the next meeting for the HMPT.

The meeting was opened for questions and comments and there were no major questions or comments.

⁶ Disaster Mitigation Act of 2000. U.S. Code, Title 42, Chapter 68, § 5121.

⁷ Senate Bill 300, N.C. General Statute, § 166-A.

Mr. Wiedenman thanked everyone for attending and identified himself and the Randolph County Emergency Management Coordinator as the first points of contact for any questions or issues. The meeting was adjourned.

February 5, 2016

Second Hazard Mitigation Planning Team Meeting – Randolph County Office Building

Mr. Ryan Wiedenman with Atkins welcomed everyone to the meeting and reminded attendees who he was and that Atkins was the consultant hired to assist with developing the *Hazard Mitigation Plan* for the County.

Mr. Wiedenman initiated the meeting with a review of the meeting handouts, which included an agenda, presentation slides, proposed goals for the *Plan*, and mitigation actions from the County's existing plan. Mr. Wiedenman reviewed the project schedule and stated that a draft of the *Hazard Mitigation Plan* would be presented to the Hazard Mitigation Planning Team at the end of February/early March.

Mr. Wiedenman then presented the findings of the *Risk Assessment*, starting with a review of the Presidential Disaster Declarations that have impacted the County. He then explained the process for preparing Hazard Profiles and discussed how each hazard falls into one of four categories: Atmospheric, Geologic, Hydrologic, and Other. He indicated that each hazard must be evaluated and then profiled and assessed to determine a relative risk for each hazard.

Mr. Wiedenman reviewed the Hazard Profiles and the following bullets summarize the information presented:

Atmospheric Hazards

- ❖ DROUGHT. There have been eleven years (out of the past fourteen, 2000-2013) where drought conditions have been reported as moderate to extreme in Randolph County and future occurrences are likely.
- ❖ EXTREME HEAT. There has been one recorded extreme heat event reported by the National Climatic Data Center (NCDC) since 1996. Heat extents of 105 degrees indicate that extreme heat is a hazard of concern for the County. Future occurrences are possible.
- ❖ HAILSTORM. There have been ninety recorded events since 1950. Future occurrences are highly likely.
- ❖ HURRICANES AND TROPICAL STORMS. NOAA data shows that fifty-eight storm tracks have come within seventy-five miles of Randolph County since 1850. Future occurrences are likely.
- ❖ LIGHTNING. NCDC data indicates six recorded lightning events since 1999; however, the Vaisala National Lightning Detection Network indicates the County is in an area that experiences two to eight flashes per square kilometer per year. Future occurrences highly likely.
- ❖ THUNDERSTORM WIND. There have been 224 severe thunderstorm events reported since 1950 with \$1.0 million in reported property damages. Three injuries have been reported. Future occurrences are highly likely.

- ❖ **TORNADOES.** There have been fifteen recorded tornado events reported in the County since 1950. \$11.6 million in property damages. At least one death and six injuries have been reported. Future occurrences are likely.
- ❖ **WINTER STORM.** There have been fifty-three recorded winter weather events in Randolph County since 1996 resulting in \$3.6 million in reported property damages. Future occurrences are highly likely.

Geologic Hazards

- ❖ **EARTHQUAKES.** There have been four recorded earthquake events in Randolph County since 1850. The strongest had a recorded magnitude of VII MMI. Future occurrences are possible.
- ❖ **LANDSLIDE.** There have not been any recorded landslide events in the County according to the USGS. Most of the County is in an area of low incidence, but parts of the eastern County are in a moderate incidence area. Future occurrences are possible.
- ❖ **LAND SUBSIDENCE.** There have been no recorded land subsidence events and the USGS indicates that the soils in the County are generally not susceptible to subsidence. However, the County noted that during the last plan update, the State had indicated that the County had some areas of risk due to abandoned mining practices in localized areas. Future occurrences unlikely.

Hydrologic Hazards

- ❖ **DAM FAILURE.** No past incidents have been recorded. Future occurrences are unlikely and damage would be highly localized. There are twenty-nine dams classified as high-hazard in the County.
- ❖ **FLOOD.** There have been thirty-eight flood events recorded in Randolph County since 1996 per NCDC. There have been twenty-two NFIP losses since 1978 and approximately \$119,000 in claims. There are four severe repetitive loss properties in the County accounting for sixteen of the recorded losses. Future occurrences are highly likely.

Other Hazards

- ❖ **WILDFIRE.** There is an average of fifty-four wildfires per year reported in Randolph County. Future occurrences are likely, but major events are not common.
- ❖ **NUCLEAR POWER PLANT EMERGENCY.** No large-scale nuclear events have been reported and future occurrences are unlikely. The eastern half of the County is located within the Shearon Harris fifty mile Ingestion Exposure Pathway Zone.
- ❖ **SOLAR FLARE.** There have been no major solar flare incidents in the County, but these events can occur at any time and any place in the world. The likelihood of a major event is relatively low, but future occurrences of some lower levels are likely.
- ❖ **TERROR THREAT.** There have been no historic terror events in the County, but several facilities were identified as potential targets and confirmed by the Planning Team. The likelihood of a major event is relatively low.

The results of the hazard identification process were used to generate a Priority Risk Index (PRI), which categorizes and prioritizes potential hazards as high, moderate, or low risk based on probability, impact, spatial extent, warning time, and duration. The highest PRI was assigned to Thunderstorm/High Wind followed by Hurricane/Tropical Storm, Winter Storm, Flood, and Tornado.

In the ensuing discussion of the overall *Risk Assessment*, Hazard Mitigation Planning Team members indicated that they felt the Dam/Levee hazard was a greater threat than indicated by the results. They felt this was a Moderate level threat to the County. In addition, the Planning Team recommended adding a hazard not initially identified in the Kickoff Meeting: Public Health/Infectious Disease. The project consultant indicated that he would add the hazard and work to collect information on its risks.

In concluding the review of Hazard Profiles, Mr. Wiedenman stated if anyone had additional information for the hazard profiles, or had concerns with any of the data presented, they should call or email him.

Mr. Wiedenman presented the *Capability Assessment Findings*. Atkins has developed a scoring system that was used to rank the participating jurisdictions in terms of capability in four major areas (Planning and Regulatory, Administrative and Technical, Fiscal, and Political). Important capability indicators include National Flood Insurance Program (NFIP) participation, Building Code Effective Grading Schedule (BCEGS) score, Community Rating System (CRS) participation, and the Local Capability Assessment Survey conducted by Atkins.

Mr. Wiedenman reviewed the Relevant Plans and Ordinances, Relevant Staff/Personnel Resources, and Relevant Fiscal Resources. All of these categories were used to rate the overall capability of the County and jurisdictions. Most jurisdictions are in the moderate range for Planning and Regulatory Capability and in the limited range for Fiscal Capability. There is variation between the jurisdictions for Administrative and Technical Capability, mainly with respect to availability staff skilled in GIS. Based upon the scoring methodology developed by Atkins, it was determined that most of the participating jurisdictions have moderate capability to implement hazard mitigation programs and activities, though the County has a high capability.

After presenting the capability results, the County indicated that there were several areas where the County had stronger capability than shown in the results. After the meeting, the County identified that a Continuity of Operations Plan (COOP) was in place for the County and that several of the municipalities had stormwater utilities in place. The consultant agreed to make those changes to the capability assessment scores.

Mr. Wiedenman also discussed the results of the public participation survey that was posted on the County's website and advertised locally by several municipalities. As of the meeting date, 286 responses had been received. Mr. Wiedenman explained that this was a very strong response rate and that there had been a lot of feedback from the public. Based on preliminary survey results, respondents felt that Winter Storm/Freeze posed the greatest threat to their neighborhood, followed by Severe Thunderstorm and Tornado. Approximately 78 percent of the respondents were interested in making their homes more resistant to hazards. However, 72 percent do not know who to contact regarding reducing their risks to hazards.

Mr. Wiedenman then reminded team members of the results of the icebreaker exercise from the first Hazard Mitigation Team meeting, where attendees were given "money" to spend on various hazard

mitigation techniques. The results were very similar to the responses by the public in terms of where money for mitigation should be spent.

Mr. Wiedenman gave an overview of *Mitigation Strategy* Development and presented the existing goals for the *Plan* and explained that Atkins recommended keeping the goals as they are. The Hazard Mitigation Team accepted the existing goals for the *Plan*. Mr. Wiedenman then provided an overview and examples of suggested mitigation actions tailored for Randolph County. Mr. Wiedenman then asked the County and the municipalities to provide a status update for their existing mitigation actions (completed, deleted, or deferred) by February 19, 2016. Mr. Wiedenman also asked Planning Team members to include any new mitigation actions by the same date.

Mr. Wiedenman thanked the group for taking the time to attend and explained that if team members had any issues or questions about the planning process or their next steps, they could contact him or the County's Emergency Management Coordinator. The meeting was adjourned.

2.6 INVOLVING THE PUBLIC

44 CFR Requirement

44 CFR Part 201.6(b)(1): The planning process shall include an opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

An important component of the mitigation planning process involved public participation. Individual citizen and community-based input provides the entire Planning Team with a greater understanding of local concerns and increases the likelihood of successfully implementing mitigation actions by developing community "buy-in" from those directly affected by the decisions of public officials. As citizens become more involved in decisions that affect their safety, they are more likely to gain a greater appreciation of the hazards present in their community and take the steps necessary to reduce their impact. Public awareness is a key component of any community's overall mitigation strategy aimed at making a home, neighborhood, school, business, or entire city safer from the potential effects of hazards.

Public involvement in the development of the *Randolph County Multi-Jurisdictional Hazard Mitigation Plan* was sought using two methods: (1) public survey instruments were made available in hard copy and online and (2) copies of the draft Plan deliverables were made available for public review on County and municipal websites and at government offices. The public was provided two opportunities to be involved in the development of the regional plan at two distinct periods during the planning process: (1) during the drafting stage of the *Plan* and (2) upon completion of a final draft Plan, but prior to official plan approval and adoption. A public participation survey (discussed in greater detail in Section 2.6.1) was made available during the planning process at various locations including on County and municipal websites.

Each of the participating jurisdictions will hold public meetings before the final plan is officially adopted by the local governing bodies. These meetings will occur at different times once FEMA has granted conditional approval of the *Plan*. Adoption resolutions will be included in Appendix A.

2.6.1 Public Survey

The Hazard Mitigation Planning Team was successful in getting citizens to provide input to the mitigation planning process through the use of the *Public Participation Survey*. The *Public Participation Survey* was designed to capture data and information from residents of Randolph County that might not be able to attend public meetings or participate through other means in the mitigation planning process.

Copies of the *Public Participation Survey* were distributed to the Hazard Mitigation Planning Team to be made available for residents to complete at local public offices. A link to an electronic version of the survey was also posted on the County and municipal websites. A total of 286 survey responses were received, which provided valuable input for the Hazard Mitigation Planning Team to consider in the development of the *Plan* update. Selected survey results are presented below.

- ❖ Approximately twenty-six percent of survey respondents had been impacted by a disaster, mainly winter/ice storms, hurricanes/tropical storms, tornadoes, and severe storms/wind.
- ❖ Respondents ranked Winter Storm/Freeze as the highest threat to their neighborhood (thirty-eight percent), followed by Severe Thunderstorm (twenty-seven percent) and Tornado (sixteen percent).
- ❖ Approximately twenty-two percent of respondents have taken actions to make their homes more resistant to hazards and seventy-eight percent are interested in making their homes more resistant to hazards.
- ❖ Approximately seventy-two percent of respondents do not know what office to contact regarding reducing their risks to hazards.
- ❖ Emergency Services and Public Education and Awareness were ranked as the most important activities for communities to pursue in reducing risks.

A copy of the survey is provided in Appendix B and a detailed summary of the survey results is provided in Appendix D.

2.7 INVOLVING THE STAKEHOLDERS

44 CFR Requirement

44 CFR Part 201.6(b)(2): The planning process shall include 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 non-profit interests to be involved in the planning process.

At the beginning of the planning process for the development of this plan, the project consultant worked with the County Emergency Management lead to initiate outreach to stakeholders to be involved in the planning process. The project consultant sent out a list of recommended stakeholders provided from FEMA Publication 386-1 titled **Getting Started: Building Support for Mitigation Planning**. The list of recommended stakeholders is found in Appendix C of that publication (Worksheet #1: Build the Planning Team) and has been included in Appendix B of this plan to demonstrate the wide range of stakeholders that were considered to participate in the development of this plan. The County Emergency Management lead used that list for reference as they invited stakeholders to participate in the planning process.

In addition to the efforts described above, the Hazard Mitigation Planning Team encouraged more open and widespread participation in the mitigation planning process by designing and distributing the *Public Participation Survey*. These opportunities were provided for local officials, residents, businesses, academia, and other private interests in the County to be involved and offer input throughout the local mitigation planning process.

Moreover, the Hazard Mitigation Planning Team pushed to get input from stakeholders outside of the planning area including surrounding counties. Surrounding counties were contacted after a draft of the *Plan* was developed and were asked to review the *Plan* and provide suggestions/comments to the consultant's project manager. These suggestions and comments were vetted through the Hazard Mitigation Planning Team before they were implemented to ensure that they met the needs of the communities for whom the *Plan* was developed. Surrounding counties that were contacted included: Davidson County, Guilford County, Chatham County, Moore County, and Montgomery County. The email documenting this contact can be found in Appendix D.

2.8 DOCUMENTATION OF PLAN PROGRESS

Progress in hazard mitigation planning for the participating jurisdictions in Randolph County is documented in this plan update. Since hazard mitigation planning efforts officially began in the most of the participating communities with the development of the initial Hazard Mitigation Plans 2003, many mitigation actions have been completed and implemented in the participating jurisdictions. These actions will help reduce the overall risk to natural hazards for the people and property in Randolph County. The actions that have been completed are documented in the *Mitigation Action Plan* found in Section 9.

In addition, community capability continues to improve with the implementation of new plans, policies, and programs that help to promote hazard mitigation at the local level. The current state of local capabilities for the participating jurisdictions is captured in Section 7: *Capability Assessment*. The participating jurisdictions continue to demonstrate their commitment to hazard mitigation and hazard mitigation planning and have proven this by developing the Hazard Mitigation Planning Team to update the *Plan* and by continuing to involve the public in the hazard mitigation planning process.

SECTION 3

COMMUNITY PROFILE

This section of the *Plan* provides a general overview of Randolph County and its participating municipalities. It consists of the following four subsections:

- ❖ 3.1 Geography and the Environment;
 - ❖ 3.2 Population and Demographics;
 - ❖ 3.3 Housing, Infrastructure, and Land Use; and
 - ❖ 3.4 Employment and Industry.
-

3.1 GEOGRAPHY AND THE ENVIRONMENT

Randolph County is located in the Piedmont area of North Carolina, containing the most central point in the State. For the purposes of this plan, Randolph County includes the City of Archdale, City of Asheboro, Town of Franklinville, Town of Liberty, Town of Ramseur, City of Randleman, Town of Seagrove, Town of Staley, City of Trinity, and all unincorporated areas within the County. An orientation map is provided as **Figure 3.1**.

Randolph County contains rolling hills, woodlands, and mountains such as the Uwharrie Mountains and Caraway Mountains. The Uwharrie National Forest is located in Randolph County covering over 34,000 acres. The North Carolina Zoological Park, the largest walk-through zoo in the world, is located near the City of Asheboro, attracting residents and tourists at various times throughout the year. Various NASCAR influences are associated with Randolph County, including the birthplace of multiple NASCAR drivers, the location of Caraway Speedway, and site of the Richard Petty Museum. Additionally, the Town of Seagrove is considered the pottery capital of North Carolina due to the large amount of potteries located within town as well as the North Carolina Pottery Center.

Randolph County is a part of the Piedmont Triad. The Piedmont Triad is located within the north-central region of North Carolina. The Triad consists of areas within Alamance, Davidson, Forsyth, Guilford, Randolph, Rockingham, and Surry Counties. Areas within and surrounding the three major cities of Greensboro, High Point, and Winston-Salem make up the base of the Piedmont Triad. The Triad has an extensive freeway network consisting of four interstate highways and numerous secondary interstate routes and US routes. This allows the area to support a mixed economy consisting of industry and manufacturing along with technology and biotechnology. The area also contains prominent regional shopping facilities.

The total land area of each of the participating jurisdictions is presented in **Table 3.1**.

TABLE 3.1: TOTAL LAND AREAS OF PARTICIPATING JURISDICTIONS

JURISDICTION	TOTAL LAND AREA
Randolph County	790 square miles
City of Archdale *	7.4 square miles
City of Asheboro	18.9 square miles
Town of Franklinville	1.6 square miles
Town of Liberty	3.1 square miles
Town of Ramseur	2.2 square miles
City of Randleman	4.1 square miles
Town of Seagrove	1.0 square miles
Town of Staley	1.2 square miles
City of Trinity	17.1 square miles

*A small portion of land that makes up Archdale is located in Guilford County.
Note: this area is not included in the Randolph County total.

Source: *Randolph County GIS*

Randolph County enjoys a moderate climate that is characterized by mild winters and hot, humid summers. In general, the spring months are marked by unpredictable weather and changes can occur rapidly with sunny skies yielding to severe thunderstorms in just a few hours.

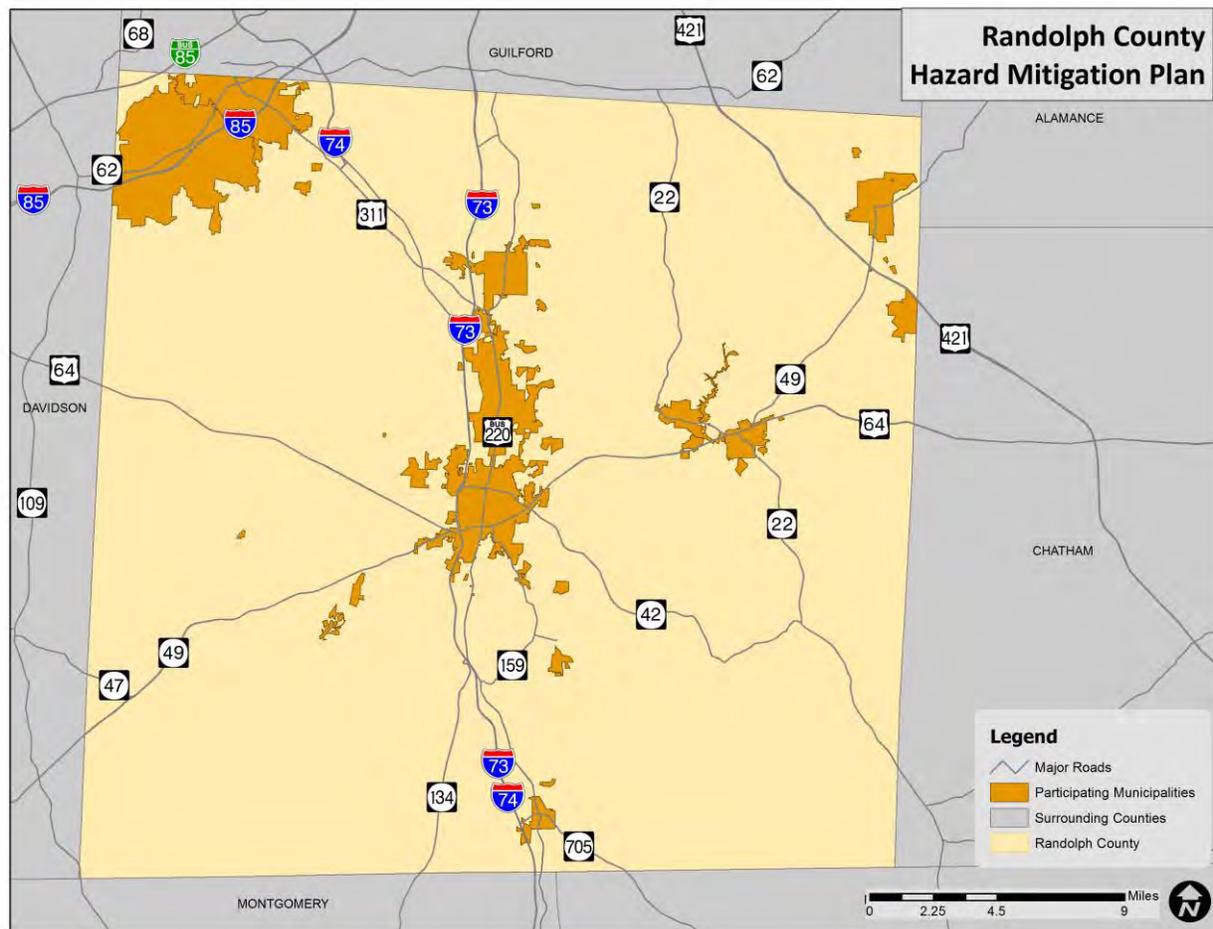
From March through May, temperatures have an average high in the 70s with lows in the 40s. Typically, the weather is milder by late March and warm by late April.

In the summer, afternoon showers and thunderstorms are common and average temperatures increase with afternoon highs reaching the upper 90s in July and August.

September through mid-November is typified by clear skies and cooler weather that alternates between warm days and cool nights. Highs and lows are usually similar to those experienced in the spring.

Winter in Randolph County is generally moderate but extremes do occur. High temperatures are usually in the lower 50s and winter lows in the lower 30s. Snow and ice do tend to occur. The most snow to occur at one time in Randolph County was 24 inches in March 1927.

FIGURE 3.1: RANDOLPH COUNTY ORIENTATION MAP



3.2 POPULATION AND DEMOGRAPHICS

The City of Trinity is the largest participating municipality by area; however, Asheboro has the largest population. Between 2000 and 2010, the majority of participating municipalities and the unincorporated County experienced population growth. Archdale had the highest growth rate at almost 27 percent. Population counts from the US Census Bureau for 1990, 2000, and 2010 for each of the participating jurisdictions are presented in **Table 3.2**.

TABLE 3.2: POPULATION COUNTS FOR PARTICIPATING JURISDICTIONS

JURISDICTION	1990 CENSUS POPULATION	2000 CENSUS POPULATION	2010 CENSUS POPULATION	% CHANGE 2000-2010
Randolph County	106,546	130,454	141,752	8.7%
City of Archdale*	2,803	9,014	11,415	26.6%
City of Asheboro	16,362	21,672	25,012	15.4%
Town of Franklinville	--	1,258	1,164	-7.5%
Town of Liberty	2,047	2,661	2,656	-0.2%
Town of Ramseur	1,186	1,588	1,692	6.5%

JURISDICTION	1990 CENSUS POPULATION	2000 CENSUS POPULATION	2010 CENSUS POPULATION	% CHANGE 2000-2010
City of Randleman	2,612	3,557	4,113	15.6%
Town of Seagrove	--	246	228	-7.3%
Town of Staley	--	347	393	13.3%
City of Trinity	5,469	6,690	6,614	-1.1%

*The 2010 total population of Archdale includes population (333 people) residing in Guilford County. Note: this population is not included in the Randolph County total.

Source: United States Census Bureau, 1990, 2000, and 2010 Census

Based on the 2010 Census, the median age of residents in Randolph County is 39.5. The racial characteristics of the participating jurisdictions are presented in **Table 3.3**. Generally, whites make up the majority of the population in the County, accounting for almost 86 percent of the population.

TABLE 3.3: DEMOGRAPHICS OF PARTICIPATING JURISDICTIONS

JURISDICTION	WHITE, PERCENT (2010)	BLACK OR AFRICAN AMERICAN, PERCENT (2010)	AMERICAN INDIAN OR ALASKA NATIVE, PERCENT (2010)	ASIAN, PERCENT (2010)	NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER, PERCENT (2010)	OTHER RACE, PERCENT (2010)	TWO OR MORE RACES, PERCENT (2010)	PERSONS OF HISPANIC ORIGIN, PERCENT (2010)*
Randolph County	85.5%	5.8%	0.7%	1.0%	0.0%	5.3%	1.7%	10.4%
City of Archdale	87.8%	4.0%	0.6%	4.8%	0.0%	1.4%	1.4%	4.0%
City of Asheboro	67.8%	12.0%	0.9%	1.4%	0.1%	15.0%	2.8%	26.9%
Town of Franklinville	76.2%	10.6%	0.0%	0.0%	0.0%	11.4%	1.8%	24.6%
Town of Liberty	67.4%	20.4%	1.1%	0.2%	0.0%	7.3%	3.7%	14.4%
Town of Ramseur	75.6%	12.6%	1.0%	1.4%	0.0%	6.4%	3.0%	15.2%
City of Randleman	86.3%	5.9%	0.6%	0.4%	0.0%	4.8%	1.9%	7.6%
Town of Seagrove	93.9%	2.6%	0.0%	0.0%	0.0%	0.0%	3.5%	1.3%
Town of Staley	80.2%	8.1%	1.0%	0.8%	0.0%	2.5%	7.4%	9.4%
City of Trinity	91.7%	4.9%	0.4%	1.2%	0.0%	1.0%	0.8%	2.3%

*Hispanics may be of any race, so also are included in applicable race categories

Source: United States Census Bureau, 2010 Census

3.3 HOUSING, INFRASTRUCTURE, AND LAND USE

3.3.1 Housing

According to the 2010 US Census, there are 61,041 housing units in Randolph County, the majority of which are single family homes or multiple unit homes. Housing information for the participating jurisdictions is presented in **Table 3.4**. As shown in the table, Randolph County has a low percentage of seasonal housing throughout the County.

TABLE 3.4: HOUSING CHARACTERISTICS OF PARTICIPATING JURISDICTIONS

JURISDICTION	HOUSING UNITS (2000)	HOUSING UNITS (2010)	SEASONAL UNITS, PERCENT (2010)	MEDIAN HOME VALUE (2010-2014)
Randolph County	54,422	61,041	0.5%	\$119,400
City of Archdale*	3,986	4,916	0.3%	\$132,600
City of Asheboro	9,515	11,158	0.5%	\$112,000
Town of Franklinville	575	438	0.2%	\$72,400
Town of Liberty	1,094	1,237	0.3%	\$116,200
Town of Ramseur	697	747	1.5%	\$97,700
City of Randleman	1,542	1,883	0.1%	\$120,900
Town of Seagrove	119	125	1.6%	\$92,000
Town of Staley	136	171	0.6%	\$100,500
City of Trinity	2,759	2,865	0.5%	\$120,400

*The 2010 housing units for Archdale include units (149 units) located in Guilford County. Note: these housing units are not included in the Randolph County total.

Source: United States Census Bureau, 2000 and 2010 Census, 2010-2014 American Community Survey 5-Year Estimates

3.3.2 Infrastructure

Transportation

There are several major highways that cross through Randolph County. Interstate 73 runs north-south from Greensboro through Asheboro and, upon construction completion, is planned to continue towards South Carolina and Virginia. Interstate 74 travels west-east connecting cities throughout North Carolina, including Winston-Salem, High Point, Asheboro, Rockingham, and Lumberton. Interstates 73 and 74 merge south of the City of Randleman and continue to the southern County line. Interstate 85 runs north-south providing transportation within North Carolina into South Carolina and Virginia, and it is the second longest interstate within North Carolina. US Route 29-70 is a north-south highway serving that operates around the City of High Point, which is partially located in Randolph County, and the greater Piedmont area of North Carolina while providing access to adjacent states. US Highway 64 runs east-west and is the longest number route in North Carolina, running from Tennessee to the Outer Banks of North Carolina. US Highway 220 runs north-south connecting multiple cities within the Central Piedmont area of North Carolina. US Highway 311 operates throughout North Carolina into Virginia, and US Highway 421 runs north-south from Fort Fisher in North Carolina to Tennessee. Within Randolph County, multiple transportation routes run in concurrency.

The Asheboro Regional Airport serves Randolph County. The airport is a city-owned public-use facility with one runway. Additionally, the Piedmont Triad International Airport located just west of Greensboro is a high use airport for out-of-state travelers and is the third busiest airport in the State averaging 280 takeoffs and landings every day.

Some residents within the County also use the Charlotte-Douglas International Airport, the largest airport in the State, and Raleigh-Durham International Airport. The Charlotte-Douglas International Airport currently offers non-stop commercial flights on nine airlines to cities around the country and the world. The Raleigh-Durham International Airport offers more than 35 domestic and international flights on nine different airlines.

In terms of other transportation services, Randolph County provides various transportation alternatives. The Regional Coordinated Area Transportation System (RCATS) provides public transportation services to residents throughout Randolph County on an advanced reservation basis. The Piedmont Authority for Regional Transportation (PART) provides bus transportation and vanpool service within the ten Piedmont Triad counties, including Randolph County. Amtrak also provides service near Randolph County.

Utilities

Electrical power in Randolph County is provided by Duke Power, Central Electric Membership Corporation, EnergyUnited, and Randolph Electric Membership Corporation. Duke Power is a major provider in many areas of North Carolina. Central Electric Membership Corporation, EnergyUnited, and Randolph Electric Membership Corporation all serve users in Randolph County as well as multiple neighboring counties.

Water and sewer services are provided throughout Randolph County by several municipalities including the City of Asheboro, City of High Point, and other localized utility companies. Most areas in the County rely on private or shared wells and septic systems.

Community Facilities

There are a number of public buildings and community facilities located throughout Randolph County. According to the data collected for the vulnerability assessment (Section 6.4.1), there are twenty-eight fire stations, seven police stations, fifty-nine schools, and sixty-nine day care facilities located within the study area.

There is one hospital in the County. Randolph Hospital is located in the City of Asheboro and currently consists of 145 beds. Additionally, three nationally-prominent teaching hospitals are within an hour's drive of the County.

Randolph County offers a variety of recreational activities throughout the County. Randolph County contains various points of interest including multiple museums, historic sites, an art gallery, the North Carolina Zoo, pottery centers, and agricultural-based activities. The County contains multiple movie theaters for indoor activities as well as at least four golf courses for more outdoor recreation. Various parks and indoor recreational opportunities are available to residents and visitors. Shopping opportunities such as antiques, crafts, boutiques, farmers markets, malls, and outlets are available in parts of the County. Numerous sports facilities are also located within Randolph County such as Asheboro Copperheads Baseball Park, Caraway Speedway, and Zoo City Motor Sports Park. Additionally, at least two vineyards and a brewery operate within the County.

3.3.3 Land Use

Randolph County is preparing for and managing development to accommodate new growth and redevelopment through planning, zoning, and growth management. Randolph County's location within the Piedmont Triad presents various opportunities to expand growth and development; however, County land use policies are designed to recognize that sustainable economic growth, environmental protection, and rural quality of life can be pursued together as mutually-supporting public policy goals. Cultural, historic, and environmental protection is considered when assessing and directing Randolph County's growth patterns. The completion of various interstates and transportation networks; future

residential, commercial, and industrial growth; and natural resource conservation impact land use in Randolph County. Randolph County does have a Growth Management Plan that promotes sustainable growth and supports various planning and zoning regulations. Local land use and associated regulations are further discussed in *Section 7: Capability Assessment*.

3.4 EMPLOYMENT AND INDUSTRY

Randolph County's traditional employment base of textiles, educational services, and agriculture has diversified in recent years to encompass more industry-based labor. The North Carolina Zoological Park, Randolph Hospital, Sealy Corporation, Malt-O-Meal, Spanx, Timken Company, Oliver Rubber Company, Teleflex Medical,¹ Klausner Home Furnishings, and Energizer Battery are just a few of the companies that provide jobs throughout Randolph County. Cotton mills that originally encouraged economic growth in the County are still in operation today in various areas of the County. Randolph County contains multiple natural, cultural, historic, and non-profit attractions that foster economic growth.

Access to multiple major transportation routes, regional airports, and available rail and truck services support continual economic growth within the County. Randolph County's location in the Piedmont Triad region allows for multiple types of commercial and industrial development and support of various business hubs. Randolph County is located in close proximity to industrial centers for the High Point Furniture Market, FedEx, The Research Triangle Park area, The Gateway University Research Park, Bank of America, Well Fargo, and Pinehurst. Economic recruitment efforts by both private and public sectors are being pursued to encourage economic growth within the County, such as the Greensboro-Randolph County Megasite near the Town of Liberty.

According to the American Community Survey (ACS) 5-year estimates, in 2014, Randolph County had an average annual employment of 111,893 workers and an average unemployment rate of 6.3 percent (compared to 6.6 percent for the State). In 2014, the manufacturing industry employed 26.9 percent of the County's workforce followed by educational services, health care and social assistance (18.7%); retail trade (11.5%); arts, entertainment, recreation, and accommodation and food services (6.8%); and construction (6.7%). For 2014, the average annual median household income in Randolph County was \$41,782 compared to \$46,693 for the State of North Carolina.

¹ Teleflex Medical will be closing operations in 2017.

SECTION 4

HAZARD IDENTIFICATION

This section describes how the planning team identified the hazards to be included in the *Plan*. It consists of the following five subsections:

- ❖ 4.1 Overview;
- ❖ 4.2 Description of Full Range of Hazards;
- ❖ 4.3 Disaster Declarations;
- ❖ 4.4 Hazard Evaluation; and
- ❖ 4.5 Hazard Identification Results.

44 CFR Requirement

44 CFR Part 201.6(c)(2)(i): The risk assessment shall include a description of the type, 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.

4.1 OVERVIEW

Randolph County is vulnerable to a wide range of natural and human-caused hazards that threaten life and property. Current FEMA regulations and guidance under the Disaster Mitigation Act of 2000 (DMA 2000) require, at a minimum, an evaluation of a full range of natural hazards. An evaluation of human-caused hazards (i.e., technological hazards, terrorism, etc.) is encouraged, though not required, for plan approval. Randolph County has included an assessment of primarily natural hazards, but some human-caused hazards have also been identified.

Upon a review of the full range of natural hazards suggested under FEMA planning guidance, the participating jurisdictions in Randolph County have identified a number of hazards that are to be addressed in their *Multi-Jurisdictional Hazard Mitigation Plan*. These hazards were identified through an extensive process that utilized input from the previous *Randolph County Multi-jurisdictional Hazard Mitigation Plan*, Randolph County Hazard Mitigation Planning Team members, research of past disaster declarations in the County,¹ and review of the *North Carolina State Hazard Mitigation Plan*. Readily available information from reputable sources (such as Federal and State agencies) was also evaluated to supplement information from these key sources.

4.2 DESCRIPTION OF FULL RANGE OF HAZARDS

Table 4.1 lists the full range of hazards initially identified for inclusion in the *Plan* and provides a brief description for each. This table includes 26 individual hazards. Some of these hazards are considered to be interrelated or cascading, but for preliminary hazard identification purposes these individual hazards are broken out separately.

¹ A complete list of disaster declarations for Randolph County can be found below in Section 4.3.

TABLE 4.1: DESCRIPTIONS OF THE FULL RANGE OF INITIALLY IDENTIFIED HAZARDS

HAZARD	DESCRIPTION
ATMOSPHERIC HAZARDS	
Avalanche	A rapid fall or slide of a large mass of snow down a mountainside.
Drought	A prolonged period of less than normal precipitation such that the lack of water causes a serious hydrologic imbalance. Common effects of drought include crop failure, water supply shortages, and fish and wildlife mortality. High temperatures, high winds, and low humidity can worsen drought conditions and also make areas more susceptible to wildfire. Human demands and actions have the ability to hasten or mitigate drought-related impacts on local communities.
Extreme Cold	Extreme cold is generally considered to occur when the temperature is at or below freezing for a period of time. Often these events are associated with winter storms and other winter weather, but extreme cold events can occur on their own. Dangers associated with extreme cold events include frostbite and hypothermia among other impacts to people, and these events can often last for several days or weeks in a row.
Hailstorm	Any storm that produces hailstones that fall to the ground; usually used when the amount or size of the hail is considered significant. Hail is formed when updrafts in thunderstorms carry raindrops into parts of the atmosphere where the temperatures are below freezing.
Heat Wave/Extreme Heat	A heat wave may occur when temperatures hover 10 degrees or more above the average high temperature for the region and last for several weeks. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when a “dome” of high atmospheric pressure traps hazy, damp air near the ground. Excessively dry and hot conditions can provoke dust storms and low visibility. A heat wave combined with a drought can be very dangerous and have severe economic consequences on a community.
Hurricane/Tropical Storm	Hurricanes and tropical storms are classified as cyclones and defined as any closed circulation developing around a 10 to 30 mile (on average) in diameter low-pressure center in which the winds rotate counter-clockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere). When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. The primary damaging forces associated with these storms are high-level sustained winds, heavy precipitation, and tornadoes. Coastal areas are also vulnerable to the additional forces of storm surge, wind-driven waves, and tidal flooding which can be more destructive than cyclone wind. The majority of hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico during the official Atlantic hurricane season, which extends from June through November.

HAZARD	DESCRIPTION
Lightning	Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a “bolt” when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes, but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes thunder. On average, 73 people are killed each year by lightning strikes in the United States.
Nor’easter	Similar to hurricanes, nor’easters are ocean storms capable of causing substantial damage to coastal areas in the Eastern United States due to their associated strong winds and heavy surf. Nor'easters are named for the winds that blow in from the northeast and drive the storm up the East Coast along the Gulf Stream, a band of warm water that lies off the Atlantic coast. They are caused by the interaction of the jet stream with horizontal temperature gradients and generally occur during the fall and winter months when moisture and cold air are plentiful. Nor’easters are known for dumping heavy amounts of rain and snow, producing hurricane-force winds, and creating high surf that causes severe beach erosion and coastal flooding.
Severe Thunderstorm/High Wind	Thunderstorms are caused by air masses of varying temperatures meeting in the atmosphere. Rapidly rising warm moist air fuels the formation of thunderstorms. Thunderstorms may occur singularly, in lines, or in clusters. They can move through an area very quickly or linger for several hours. Thunderstorms may result in hail, tornadoes, or straight-line winds. Windstorms pose a threat to lives, property, and vital utilities primarily due to the effects of flying debris and can down trees and power lines.
Tornado	A tornado is a violently rotating column of air that has contact with the ground and is often visible as a funnel cloud. Its vortex rotates cyclonically with wind speeds ranging from as low as 40 mph to as high as 300 mph. Tornadoes are most often generated by thunderstorm activity when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The destruction caused by tornadoes ranges from light to catastrophic depending on the intensity, size, and duration of the storm.
Winter Storm and Freeze	Winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Blizzards, the most dangerous of all winter storms, combine low temperatures, heavy snowfall, and winds of at least 35 miles per hour, reducing visibility to only a few yards. Ice storms occur when moisture falls and freezes immediately upon impact on trees, power lines, communication towers, structures, roads, and other hard surfaces. Winter storms and ice storms can down trees, cause widespread power outages, damage property, and cause fatalities and injuries to human life.

HAZARD	DESCRIPTION
GEOLOGIC HAZARDS	
Earthquake	A sudden, rapid shaking of the Earth caused by the breaking and shifting of rock beneath the surface. This movement forces the gradual building and accumulation of energy. Eventually, strain becomes so great that the energy is abruptly released, causing the shaking at the earth's surface which we know as an earthquake. Roughly 90 percent of all earthquakes occur at the boundaries where plates meet, although it is possible for earthquakes to occur entirely within plates. Earthquakes can affect hundreds of thousands of square miles, cause damage to property measured in the tens of billions of dollars, result in loss of life and injury to hundreds of thousands of persons, and disrupt the social and economic functioning of the affected area.
Expansive Soils	Soils that will exhibit some degree of volume change with variations in moisture conditions. The most important properties affecting degree of volume change in a soil are clay mineralogy and the aqueous environment. Expansive soils will exhibit expansion caused by the intake of water and, conversely, will exhibit contraction when moisture is removed by drying. Generally speaking, they often appear sticky when wet and are characterized by surface cracks when dry. Expansive soils become a problem when structures are built upon them without taking proper design precautions into account with regard to soil type. Cracking in walls and floors can be minor or can be severe enough for the home to be structurally unsafe.
Landslide	The movements of a mass of rock, debris, or earth down a slope when the force of gravity pulling down the slope exceeds the strength of the earth materials that comprise to hold it in place. Slopes greater than 10 degrees are more likely to slide, as are slopes where the height from the top of the slope to its toe is greater than 40 feet. Slopes are also more likely to fail if vegetative cover is low and/or soil water content is high.
Land Subsidence/Sinkhole	The gradual settling or sudden sinking of the Earth's surface due to the subsurface movement of earth materials. Causes of land subsidence include groundwater pumpage, aquifer system compaction, drainage of organic soils, underground mining, hydrocompaction, natural compaction, sinkholes, and thawing permafrost.
Tsunami	A series of waves generated by an undersea disturbance such as an earthquake. The speed of a tsunami traveling away from its source can range from up to 500 miles per hour in deep water to approximately 20 to 30 miles per hour in shallower areas near coastlines. Tsunamis differ from regular ocean waves in that their currents travel from the water surface all the way down to the sea floor. Wave amplitudes in deep water are typically less than one meter; they are often barely detectable to the human eye. However, as they approach shore, they slow in shallower water, basically causing the waves from behind to effectively "pile up," and wave heights increase dramatically. As opposed to typical waves which crash at the shoreline, tsunamis bring with them a continuously flowing 'wall of water' with the potential to cause devastating damage in coastal areas located immediately along the shore.
Volcano	A mountain that opens downward to a reservoir of molten rock below the surface of the earth. While most mountains are created by forces pushing up the earth from below, volcanoes are different in that they are built up over time by an accumulation of their own eruptive products: lava, ash flows, and airborne ash and dust. Volcanoes erupt when pressure from gases and the molten rock beneath becomes strong enough to cause an explosion.

HAZARD	DESCRIPTION
HYDROLOGIC HAZARDS	
Dam and Levee Failure	Dam failure is the collapse, breach, or other failure of a dam structure resulting in downstream flooding. In the event of a dam failure, the energy of the water stored behind even a small dam is capable of causing loss of life and severe property damage if development exists downstream of the dam. Dam failure can result from natural events, human-induced events, or a combination of the two. The most common cause of dam failure is prolonged rainfall that produces flooding. Failures due to other natural events such as hurricanes, earthquakes, or landslides are significant because there is generally little or no advance warning.
Erosion	Erosion is the gradual breakdown and movement of land due to both physical and chemical processes of water, wind, and general meteorological conditions. Natural, or geologic, erosion has occurred since the Earth's formation and continues at a very slow and uniform rate each year.
Flood	The accumulation of water within a water body which results in the overflow of excess water onto adjacent lands, usually floodplains. The floodplain is the land adjoining the channel of a river, stream ocean, lake, or other watercourse or water body that is susceptible to flooding. Most floods fall into the following three categories: riverine flooding, coastal flooding, or shallow flooding (where shallow flooding refers to sheet flow, ponding, and urban drainage).
Storm Surge	A storm surge is a large dome of water often 50 to 100 miles wide and rising anywhere from four to five feet in a Category 1 hurricane up to more than 30 feet in a Category 5 storm. Storm surge heights and associated waves are also dependent upon the shape of the offshore continental shelf (narrow or wide) and the depth of the ocean bottom (bathymetry). A narrow shelf, or one that drops steeply from the shoreline and subsequently produces deep water close to the shoreline, tends to produce a lower surge but higher and more powerful storm waves. Storm surge arrives ahead of a storm's actual landfall and the more intense the hurricane is, the sooner the surge arrives. Storm surge can be devastating to coastal regions, causing severe beach erosion and property damage along the immediate coast. Further, water rise caused by storm surge can be very rapid, posing a serious threat to those who have not yet evacuated flood-prone areas.
OTHER HAZARDS	
Wildfire	An uncontrolled fire burning in an area of vegetative fuels such as grasslands, brush, or woodlands. Heavier fuels with high continuity, steep slopes, high temperatures, low humidity, low rainfall, and high winds all work to increase risk for people and property located within wildfire hazard areas or along the urban/wildland interface. Wildfires are part of the natural management of forest ecosystems, but most are caused by human factors. Over 80 percent of forest fires are started by negligent human behavior such as smoking in wooded areas or improperly extinguishing campfires. The second most common cause for wildfire is lightning.

HAZARD	DESCRIPTION
Solar Flare	According to NOAA, solar flares are large outbursts of electromagnetic radiation from the Sun lasting from minutes to hours. They are caused by magnetic reconnection associated with large-scale eruptions of magnetic flux called “coronal mass ejections” (CMEs). Solar flares occur in a large range of strengths and are classified on a logarithmic scale based on their intensity in the 1-minute averaged NOAA/GOES XRS instrument’s 0.1 -- 0.8 nm spectral band, with the smallest flares being labeled “A” flares, the next (10 times) larger called “B” flares, the next larger “C” flares, followed by the fairly large “M” flares, and finally the largest “X” flares.
Nuclear Power Plant Emergency	A nuclear and radiation accident is defined by the International Atomic Energy Agency as “an event that has led to significant consequences to people, the environment, or the facility.” Often, this type of incident results from damage to the reactor core of a nuclear power plant which can release radioactivity into the environment. The degree of exposure from nuclear accidents has varied from serious to catastrophic.
Terror Threat	Terrorism is defined by FEMA as, “the use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion, or ransom.” Terrorist acts may include assassinations, kidnappings, hijackings, bomb scares and bombings, cyber attacks (computer-based), and the use of chemical, biological, nuclear and radiological weapons.
Public Health/Infectious Disease Threat	Public health threats are often defined by an infectious disease that involves a biological agent/disease that may result in mass casualties or an outbreak of symptoms in those affected. Often emerging diseases are the greatest threat because they are new or varied iterations of existing threats and the population may not have built up a collective immunity to the disease.

4.3 DISASTER DECLARATIONS

Disaster declarations provide initial insight into the hazards that may impact the Randolph County planning area. Since 1996, eight presidential disaster declarations have been reported in Randolph County. This includes five storms related to severe winter weather and three hurricanes. However, this list is not inclusive of many of the major disaster events that impacted the County and which may have resulted in Small Business Administration disaster loan assistance or no federal assistance.

Table 4.2 lists the disaster declarations in Randolph County.

TABLE 4.2: RANDOLPH COUNTY DISASTER DECLARATIONS

YEAR	DISASTER NUMBER	DESCRIPTION
1996	1087	BLIZZARD OF 1996
1996	1103	WINTER STORM
1996	1134	HURRICANE FRAN
1999	1292	HURRICANE FLOYD
2000	1312	SEVERE WINTER STORM
2002	1448	SEVERE ICE STORM
2004	1553	HURRICANE IVAN

YEAR	DISASTER NUMBER	DESCRIPTION
2014	4167	SEVERE WINTER STORM

4.4 HAZARD EVALUATION

Table 4.3 documents the evaluation process used for determining which of the initially identified hazards are considered significant enough to warrant further evaluation in the risk assessment. For each hazard considered, the table indicates whether or not the hazard was identified as a significant hazard to be further assessed, how this determination was made, and why this determination was made. The table works to summarize not only those hazards that *were* identified (and why) but also those that *were not* identified along with the reasoning for their exclusion from the *Plan*. Hazard events not identified for inclusion at this time may be addressed during future evaluations and updates of the risk assessment if deemed necessary by the Hazard Mitigation Planning Team during the *Plan* update process.

TABLE 4.3: DOCUMENTATION OF THE HAZARD EVALUATION PROCESS

NATURAL HAZARDS CONSIDERED	WAS THIS HAZARD IDENTIFIED AS A SIGNIFICANT HAZARD TO BE ADDRESSED IN THE PLAN AT THIS TIME? (YES OR NO)	HOW WAS THIS DETERMINATION MADE?	WHY WAS THIS DETERMINATION MADE?
ATMOSPHERIC HAZARDS			
Avalanche	NO	<ul style="list-style-type: none"> • Review of FEMA's Multi-Hazard Identification and Risk Assessment. • Review of the <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Review of US Forest Service National Avalanche Center website. 	<ul style="list-style-type: none"> • The United States avalanche hazard is limited to mountainous western states including Alaska as well as some areas of low risk in New England. • Avalanche hazard was removed from the <i>North Carolina State Hazard Mitigation Plan</i> after determining the mountain elevation in Western North Carolina did have enough snow to produce this hazard. • Avalanche is not included in the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • There is no risk of avalanche events in North Carolina.

SECTION 4: HAZARD IDENTIFICATION

NATURAL HAZARDS CONSIDERED	WAS THIS HAZARD IDENTIFIED AS A SIGNIFICANT HAZARD TO BE ADDRESSED IN THE PLAN AT THIS TIME? (YES OR NO)	HOW WAS THIS DETERMINATION MADE?	WHY WAS THIS DETERMINATION MADE?
Drought	YES	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of the <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Review of the NC State Climate Office website. 	<ul style="list-style-type: none"> • Drought is a normal part of virtually all climatic regimes, including areas with high and low average rainfall. • Droughts are discussed in <i>North Carolina State Hazard Mitigation Plan</i> as a lesser hazard. • Drought is included in the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • There are reports of moderate to extreme drought conditions in eleven of the last fourteen years in Randolph County according to the NC State Climate Office.
Extreme Cold	NO	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of the <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Review of NOAA NCDC Storm Events Database. 	<ul style="list-style-type: none"> • Because North Carolina is located in the southeastern United States, it rarely experiences extreme cold events that are on par with other locations in the country. • Extreme cold events are discussed in <i>the North Carolina State Hazard Mitigation Plan</i> as a greater hazard. • Extreme cold was not included in the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • NCDC reports one cold/wind chill event for Randolph County since 1996.

NATURAL HAZARDS CONSIDERED	WAS THIS HAZARD IDENTIFIED AS A SIGNIFICANT HAZARD TO BE ADDRESSED IN THE PLAN AT THIS TIME? (YES OR NO)	HOW WAS THIS DETERMINATION MADE?	WHY WAS THIS DETERMINATION MADE?
Hailstorm	YES	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Review of NOAA NCEM Storm Events Database. 	<ul style="list-style-type: none"> • Although hailstorms occur primarily in the Midwestern states, they do occur in every state on the mainland U.S. Most inland regions experience hailstorms at least two or more days each year. • Hailstorm events are discussed in the <i>North Carolina State Hazard Mitigation Plan</i> under the Severe Thunderstorm hazard. • NCEM reports ninety hailstorm events (0.75 to 2.75 inch size hail) for Randolph County since 1950.
Heat Wave/Extreme Heat	YES	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of the <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Review of NOAA NCEM Storm Events Database. 	<ul style="list-style-type: none"> • Many areas of the United States are susceptible to heat waves, including North Carolina. • The <i>North Carolina State Hazard Mitigation Plan</i> reports the central portion of the State as having a moderate vulnerability. • Extreme (severe) heat was included in the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i> under the extreme temperatures hazard. • NCEM reports one extreme heat event for Randolph County.

NATURAL HAZARDS CONSIDERED	WAS THIS HAZARD IDENTIFIED AS A SIGNIFICANT HAZARD TO BE ADDRESSED IN THE PLAN AT THIS TIME? (YES OR NO)	HOW WAS THIS DETERMINATION MADE?	WHY WAS THIS DETERMINATION MADE?
Hurricane/Tropical Storm	YES	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Analysis of NOAA historical tropical cyclone tracks and National Hurricane Center Website. • Review of NOAA NCDC Storm Events Database. • Review of historical presidential disaster declarations. • FEMA Hazus-MH storm return periods. 	<ul style="list-style-type: none"> • The Atlantic and Gulf regions are most prone to landfall by hurricanes and tropical storms. • Hurricane and tropical storm events are discussed in <i>the North Carolina State Hazard Mitigation Plan</i> and are listed as a greater hazard. • Hurricanes and tropical weather were addressed in the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • NOAA historical records indicate fifty-six hurricanes/tropical disturbances have come within seventy-five miles of Randolph County since 1850. • NCDC reports four hurricane events since 1996 for Randolph County. • Three of the eight disaster declarations in Randolph County were directly related to hurricane events. • The 50-year return period peak gust for hurricane and tropical storm events in Randolph County is around 67 mph.

NATURAL HAZARDS CONSIDERED	WAS THIS HAZARD IDENTIFIED AS A SIGNIFICANT HAZARD TO BE ADDRESSED IN THE PLAN AT THIS TIME? (YES OR NO)	HOW WAS THIS DETERMINATION MADE?	WHY WAS THIS DETERMINATION MADE?
Lightning	YES	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Review of NOAA NCEM Storm Events Database. • Review of Vaisala’s NLDN Lightning Flash Density Map. 	<ul style="list-style-type: none"> • Lightning events are discussed in the <i>North Carolina State Hazard Mitigation Plan</i> as part of the severe thunderstorm hazard. • Lightning is included in the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i> under severe thunderstorms. • NCEM reports six lightning events for Randolph County since 1999. These events have resulted in \$35,893 (2014 dollars) in property damage. • According to Vaisala’s U.S. National Lightning Detection Network, Randolph County is located in an area that experienced an average of one to eight lightning flashes per square kilometer per year between 2005 and 2014.
Nor’easter	NO	<ul style="list-style-type: none"> • Review of <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Review of NOAA NCEM Storm Events Database. 	<ul style="list-style-type: none"> • Nor’easters are discussed in the <i>North Carolina State Hazard Mitigation Plan</i>. The Piedmont Region, which includes Randolph County, has relatively low vulnerability compared to the state. • Nor’easters were not identified in the previous Randolph County hazard mitigation plan. • NCEM does not report any nor’easter activity for Randolph County. However, nor’easters may have affected the area as severe winter storms. In this case, the activity would be reported under winter storm events.

NATURAL HAZARDS CONSIDERED	WAS THIS HAZARD IDENTIFIED AS A SIGNIFICANT HAZARD TO BE ADDRESSED IN THE PLAN AT THIS TIME? (YES OR NO)	HOW WAS THIS DETERMINATION MADE?	WHY WAS THIS DETERMINATION MADE?
Severe Thunderstorm/High Wind	YES	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Review of NOAA NCEM Storm Events Database. • Review of historical presidential disaster declarations. 	<ul style="list-style-type: none"> • Over 100,000 thunderstorms are estimated to occur each year on the U.S. mainland, and they are experienced in nearly every region. • Severe thunderstorm events are discussed in the <i>North Carolina State Hazard Mitigation Plan</i> and are identified in conjunction with the tornado hazard as a lesser hazard. • Severe thunderstorm events were addressed in the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • NCEM reports 224 thunderstorm/high wind events in Randolph County since 1950. These events have resulted in three injuries and \$1.0 million (2015 dollars) in property damage. • None of the County’s eight disaster declarations were directly related to severe storm events.
Tornado	YES	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Review of NOAA NCEM Storm Events Database. • Review of historical presidential disaster declarations. 	<ul style="list-style-type: none"> • From 1953 to 1993, North Carolina averaged 10 to 25 tornadoes per year. • Tornado events are discussed in the <i>North Carolina State Hazard Mitigation Plan</i>. The Piedmont Region, which includes Randolph County, has relatively low vulnerability but it is the highest vulnerability in the State. • Tornado events were addressed in the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • NCEM reports 15 tornado events in Randolph County since 1950. These events have resulted in one recorded death, six injuries, and \$11.6 million (2015 dollars) in property damage with the most severe being an F3. • None of the County’s eight disaster declarations were directly related to tornado events.

NATURAL HAZARDS CONSIDERED	WAS THIS HAZARD IDENTIFIED AS A SIGNIFICANT HAZARD TO BE ADDRESSED IN THE PLAN AT THIS TIME? (YES OR NO)	HOW WAS THIS DETERMINATION MADE?	WHY WAS THIS DETERMINATION MADE?
Winter Storm and Freeze	YES	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Review of NOAA NCDC Storm Events Database. • Review of historical presidential disaster declarations. 	<ul style="list-style-type: none"> • Winter storms affect every state in the continental U.S. and Alaska. • Severe winter storms, including snow storms and ice storms, are discussed in the <i>North Carolina State Hazard Mitigation Plan</i>. • Winter snow and ice storm events were addressed in the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • NCDC reports that Randolph County has been affected by fifty-three snow and ice events since 1996. These events resulted in \$3.6 million (2015 dollars) in damages. • Five of the eight disaster declarations in Randolph County were directly related to winter storm events.

NATURAL HAZARDS CONSIDERED	WAS THIS HAZARD IDENTIFIED AS A SIGNIFICANT HAZARD TO BE ADDRESSED IN THE PLAN AT THIS TIME? (YES OR NO)	HOW WAS THIS DETERMINATION MADE?	WHY WAS THIS DETERMINATION MADE?
GEOLOGIC HAZARDS			
Earthquake	YES	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Review of the National Geophysical Data Center. • Review of USGS Seismic Hazard Maps. 	<ul style="list-style-type: none"> • Although the zone of greatest seismic activity in the United States is along the Pacific Coast, eastern regions have experienced significant earthquakes. • Earthquake events are discussed in the <i>North Carolina State Hazard Mitigation Plan</i> and Randolph County is considered to be at low to moderate risk to an earthquake event. • Earthquake was included in the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Earthquakes have occurred in and around the State of North Carolina in the past. The state is affected by the Charleston and the New Madrid (near Missouri) Fault lines which have generated a magnitude 8.0 earthquake in the last 200 years. • Four events are known to have occurred in the County according to the National Geophysical Data Center. The greatest MMI reported was a VII. • According to USGS seismic hazard maps, the peak ground acceleration (PGA) with a 10% probability of exceedance in fifty years for Randolph County is approximately two to four %g (where g is acceleration of gravity). FEMA recommends that earthquakes be further evaluated for mitigation purposes in areas with a PGA of three %g or more.

NATURAL HAZARDS CONSIDERED	WAS THIS HAZARD IDENTIFIED AS A SIGNIFICANT HAZARD TO BE ADDRESSED IN THE PLAN AT THIS TIME? (YES OR NO)	HOW WAS THIS DETERMINATION MADE?	WHY WAS THIS DETERMINATION MADE?
Expansive Soils	NO	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Review of USDA Soil Conservation Service’s Soil Survey. 	<ul style="list-style-type: none"> • The effects of expansive soils are most prevalent in parts of the Southern, Central, and Western U.S. • Expansive soils are identified in the <i>North Carolina State Hazard Mitigation Plan</i>; however, the Piedmont Region, which includes Randolph County, does not identify expansive soils as a major hazard. • Randolph County is located in an area that has little to no clay swelling potential. • The previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i> did not identify expansive soils as a potential hazard.
Landslide	YES	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Review of USGS Landslide Incidence and Susceptibility Hazard Map. • Review of the North Carolina Geological Survey database of historic landslides. 	<ul style="list-style-type: none"> • Landslides occur in every state in the U.S, and they are most common in the coastal ranges of California, the Colorado Plateau, the Rocky Mountains, and the Appalachian Mountains. • Landslide/debris flow events are discussed in the <i>North Carolina State Hazard Mitigation Plan</i>, and the Piedmont Region, which includes Randolph County, has moderate vulnerability compared to the state. • The previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i> does address landslides. • USGS landslide hazard maps indicate that a moderate incidence rate is found in the eastern part of the County. • Data provided by NCGS indicate there are no recorded landslide events in the Randolph County. However, the dataset provided was incomplete.

NATURAL HAZARDS CONSIDERED	WAS THIS HAZARD IDENTIFIED AS A SIGNIFICANT HAZARD TO BE ADDRESSED IN THE PLAN AT THIS TIME? (YES OR NO)	HOW WAS THIS DETERMINATION MADE?	WHY WAS THIS DETERMINATION MADE?
Land Subsidence/Sinkhole	YES	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. 	<ul style="list-style-type: none"> • Land subsidence affects at least forty-five states, including North Carolina. However, because of the broad range of causes and impacts, there has been limited national focus on this hazard. • <i>The North Carolina State Hazard Mitigation Plan</i> delineates certain areas that are susceptible to land subsidence hazards in North Carolina; Randolph County has low to moderate vulnerability compared to the state. • The previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i> does identify sinkholes (a type of land subsidence) as a potential hazard.
Tsunami	NO	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Review of FEMA “How-to” mitigation planning guidance (Publication 386-2, “Understanding Your Risks – Identifying Hazards and Estimating Losses”). 	<ul style="list-style-type: none"> • No record exists of a catastrophic Atlantic basin tsunami impacting the mid-Atlantic coast of the United States. • Tsunami inundation zone maps are not available for communities located along the U.S. East Coast. • Tsunamis are discussed in the <i>North Carolina State Hazard Mitigation Plan</i> and described as a greater hazard for the State. However, the Piedmont Region, which includes Randolph County, scored a zero for tsunami hazard risk. • The previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i> did not address tsunamis. • FEMA mitigation planning guidance suggests that locations along the U.S. East Coast have a relatively low tsunami risk and need not conduct a tsunami risk assessment at this time.

NATURAL HAZARDS CONSIDERED	WAS THIS HAZARD IDENTIFIED AS A SIGNIFICANT HAZARD TO BE ADDRESSED IN THE PLAN AT THIS TIME? (YES OR NO)	HOW WAS THIS DETERMINATION MADE?	WHY WAS THIS DETERMINATION MADE?
Volcano	NO	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of <i>North Carolina State Hazard Mitigation Plan</i>. • Review of USGS Volcano Hazards Program website. 	<ul style="list-style-type: none"> • More than sixty-five potentially active volcanoes exist in the United States and most are located in Alaska. The Western states and Hawaii are also potentially affected by volcanic hazards. • There are no active volcanoes in North Carolina. • There has not been a volcanic eruption in North Carolina in over 1 million years. • No volcanoes are located near Randolph County.
HYDROLOGIC HAZARDS			
Dam and Levee Failure	YES	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Review of North Carolina Division of Energy, Mineral, and Land Resources website. 	<ul style="list-style-type: none"> • The National Inventory of Dams shows dams are located in every state. • Dam failure is discussed in the <i>North Carolina State Hazard Mitigation Plan</i> and is listed as a higher hazard for the Piedmont Region than many other areas of the state. The Piedmont Region includes Randolph County. • The previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i> did address dam failure. • Of the eighty-nine dams reported on the North Carolina Inventory of Dams in Randolph County, twenty-nine are high hazard (33%). (High hazard is defined as “where failure or mis-operation will probably cause loss of human life.”)

NATURAL HAZARDS CONSIDERED	WAS THIS HAZARD IDENTIFIED AS A SIGNIFICANT HAZARD TO BE ADDRESSED IN THE PLAN AT THIS TIME? (YES OR NO)	HOW WAS THIS DETERMINATION MADE?	WHY WAS THIS DETERMINATION MADE?
Erosion	NO	<ul style="list-style-type: none"> • Review of <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. 	<ul style="list-style-type: none"> • Coastal erosion is discussed in the <i>North Carolina State Hazard Mitigation Plan</i> but only for coastal areas (there is no discussion of riverine erosion). Randolph County is not located in a coastal area. • Erosion is not included as a hazard in the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>.
Flood	YES	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Review of NOAA NCEM Storm Events Database. • Review of historical disaster declarations. • Review of FEMA DFIRM data. • Review of FEMA’s NFIP Community Status Book and Community Rating System (CRS). 	<ul style="list-style-type: none"> • Floods occur in all fifty states and in the U.S. territories. • The flood hazard is thoroughly discussed in the <i>North Carolina State Hazard Mitigation Plan</i>. Randolph County was found to have low to moderate vulnerability compared to the state. • The previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i> addresses flood hazard. • NCEM reports that Randolph County has been affected by thirty-eight flood events since 1996. • None of the County’s eight disaster declarations were flood-related; however, three declarations were hurricane-related which likely caused flooding issues. • Approximately 4.5% of Randolph County is located in an identified floodplain (100- or 500-year). • Eight of the ten jurisdictions in the County participate in the NFIP; however, no jurisdictions currently participate in the CRS.

SECTION 4: HAZARD IDENTIFICATION

NATURAL HAZARDS CONSIDERED	WAS THIS HAZARD IDENTIFIED AS A SIGNIFICANT HAZARD TO BE ADDRESSED IN THE PLAN AT THIS TIME? (YES OR NO)	HOW WAS THIS DETERMINATION MADE?	WHY WAS THIS DETERMINATION MADE?
Storm Surge	NO	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Review of NOAA NCEM Storm Events Database. 	<ul style="list-style-type: none"> • Given the inland location of Randolph County, storm surge would not affect the area. • Storm surge is discussed in the <i>North Carolina State Hazard Mitigation Plan</i> under the hurricane hazard and indicates that the Piedmont Region, which includes Randolph County, has zero vulnerability to storm surge. • The previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i> did not address storm surge. • No historical events were reported by NCEM.

SECTION 4: HAZARD IDENTIFICATION

NATURAL HAZARDS CONSIDERED	WAS THIS HAZARD IDENTIFIED AS A SIGNIFICANT HAZARD TO BE ADDRESSED IN THE PLAN AT THIS TIME? (YES OR NO)	HOW WAS THIS DETERMINATION MADE?	WHY WAS THIS DETERMINATION MADE?
OTHER HAZARDS			
Wildfire	YES	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of <i>North Carolina State Hazard Mitigation Plan</i>. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Review of Southern Wildfire Risk Assessment (SWRA) Data. • Review of the NC Division of Forest Resources website. 	<ul style="list-style-type: none"> • Wildfires occur in virtually all parts of the United States. Wildfire hazard risks will increase as low-density development along the urban/wildland interface increases. • Wildfires are discussed in the <i>North Carolina State Hazard Mitigation Plan</i> as a greater hazard of concern though the Piedmont Region, which includes Randolph County, was found to have relatively low vulnerability compared to the state. • The previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i> addressed wildfire. • A review of SWRA data indicates that there are some areas of elevated concern in Randolph County. • According to the North Carolina Division of Forest Resources, Randolph County experiences an average of fifty-four fires each year which burn a combined ninety-five acres on average. • Wildfire hazard risks will increase as low-density development along the urban/wildland interface increases.
Solar Flare	YES	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of the NOAA Space Weather scales. • Discussions with local officials. 	<ul style="list-style-type: none"> • The previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i> did not include solar flares; however, it was discussed as a potential threat at meetings of the HMPT. • Solar flares are a threat that can occur without regard to specific location, so it was evaluated in this plan.

NATURAL HAZARDS CONSIDERED	WAS THIS HAZARD IDENTIFIED AS A SIGNIFICANT HAZARD TO BE ADDRESSED IN THE PLAN AT THIS TIME? (YES OR NO)	HOW WAS THIS DETERMINATION MADE?	WHY WAS THIS DETERMINATION MADE?
Nuclear Power Plant Emergency	YES	<ul style="list-style-type: none"> • Review of IAEA data on the location of nuclear reactors. • Discussion with local officials about location of nuclear power stations. 	<ul style="list-style-type: none"> • The Shearon Harris Nuclear Power Plant is located within fifty miles of the eastern half of Randolph County. • The previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i> did not include nuclear power plant emergency; however, it is a hazard of concern. • A nuclear accident is unlikely to occur, but could cause severe damage in the event of a major incident.
Terrorism	YES	<ul style="list-style-type: none"> • Review of local official knowledge. • Discussions with local officials. 	<ul style="list-style-type: none"> • The previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i> did not include terrorism; however, it is a hazard that could occur anywhere and is of concern to the HMPT. • There are several high profiles targets in the area that caused the HMPT to determine that the hazard should be evaluated further.
Public Health/Infectious Disease Threat	YES	<ul style="list-style-type: none"> • Review of FEMA’s Multi-Hazard Identification and Risk Assessment. • Review of the previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i>. • Discussions with local officials. 	<ul style="list-style-type: none"> • The previous <i>Randolph County Multi-jurisdictional Hazard Mitigation Plan</i> did not include public health/infectious disease; however, it was discussed as a potential threat at meetings of the HMPT. • Public health emergencies are often unpredictable and can ramp up quickly depending on how quickly they are recognized. These threats will potentially impact the County in the future.

4.5 HAZARD IDENTIFICATION RESULTS

Table 4.4 provides a summary of the hazard identification and evaluation process noting that 18 of the 26 initially identified hazards are considered significant enough for further evaluation through this Plan’s risk assessment (marked with a “☑”).

TABLE 4.4: SUMMARY RESULTS OF THE HAZARD IDENTIFICATION AND EVALUATION PROCESS

ATMOSPHERIC HAZARDS	GEOLOGIC HAZARDS
<input type="checkbox"/> Avalanche	<input checked="" type="checkbox"/> Earthquake
<input checked="" type="checkbox"/> Drought	<input type="checkbox"/> Expansive Soils
<input type="checkbox"/> Extreme Cold	<input checked="" type="checkbox"/> Landslide
<input checked="" type="checkbox"/> Hailstorm	<input checked="" type="checkbox"/> Land Subsidence/Sinkhole
<input checked="" type="checkbox"/> Heat Wave/Extreme Heat	<input type="checkbox"/> Tsunami
<input checked="" type="checkbox"/> Hurricane/Tropical Storm	<input type="checkbox"/> Volcano
<input checked="" type="checkbox"/> Lightning	HYDROLOGIC HAZARDS
<input type="checkbox"/> Nor'easter	<input checked="" type="checkbox"/> Dam and Levee Failure
<input checked="" type="checkbox"/> Severe Thunderstorm/High Wind	<input type="checkbox"/> Erosion
<input checked="" type="checkbox"/> Tornado	<input checked="" type="checkbox"/> Flood
<input checked="" type="checkbox"/> Winter Storm and Freeze	<input type="checkbox"/> Storm Surge
	OTHER HAZARDS
	<input checked="" type="checkbox"/> Wildfire
	<input checked="" type="checkbox"/> Solar Flare
	<input checked="" type="checkbox"/> Nuclear Power Plant Emergency
	<input checked="" type="checkbox"/> Terror Threat
	<input checked="" type="checkbox"/> Public Health/Infectious Disease Threat

= Hazard considered significant enough for further evaluation in the Randolph County hazard risk assessment.

SECTION 5

HAZARD PROFILES

This section includes detailed hazard profiles for each of the hazards identified in the previous section (*Hazard Identification*) as significant enough for further evaluation in the *Randolph County Multi-jurisdictional Hazard Mitigation Plan*. It contains the following subsections:

Overview

- ❖ 5.1 Overview;
- ❖ 5.2 Study Area;

Atmospheric Hazards

- ❖ 5.3 Drought;
- ❖ 5.4 Hailstorm;
- ❖ 5.5 Heat Wave/Extreme Heat;
- ❖ 5.6 Hurricane/Tropical Storm;
- ❖ 5.7 Lightning;
- ❖ 5.8 Severe Thunderstorm/High Wind;
- ❖ 5.9 Tornado;
- ❖ 5.10 Winter Storm and Freeze;

Geologic Hazards

- ❖ 5.11 Earthquake;
- ❖ 5.12 Landslide;

- ❖ 5.13 Land Subsidence/Sinkhole;

Hydrologic Hazards

- ❖ 5.14 Dam and Levee Failure;
- ❖ 5.15 Flood;

Other Hazards

- ❖ 5.16 Wildfire;
- ❖ 5.17 Solar Flare;
- ❖ 5.18 Nuclear Power Plant Emergency;
- ❖ 5.19 Terror Threat;
- ❖ 5.20 Public Health/Infectious Disease Threat;

Conclusions

- ❖ 5.21 Conclusions on Hazard Risk; and
- ❖ 5.22 Final Determinations.

44 CFR Requirement

44 CFR Part 201.6(c)(2)(i): The risk assessment shall include a description of the type, 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

Overview

5.1 OVERVIEW

Each hazard profiled below was considered significant enough to do an assessment on the hazard. The hazard profiles include a general description of the hazard, its location and extent, notable historical occurrences, and the probability of future occurrences. Each profile also includes specific items noted by members of the Randolph County Hazard Mitigation Planning Team as it relates to unique historical or anecdotal hazard information for Randolph County or a participating municipality within it.

The following hazards were identified:

- ❖ **Atmospheric**
 - ❖ Drought;
 - ❖ Hailstorm;
 - ❖ Heat Wave/Extreme Heat;
 - ❖ Hurricane/Tropical Storm;
 - ❖ Lightning;
 - ❖ Severe Thunderstorm/High Wind;
 - ❖ Tornado;
 - ❖ Winter Storm and Freeze;
- ❖ **Geologic**
 - ❖ Earthquake;
 - ❖ Landslide;
 - ❖ Land Subsidence/Sinkhole;
- ❖ **Hydrologic**
 - ❖ Dam and Levee Failure;
 - ❖ Flood;
- ❖ **Other**
 - ❖ Wildfire;
 - ❖ Solar Flare;
 - ❖ Nuclear Power Plant Emergency;
 - ❖ Terror Threat; and
 - ❖ Public Health/Infectious Disease Threat.

5.2 STUDY AREA

Randolph County includes nine municipalities and the unincorporated area of the County. **Table 5.1** provides a summary table of the participating municipalities. In addition, **Figure 5.1** provides a base map of Randolph County for reference.

**TABLE 5.1: PARTICIPATING JURISDICTIONS IN THE *RANDOLPH COUNTY*
*MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN***

Randolph County	
City of Archdale	City of Randleman
City of Asheboro	Town of Seagrove
Town of Franklinville	Town of Staley
Town of Liberty	City of Trinity
Town of Ramseur	

FIGURE 5.1: RANDOLPH COUNTY BASE MAP

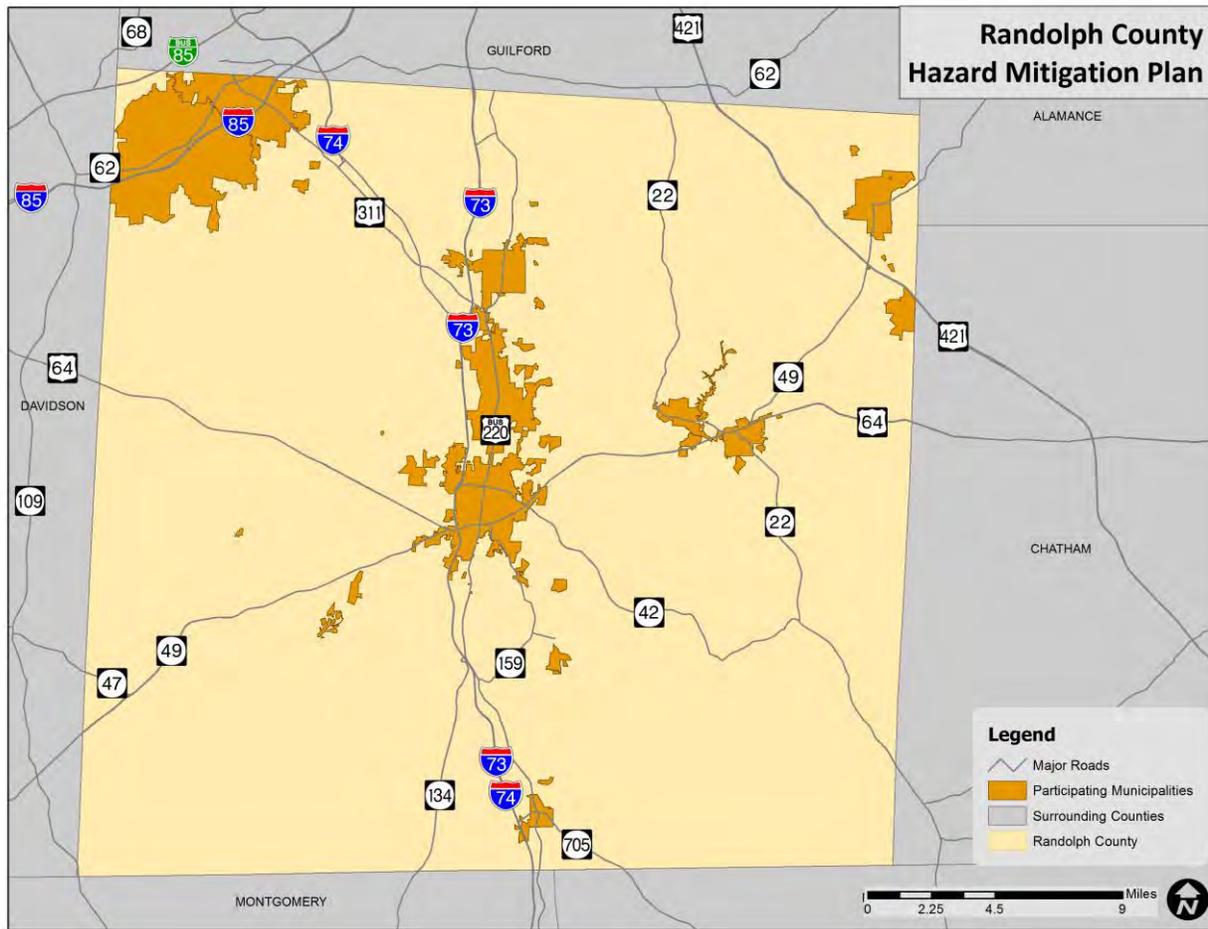


Table 5.2 lists each significant hazard for Randolph County and identifies whether or not it has been determined to be a specific hazard of concern for the nine municipal jurisdictions and the County’s unincorporated areas. This is based on the best available data and information from the Randolph County Hazard Mitigation Planning Team. (● = hazard of concern)

TABLE 5.2 SUMMARY OF IDENTIFIED HAZARD EVENTS IN RANDOLPH COUNTY

JURISDICTION	ATMOSPHERIC							GEOLOGIC			HYDRO			OTHER				
	DROUGHT	HAILSTORM	HEAT WAVE/ EXTREME HEAT	HURRICANE/ TROPICAL STORM	LIGHTNING	SEVERE THUNDERSTORM	TORNADO	WINTER STORM AND FREEZE	EARTHQUAKE	LANDSLIDE	LAND SUBSIDENCE/ SINKHOLE	DAM AND LEVEE FAILURE	FLOOD	WILDFIRE	SOLAR FLARE	NUCLEAR POWER PLANT EMERGENCY	TERROR THREAT	PUBLIC HEALTH/ INFECTIOUS
Randolph County																		
City of Archdale	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	
City of Asheboro	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Town of Franklinville	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

JURISDICTION	ATMOSPHERIC								GEOLOGIC			HYDRO		OTHER					
	DROUGHT	HAILSTORM	HEAT WAVE/ EXTREME HEAT	HURRICANE/ TROPICAL STORM	LIGHTNING	SEVERE THUNDERSTORM	TORNADO	WINTER STORM AND FREEZE	EARTHQUAKE	LANDSLIDE	LAND SUBSIDENCE/ SINKHOLE	DAM AND LEVEE FAILURE	FLOOD	WILDFIRE	SOLAR FLARE	NUCLEAR POWER PLANT EMERGENCY	TERROR THREAT	PUBLIC HEALTH/ INFECTIOUS	DISEASE THREAT
Town of Liberty	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Town of Ramseur	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
City of Randleman	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Town of Seagrove	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Town of Staley	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
City of Trinity	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Unincorporated Area	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Atmospheric Hazards

5.3 DROUGHT

5.3.1 Background

Drought is a normal part of virtually all climatic regions, including areas with high and low average rainfall. Drought is the consequence of a natural reduction in the amount of precipitation expected over an extended period of time, usually a season or more in length. High temperatures, high winds, and low humidity can exacerbate drought conditions. In addition, human actions and demands for water resources can hasten drought-related impacts. Drought may also lead to more severe wildfires.

Droughts are typically classified into one of four types: 1) meteorological, 2) hydrologic, 3) agricultural, or 4) socioeconomic. **Table 5.3** presents definitions for these types of drought.

TABLE 5.3 DROUGHT CLASSIFICATION DEFINITIONS

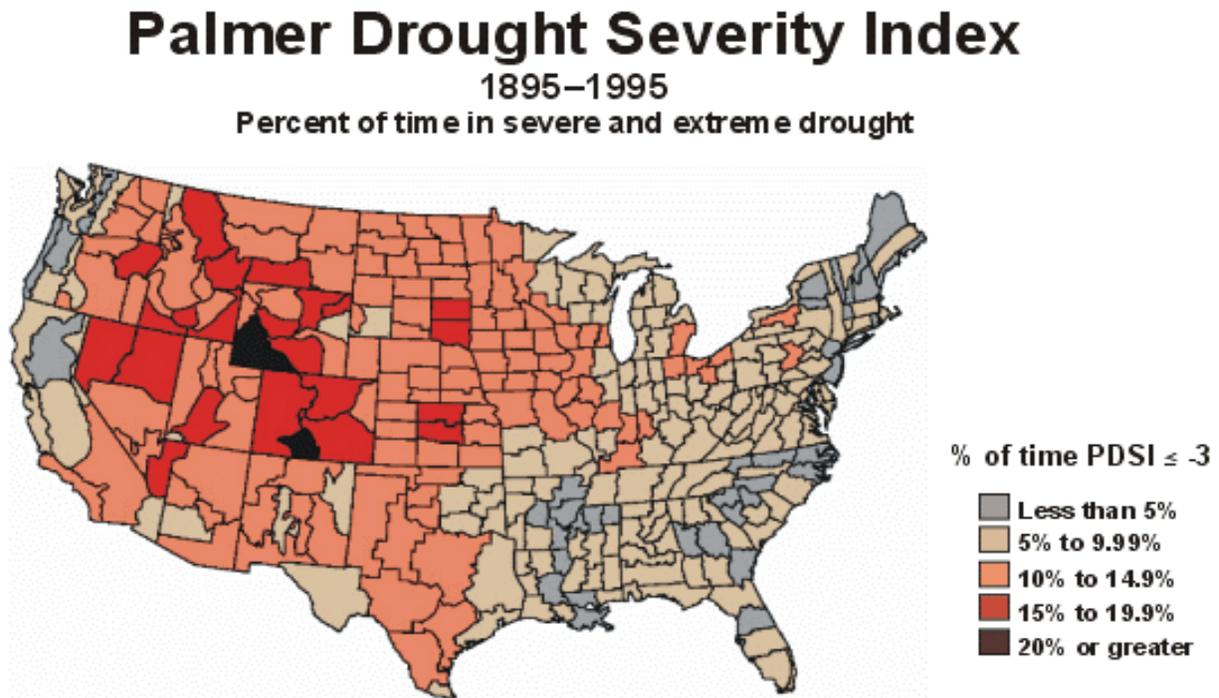
Meteorological Drought	The degree of dryness or departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
Hydrologic Drought	The effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
Agricultural Drought	Soil moisture deficiencies relative to water demands of plant life, usually crops.
Socioeconomic Drought	The effect of demands for water exceeding the supply as a result of a weather-related supply shortfall.

Source: Federal Emergency Management Agency, *Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy*, <https://www.fema.gov/media-library/assets/documents/7251>

Droughts are slow-onset hazards but, over time, can have very damaging affects to crops, municipal water supplies, recreational uses, and wildlife. If drought conditions extend over a number of years, the direct and indirect economic impact can be significant.

The Palmer Drought Severity Index (PDSI) is based on observed drought conditions and range from -0.5 (incipient dry spell) to -4.0 (extreme drought). Evident in **Figure 5.2**, the Palmer Drought Severity Index Summary Map for the United States, drought affects most areas of the United States but is less severe in the Eastern United States.

FIGURE 5.2: PALMER DROUGHT SEVERITY INDEX SUMMARY MAP FOR THE UNITED STATES



Source: National Drought Mitigation Center, <http://drought.unl.edu/Planning/Monitoring/HistoricalPDSIMaps.aspx>

5.3.2 Location and Spatial Extent

Drought typically covers a large area and cannot be confined to any geographic or political boundaries. According to the Palmer Drought Severity Index (**Figure 5.2**), central North Carolina has a relatively low risk for drought hazard. However, local areas may experience much more severe and/or frequent drought events than what is represented on the Palmer Drought Severity Index map. Furthermore, it is assumed that Randolph County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment.

5.3.3 Historical Occurrences

Data from the United States Drought Monitor and North Carolina State Climate Office were used to ascertain historical drought events in Randolph County. The United States Drought Monitor reports data on North Carolina drought conditions from 2000 to 2015. It classifies drought by County on a scale of D0 to D4 where:

- ❖ D0: Abnormally Dry;

- ❖ D1: Moderate Drought;
- ❖ D2: Severe Drought;
- ❖ D3: Extreme Drought; and
- ❖ D4: Exceptional Drought.

According to the United States Drought Monitor, Randolph County had drought occurrences (including D0: abnormally dry) in each of the last 16 years (2000-2015) as shown in **Table 5.4**. It should be noted that the United States Drought Monitor also estimates what percentage of the County is in each classification of drought severity. For example, the most severe classification reported may be exceptional, but a majority of the County may actually be in a less severe condition.

TABLE 5.4: SUMMARY OF DROUGHT OCCURRENCES IN RANDOLPH COUNTY

Abnormally Dry (D0) Moderate Drought (D1) Severe Drought (D2) Extreme Drought (D3) Exceptional Drought (D4)

YEAR	RANDOLPH COUNTY
2000	D2
2001	D3
2002	D4
2003	D0
2004	D0
2005	D2
2006	D2
2007	D4
2008	D4
2009	D1
2010	D1
2011	D2
2012	D1
2013	D1
2014	D0
2015	D2

Source: United States Drought Monitor,
<http://droughtmonitor.unl.edu/MapsAndData/DataTables.aspx>

The North Carolina State Climate Office also reports data on North Carolina drought conditions from 2000 to 2013. It classifies drought conditions based on the Palmer Drought Severity Index (-4.0 to 4.0). According to the North Carolina State Climate Office, Randolph County has experienced at least moderate drought in 11 of the last 14 years. The County’s highest level of drought each year according to the Palmer Drought Severity Index can be found in **Table 5.5**.

TABLE 5.5: HISTORICAL DROUGHT OCCURRENCES IN RANDOLPH COUNTY

extreme drought	severe drought	moderate drought	mid-range	moderately moist	very moist	extremely moist
■	■	■	■	■	■	■
-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.99	+3.00 to +3.99	+4.00 and above

YEAR	HIGHEST LEVEL OF DROUGHT REACHED	DROUGHT CATEGORY
2000	-0.40	Mid-range
2001	-2.83	Moderate
2002	-3.43	Severe
2003	-4.98	Extreme
2004	-0.38	Mid-range
2005	-2.04	Moderate
2006	-2.37	Moderate
2007	-2.86	Moderate
2008	-4.16	Extreme
2009	-4.37	Extreme
2010	-1.08	Mid-range
2011	-2.53	Moderate
2012	-3.44	Severe
2013	-2.84	Moderate

Source: North Carolina State Climate Office,
<http://climate.ncsu.edu/climate/drought/historical>

5.3.4 Probability of Future Occurrences

Based on historical occurrence information, it is assumed that all of Randolph County has a probability level of likely (between 10 and 100 percent annual probability) for future drought events. This hazard may vary slightly by location but each area has an equal probability of experiencing a drought. However, historical information also indicates that there is a much lower probability for extreme, long-lasting drought conditions.

5.4 HAILSTORM

5.4.1 Background

Hailstorms are a potentially damaging outgrowth of severe thunderstorms (thunderstorms are discussed separately). 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 they develop to a sufficient weight and fall as precipitation. Hail typically takes the form of spheres or irregularly-shaped masses 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. **Table 5.6** shows the TORRO Hailstorm Intensity Scale which is a way of measuring hail severity.

TABLE 5.6: TORRO HAILSTORM INTENSITY SCALE

	INTENSITY CATEGORY	TYPICAL HAIL DIAMETER (MM)*	PROBABLE KINETIC ENERGY (J-M ²)	MM TO INCH CONVERSION (INCHES)	TYPICAL DAMAGE IMPACTS
H0	Hard Hail	5	0-20	0 - 0.2	No damage.
H1	Potentially Damaging	5-15	>20	0.2 - 0.6	Slight general damage to plants, crops.
H2	Significant	10-20	>100	0.4 - 0.8	Significant damage to fruit, crops, vegetation.
H3	Severe	20-30	>300	0.8 - 1.2	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored.
H4	Severe	25-40	>500	1.0 - 1.6	Widespread glass damage, vehicle bodywork damage.
H5	Destructive	30-50	>800	1.2 - 2.0	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries.
H6	Destructive	40-60		1.6 - 2.4	Bodywork of grounded aircraft dented, brick walls pitted.
H7	Destructive	50-75		2.0 - 3.0	Severe roof damage, risk of serious injuries.
H8	Destructive	60-90		1.6 - 3.5	(Severest recorded in the British Isles) Severe damage to aircraft bodywork.
H9	Super Hailstorms	75-100		3.0 - 3.9	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open.
H10	Super Hailstorms	>100			Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open.

Source: Tornado and Storm Research Organisation, <http://www.torro.org.uk/site/hscale.php>

5.4.2 Location and Spatial Extent

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that Randolph County is uniformly exposed to severe thunderstorms; therefore, all areas of the County are equally exposed to hail which may be produced by such storms.

5.4.3 Historical Occurrences

According to the National Climatic Data Center, ninety recorded hailstorm events have affected Randolph County since 1983.¹ **Table 5.7** is a summary of the hail events in Randolph County.

¹ These hail events are only inclusive of those reported by the National Climatic Data Center (NCDC) from 1955 through July 2015. It is likely that additional hail events have affected Randolph County. In addition to NCDC, the North Carolina Department

TABLE 5.7: SUMMARY OF HAIL OCCURRENCES IN RANDOLPH COUNTY

LOCATION	NUMBER OF OCCURRENCES	DEATHS/INJURIES	PROPERTY DAMAGE (2015)	ANNUALIZED PROPERTY LOSS
City of Archdale	4	0/0	\$0	\$0
City of Asheboro	31	0/0	\$0	\$0
Town of Franklinville	0	0/0	\$0	\$0
Town of Liberty	3	0/0	\$0	\$0
Town of Ramseur	7	0/0	\$0	\$0
City of Randleman	6	0/0	\$0	\$0
Town of Seagrove	5	0/0	\$0	\$0
Town of Staley	0	0/0	\$0	\$0
City of Trinity	0	0/0	\$0	\$0
Unincorporated Area	34	0/0	\$0	\$0
RANDOLPH COUNTY TOTAL	90	0/0	\$0	\$0

Source: National Climatic Data Center

Table 5.8 provides detailed information about each event that occurred in the County. Hail ranged in diameter from 0.75 inches to 2.75 inches. NCDC reports that hail occurrences did not result in any property damages, but that is almost certainly not the case as local officials estimate thousands of dollars of property damage.² It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Climatic Data Center. It is likely that damages are much greater than the reported value.

TABLE 5.8: HISTORICAL HAIL OCCURRENCES IN RANDOLPH COUNTY

	DATE	MAGNITUDE	DEATHS/INJURIES	PROPERTY DAMAGE*
City of Archdale				
ARCHDALE	3/20/1998	0.88 in.	0/0	\$0
ARCHDALE	5/7/1998	0.88 in.	0/0	\$0
ARCHDALE	6/3/2000	1.75 in.	0/0	\$0
ARCHDALE	5/18/2006	0.75 in.	0/0	\$0
City of Asheboro				
Asheboro	5/29/1993	0.75 in.	0/0	\$0
ASHEBORO	5/24/1996	0.75 in.	0/0	\$0
ASHEBORO	5/29/1996	1.00 in.	0/0	\$0
ASHEBORO	5/1/1997	0.75 in.	0/0	\$0
ASHEBORO	5/1/1997	0.88 in.	0/0	\$0
ASHEBORO	3/20/1998	0.75 in.	0/0	\$0
ASHEBORO	6/15/1998	0.75 in.	0/0	\$0
ASHEBORO	6/15/1998	0.75 in.	0/0	\$0

of Insurance office was contacted for information. As additional local data becomes available, this hazard profile will be amended.

² Adjusted dollar values were calculated based on the average Consumer Price Index for a given calendar year. This index value has been calculated every year since 1913. For 2015, the November 2015 monthly index was used.

SECTION 5: HAZARD PROFILES

	DATE	MAGNITUDE	DEATHS/INJURIES	PROPERTY DAMAGE*
ASHEBORO	7/18/2003	0.75 in.	0/0	\$0
ASHEBORO	4/25/2006	0.75 in.	0/0	\$0
ASHEBORO	4/25/2006	0.75 in.	0/0	\$0
ASHEBORO	5/18/2006	0.88 in.	0/0	\$0
ASHEBORO	5/18/2006	0.88 in.	0/0	\$0
ASHEBORO	5/20/2006	0.88 in.	0/0	\$0
ASHEBORO	5/20/2006	1.00 in.	0/0	\$0
ASHEBORO	5/20/2006	0.75 in.	0/0	\$0
ASHEBORO	5/20/2006	1.00 in.	0/0	\$0
ASHEBORO	6/8/2006	1.00 in.	0/0	\$0
ASHEBORO	4/15/2007	0.88 in.	0/0	\$0
ASHEBORO	4/15/2007	0.88 in.	0/0	\$0
ASHEBORO	4/15/2007	0.88 in.	0/0	\$0
ASHEBORO	6/11/2007	1.00 in.	0/0	\$0
ASHEBORO	6/13/2007	1.00 in.	0/0	\$0
ASHEBORO	4/27/2008	0.75 in.	0/0	\$0
ASHEBORO MUNI ARPT	5/8/2008	0.75 in.	0/0	\$0
NORTH ASHEBORO	5/8/2008	0.75 in.	0/0	\$0
ASHEBORO SOUTH	5/20/2008	0.88 in.	0/0	\$0
ASHEBORO MUNI ARPT	4/9/2011	1.00 in.	0/0	\$0
ASHEBORO	4/25/2014	1.00 in.	0/0	\$0
ASHEBORO SOUTH	4/25/2014	1.00 in.	0/0	\$0
ASHEBORO MUNI ARPT	4/20/2015	1.00 in.	0/0	\$0
ASHEBORO SOUTH	7/13/2015	1.25 in.	0/0	\$0
Town of Franklinville				
<i>None Reported</i>	--	--	--	--
Town of Liberty				
LIBERTY	5/14/2006	0.75 in.	0/0	\$0
LIBERTY	4/20/2008	0.75 in.	0/0	\$0
LIBERTY	8/14/2011	1.50 in.	0/0	\$0
Town of Ramseur				
Ramseur	7/3/1995	1.00 in.	0/0	\$0
RAMSEUR	5/26/1998	0.88 in.	0/0	\$0
RAMSEUR	6/3/1998	1.75 in.	0/0	\$0
RAMSEUR	6/30/1998	0.88 in.	0/0	\$0
RAMSEUR	7/9/2003	1.00 in.	0/0	\$0
RAMSEUR	6/2/2006	0.88 in.	0/0	\$0
RAMSEUR	4/20/2008	0.75 in.	0/0	\$0
City of Randleman				
RANDLEMAN	5/11/1996	1.00 in.	0/0	\$0
RANDLEMAN	7/18/1996	1.75 in.	0/0	\$0
RANDLEMAN	10/18/1996	0.75 in.	0/0	\$0
RANDLEMAN	4/17/1998	0.75 in.	0/0	\$0

SECTION 5: HAZARD PROFILES

	DATE	MAGNITUDE	DEATHS/INJURIES	PROPERTY DAMAGE*
RANDLEMAN	5/14/2006	0.88 in.	0/0	\$0
RANDLEMAN	6/23/2006	0.88 in.	0/0	\$0
Town of Seagrove				
SEAGROVE	7/31/1996	0.88 in.	0/0	\$0
SEAGROVE	5/26/1998	2.00 in.	0/0	\$0
SEAGROVE	5/14/2006	0.75 in.	0/0	\$0
SEAGROVE	5/20/2006	0.88 in.	0/0	\$0
SEAGROVE	4/10/2009	1.00 in.	0/0	\$0
Town of Staley				
<i>None Reported</i>	--	--	--	--
City of Trinity				
<i>None Reported</i>	--	--	--	--
Unincorporated Area				
RANDOLPH CO.	4/2/1983	1.75 in.	0/0	\$0
RANDOLPH CO.	5/22/1985	1.00 in.	0/0	\$0
RANDOLPH CO.	6/4/1985	1.75 in.	0/0	\$0
RANDOLPH CO.	6/4/1985	2.75 in.	0/0	\$0
RANDOLPH CO.	6/4/1985	2.75 in.	0/0	\$0
RANDOLPH CO.	8/29/1987	2.75 in.	0/0	\$0
RANDOLPH CO.	5/23/1988	1.75 in.	0/0	\$0
RANDOLPH CO.	6/9/1988	1.75 in.	0/0	\$0
RANDOLPH CO.	6/26/1988	0.75 in.	0/0	\$0
RANDOLPH CO.	6/8/1990	1.75 in.	0/0	\$0
RANDOLPH CO.	6/26/1992	0.75 in.	0/0	\$0
RANDOLPH CO.	7/3/1992	0.75 in.	0/0	\$0
HILLSVILLE	4/20/1996	0.75 in.	0/0	\$0
SOPHIA	6/15/1998	0.88 in.	0/0	\$0
MARTHA	4/22/2006	0.88 in.	0/0	\$0
MILLBORO	4/27/2008	0.75 in.	0/0	\$0
MARTHA	5/8/2008	0.88 in.	0/0	\$0
FARMER	5/9/2008	0.75 in.	0/0	\$0
FLINT HILL	5/11/2008	0.75 in.	0/0	\$0
LEVEL CROSS	5/20/2008	0.75 in.	0/0	\$0
SALEM	5/20/2008	0.75 in.	0/0	\$0
JACKSONS CREEK	9/30/2008	0.75 in.	0/0	\$0
GLENOLA	5/6/2009	0.75 in.	0/0	\$0
REDCROSS	6/9/2009	0.88 in.	0/0	\$0
ERECT	6/27/2009	1.00 in.	0/0	\$0
RAMSEUR YORKS FLD AR	6/27/2009	0.88 in.	0/0	\$0
SALEM	8/5/2009	0.75 in.	0/0	\$0
FULLERS	6/29/2010	1.00 in.	0/0	\$0
JACKSONS CREEK	7/21/2012	1.00 in.	0/0	\$0
SOPHIA	4/19/2013	1.25 in.	0/0	\$0
FARMER	6/19/2015	1.00 in.	0/0	\$0
PARKS XRDS	6/26/2015	1.00 in.	0/0	\$0

	DATE	MAGNITUDE	DEATHS/INJURIES	PROPERTY DAMAGE*
PISGAH	6/26/2015	2.00 in.	0/0	\$0

*Property damage is reported in 2015 dollars; All damage may not have been reported.

Source: National Climatic Data Center

5.4.4 Probability of Future Occurrences

Based on historical occurrence information, it is assumed that the probability of future hail occurrences is highly likely (100 percent annual probability). Since hail is an atmospheric hazard (coinciding with thunderstorms), it is assumed that the entire County has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the County.

5.5 HEAT WAVE/EXTREME HEAT

5.5.1 Background

Extreme heat, like drought, poses little risk to property. However, extreme heat can have devastating effects on health. Extreme heat is often referred to as a “heat wave.” According to the National Weather Service, there is no universal definition for a heat wave, but the standard U.S. definition is any event lasting at least three days where temperatures reach ninety degrees Fahrenheit or higher. However, it may also be defined as an event at least three days long where temperatures are ten degrees greater than the normal temperature for the affected area. Heat waves are typically accompanied by humidity but may also be very dry. These conditions can pose serious health threats causing an average of 1,500 deaths each summer in the United States.³

According to the National Oceanic and Atmospheric Administration, heat is the number one weather-related killer among natural hazards, followed by frigid winter temperatures. The National Weather Service devised the Heat Index as a mechanism to better inform the public of heat dangers. The Heat Index Chart, shown in **Figure 5.3**, uses air temperature and humidity to determine the heat index or apparent temperature.

³ <http://www.noaa.gov/themes/heat.php>

FIGURE 5.3: HEAT INDEX CHART

		Relative Humidity (in percent)																						
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100		
Air Temp (in F)	140	125																						
	135	120	128																					
	130	117	122	131																				
	125	111	116	123	131	141																		
	120	107	111	116	123	130	139	148																
	115	103	107	111	115	120	127	135	143	151														
	110	99	102	105	108	112	117	123	130	137	143	150												
	105	95	97	100	102	105	109	113	118	123	129	135	142	149										
	100	91	93	95	97	99	101	104	107	110	115	120	126	132	138	144								
	95	87	88	90	91	93	94	96	98	101	104	107	110	114	119	124	130	136						
	90	83	84	85	86	87	88	90	91	93	95	96	98	100	102	106	109	113	117	122				
	85	78	79	80	81	82	83	84	85	86	87	88	89	90	91	93	95	97	99	102	105	108		
	80	73	74	75	76	77	77	78	79	79	80	81	81	82	83	85	86	86	87	88	89	91		
	75	69	69	70	71	72	72	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80		
	70	64	64	65	65	66	66	67	67	68	68	69	69	70	70	70	70	71	71	71	71	71	72	

Source: National Weather Service, National Oceanic and Atmospheric Administration,
http://www.nws.noaa.gov/om/heat/heat_index.shtml

Table 5.9 shows the dangers associated with different heat index temperatures. Some populations, such as the elderly and young, are more susceptible to heat danger than other segments of the population.

TABLE 5.9: HEAT DISORDERS ASSOCIATED WITH HEAT INDEX TEMPERATURE

HEAT INDEX TEMPERATURE (FAHRENHEIT)	DESCRIPTION OF RISKS
80° - 90°	Fatigue possible with prolonged exposure and/or physical activity.
90° - 105°	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity.
105° - 130°	Sunstroke, heat cramps, and heat exhaustion likely, and heatstroke possible with prolonged exposure and/or physical activity.
130° or higher	Heatstroke or sunstroke is highly likely with continued exposure.

Source: National Weather Service, National Oceanic and Atmospheric Administration,
<http://www.nws.noaa.gov/om/brochures/heatwave.pdf>

Finally, it should be noted that stagnant atmospheric conditions trap pollutants, thus adding unhealthy air to excessively hot temperatures. In addition, the “urban heat island effect” can produce significantly higher nighttime temperatures because asphalt and concrete (which store heat longer) gradually release heat at night. Thus, urban areas tend to be at greater risk to heat effects.

5.5.2 Location and Spatial Extent

Excessive heat typically impacts a large area and cannot be confined to any geographic or political boundaries. The entire County is susceptible to extreme heat conditions.

5.5.3 Historical Occurrences

July 22, 1998 – Heat – Excessive heat plagued central North Carolina during July 22 through July 23, 1998. Maximum temperatures reached the 98 to 103 degree range combined with dew points in the 78 to 80 degree range with little wind to give heat index values of around 110 degrees for several hours each afternoon. To make matters worse, the minimum temperatures did not fall below 80 at several locations and those that did achieved that feat for only an hour or two. Strong thunderstorms ended the 2 day excessive heat ordeal on the evening of the twenty-third when rain cooled the environment enough to send temperatures into the lower 70's at most locations.

In addition, information from the State Climate Office of North Carolina was reviewed to obtain historical temperature records in the County. Temperature information has been recorded in Randolph County since 1905. The recorded maximum for the County can be found below in **Table 5.10**:

TABLE 5.10: HIGHEST RECORDED TEMPERATURE IN RANDOLPH COUNTY

LOCATION	DATE	TEMPERATURE (°F)
Asheboro 2W Station (City Water Plant)	08/18/1988	105

Source: State Climate Office of North Carolina

The State Climate Office also reports average maximum temperatures at various stations in the County. The most centralized location is in Asheboro. **Table 5.11** shows the average maximum temperatures from 1971 to 2000 at the Asheboro 2W observation station which can be used as a general comparison for the County.

TABLE 5.11: AVERAGE MAXIMUM TEMPERATURE IN RANDOLPH COUNTY

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Avg. Max (°F)	48.5	53.2	61.7	71.0	77.4	83.9	87.7	85.6	79.6	70.3	60.7	51.5

Source: State Climate Office of North Carolina

5.5.4 Probability of Future Occurrences

Based on historical occurrence information, it is assumed that all of Randolph County has a probability level of possible (between 1 and 10 percent annual probability) for future extreme heat events to impact the County.

5.6 HURRICANE/TROPICAL STORM

5.6.1 Background

Hurricanes and tropical storms are classified as tropical cyclones and defined as any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and whose diameter averages 10 to 30 miles across. A tropical cyclone refers to any such circulation that develops over tropical waters. Tropical cyclones act as a “safety-valve,” limiting the continued build-up of heat and energy in tropical regions by maintaining the atmospheric heat and moisture balance between the tropics and the pole-ward latitudes. The primary damaging forces associated with these storms are high-level sustained winds, heavy precipitation, and tornadoes.

The key energy source for a tropical cyclone is the release of latent heat from the condensation of warm water. Their formation requires a low-pressure disturbance, warm sea surface temperature, rotational force from the spinning of the earth, and the absence of wind shear in the lowest 50,000 feet of the atmosphere. The majority of hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico during the official Atlantic hurricane season, which encompasses the months of June through November. The peak of the Atlantic hurricane season is in early to mid-September and the average number of storms that reach hurricane intensity per year in the Atlantic basin is about six.

As an incipient hurricane develops, barometric pressure (measured in millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. Hurricane intensity is further classified by the Saffir-Simpson Scale (**Table 5.12**), which rates hurricane intensity on a scale of 1 to 5, with 5 being the most intense.

TABLE 5.12: SAFFIR-SIMPSON SCALE

CATEGORY	MAXIMUM SUSTAINED WIND SPEED (MPH)	MINIMUM SURFACE PRESSURE (MILLIBARS)
1	74–95	Greater than 980
2	96–110	979–965
3	111–129	964–945
4	130–156	944–920
5	157 +	Less than 920

Source: National Hurricane Center, 2012, <http://www.nhc.noaa.gov/aboutsshws.php>

The Saffir-Simpson Scale categorizes hurricane intensity linearly based upon maximum sustained winds and barometric pressure, which are combined to estimate potential damage. Categories 3, 4, and 5 are classified as “major” hurricanes and, while hurricanes within this range comprise only 20 percent of total tropical cyclone landfalls, they account for over 70 percent of the damage in the United States. **Table 5.13** describes the damage that could be expected for each category of hurricane. Damage during hurricanes may also result from spawned tornadoes, storm surge, and inland flooding associated with heavy rainfall that usually accompanies these storms.

TABLE 5.13: HURRICANE DAMAGE CLASSIFICATIONS

STORM CATEGORY	DAMAGE LEVEL	DESCRIPTION OF DAMAGES	PHOTO EXAMPLE
1	MINIMAL	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal flooding and minor pier damage.	
2	MODERATE	Some roofing material, door, and window damage. Considerable damage to vegetation, mobile homes, etc. Flooding damages piers and small craft in unprotected moorings may break their moorings.	
3	EXTENSIVE	Some structural damage to small residences and utility buildings, with a minor amount of curtainwall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures, with larger structures damaged by floating debris. Terrain may be flooded well inland.	
4	EXTREME	More extensive curtainwall failures with some complete roof structure failure on small residences. Major erosion of beach areas. Terrain may be flooded well inland.	
5	CATASTROPHIC	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Flooding causes major damage to lower floors of all structures near the shoreline. Massive evacuation of residential areas may be required.	

Source: National Hurricane Center, 2012, <http://www.nhc.noaa.gov/aboutsshws.php>

5.6.2 Location and Spatial Extent

Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect Randolph County. All areas in Randolph County are equally susceptible to hurricane and tropical storms.

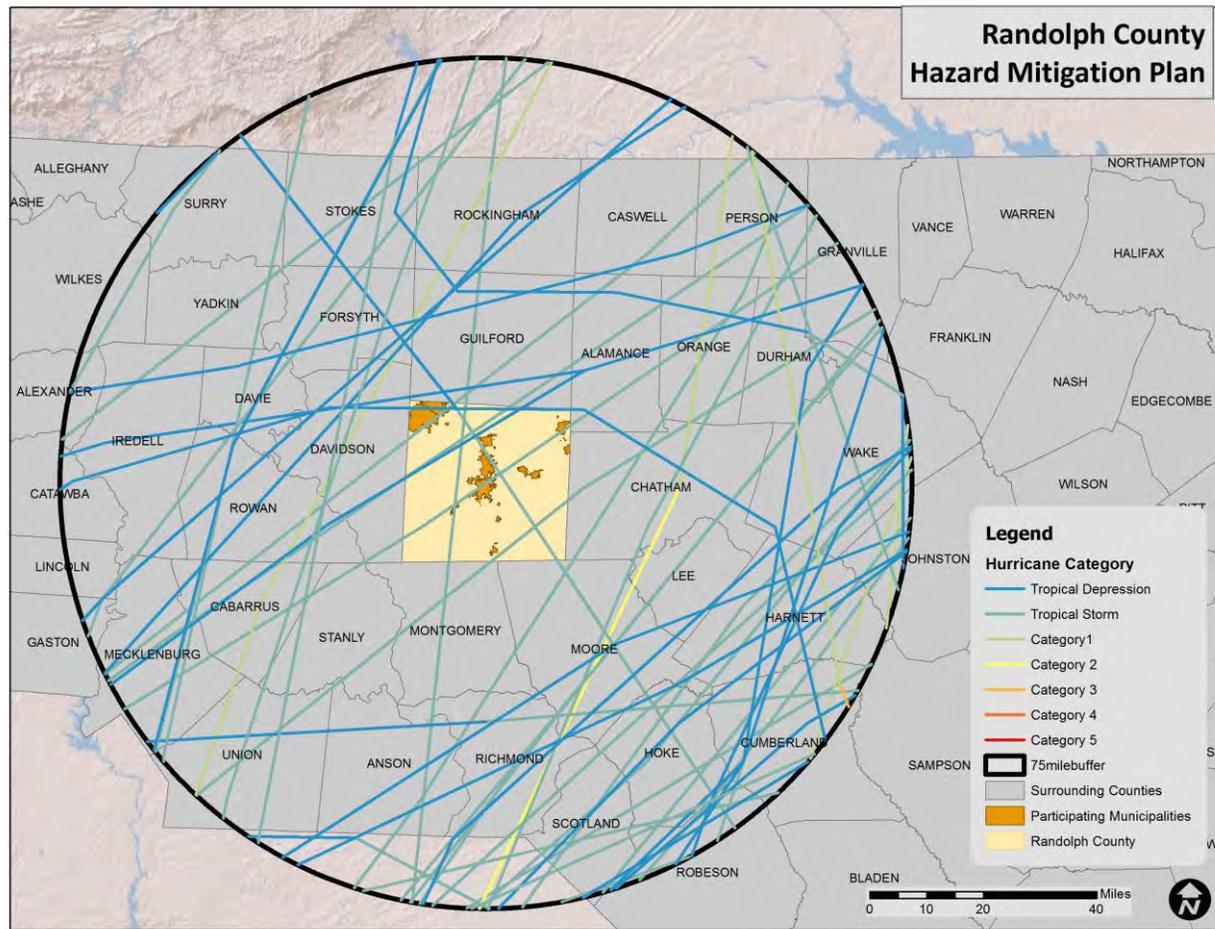
5.6.3 Historical Occurrences

According to the National Hurricane Center's historical storm track records, fifty-eight hurricane/tropical storm tracks have passed within seventy-five miles of Randolph County since 1854.⁴ This includes six hurricanes, thirty-two tropical storms, and twenty tropical depressions.

Of the recorded storm events, eight have traversed directly through Randolph County as shown in **Figure 5.4**.

⁴These storm track statistics do not include extra-tropical storms. Though these related hazard events are less severe in intensity, they may cause significant local impact in terms of rainfall and high winds.

FIGURE 5.4: HISTORICAL HURRICANE STORM TRACKS WITHIN 75 MILES OF RANDOLPH COUNTY



Source: National Oceanic and Atmospheric Administration; National Hurricane Center

Table 5.14 provides the date of occurrence, name (if applicable), maximum wind speed (as recorded within seventy-five miles of Randolph County), and category of the storm based on the wind speed within the seventy-five mile buffer according to the Saffir-Simpson Scale.

TABLE 5.14: HISTORICAL STORM TRACKS WITHIN 75 MILES OF RANDOLPH COUNTY (1850–2014)

DATE OF OCCURRENCE	STORM NAME	MAXIMUM WIND SPEED (KNOTS)	STORM CATEGORY
9/9/1854	UNNAMED	50	Tropical Storm
9/17/1859	UNNAMED	40	Tropical Storm
6/23/1867	UNNAMED	40	Tropical Storm
10/4/1877	UNNAMED	50	Tropical Storm
9/12/1878	UNNAMED	60	Tropical Storm
9/11/1882	UNNAMED	40	Tropical Storm
10/12/1885	UNNAMED	40	Tropical Storm
6/22/1886	UNNAMED	35	Tropical Storm

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DATE OF OCCURRENCE	STORM NAME	MAXIMUM WIND SPEED (KNOTS)	STORM CATEGORY
7/1/1886	UNNAMED	45	Tropical Storm
9/10/1888	UNNAMED	35	Tropical Storm
9/24/1889	UNNAMED	45	Tropical Storm
8/28/1893	UNNAMED	75	Category 1
10/13/1893	UNNAMED	80	Category 1
10/4/1893	UNNAMED	40	Tropical Storm
9/29/1896	UNNAMED	85	Category 2
10/31/1899	UNNAMED	75	Category 1
7/13/1901	UNNAMED	35	Tropical Storm
6/16/1902	UNNAMED	35	Tropical Storm
9/14/1904	UNNAMED	60	Tropical Storm
9/23/1907	UNNAMED	35	Tropical Storm
8/31/1911	UNNAMED	25	Tropical Depression
6/14/1912	UNNAMED	35	Tropical Storm
9/3/1913	UNNAMED	40	Tropical Storm
8/3/1915	UNNAMED	35	Tropical Storm
9/23/1920	UNNAMED	35	Tropical Storm
10/3/1927	UNNAMED	40	Tropical Storm
8/11/1928	UNNAMED	30	Tropical Depression
10/2/1929	UNNAMED	50	Tropical Storm
9/6/1935	UNNAMED	45	Tropical Storm
10/20/1944	UNNAMED	50	Tropical Storm
9/18/1945	UNNAMED	50	Tropical Storm
10/9/1946	UNNAMED	30	Tropical Depression
9/24/1947	UNNAMED	30	Tropical Depression
8/28/1949	UNNAMED	40	Tropical Storm
8/31/1952	ABLE	45	Tropical Storm
8/17/1955	DIANE	60	Tropical Storm
7/10/1959	CINDY	30	Tropical Depression
8/31/1964	CLEO	25	Tropical Depression
6/9/1968	ABBY	25	Tropical Depression
5/26/1970	ALMA	25	Tropical Depression
9/15/1976	UNNAMED	30	Tropical Depression
9/8/1977	BABE	25	Tropical Depression
9/5/1979	DAVID	55	Tropical Storm
7/25/1985	BOB	55	Tropical Storm
8/18/1985	DANNY	25	Tropical Depression
9/8/1987	UNNAMED	Not Available	Tropical Depression
8/29/1988	CHRIS	25	Tropical Depression
9/6/1996	FRAN	100	Category 3
7/24/1997	DANNY	30	Tropical Depression
9/5/1999	DENNIS	35	Tropical Storm
9/16/1999	FLOYD*	90	Category 2
9/19/2000	GORDON	25	Tropical Depression
9/23/2000	HELENE	25	Tropical Depression

DATE OF OCCURRENCE	STORM NAME	MAXIMUM WIND SPEED (KNOTS)	STORM CATEGORY
8/30/2004	GASTON	30	Tropical Depression
9/16/2004	IVAN*	20	Tropical Depression
9/28/2004	JEANNE	20	Tropical Depression
7/7/2005	CINDY	20	Tropical Depression
6/14/2006	ALBERTO	35	Tropical Storm

*Although storm track was outside of the seventy-five mile buffer, this event was considered significant enough to include.

Source: National Hurricane Center

The National Climatic Data Center reported four events associated with a hurricane or tropical storm in Randolph County since 1996. Additionally, Federal records indicate that three disaster declarations were made in 1996 (Hurricane Fran), 1999 (Hurricane Floyd), and 2004 (Hurricane Ivan) for the County.⁵

Flooding is generally the greatest hazard of concern with hurricane and tropical storm events in Randolph County, though some events do carry winds that can have significant impacts on the County. Some anecdotal information is available for the major storms that have impacted the area as found below.

Hurricane Fran – September 5-6, 1996

After being hit just a few weeks earlier by Hurricane Bertha, North Carolina was impacted by the one of the most devastating storms to ever make landfall along the Atlantic Coast. Fran dropped more than 10 inches of rain in many areas and had sustained winds of around 115 miles per hour as it hit the coast and began its path along the I-40 corridor in central North Carolina. In the end, over \$3 billion in damages were reported in the State. Damages to infrastructure and agriculture added to the overall toll and more than 1.7 million people in the State were left without power.

Hurricane Floyd – September 16, 1999

Hurricane Floyd, combined with the weather conditions before and immediately after this hurricane, resulted in the most severe flooding and devastation in North Carolina history. In North Carolina, the storm resulted in thirty-five fatalities, over \$3 billion in damages, 7,000 destroyed homes, 56,000 damaged homes, 1,500 people rescued from flooded areas, and more than 500,000 customers without electricity. Additionally, the flooding caused an estimated \$813 million in agricultural losses affecting 32,000 farmers. There was also significant loss of livestock including 2,860,827 poultry, 28,000 swine, and 619 cattle.

Hurricane Ivan – September 16-17, 2004

Just a week and a half following Tropical Storm Frances, the remnants of Hurricane Ivan hit western North Carolina when many streams and rivers were already well above flood stage. The widespread flooding forced many roads to be closed and landslides were common across the mountain region. Wind gusts reached between forty and sixty MPH across the higher elevations of the Appalachian Mountains resulting in numerous downed trees. More than \$13.8 million of federal aid was dispersed across North Carolina following Ivan.

⁵ A complete listing of historical disaster declarations can be found in Section 4: *Hazard Identification*.

5.6.4 Probability of Future Occurrences

Given the inland location of the County, it is more likely to be affected by remnants of hurricane and tropical storm systems (as opposed to a major hurricane) which may result in flooding or high winds. The probability of being impacted is less than coastal areas, but still remains a real threat to Randolph County due to induced events like flooding. Based on historical evidence, the probability level of future occurrence is likely (between 10 and 100 percent annual probability). Given the regional nature of the hazard, all areas in the County are equally exposed to this hazard. When the County is impacted, the damage could be widespread, threatening lives and property throughout the planning area.

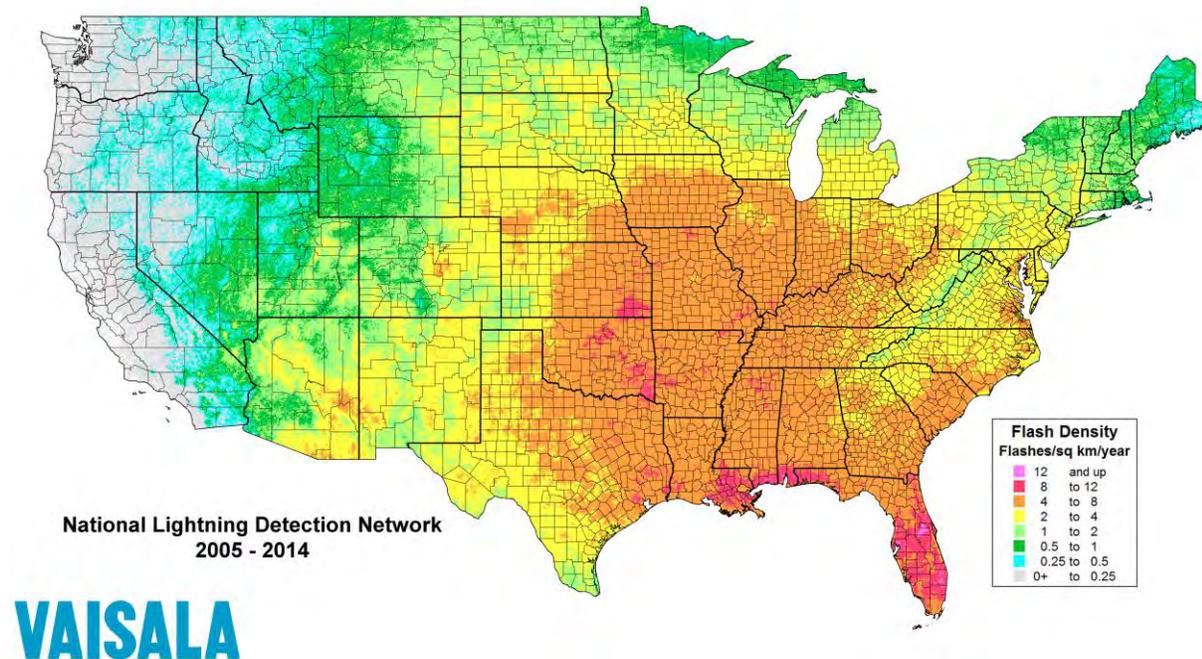
5.7 LIGHTNING

5.7.1 Background

Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a “bolt” when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes the thunder which often accompanies lightning strikes. While most often affiliated with severe thunderstorms, lightning may also strike outside of heavy rain and might occur as far as ten miles away from any rainfall.

Lightning strikes occur in very small, localized areas. For example, they may strike a building, electrical transformer, or even a person. According to FEMA, lightning injures an average of three hundred people and kills people each year in the United States. Direct lightning strikes also have the ability to cause significant damage to buildings, critical facilities, and infrastructure largely by igniting a fire. Lightning is also responsible for igniting wildfires that can result in widespread damages to property.

Figure 5.5 shows a lightning flash density map for the years 2005-2014 based upon data provided by Vaisala’s U.S. National Lightning Detection Network (NLDN®).

FIGURE 5.5: LIGHTNING FLASH DENSITY IN THE UNITED STATES

Source: Vaisala United States National Lightning Detection Network,
<http://www.vaisala.com/en/products/thunderstormandlightningdetectionsystems/Pages/NLDN.aspx>

5.7.2 Location and Spatial Extent

Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of Randolph County is uniformly exposed to lightning.

5.7.3 Historical Occurrences

According to the National Climatic Data Center, there have been a total of six recorded lightning events in Randolph County since 1999, as listed in summary **Table 5.15**.⁶ These events resulted in around \$35,000 (2015 dollars) in property damages.⁷

TABLE 5.15: SUMMARY OF LIGHTNING OCCURRENCES IN RANDOLPH COUNTY

LOCATION	NUMBER OF OCCURRENCES	DEATHS/INJURIES	PROPERTY DAMAGE (2015)	ANNUALIZED PROPERTY LOSS
City of Archdale	0	0/0	\$0	\$0
City of Asheboro	3	0/0	\$3,172	\$198

⁶ These lightning events are only inclusive of those reported by the National Climatic Data Center (NCDC) from 1996 through July 2015. It is certain that additional lightning events have occurred in Randolph County. The State Fire Marshall's office was also contacted for additional information but none could be provided. As additional local data becomes available, this hazard profile will be amended.

⁷ Adjusted dollar values were calculated based on the average Consumer Price Index for a given calendar year. This index value has been calculated every year since 1913. For 2015, the November 2015 monthly index was used.

LOCATION	NUMBER OF OCCURRENCES	DEATHS/INJURIES	PROPERTY DAMAGE (2015)	ANNUALIZED PROPERTY LOSS
Town of Franklinville	0	0/0	\$0	\$0
Town of Liberty	0	0/0	\$0	\$0
Town of Ramseur	0	0/0	\$0	\$0
City of Randleman	1	0/0	\$10,907	\$2,181
Town of Seagrove	0	0/0	\$0	\$0
Town of Staley	0	0/0	\$0	\$0
City of Trinity	0	0/0	\$0	\$0
Unincorporated Area	2	0/0	\$21,814	\$1,454
RANDOLPH COUNTY TOTAL	6	0/0	\$35,893	\$3,834

Source: National Climatic Data Center

Detailed information on historical lightning events can be found in **Table 5.16**.

TABLE 5.16: HISTORICAL OCCURRENCES IN RANDOLPH COUNTY

	DATE	DEATHS/INJURIES	PROPERTY DAMAGE*	DETAILS
City of Archdale				
<i>None Reported</i>				
City of Asheboro				
ASHEBORO	8/14/1999	0/0	\$0	Two children and three adults were injured by lightning at Camp Woodfield, a Scout camp in Tabernacle Township west of Asheboro. All were transported to the hospital, treated and released. The group was camping near a tree that got struck by lightning.
ASHEBORO	7/2/2002	0/0	\$0	A barn was struck by lightning and set on fire, destroying the barn, a car, a motorcycle, and a tractor.
ASHEBORO	2/28/2011	0/0	\$3,172	A woman was injured when lightning struck nearby.
Town of Franklinville				
<i>None Reported</i>				
Town of Liberty				
<i>None Reported</i>				
Town of Ramseur				
<i>None Reported</i>				

	DATE	DEATHS/INJURIES	PROPERTY DAMAGE*	DETAILS
City of Randleman				
RANDLEMAN	6/12/2010	0/0	\$10,907	A trained spotter reported a residential fire due to lightning at 5184 Fairview Farm Road. Lightning struck a gas line igniting the fire.
Town of Seagrove				
<i>None Reported</i>	--	--	--	--
Town of Staley				
<i>None Reported</i>	--	--	--	--
City of Trinity				
<i>None Reported</i>	--	--	--	--
Unincorporated Area				
SOPHIA	5/28/2000	0/0	\$395,942	A house fire was caused by a lightning strike at 225 Uwharrie St. in Asheboro.
HILLSVILLE	6/14/2010	0/0	\$21,814	Two homes were struck by lightning in northern Randolph County resulting in minor damages to both residences.

*Property Damage is reported in 2015 dollars; all damage may not have been reported.

Source: National Climatic Data Center

It is certain that more than six events have impacted the County. Many of the reported events are those that caused damage, though it should be expected that damages are likely much higher for this hazard than what is reported.

5.7.4 Probability of Future Occurrences

Although there was not a high number of historical lightning events reported throughout Randolph County via NCDC data, it is considered a regular occurrence, especially accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though not all events will cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN[®]), Randolph County is located in an area of the country that experienced an average of one to eight lightning flashes per square kilometer per year between 2005 and 2014. Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the County.

5.8 SEVERE THUNDERSTORM/HIGH WIND

5.8.1 Background

Thunderstorms can produce a variety of accompanying hazards including wind (discussed here), hail, and lightning.⁸ Although thunderstorms generally affect a small area, they are very dangerous and may cause substantial property damage.

Three conditions need to occur for a thunderstorm to form. First, it needs moisture to form clouds and rain. Second, it needs unstable air, such as warm air that can rise rapidly (this often referred to as the “engine” of the storm). Third, thunderstorms need lift, which comes in the form of cold or warm fronts, sea breezes, mountains, or the sun’s heat. When these conditions occur simultaneously, air masses of varying temperatures meet, and a thunderstorm is formed. These storm events can occur singularly, in lines, or in clusters. Furthermore, they can move through an area very quickly or linger for several hours.

According to the National Weather Service, more than 100,000 thunderstorms occur each year, though only about 10 percent of these storms are classified as “severe.” A severe thunderstorm occurs when the storm produces at least one of these three elements: 1) hail at least one inch in diameter, 2) a tornado, or 3) winds of at least fifty-eight miles per hour.

Thunderstorm events have the capability of producing straight-line winds that can cause severe destruction to communities and threaten the safety of a population. Such wind events, sometimes separate from a thunderstorm event, are common throughout Randolph County. Therefore, high winds are also reported in this section.

High winds can form due to pressure of the Northeast coast that combines with strong pressure moving through the Ohio Valley. This creates a tight pressure gradient across the region, resulting in high winds which increase with elevation. It is common for gusts of thirty to sixty miles per hour to occur.

Downbursts are also possible with thunderstorm events. Such events are an excessive burst of wind in excess of 125 miles per hour. They are often confused with tornadoes. Downbursts are caused by down drafts from the base of a convective thunderstorm cloud. It occurs when rain-cooled air within the cloud becomes heavier than its surroundings. Thus, air rushes towards the ground in a destructive yet isolated manner. There are two types of downbursts. Downbursts less than 2.5 miles wide, duration less than five minutes, and winds up to 168 miles per hour are called “microbursts.” Larger events greater than 2.5 miles at the surface and longer than five minutes with winds up to 130 miles per hour are referred to as “macrobursts.”

5.8.2 Location and Spatial Extent

A thunderstorm event is an atmospheric hazard and, thus, has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. In addition to thunderstorms, Randolph County typically experiences several straight-line wind events each year. These wind events can and have

⁸ The hail and lightning hazards are discussed as separate hazards in this section.

caused significant damage. It is assumed that Randolph County has uniform exposure to a thunderstorm/wind event and the spatial extent of an impact could be large.

5.8.3 Historical Occurrences

According to NCDC, there have been 224 reported thunderstorm and high wind events since 1961 in Randolph County.⁹ These events caused around \$1.0 million (2015 dollars) in damages.¹⁰ There were also reports of three injuries. **Table 5.17** summarizes this information.

TABLE 5.17: SUMMARY OF THUNDERSTORM/HIGH WIND OCCURRENCES IN RANDOLPH COUNTY

LOCATION	NUMBER OF OCCURRENCES	DEATHS/INJURIES	PROPERTY DAMAGE (2015)	ANNUALIZED PROPERTY LOSS
City of Archdale	8	0/0	\$255,238	\$13,434
City of Asheboro	41	0/2	\$148,316	\$7,806
Town of Franklinville	3	0/0	\$518	\$35
Town of Liberty	10	0/0	\$4,143	\$259
Town of Ramseur	7	0/0	\$8,301	\$437
City of Randleman	9	0/0	\$84,023	\$3,819
Town of Seagrove	11	0/1	\$14,731	\$921
Town of Staley	1	0/0	\$0	\$0
City of Trinity	7	0/0	\$5,454	\$321
Unincorporated Area	127	0/0	\$493,449	\$9,138
RANDOLPH COUNTY TOTAL	224	0/3	\$1,014,173	\$36,169

Source: National Climatic Data Center

Table 5.18 provides detailed thunderstorm and high wind event reports, including date, magnitude, and associated damages for each event.

TABLE 5.18: HISTORICAL THUNDERSTORM/HIGH WIND OCCURRENCES IN RANDOLPH COUNTY

	DATE	TYPE	MAGNITUDE†	DEATHS/INJURIES	PROPERTY DAMAGE*
City of Archdale					
ARCHDALE	4/30/1996	Thunderstorm Wind	0 kts.	0/0	\$0
ARCHDALE	5/20/2000	Thunderstorm Wind	60 kts. E	0/0	\$0
ARCHDALE	5/2/2003	Thunderstorm Wind	60 kts. EG	0/0	\$0
ARCHDALE	6/8/2003	Thunderstorm Wind	50 kts. EG	0/0	\$0
ARCHDALE	7/19/2003	Thunderstorm Wind	50 kts. EG	0/0	\$0
ARCHDALE	5/20/2008	Thunderstorm Wind	50 kts. EG	0/0	\$0

⁹ These thunderstorm events are only inclusive of those reported by the National Climatic Data Center (NCDC) from 1955 through July 2015 and these high wind events are only inclusive of those reported by NCDC from 1996 through July 2015. It is likely that additional thunderstorm and high wind events have occurred in Randolph County. As additional local data becomes available, this hazard profile will be amended.

¹⁰ Adjusted dollar values were calculated based on the average Consumer Price Index for a given calendar year. This index value has been calculated every year since 1913. For 2015, the November 2015 monthly index was used.

SECTION 5: HAZARD PROFILES

	DATE	TYPE	MAGNITUDE†	DEATHS/INJURIES	PROPERTY DAMAGE*
ARCHDALE	6/13/2013	Thunderstorm Wind	60 kts. EG	0/0	\$255,238
ARCHDALE	3/12/2014	Thunderstorm Wind	50 kts. EG	0/0	\$0
City of Asheboro					
Asheboro	7/24/1995	Thunderstorm Wind	0 kts.	0/0	\$78,031
ASHEBORO/RAMSEUR	7/15/1996	Thunderstorm Wind	0 kts.	0/0	\$0
ASHEBORO	7/4/1997	Thunderstorm Wind	50 kts.	0/0	\$37,046
ASHEBORO	6/3/1998	Thunderstorm Wind	50 kts.	0/0	\$0
ASHEBORO	6/30/1998	Thunderstorm Wind	100 kts.	0/0	\$0
ASHEBORO	7/20/1998	Thunderstorm Wind	50 kts.	0/0	\$0
ASHEBORO	5/27/2000	Thunderstorm Wind	50 kts. E	0/0	\$0
ASHEBORO	8/18/2001	Thunderstorm Wind	50 kts. E	0/0	\$0
ASHEBORO MUNI ARPT	8/18/2001	Thunderstorm Wind	60 kts. E	0/0	\$0
ASHEBORO	6/1/2002	Thunderstorm Wind	50 kts. E	0/0	\$0
ASHEBORO	6/26/2002	Thunderstorm Wind	60 kts. E	0/2	\$0
ASHEBORO	2/22/2003	Thunderstorm Wind	70 kts. EG	0/0	\$0
ASHEBORO	11/19/2003	Thunderstorm Wind	55 kts. MG	0/0	\$0
ASHEBORO	1/14/2005	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO	3/8/2005	Thunderstorm Wind	60 kts. EG	0/0	\$0
ASHEBORO	7/28/2005	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO	7/20/2006	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO	8/30/2006	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO	6/11/2007	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO WEST	8/21/2007	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO	8/22/2007	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO	8/22/2007	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO	8/22/2007	Thunderstorm Wind	53 kts. EG	0/0	\$0
NORTH ASHEBORO	7/4/2008	Thunderstorm Wind	50 kts. EG	0/0	\$0
NORTH ASHEBORO	7/4/2008	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO MUNI ARPT	5/20/2008	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO	7/5/2008	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO SOUTH	7/8/2008	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO	7/13/2009	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO	6/12/2010	Thunderstorm Wind	50 kts. EG	0/0	\$10,907
ASHEBORO SOUTH	7/17/2010	Thunderstorm Wind	50 kts. EG	0/0	\$21,814
ASHEBORO SOUTH	6/18/2011	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO SOUTH	2/24/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO HINSHAW ARP	5/14/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO MUNI ARPT	5/14/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO	7/28/2012	Thunderstorm Wind	50 kts. EG	0/0	\$518
ASHEBORO MUNI ARPT	7/28/2013	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO MUNI ARPT	4/25/2014	Thunderstorm Wind	50 kts. EG	0/0	\$0

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	DATE	TYPE	MAGNITUDE†	DEATHS/INJURIES	PROPERTY DAMAGE*
ASHEBORO SOUTH	4/25/2014	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO WEST	4/25/2014	Thunderstorm Wind	50 kts. EG	0/0	\$0
ASHEBORO SOUTH	7/1/2015	Thunderstorm Wind	50 kts. EG	0/0	\$0
Town of Franklinville					
FRANKLINVILLE	5/27/2000	Thunderstorm Wind	50 kts. E	0/0	\$0
FRANKLINVILLE	7/28/2012	Thunderstorm Wind	50 kts. EG	0/0	\$518
FRANKLINVILLE	7/8/2015	Thunderstorm Wind	50 kts. EG	0/0	\$0
Town of Liberty					
LIBERTY	8/14/1999	Thunderstorm Wind	--	0/0	\$0
LIBERTY	2/22/2003	Thunderstorm Wind	60 kts. EG	0/0	\$0
LIBERTY	11/16/2006	Thunderstorm Wind	50 kts. EG	0/0	\$0
LIBERTY	9/28/2009	Thunderstorm Wind	50 kts. EG	0/0	\$0
LIBERTY	2/24/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
LIBERTY	5/9/2012	Thunderstorm Wind	50 kts. EG	0/0	\$1,036
LIBERTY	7/24/2012	Thunderstorm Wind	50 kts. EG	0/0	\$1,036
LIBERTY	7/24/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
LIBERTY	7/24/2012	Thunderstorm Wind	50 kts. EG	0/0	\$2,071
LIBERTY	7/24/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
Town of Ramseur					
ASHEBORO/RAMSEUR	7/15/1996	Thunderstorm Wind	0 kts.	0/0	\$0
RAMSEUR	7/20/1998	Thunderstorm Wind	50 kts.	0/0	\$7,296
RAMSEUR	8/10/2000	Thunderstorm Wind	50 kts. E	0/0	\$0
RAMSEUR	6/2/2006	Thunderstorm Wind	50 kts. EG	0/0	\$0
RAMSEUR	6/12/2006	Thunderstorm Wind	50 kts. EG	0/0	\$0
RAMSEUR	7/24/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
RAMSEUR	6/9/2014	Thunderstorm Wind	50 kts. EG	0/0	\$1,005
City of Randleman					
Randleman	4/16/1993	Thunderstorm Wind	0 kts.	0/0	\$8,230
RANDLEMAN	5/11/1996	Thunderstorm Wind	0 kts.	0/0	\$75,793
RANDLEMAN	7/18/1996	Thunderstorm Wind	0 kts.	0/0	\$0
RANDLEMAN	7/16/1997	Thunderstorm Wind	50 kts.	0/0	\$0
RANDLEMAN	3/11/2000	Thunderstorm Wind	50 kts. E	0/0	\$0
RANDLEMAN	6/15/2000	Thunderstorm Wind	50 kts. E	0/0	\$0
RANDLEMAN	8/18/2000	Thunderstorm Wind	50 kts. E	0/0	\$0
RANDLEMAN	7/22/2002	Thunderstorm Wind	50 kts. E	0/0	\$0
RANDLEMAN	7/4/2008	Thunderstorm Wind	50 kts. EG	0/0	\$0
Town of Seagrove					
SEAGROVE	7/6/1999	Thunderstorm Wind	50 kts.	0/0	\$0
SEAGROVE	9/29/1999	Thunderstorm Wind	50 kts.	0/0	\$0
SEAGROVE	5/21/2000	Thunderstorm Wind	50 kts. E	0/0	\$0
SEAGROVE	4/17/2006	Thunderstorm Wind	50 kts. EG	0/0	\$0
SEAGROVE	5/12/2007	Thunderstorm Wind	50 kts. EG	0/0	\$0
SEAGROVE	7/8/2008	Thunderstorm Wind	50 kts. EG	0/0	\$0
SEAGROVE	7/13/2010	Thunderstorm Wind	50 kts. EG	0/0	\$5,454
SEAGROVE	7/17/2010	Thunderstorm Wind	50 kts. EG	0/1	\$3,272

SECTION 5: HAZARD PROFILES

	DATE	TYPE	MAGNITUDE†	DEATHS/INJURIES	PROPERTY DAMAGE*
SEAGROVE	3/3/2012	Thunderstorm Wind	56 kts. EG	0/0	\$0
SEAGROVE	6/9/2014	Thunderstorm Wind	50 kts. EG	0/0	\$1,005
SEAGROVE	7/13/2015	Thunderstorm Wind	50 kts. EG	0/0	\$5,000
Town of Staley					
STALEY	8/5/2009	Thunderstorm Wind	50 kts. EG	0/0	\$0
City of Trinity					
TRINITY	6/30/1998	Thunderstorm Wind	50 kts.	0/0	\$0
TRINITY	5/22/2001	Thunderstorm Wind	50 kts. E	0/0	\$0
TRINITY	8/2/2008	Thunderstorm Wind	50 kts. EG	0/0	\$0
TRINITY	9/28/2009	Thunderstorm Wind	50 kts. EG	0/0	\$0
TRINITY	6/14/2010	Thunderstorm Wind	50 kts. EG	0/0	\$5,454
TRINITY	2/28/2011	Thunderstorm Wind	50 kts. EG	0/0	\$0
TRINITY	6/9/2014	Thunderstorm Wind	50 kts. EG	0/0	\$0
Unincorporated Area					
RANDOLPH CO.	6/9/1961	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	6/14/1961	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	5/1/1966	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	7/3/1970	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	3/24/1975	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	6/24/1978	Thunderstorm Wind	87 kts.	0/0	\$0
RANDOLPH CO.	7/25/1978	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	7/28/1981	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	7/4/1983	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	5/8/1984	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	7/10/1984	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	6/4/1985	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	6/4/1985	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	6/5/1985	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	6/7/1985	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	6/7/1985	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	7/22/1985	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	8/29/1987	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	8/29/1987	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	5/17/1988	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	6/26/1988	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	6/26/1988	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	5/5/1989	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	5/6/1989	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	6/5/1989	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	6/16/1989	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	6/16/1989	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	4/9/1991	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	4/29/1991	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	3/10/1992	Thunderstorm Wind	57 kts.	0/0	\$0
RANDOLPH CO.	3/19/1992	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	4/24/1992	Thunderstorm Wind	0 kts.	0/0	\$0

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	DATE	TYPE	MAGNITUDE†	DEATHS/INJURIES	PROPERTY DAMAGE*
Sophia	8/27/1994	Thunderstorm Wind	0 kts.	0/0	\$0
RANDOLPH CO.	5/19/1995	Thunderstorm Wind	0 kts.	0/0	\$0
Durham	7/24/1995	Thunderstorm Wind	0 kts.	0/0	\$0
COUNTYWIDE	1/19/1996	Thunderstorm Wind	0 kts.	0/0	\$0
RED CROSS	2/21/1997	Thunderstorm Wind	50 kts.	0/0	\$0
RANDOLPH (ZONE)	2/3/1998	High Wind	35 kts.	0/0	\$0
RANDOLPH (ZONE)	2/16/1998	High Wind	45 kts.	0/0	\$0
ERECT	4/1/2001	Thunderstorm Wind	50 kts. E	0/0	\$0
COUNTYWIDE	5/13/2002	Thunderstorm Wind	50 kts. E	0/0	\$0
COUNTYWIDE	5/13/2002	Thunderstorm Wind	50 kts. E	0/0	\$0
RANDOLPH (ZONE)	3/7/2004	High Wind	50 kts. EG	0/0	\$100,725
NEW HOPE	7/1/2005	Thunderstorm Wind	50 kts. EG	0/0	\$0
SOPHIA	7/7/2005	Thunderstorm Wind	50 kts. EG	0/0	\$0
COLERIDGE	6/12/2006	Thunderstorm Wind	50 kts. EG	0/0	\$0
COLERIDGE	4/15/2007	Thunderstorm Wind	50 kts. EG	0/0	\$0
RANDOLPH (ZONE)	4/16/2007	Strong Wind	42 kts. MG	0/0	\$0
COLERIDGE	7/10/2007	Thunderstorm Wind	50 kts. EG	0/0	\$0
ERECT	7/10/2007	Thunderstorm Wind	50 kts. EG	0/0	\$0
GLENOLA	8/21/2007	Thunderstorm Wind	50 kts. EG	0/0	\$0
LEVEL CROSS	8/21/2007	Thunderstorm Wind	50 kts. EG	0/0	\$0
RANDOLPH (ZONE)	2/10/2008	Strong Wind	43 kts. EG	0/0	\$5,523
RANDOLPH (ZONE)	3/8/2008	Strong Wind	42 kts. EG	0/0	\$0
JACKSONS CREEK	7/4/2008	Thunderstorm Wind	50 kts. EG	0/0	\$0
JACKSONS CREEK	7/4/2008	Thunderstorm Wind	50 kts. EG	0/0	\$0
JACKSONS CREEK	7/4/2008	Thunderstorm Wind	50 kts. EG	0/0	\$0
FARMER	7/9/2008	Thunderstorm Wind	50 kts. EG	0/0	\$0
CEDAR FALLS	8/27/2008	Thunderstorm Wind	50 kts. EG	0/0	\$0
RANDOLPH (ZONE)	1/7/2009	Strong Wind	43 kts. EG	0/0	\$1,109
FARMER	6/11/2009	Thunderstorm Wind	55 kts. EG	0/0	\$0
PARKS XRDS	7/13/2009	Thunderstorm Wind	50 kts. EG	0/0	\$0
PISGAH	7/27/2009	Thunderstorm Wind	50 kts. EG	0/0	\$0
FLINT HILL	8/5/2009	Thunderstorm Wind	50 kts. EG	0/0	\$0
LEVEL CROSS	8/5/2009	Thunderstorm Wind	50 kts. EG	0/0	\$0
AUMAN CORNER	8/11/2009	Thunderstorm Wind	50 kts. EG	0/0	\$5,543
DOGWOOD ACRES	9/28/2009	Thunderstorm Wind	50 kts. EG	0/0	\$0
JACKSONS CREEK	9/28/2009	Thunderstorm Wind	50 kts. EG	0/0	\$0
JACKSONS CREEK	9/28/2009	Thunderstorm Wind	50 kts. EG	0/0	\$0
RANDOLPH (ZONE)	11/11/2009	Strong Wind	35 kts. EG	0/0	\$1,109
RANDOLPH (ZONE)	12/9/2009	Strong Wind	40 kts. EG	0/0	\$1,109
RANDOLPH (ZONE)	2/10/2010	High Wind	50 kts. EG	0/0	\$1,091
AUMAN CORNER	6/14/2010	Thunderstorm Wind	50 kts. EG	0/0	\$0
AUMAN CORNER	6/14/2010	Thunderstorm Wind	50 kts. EG	0/0	\$0
ULAH	6/14/2010	Thunderstorm Wind	50 kts. EG	0/0	\$1,091
ULAH	6/14/2010	Thunderstorm Wind	50 kts. EG	0/0	\$10,907
GLENOLA	12/1/2010	Thunderstorm Wind	50 kts. EG	0/0	\$0
SALEM	4/5/2011	Thunderstorm Wind	50 kts. EG	0/0	\$52,867

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	DATE	TYPE	MAGNITUDE†	DEATHS/INJURIES	PROPERTY DAMAGE*
JACKSONS CREEK	4/26/2011	Thunderstorm Wind	50 kts. EG	0/0	\$0
ARCHDALE JOHNSON ARP	4/28/2011	Thunderstorm Wind	50 kts. EG	0/0	\$10,573
GLENOLA	4/28/2011	Thunderstorm Wind	50 kts. EG	0/0	\$0
LEVEL CROSS	4/28/2011	Thunderstorm Wind	50 kts. EG	0/0	\$0
NEW MARKET	4/28/2011	Thunderstorm Wind	50 kts. EG	0/0	\$0
NEW MARKET	4/28/2011	Thunderstorm Wind	50 kts. EG	0/0	\$0
RANDOLPH (ZONE)	4/28/2011	Strong Wind	49 kts. EG	0/0	\$1,057
RANDOLPH (ZONE)	4/28/2011	Strong Wind	49 kts. EG	0/0	\$529
RANDOLPH (ZONE)	4/28/2011	Strong Wind	49 kts. EG	0/0	\$529
DOGWOOD ACRES	5/3/2011	Thunderstorm Wind	50 kts. EG	0/0	\$0
AUMAN CORNER	9/27/2011	Thunderstorm Wind	50 kts. EG	0/0	\$0
FARMER	2/23/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
ERECT	2/24/2012	Thunderstorm Wind	50 kts. EG	0/0	\$518
ULAH	3/24/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
MC LANETON	5/9/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
REDCROSS	5/9/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
DOGWOOD ACRES	5/14/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
RANDOLPH (ZONE)	5/14/2012	Strong Wind	49 kts. EG	0/0	\$10,359
FARMER	5/22/2012	Thunderstorm Wind	50 kts. EG	0/0	\$5,180
WHYNOT	5/22/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
ERECT	7/24/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
GLENOLA	7/24/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
JULIAN KECKS FLD ARP	7/24/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
LINEBERRY	7/24/2012	Thunderstorm Wind	50 kts. EG	0/0	\$3,108
MC LANETON	7/24/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
MC LANETON	7/24/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
MC LANETON	7/24/2012	Thunderstorm Wind	50 kts. EG	0/0	\$2,071
MC LANETON	7/24/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
RAMSEUR YORKS FLD AR	7/24/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
WHITES CHAPEL	7/24/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
WHITES CHAPEL	7/27/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
PISGAH	8/8/2012	Thunderstorm Wind	50 kts. EG	0/0	\$0
RANDOLPH (ZONE)	1/17/2013	Strong Wind	30 kts. EG	0/0	\$255,238
RANDOLPH (ZONE)	1/30/2013	Strong Wind	40 kts. EG	0/0	\$1,021
AUMAN CORNER	4/12/2013	Thunderstorm Wind	50 kts. EG	0/0	\$7,657
REDCROSS	6/10/2013	Thunderstorm Wind	50 kts. EG	0/0	\$0
NEW HOPE	7/28/2013	Thunderstorm Wind	50 kts. EG	0/0	\$0
JACKSONS CREEK	1/11/2014	Thunderstorm Wind	50 kts. EG	0/0	\$1,507
FARMER	6/9/2014	Thunderstorm Wind	50 kts. EG	0/0	\$3,014
SALEM	6/9/2014	Thunderstorm Wind	50 kts. EG	0/0	\$2,009
SALEM	9/2/2014	Thunderstorm Wind	50 kts. EG	0/0	\$0
ULAH	9/2/2014	Thunderstorm Wind	50 kts. EG	0/0	\$0
NEW HOPE	9/16/2014	Thunderstorm Wind	50 kts. EG	0/0	\$1,005
SALEM	9/16/2014	Thunderstorm Wind	50 kts. EG	0/0	\$0

	DATE	TYPE	MAGNITUDE†	DEATHS/INJURIES	PROPERTY DAMAGE*
ULAH	6/1/2015	Thunderstorm Wind	50 kts. EG	0/0	\$0
GLENOLA	6/20/2015	Thunderstorm Wind	50 kts. EG	0/0	\$5,000
WHITES CHAPEL	6/26/2015	Thunderstorm Wind	50 kts. EG	0/0	\$2,000
CHEEKS	6/30/2015	Thunderstorm Wind	50 kts. EG	0/0	\$0
JACKSONS CREEK	7/13/2015	Thunderstorm Wind	50 kts. EG	0/0	\$0

*Property damage is reported in 2015 dollars; All damage may not have been reported.

†E = estimated; EG = estimated gust; ES = estimated sustained; MG = measured gust; MS = measured sustained

Source: National Climatic Data Center

5.8.4 Probability of Future Occurrences

Given the high number of previous events, it is certain that thunderstorm/high wind events, including, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for future thunderstorm events for the entire County.

5.9 TORNADO

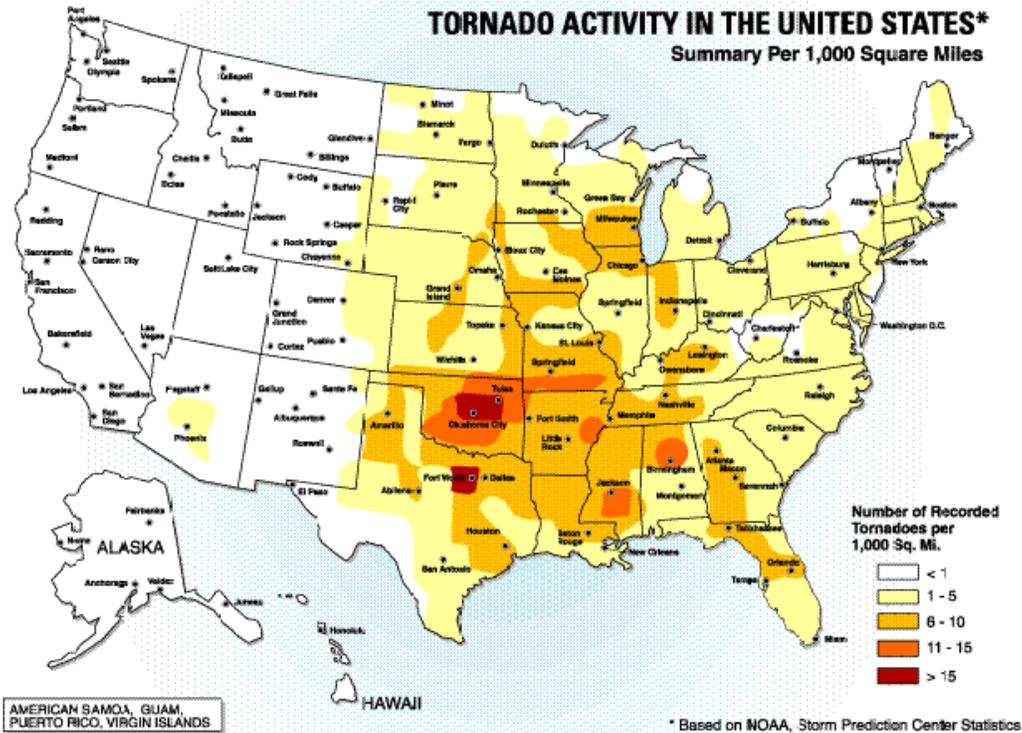
5.9.1 Background

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are most often generated by thunderstorm activity (but sometimes result from hurricanes and other tropical storms) when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The damage caused by a tornado is a result of the high wind velocity and wind-blown debris, also accompanied by lightning or large hail. According to the National Weather Service, tornado wind speeds normally range from forty miles per hour to more than three-hundred miles per hour. The most violent tornadoes have rotating winds of 250 miles per hour or more and are capable of causing extreme destruction and turning normally harmless objects into deadly missiles.

Each year, an average of over eight-hundred tornadoes is reported nationwide, resulting in an average of eighty deaths and 1,500 injuries.¹¹ According to the NOAA Storm Prediction Center (SPC), the highest concentration of tornadoes in the United States has been in Oklahoma, Texas, Kansas, and Florida respectively. Although the Great Plains region of the Central United States does favor the development of the largest and most dangerous tornadoes (earning the designation of “tornado alley”), Florida experiences the greatest number of tornadoes per square mile of all U.S. states (SPC, 2002). **Figure 5.6** shows tornado activity in the United States based on the number of recorded tornadoes per 1,000 square miles.

¹¹ NOAA, 2009.

FIGURE 5.6: TORNADO ACTIVITY IN THE UNITED STATES



Source: Federal Emergency Management Agency, *Taking Shelter from the Storm: Building a Safe Room inside Your House*, 1998, <http://www.fema.gov/pdf/library/ism2.pdf>

Tornadoes are more likely to occur during the months of March through May and are most likely to form in the late afternoon and early evening. Most tornadoes are a few dozen yards wide and touch down briefly, but even small short-lived tornadoes can inflict tremendous damage. Highly destructive tornadoes may carve out a path over a mile wide and several miles long.

The destruction caused by tornadoes ranges from light to inconceivable depending on the intensity, size, and duration of the storm. Typically, tornadoes cause the greatest damage to structures of light construction, including residential dwellings (particularly mobile homes). Tornadic magnitude is reported according to the Fujita and Enhanced Fujita Scales. Tornado magnitudes prior to 2005 were determined using the traditional version of the Fujita Scale (**Table 5.19**).

TABLE 5.19: THE FUJITA SCALE (EFFECTIVE PRIOR TO 2005)

F-SCALE NUMBER	INTENSITY	WIND SPEED	TYPE OF DAMAGE DONE
F0	GALE TORNADO	40–72 MPH	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
F1	MODERATE TORNADO	73–112 MPH	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	SIGNIFICANT TORNADO	113–157 MPH	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	SEVERE TORNADO	158–206 MPH	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
F4	DEVASTATING TORNADO	207–260 MPH	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	INCREDIBLE TORNADO	261–318 MPH	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.
F6	INCONCEIVABLE TORNADO	319–379 MPH	These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies.

Source: National Weather Service, <http://www.spc.noaa.gov/faq/tornado/f-scale.html>

Tornado magnitudes that were determined in 2005 and later were determined using the Enhanced Fujita Scale (**Table 5.20**).

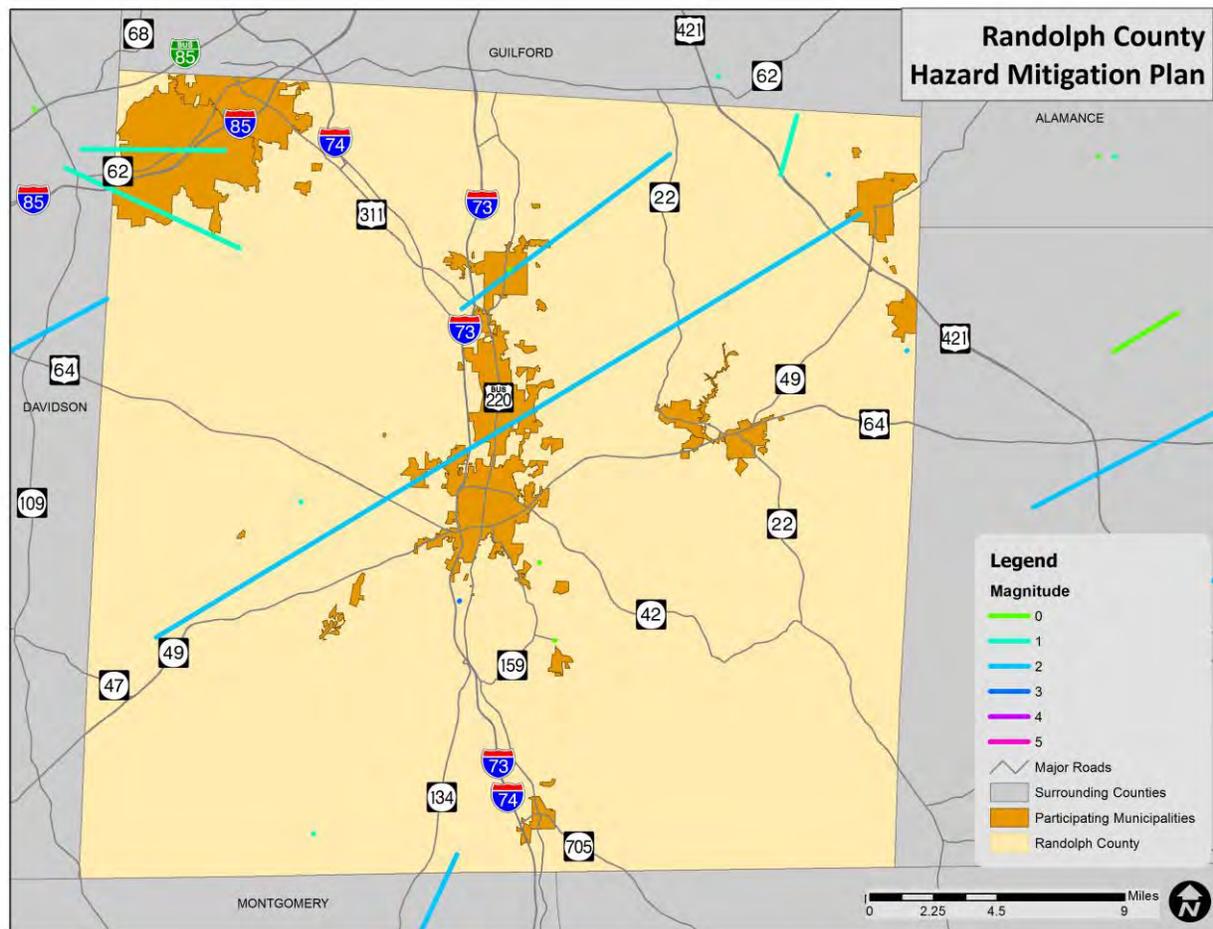
TABLE 5.20: THE ENHANCED FUJITA SCALE (EFFECTIVE 2005 AND LATER)

EF-SCALE NUMBER	INTENSITY PHRASE	3 SECOND GUST (MPH)	TYPE OF DAMAGE DONE
EF0	GALE	65–85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
EF1	MODERATE	86–110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
EF2	SIGNIFICANT	111–135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
EF3	SEVERE	136–165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
EF4	DEVASTATING	166–200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
EF5	INCREDIBLE	Over 200	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.

Source: National Weather Service, <http://www.spc.noaa.gov/faq/tornado/ef-scale.html>

5.9.2 Location and Spatial Extent

Tornadoes occur throughout the State of North Carolina, and thus in Randolph County. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random and it is extremely difficult to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that Randolph County is uniformly exposed to this hazard. **Figure 5.7** shows tornado track data for many of the major tornado events that have impacted the County. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

FIGURE 5.7: HISTORICAL TORNADO TRACKS IN RANDOLPH COUNTY

Source: National Weather Service Storm Prediction Center

5.9.3 Historical Occurrences

According to the National Climatic Data Center, there have been a total of fifteen recorded tornado events in Randolph County since 1954 (**Table 5.21**), resulting in \$11.6 million (2015 dollars) in property damages.^{12 13}

TABLE 5.21: SUMMARY OF TORNADO OCCURRENCES IN RANDOLPH COUNTY

LOCATION	NUMBER OF OCCURRENCES	DEATHS/INJURIES	PROPERTY DAMAGE (2015)	ANNUALIZED PROPERTY LOSS
City of Archdale	2	0/0	\$159,216	\$2,610
City of Asheboro	2	0/0	\$4,365,602	\$71,567

¹² These tornado events are only inclusive of those reported by the National Climatic Data Center (NCDC) from 1950 through July 2015. It is likely that additional tornadoes have occurred in Randolph County. As additional local data becomes available, this hazard profile will be amended.

¹³ Adjusted dollar values were calculated based on the average Consumer Price Index for a given calendar year. This index value has been calculated every year since 1913. For 2015, the November 2015 monthly index was used.

LOCATION	NUMBER OF OCCURRENCES	DEATHS/INJURIES	PROPERTY DAMAGE (2015)	ANNUALIZED PROPERTY LOSS
Town of Franklinville	0	0/0	\$0	\$0
Town of Liberty	0*	0/0	\$0	\$0
Town of Ramseur	0	0/0	\$0	\$0
City of Randleman	2	0/0	\$983,389	\$16,121
Town of Seagrove	0	0/0	\$0	\$0
Town of Staley	0	0/0	\$0	\$0
City of Trinity	2	0/1	\$2,444,373	\$40,071
Unincorporated Area	7	1/5	\$3,617,300	\$59,300
RANDOLPH COUNTY TOTAL	15	1/6	\$11,569,880	\$189,670

**The Town of Liberty was impacted by the 1991 tornado that also impacted Asheboro. This tornado is only counted once in the total for the county and it should be noted that damages are only recorded under the Asheboro row. However, damages recorded from this event occurred in both communities.*

Source: National Climatic Data Center

In addition, one death and six injuries were reported (**Table 5.22**). The magnitude of these tornadoes ranged from F0 to F3 and EF0 to EF1 in intensity, although an EF5 event is possible. It is important to note that only tornadoes that have been reported are factored into this risk assessment. It is likely that a high number of occurrences have gone unreported over the past 65 years.

TABLE 5.22: HISTORICAL TORNADO OCCURRENCES IN RANDOLPH COUNTY

	DATE	MAGNITUDE	DEATHS/INJURIES	PROPERTY DAMAGE*	DETAILS
City of Archdale					
Archdale	8/18/1970	F1	0/0	\$153,246	--
Archdale	3/8/1983	F0	0/0	\$5,970	A small tornado touched down near Trinity where it uprooted trees, destroyed an outbuilding and damaged two mobile homes.
City of Asheboro					
RANDOLPH CO.	3/29/1991	F2	0/0	\$4,365,602	A small tornado touched down near Farmer in southwest Randolph County snapping off and uprooting trees. No structures were reported damaged. The tornado moved northeasterly and touched down again in the northern part of the City of Asheboro east of U.S. Highway 220. The tornado reached its maximum intensity in the City where it damaged or destroyed sixty-eight residences. Unbelievable, there were no serious injuries or fatalities. The tornado weakened and continued to produce intermittent damage to trees on a path to Liberty where it

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	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE*	DETAILS
					touched down for the last time. Damage estimates were near \$600,000.
Asheboro	5/11/1995	F0	0/0	\$0	A small tornado was sighted by an emergency rescue team and the public. Trees and power lines were blown down.
Town of Franklinville					
<i>None Reported</i>	--	--	--	--	--
Town of Liberty					
<i>None Reported</i>	--	--	--	--	--
Town of Ramseur					
<i>None Reported</i>	--	--	--	--	--
City of Randleman					
Randleman	10/1/1977	F2	0/0	\$981,180	A tornado touched down near US Highway 311 and across southern Randleman and on northwest to Lineberry south of Climax. Total damage to buildings and poultry \$100,000.
Randleman	8/27/2008	EFO	0/0	\$2,209	A weak tornado briefly touched down along Applewood Road. Most of the damage was confined to two outbuildings and numerous trees in the area. Moderately sized cement yard statures were also tossed along with the under the skirting of a manufactured home. A light metal carport was thrown well across Applewood Road.
Town of Seagrove					
<i>None Reported</i>	--	--	--	--	--
Town of Staley					
<i>None Reported</i>	--	--	--	--	--
City of Trinity					
Trinity	5/28/1973	F1	0/0	\$1,339,178	Thomasville to Trinity area mobile home, trees, and property damage with some local flooding.
Trinity	3/24/1975	F1	0/1	\$1,105,195	--
Unincorporated Area					
RANDOLPH CO.	8/17/1954	F2	0/0	\$2,210,390	--
RANDOLPH CO.	10/7/1965	F3	1/4	\$188,760	--
RANDOLPH CO.	4/18/1969	F2	0/1	\$162,015	--
RANDOLPH CO.	6/16/1989	F1	0/0	\$479,512	A small tornado touched down briefly about five miles west of Asheboro just north of U.S. Highway 64. It destroyed a mobile home and damaged a barn. A large number of trees were blown down. A small

	DATE	MAGNITUDE	DEATHS/ INJURIES	PROPERTY DAMAGE*	DETAILS
					tornado touched down briefly in a rural part of southwest Randolph County. Most of the damage was to trees but it did cut through the middle part of a very long metal building.
RANDOLPH CO.	6/16/1989	F1	0/0	\$47,951	A small tornado touched down briefly about five miles west of Asheboro just north of U.S. Highway 64. It destroyed a mobile home and damaged a barn. A large number of trees were blown down. A small tornado touched down briefly in a rural part of southwest Randolph County.
JULIAN	5/7/1998	F1	0/0	\$0	--
FULLERS	11/16/2011	EF1	0/0	\$528,672	The tornado crossed into western Randolph County at approximately 6:23 pm EST. Numerous homes in the Welborne Ridge Court subdivision were damaged. Damage here was mostly to roofs and siding. A travel trailer inside the mobile home park was flipped over and a nearby pickup truck was blown between fifty and seventy-five feet. A wooden outbuilding was also destroyed. Damage within the subdivision was consistent with EF-1 tornado intensity. The last observed tornado damage and end point of the tornado track was to a barn on Finch Farm Road. Damage to the barn was consistent with that of the nearby Welborne Ridge Court Subdivision. In total, more than a dozen structures were damaged in Randolph County.

*Property damage is reported in 2015 dollars; All damage may not have been reported.

Source: National Climatic Data Center

5.9.4 Probability of Future Occurrences

According to historical information, tornado events are not an annual occurrence for the County. However, given the County's location in the southeastern United States and history of tornadoes, an occurrence is possible every few years. While the majority of the reported tornado events are small in terms of size, intensity, and duration, they do pose a significant threat should Randolph County experience a direct tornado strike. The probability of future tornado occurrences affecting Randolph County is likely (between 10 and 100 percent annual probability).

5.10 WINTER STORM AND FREEZE

5.10.1 Background

A winter storm can range from a moderate snow over a period of a few hours to blizzard conditions with blinding wind-driven snow that lasts for several days. Events may include snow, sleet, freezing rain or a mix of these wintry forms of precipitation. Some winter storms might be large enough to affect several states, while others might affect only localized areas. Occasionally, heavy snow might also cause significant property damages, such as roof collapses on older buildings. All winter storm events have the potential to present dangerous conditions to the affected area.

Snow Storms

Larger snowfalls pose a greater risk, reducing visibility due to blowing snow and making driving conditions treacherous. A heavy snow event is defined by the National Weather Service as an accumulation of four or more inches in twelve hours or less. A blizzard is the most severe form of winter storm. It combines low temperatures, heavy snow, and winds of thirty-five miles per hour or more, which reduces visibility to a quarter mile or less for at least three hours. Winter storms are often accompanied by sleet, freezing rain, or an ice storm. Such freeze events are particularly hazardous as they create treacherous surfaces.

Ice Storms

Ice storms, which are much more common in Randolph County than snow storms, are defined as storms with significant amounts of freezing rain and are a result of cold air damming (CAD). CAD is a shallow, surface-based layer of relatively cold, stably-stratified air entrenched against the eastern slopes of the Appalachian Mountains. With warmer air above, falling precipitation in the form of snow melts, then becomes either super-cooled (liquid below the melting point of water) or re-freezes. In the former case, super-cooled droplets can freeze on impact (freezing rain), while in the latter case, the re-frozen water particles are ice pellets (or sleet). Sleet is defined as partially frozen raindrops or refrozen snowflakes that form into small ice pellets before reaching the ground. They typically bounce when they hit the ground and do not stick to the surface. However, it does accumulate like snow, posing similar problems and has the potential to accumulate into a layer of ice on surfaces. Freezing rain, conversely, usually sticks to the ground, creating a sheet of ice on the roadways and other surfaces.

All of the winter storm elements (snow, sleet, ice, etc.) have the potential to cause significant hazards to a community. Even small accumulations can down power or communication lines and tree limbs, impact services, and create hazardous driving conditions for several days.

5.10.2 Location and Spatial Extent

Nearly the entire continental United States is susceptible to winter storm events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. Randolph County is accustomed to severe winter weather conditions and often receives winter weather during the winter months. Given the atmospheric nature of the hazard, the entire County has uniform exposure to a winter storm.

5.10.3 Historical Occurrences

Winter weather has resulted in five disaster declarations in Randolph County. This includes the Blizzard of 1996, one subsequent 1996 winter storm, a severe winter storm in 2000, an ice storm in 2002 and a severe winter storm in 2014.¹⁴ The National Climatic Data Center does not report winter storm events at the municipal level, however, there have been a total of 53 recorded winter storm events in Randolph County since 1996 (**Table 5.23**).¹⁵ These events resulted in around \$3.6 million (2015 dollars) in damages.¹⁶ Detailed information on the recorded winter storm events can be found in **Table 5.24**.

TABLE 5.23: SUMMARY OF WINTER STORM EVENTS IN RANDOLPH COUNTY

LOCATION	NUMBER OF OCCURRENCES	DEATHS/INJURIES	PROPERTY DAMAGE (2015)	ANNUALIZED PROPERTY LOSS
Randolph County	53	0/0	\$3,631,636	\$191,139

Source: National Climatic Data Center

TABLE 5.24: HISTORICAL WINTER STORM EVENTS IN RANDOLPH COUNTY

DATE	TYPE OF STORM	DEATHS/INJURIES	PROPERTY DAMAGE*
2/13/1997	Winter Storm	0/0	\$0
12/29/1997	Winter Storm	0/0	\$0
1/18/2000	Winter Storm	0/0	\$0
1/20/2000	Winter Storm	0/0	\$0
1/22/2000	Winter Storm	0/0	\$0
1/24/2000	Winter Storm	0/0	\$0
1/28/2000	Winter Storm	0/0	\$0
1/3/2002	Winter Storm	0/0	\$0
12/4/2002	Winter Storm	0/0	\$0
2/16/2003	Winter Storm	0/0	\$0
2/27/2003	Winter Storm	0/0	\$0
1/26/2004	Winter Storm	0/0	\$0
2/15/2004	Winter Storm	0/0	\$0
2/26/2004	Winter Storm	0/0	\$0
1/30/2005	Winter Storm	0/0	\$0
2/1/2007	Winter Storm	0/0	\$0
1/20/2009	Winter Storm	0/0	\$0
3/1/2009	Winter Storm	0/0	\$0
1/29/2010	Winter Storm	0/0	\$0
3/2/2010	Winter Storm	0/0	\$0
12/25/2010	Winter Storm	0/0	\$0
12/25/2010	Winter Storm	0/0	\$0

¹⁴ A complete listing of historical disaster declarations can be found in Section 4: *Hazard Profiles*.

¹⁵ These ice and winter storm events are only inclusive of those reported by the National Climatic Data Center (NCDC) from 1996 through July 2015. It is likely that additional winter storm conditions have affected Randolph County.

¹⁶ Adjusted dollar values were calculated based on the average Consumer Price Index for a given calendar year. This index value has been calculated every year since 1913. For 2015, the November 2015 monthly index was used.

DATE	TYPE OF STORM	DEATHS/ INJURIES	PROPERTY DAMAGE*
1/10/2011	Winter Storm	0/0	\$0
1/17/2013	Winter Storm	0/0	\$0
2/12/2014	Winter Storm	0/0	\$0
2/16/2015	Winter Storm	0/0	\$0
2/25/2015	Winter Storm	0/0	\$500,000
1/11/1996	Ice Storm	0/0	\$0
2/2/1996	Ice Storm	0/0	\$0
12/23/1998	Ice Storm	0/0	\$0
1/2/1999	Ice Storm	0/0	\$0
3/6/2014	Ice Storm	0/0	\$3,114,430
12/13/2003	Winter Weather	0/0	\$0
12/15/2005	Winter Weather	0/0	\$0
1/18/2007	Winter Weather	0/0	\$0
1/21/2007	Winter Weather	0/0	\$0
12/7/2007	Winter Weather	0/0	\$17,206
1/17/2008	Winter Weather	0/0	\$0
1/19/2008	Winter Weather	0/0	\$0
12/30/2009	Winter Weather	0/0	\$0
2/12/2010	Winter Weather	0/0	\$0
12/4/2010	Winter Weather	0/0	\$0
12/16/2010	Winter Weather	0/0	\$0
12/18/2010	Winter Weather	0/0	\$0
1/21/2014	Winter Weather	0/0	\$0
1/28/2014	Winter Weather	0/0	\$0
2/11/2014	Winter Weather	0/0	\$0
3/17/2014	Winter Weather	0/0	\$0
1/13/2015	Winter Weather	0/0	\$0
2/24/2015	Winter Weather	0/0	\$0

*Property damage is reported in 2015 dollars; All damage may not have been reported.

Source: National Climatic Data Center

There have been several severe winter weather events in Randolph County. The following describes two of the major events (one snow and one ice event) and associated impacts on the County. Similar impacts can be expected with most severe winter weather.

1996 Winter Storm – January 6-8, 1996

This storm left two feet of snow in some areas and several thousand citizens without power for up to nine days. Although shelters were opened, some roads were impassible for many days. This event caused considerable disruption to business, industry, schools, and government services.

2002 Ice Storm – December 4-5, 2002

An ice storm produced up to an inch of freezing rain in central North Carolina impacting forty counties. A total of twenty-four people were killed, and as many as 1.8 million people were left without electricity. Additionally, property damage was estimated at almost \$100 million. New records were also set for traffic accidents and school closing durations. The scale of destruction was comparable to that of

hurricanes that have impacted the State, such as Hurricane Fran in 1996. The storm cost the State \$97.2 million in response and recovery.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could lead to fires or an accumulation of toxic fumes.

5.10.4 Probability of Future Occurrences

Winter storm events will remain a regular occurrence in Randolph County due to its location in the central part of the State. According to historical information, Randolph County generally experiences several winter storm events each year. Therefore, the probability of future occurrences is highly likely (100 percent annual probability).

Geologic Hazards

5.11 EARTHQUAKE

5.11.1 Background

An earthquake is movement or trembling of the ground produced by sudden displacement of rock in the Earth's crust. Earthquakes can affect hundreds of thousands of square miles, cause damage to property measured in the tens of billions of dollars, result in loss of life and injury to hundreds of thousands of persons, and disrupt the social and economic functioning of the affected area.

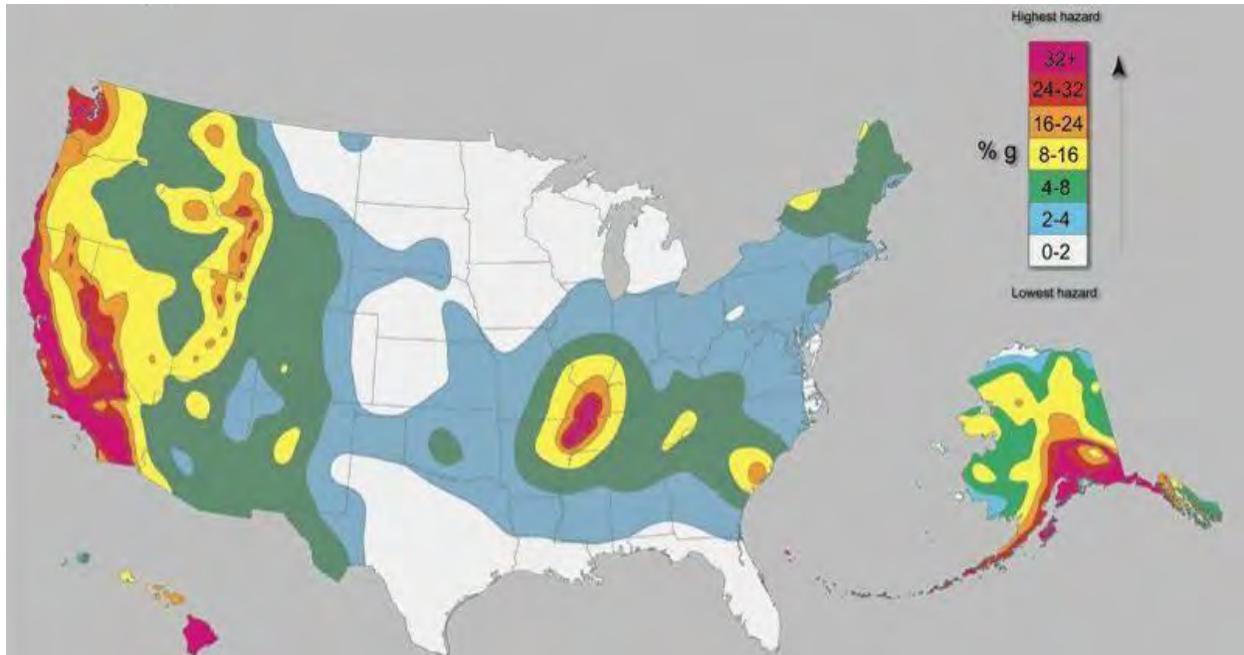
Most property damage and earthquake-related deaths are caused by the failure and collapse of structures due to ground shaking. The level of damage depends upon the amplitude and duration of the shaking, which are directly related to the earthquake size, distance from the fault, site, and regional geology. Other damaging earthquake effects include landslides, the down-slope movement of soil and rock (mountain regions and along hillsides), and liquefaction, in which ground soil loses the ability to resist shear and flows much like quick sand. In the case of liquefaction, anything relying on the substrata for support can shift, tilt, rupture, or collapse.

Most earthquakes are caused by the release of stresses accumulated as a result of the rupture of rocks along opposing fault planes in the Earth's outer crust. These fault planes are typically found along borders of the Earth's ten tectonic plates. The areas of greatest tectonic instability occur at the perimeters of the slowly moving plates, as these locations are subjected to the greatest strains from plates traveling in opposite directions and at different speeds. Deformation along plate boundaries causes strain in the rock and the consequent buildup of stored energy. When the built-up stress exceeds the rock's strength, a rupture occurs. The rock on both sides of the fracture is snapped, releasing the stored energy and producing seismic waves, generating an earthquake.

The greatest earthquake threat in the United States is along tectonic plate boundaries and seismic fault lines located in the central and western states; however, the Eastern United State does face moderate

risk to less frequent, less intense earthquake events. **Figure 5.8** shows the relative seismic risk for the United States.

FIGURE 5.8: UNITED STATES EARTHQUAKE HAZARD MAP



Source: United States Geological Survey, <http://earthquake.usgs.gov/hazards/products/conterminous/>

Earthquakes are measured in terms of their magnitude and intensity. Magnitude is measured using the Richter Scale, an open-ended logarithmic scale that describes the energy release of an earthquake through a measure of shock wave amplitude (**Table 5.25**).

TABLE 5.25: RICHTER SCALE

RICHTER MAGNITUDES	EARTHQUAKE EFFECTS
< 3.5	Generally not felt, but recorded.
3.5 - 5.4	Often felt, but rarely causes damage.
5.4 - 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1 - 6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0 - 7.9	Major earthquake. Can cause serious damage over larger areas.
8 or >	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

Source: Federal Emergency Management Agency, <http://www.fema.gov/earthquake>

Each unit increase in magnitude on the Richter Scale corresponds to a ten-fold increase in wave amplitude, or a thirty-two-fold increase in energy. Intensity is most commonly measured using the Modified Mercalli Intensity (MMI) Scale based on direct and indirect measurements of seismic effects. The scale levels are typically described using roman numerals, ranging from “I” corresponding to imperceptible (instrumental) events to “XII” for catastrophic (total destruction). A detailed description of

the Modified Mercalli Intensity Scale of earthquake intensity and its correspondence to the Richter Scale is given in **Table 5.26**.

TABLE 5.26: MODIFIED MERCALLI INTENSITY SCALE FOR EARTHQUAKES

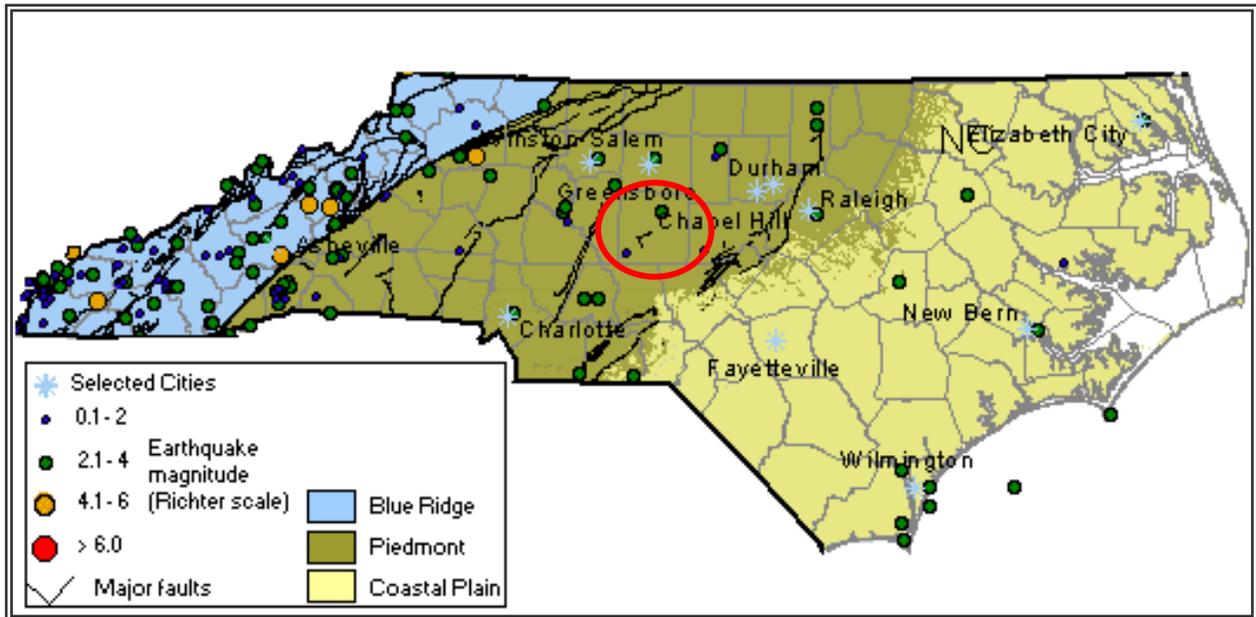
SCALE	INTENSITY	DESCRIPTION OF EFFECTS	CORRESPONDING RICHTER SCALE MAGNITUDE
I	INSTRUMENTAL	Detected only on seismographs.	
II	FEEBLE	Some people feel it.	< 4.2
III	SLIGHT	Felt by people resting; like a truck rumbling by.	
IV	MODERATE	Felt by people walking.	
V	SLIGHTLY STRONG	Sleepers awake; church bells ring.	< 4.8
VI	STRONG	Trees sway; suspended objects swing, objects fall off shelves.	< 5.4
VII	VERY STRONG	Mild alarm; walls crack; plaster falls.	< 6.1
VIII	DESTRUCTIVE	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged.	
IX	RUINOUS	Some houses collapse; ground cracks; pipes break open.	< 6.9
X	DISASTROUS	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread.	< 7.3
XI	VERY DISASTROUS	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards.	< 8.1
XII	CATASTROPHIC	Total destruction; trees fall; ground rises and falls in waves.	> 8.1

Source: Federal Emergency Management Agency, <http://www.fema.gov/earthquake>

5.11.2 Location and Spatial Extent

Approximately two-thirds of North Carolina is subject to earthquakes, with the western and southeast region most vulnerable to a very damaging earthquake. In terms of major faults, the State is primarily affected by the Charleston Fault in South Carolina and New Madrid Fault in Tennessee. Both of these faults have generated earthquakes measuring greater than 8 on the Richter Scale during the last 200 years. In addition, there are several smaller fault lines throughout North Carolina and neighboring states such as the Eastern Tennessee and Virginia seismic zones. These zones have produced smaller earthquakes, but are more likely to have an impact on Randolph County. **Figure 5.9** is a map showing geological and seismic information for North Carolina including some fault lines and historic event epicenters.

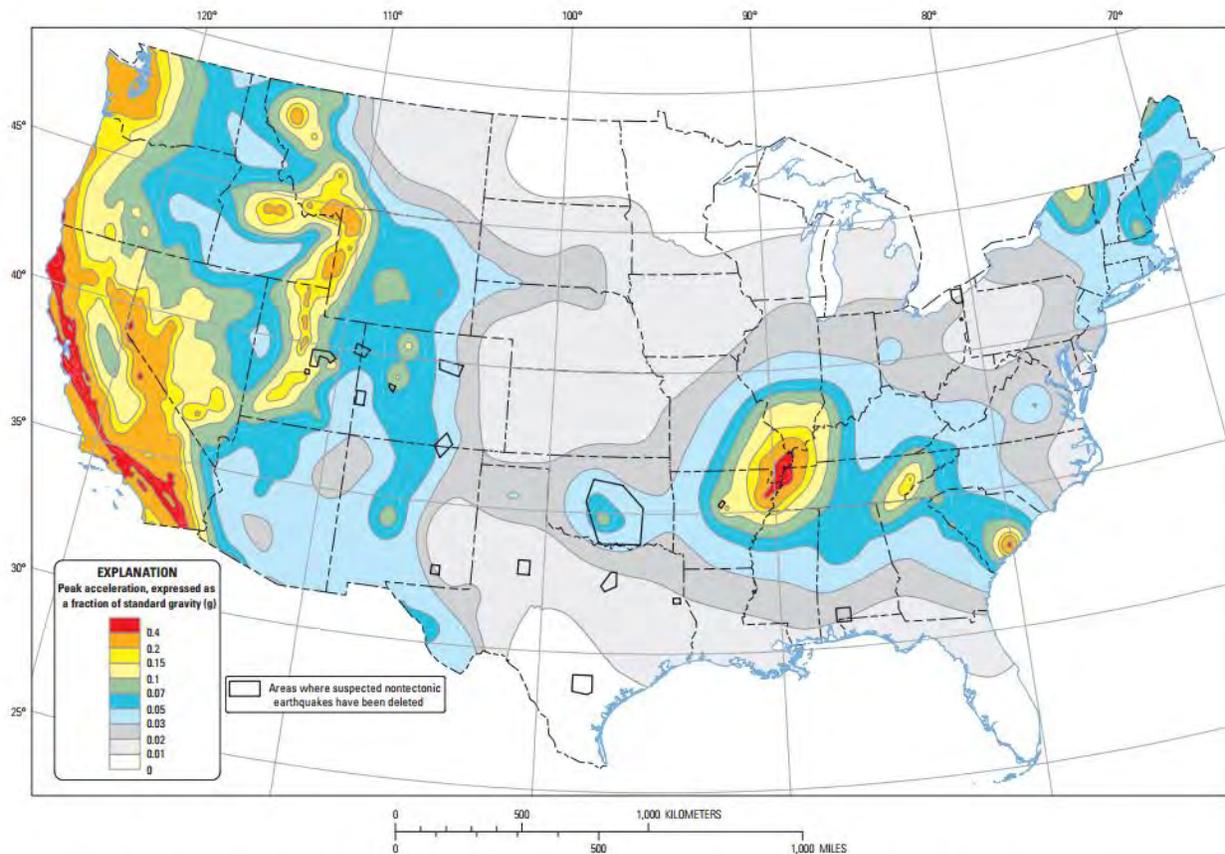
FIGURE 5.9: GEOLOGICAL AND SEISMIC INFORMATION FOR NORTH CAROLINA



Source: North Carolina Geological Survey, <http://geodata.lib.ncsu.edu/fedgov/noaa/commvuln/htm/hother.htm>

Figure 5.10 shows the intensity level associated with Randolph County, based on the national USGS map of peak ground acceleration with 10 percent probability of exceedance in fifty years. Peak ground acceleration is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in fifty years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Randolph County lies within an approximate zone of 0.02 to 0.05 peak acceleration. This indicates that the County as a whole exists within an area of low to moderate seismic risk.

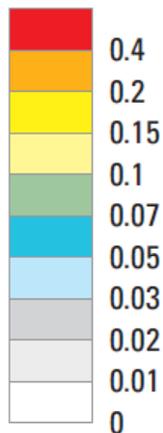
FIGURE 5.10: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS



Ten-percent probability of exceedance in 50 years map of peak ground acceleration

EXPLANATION

Peak acceleration, expressed as a fraction of standard gravity (g)



Areas where suspected nontectonic earthquakes have been deleted

Source: United States Geological Survey, 2014, <http://earthquake.usgs.gov/hazards/products/conterminous/index.php>

5.11.3 Historical Occurrences

At least five earthquakes are known to have affected Randolph County since 1886. The strongest of these measured a VII on the Modified Mercalli Intensity (MMI) scale and was likely an aftershock felt from the Charleston Earthquake of 1886. **Table 5.27** provides a summary of earthquake events reported by the National Geophysical Data Center between 1638 and 1985.

TABLE 5.27: SUMMARY OF SEISMIC ACTIVITY IN RANDOLPH COUNTY

LOCATION	NUMBER OF OCCURRENCES	GREATEST MMI REPORTED	RICHTER SCALE EQUIVALENT
City of Archdale	0	--	--
City of Asheboro	1	VII	< 6.1
Town of Franklinville	2	IV	< 4.8
Town of Liberty	0	--	--
Town of Ramseur	0	--	--
City of Randleman	0	--	--
Town of Seagrove	0	--	--
Town of Staley	1	III	< 4.8
City of Trinity	0	--	--
Unincorporated Area	1	IV	< 4.8
RANDOLPH COUNTY TOTAL	5	VII	< 6.1

Source: National Geophysical Data Center

Table 5.28 presents a detailed occurrence of each event including the date, distance from the epicenter, magnitude, and Modified Mercalli Intensity (if known).¹⁷

TABLE 5.28: SIGNIFICANT SEISMIC EVENTS IN RANDOLPH COUNTY (1638-1985)

LOCATION	DATE	EPICENTRAL DISTANCE	MAGNITUDE	MMI
City of Archdale				
None Reported	--	--	--	--
City of Asheboro				
Asheboro	9/1/1886	312.0 km	Unknown	VII
Town of Franklinville				
Franklinville	11/25/1898	Unknown	Unknown	IV
Franklinville	3/4/1981	5.0 km	2.8	III
Town of Liberty				
None Reported	--	--	--	--
Town of Ramseur				
None Reported	--	--	--	--

¹⁷ Due to reporting mechanisms, not all earthquakes events were recorded during this time. Furthermore, some are missing data, such as the epicenter location, due to a lack of widely used technology. In these instances, a value of "unknown" is reported.

LOCATION	DATE	EPICENTRAL DISTANCE	MAGNITUDE	MMI
City of Randleman				
None Reported	--	--	--	--
Town of Seagrove				
None Reported	--	--	--	--
Town of Staley				
Staley	11/20/1969	220.0 km	4.3	III
City of Trinity				
None Reported	--	--	--	--
Unincorporated Area				
Cedar Falls	3/4/1981	--	2.8	IV

Source: National Geophysical Data Center

In addition to those earthquakes specifically affecting Randolph County, a list of earthquakes that have caused damage throughout North Carolina is presented below in **Table 5.29**.

TABLE 5.29: EARTHQUAKES WHICH HAVE CAUSED DAMAGE IN NORTH CAROLINA

DATE	LOCATION	RICHTER SCALE (MAGNITUDE)	MMI (INTENSITY)	MMI IN NORTH CAROLINA
12/16/1811 - 1	NE Arkansas	8.5	XI	VI
12/16/1811 - 2	NE Arkansas	8.0	X	VI
12/18/1811 - 3	NE Arkansas	8.0	X	VI
01/23/1812	New Madrid, MO	8.4	XI	VI
02/07/1812	New Madrid, MO	8.7	XII	VI
04/29/1852	Wytheville, VA	5.0	VI	VI
08/31/1861	Wilkesboro, NC	5.1	VII	VII
12/23/1875	Central Virginia	5.0	VII	VI
08/31/1886	Charleston, SC	7.3	X	VII
05/31/1897	Giles County, VA	5.8	VIII	VI
01/01/1913	Union County, SC	4.8	VII	VI
02/21/1916	Asheville, NC	5.5	VII	VII
07/08/1926	Mitchell County, NC	5.2	VII	VII
11/03/1928	Newport, TN	4.5	VI	VI
05/13/1957	McDowell County, NC	4.1	VI	VI
07/02/1957	Buncombe County, NC	3.7	VI	VI
11/24/1957	Jackson County, NC	4.0	VI	VI
10/27/1959 *	Chesterfield, SC	4.0	VI	VI
07/13/1971	Newry, SC	3.8	VI	VI
11/30/1973	Alcoa, TN	4.6	VI	VI
11/13/1976	Southwest Virginia	4.1	VI	VI
05/05/1981	Henderson County, NC	3.5	VI	VI
08/23/2011	Louisa County, VA	5.8	VII	V

* Conflicting reports on this event, intensity in North Carolina could have been either V or VI

Source: This information compiled by Dr. Kenneth B. Taylor and provided by Tiawana Ramsey of NCEM. Information was compiled from the National Earthquake Center, Earthquakes of the US by Carl von Hake (1983), and a compilation of

newspaper reports in the Eastern Tennessee Seismic Zone compiled by Arch Johnston, CERl, Memphis State University (1983).

5.11.4 Probability of Future Occurrences

The probability of significant, damaging earthquake events affecting Randolph County is unlikely. However, it is possible that future earthquakes resulting in light to moderate perceived shaking and damages ranging from none to very light will affect the County. The annual probability level for the County is estimated between 1 and 10 percent (possible).

5.12 LANDSLIDE

5.12.1 Background

A landslide is the downward and outward movement of slope-forming soil, rock, and vegetation, which is driven by gravity. Landslides may be triggered by both natural and human-caused changes in the environment, including heavy rain, rapid snow melt, steepening of slopes due to construction or erosion, earthquakes, volcanic eruptions, and changes in groundwater levels.

There are several types of landslides: rock falls, rock topple, slides, and flows. Rock falls are rapid movements of bedrock, which result in bouncing or rolling. A topple is a section or block of rock that rotates or tilts before falling to the slope below. Slides are movements of soil or rock along a distinct surface of rupture, which separates the slide material from the more stable underlying material. Mudflows, sometimes referred to as mudslides, mudflows, lahars or debris avalanches, are fast-moving rivers of rock, earth, and other debris saturated with water. They develop when water rapidly accumulates in the ground, such as heavy rainfall or rapid snowmelt, changing the soil into a flowing river of mud or "slurry." Slurry can flow rapidly down slopes or through channels and can strike with little or no warning at avalanche speeds. Slurry can travel several miles from its source, growing in size as it picks up trees, cars, and other materials along the way. As the flows reach flatter ground, the mudflow spreads over a broad area where it can accumulate in thick deposits.

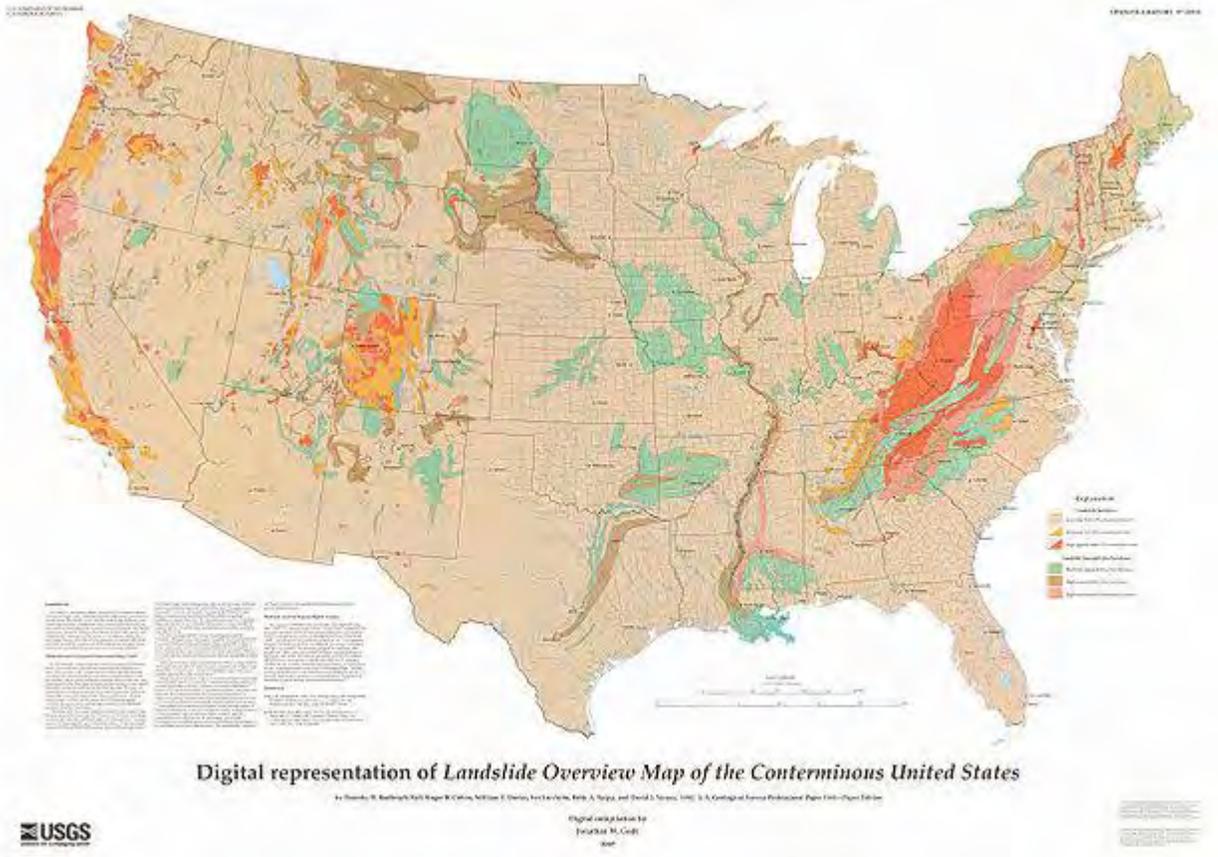
Landslides are typically associated with periods of heavy rainfall or rapid snow melt and tend to worsen the effects of flooding that often accompanies these events. In areas burned by forest and brush fires, a lower threshold of precipitation may initiate landslides. Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly.

Among the most destructive types of debris flows are those that accompany volcanic eruptions. A spectacular example in the United States was a massive debris flow resulting from the 1980 eruptions of Mount St. Helens, Washington. Areas near the bases of many volcanoes in the Cascade Mountain Range of California, Oregon, and Washington are at risk from the same types of flows during future volcanic eruptions.

Areas that are generally prone to landslide hazards include previous landslide areas, the bases of steep slopes, the bases of drainage channels, and developed hillsides where subsurface sewage disposal systems are used. Areas that are typically considered safe from landslides include areas that have not moved in the past, relatively flat-lying areas away from sudden changes in slope, and areas at the top or along ridges set back from the tops of slopes.

According to the United States Geological Survey, each year landslides cause \$5.1 billion (2009 dollars) in damage and between twenty-five and fifty deaths in the United States.¹⁸ Figure 5.11 delineates areas where large numbers of landslides have occurred and areas that are susceptible to landsliding in the conterminous United States.¹⁹

FIGURE 5.11: LANDSLIDE OVERVIEW MAP OF THE CONTERMINOUS UNITED STATES²⁰



Landslide Incidence		Landslide Susceptibility/Incidence	
	Low Incidence (less than 1.5% of area involved)		Moderate susceptibility/low incidence
	Moderate Incidence (1.5%-15% of area involved)		High susceptibility/low incidence
	High Incidence (greater than 15% of area involved)		High susceptibility/moderate incidence

Source: United States Geological Survey, <http://landslides.usgs.gov/hazards/nationalmap/>

¹⁸ United States Geological Survey (USGS). United States Department of the Interior. "Landslide Hazards – A National Threat." 2005.

¹⁹ This map layer is provided in the U.S. Geological Survey Professional Paper 1183, Landslide Overview Map of the Conterminous United States, available online at: http://landslides.usgs.gov/html_files/landslides/nationalmap/national.html.

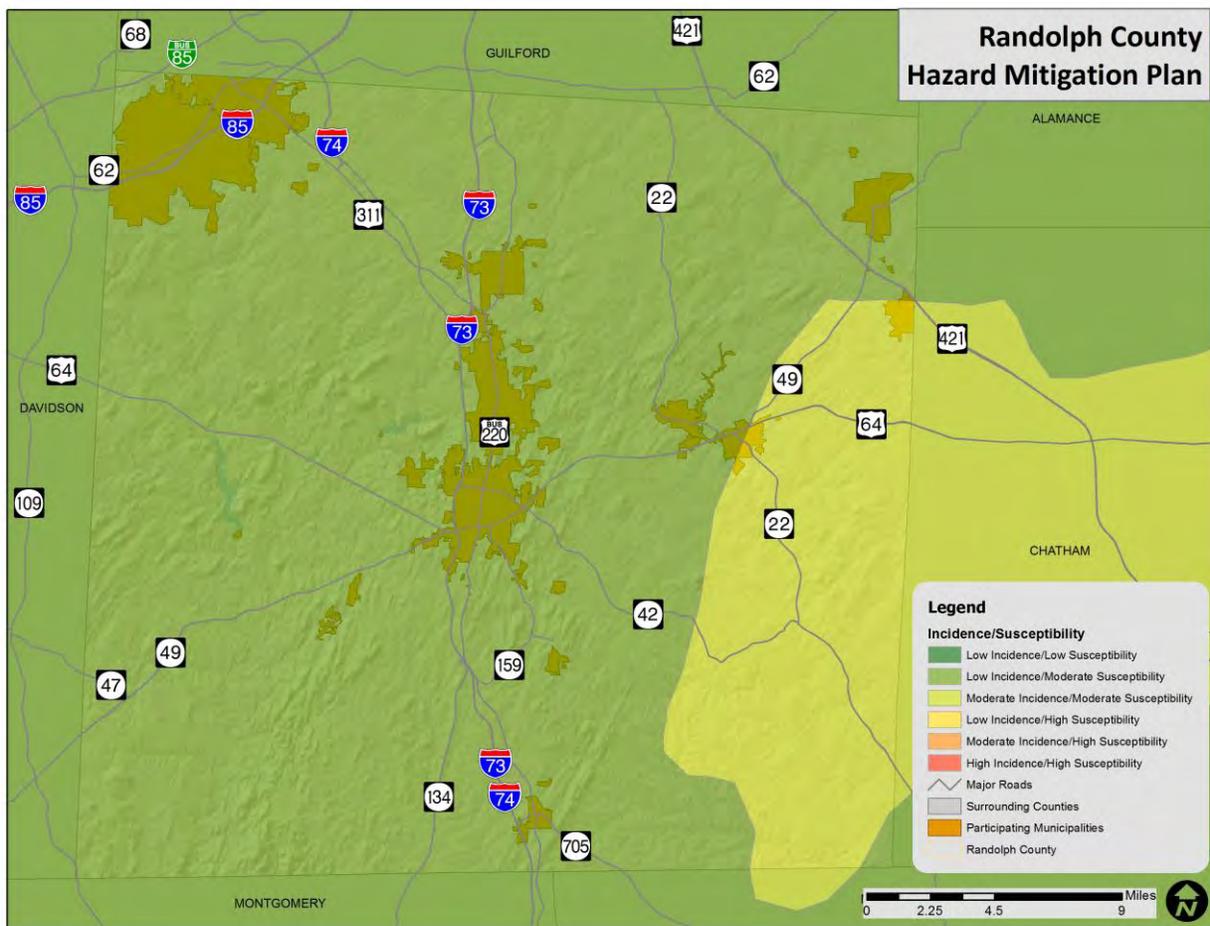
²⁰ Susceptibility not indicated where same or lower than incidence. Susceptibility to landsliding was defined as the probable degree of response of [the area] rocks and soils to natural or artificial cutting or loading of slopes, or to anomalously high precipitation. High, moderate, and low susceptibility are delimited by the same percentages used in classifying the incidence of landsliding. Some generalization was necessary at this scale, and several small areas of high incidence and susceptibility were slightly exaggerated.

5.12.2 Location and Spatial Extent

Landslides occur along steep slopes when the pull of gravity can no longer be resisted (often due to heavy rain). Human development can also exacerbate risk by building on previously undevelopable steep slopes and constructing roads by cutting through hills or mountains. Landslides are possible in Randolph County.

According to **Figure 5.12** below, the eastern part of the County has moderate landslide incidence and susceptibility. However, the majority of the County is located in an area of low incidence and moderate susceptibility.

FIGURE 5.12: LANDSLIDE SUSCEPTIBILITY AND INCIDENCE MAP OF RANDOLPH COUNTY



Source: United States Geological Survey

5.12.3 Historical Occurrences

Steeper topography in some areas of Randolph County makes the planning area susceptible to landslides. Most landslides are caused by heavy rainfall in the area. Building on steep slopes that was not previously possible also contributes to risk. Although no landslide incidents have been reported in

the County, it should be noted that the North Carolina Geologic Survey (NCGS) emphasized the dataset provided was incomplete. Therefore, there may be additional historical landslide occurrences that were not reported. Some incidence mapping has also been completed throughout the western portion of North Carolina though it is not complete either.

5.12.4 Probability of Future Occurrences

Based on historical information and the USGS susceptibility index, the probability of future landslide events is unlikely (less than 1 percent probability). Local conditions may become more favorable for landslides due to heavy rain for example. This would increase the likelihood of occurrence. It should also be noted that some areas in the County have greater risk than others given factors such as steepness of slope and modification of slopes.

5.13 LAND SUBSIDENCE/SINKHOLE

5.13.1 Background

Land subsidence is the gradual settling or sudden sinking of the Earth's surface due to the subsurface movement of earth materials. This can occur over a large area or a small spot, creating a sinkhole. Causes of land subsidence include groundwater pumpage, aquifer system compaction, drainage of organic soils, underground mining, hydrocompaction, natural compaction, sinkholes, and thawing permafrost.

The geological composition of an area impacts the potential for subsidence. Karst and evaporative rock contribute to land subsidence. Karst is distinctive topography in which the landscape is largely shaped by the dissolving action of water on carbonate bedrock (usually limestone, dolomite, or marble). As groundwater flows, voids are created from dissolving subsurface foundations. Karst topography includes land subsidence in the form of sink holes, which is brought on by sinking soils resulting from caves or cavities below the surface. Evaporative rock (salt and gypsum) are soluble in water and large cavity formations can occur. Sink holes or cavity collapses occur when these underground voids are created naturally, or artificially, and then collapse due to natural or human induced forces.

Underground mining of coal, salt, limestone, and gypsum contribute to subsidence. Most mining is accomplished by direct human action utilizing heavy machinery to remove the material; however, with salt there are cases where pressurized water is used to wash-out the deposit (solution mining). All of these mines create voids under the Earth's surface. Several key factors determining the potential for these voids to collapse include depth, mining technique used, types of rock and or soils, and development on the ground surface.

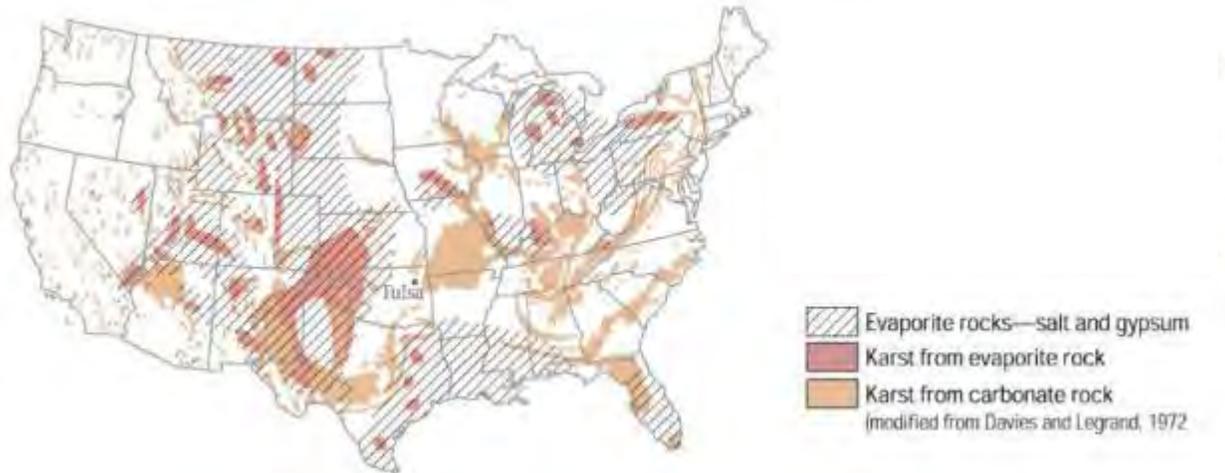
Subsidence causes regional drainage patterns to change. This can impact flooding, back up storm drains, and damage infrastructure. Subsidence can also negatively impact riverine flooding by altering the topography and rupturing the land surface.

5.13.2 Location and Spatial Extent

According to the U.S. Geological Survey (USGS), subsidence affects an estimated 17,000 square miles in forty-five states, including North Carolina. Salt and gypsum underlie about 35 to 40 percent of the United States, though in many areas they are buried at great depths.

Figure 5.13 shows the location of rock types associated with subsidence in the United States. It indicates that there may be some areas within the County that are underlain with karst from carbonate rock.

FIGURE 5.13: MAP OF ROCK TYPES ASSOCIATED WITH SUBSIDENCE IN THE UNITED STATES



Source: United States Geological Survey, <http://water.usgs.gov/ogw/pubs/fs00165/>

5.13.3 Historical Occurrences

Although there is no extensive history of land subsidence in the County, anecdotal evidence of isolated areas where abandoned mines may have caused sinkholes has been noted. Although local County officials have not noted the impacts from these swings and changes in soil, potential impacts on roads and other infrastructure could come in the form of large cracks and breaks, which may cause stops in daily operations and significant costs to local, State, and Federal budgets. Often the cost to repair this infrastructure can be in the range of millions of dollars depending on the degree of damage and necessity for quick repairs.

5.13.4 Probability of Future Occurrences

The probability of future land subsidence events in the region is unlikely (less than 1 percent annual probability). The potential for land subsidence may be impacted by local conditions such as heavy rain or extremely dry periods.

Hydrologic Hazards

5.14 DAM AND LEVEE FAILURE

5.14.1 Background

Worldwide interest in dam and levee safety has risen significantly in recent years. Aging infrastructure, new hydrologic information, and population growth in floodplain areas downstream from dams and near levees have resulted in an increased emphasis on safety, operation, and maintenance.

There are approximately 80,000 dams in the United States today, the majority of which are privately owned. Other owners include State and local authorities, public utilities, and federal agencies. The benefits of dams are numerous in that they provide water for drinking, navigation, and agricultural irrigation. Dams also provide hydroelectric power, create lakes for fishing and recreation, and save lives by preventing or reducing floods.

Though dams have many benefits, they also can pose a risk to communities if not designed, operated, and maintained properly. In the event of a dam failure, the energy of the water stored behind even a small dam is capable of causing loss of life and great property damage if development exists downstream. If a levee breaks, scores of properties may become submerged in floodwaters and residents may become trapped by rapidly rising water. The failure of dams and levees has the potential to place large numbers of people and great amounts of property in harm's way.

5.14.2 Location and Spatial Extent

The North Carolina Division of Energy, Mineral, and Land Resources provides information on dams, including a hazard potential classification. There are three hazard classifications—high, intermediate, and low—that correspond to qualitative descriptions and quantitative guidelines. **Table 5.30** explains these classifications.

TABLE 5.30: NORTH CAROLINA DAM HAZARD CLASSIFICATIONS

HAZARD CLASSIFICATION	DESCRIPTION	QUANTITATIVE GUIDELINES
Low	Interruption of road service, low volume roads	Less than 25 vehicles per day
	Economic damage	Less than \$30,000
Intermediate	Damage to highways, Interruption of service	25 to less than 250 vehicles per day
	Economic damage	\$30,000 to less than \$200,000
High	Loss of human life*	Probable loss of 1 or more human lives
	Economic damage	More than \$200,000
	*Probable loss of human life due to breached roadway or bridge on or below the dam.	250 or more vehicles per day

Source: North Carolina Division of Energy, Mineral, and Land Resources, <https://ncdenr.s3.amazonaws.com/s3fs-public/Energy%20Mineral%20and%20Land%20Resources/Land%20Resources/Land%20Quality/dam%20hazards.pdf>

According to the North Carolina Division of Energy, Mineral, and Land Resources, there are 204 dams in Randolph County.²¹ **Figure 5.14** shows the dam locations and the corresponding hazard ranking for each. Of these dams, 32 are classified as high hazard potential. These high hazard dams are listed in **Table 5.31**.

²¹ The 2014 list of high hazard dams was distributed to local officials by the North Carolina Division of Energy, Mineral, and Land Resources in mid-2015 and was also available online (<http://deq.nc.gov/about/divisions/energy-mineral-land-resources/energy-mineral-land-permits/dam-safety>).

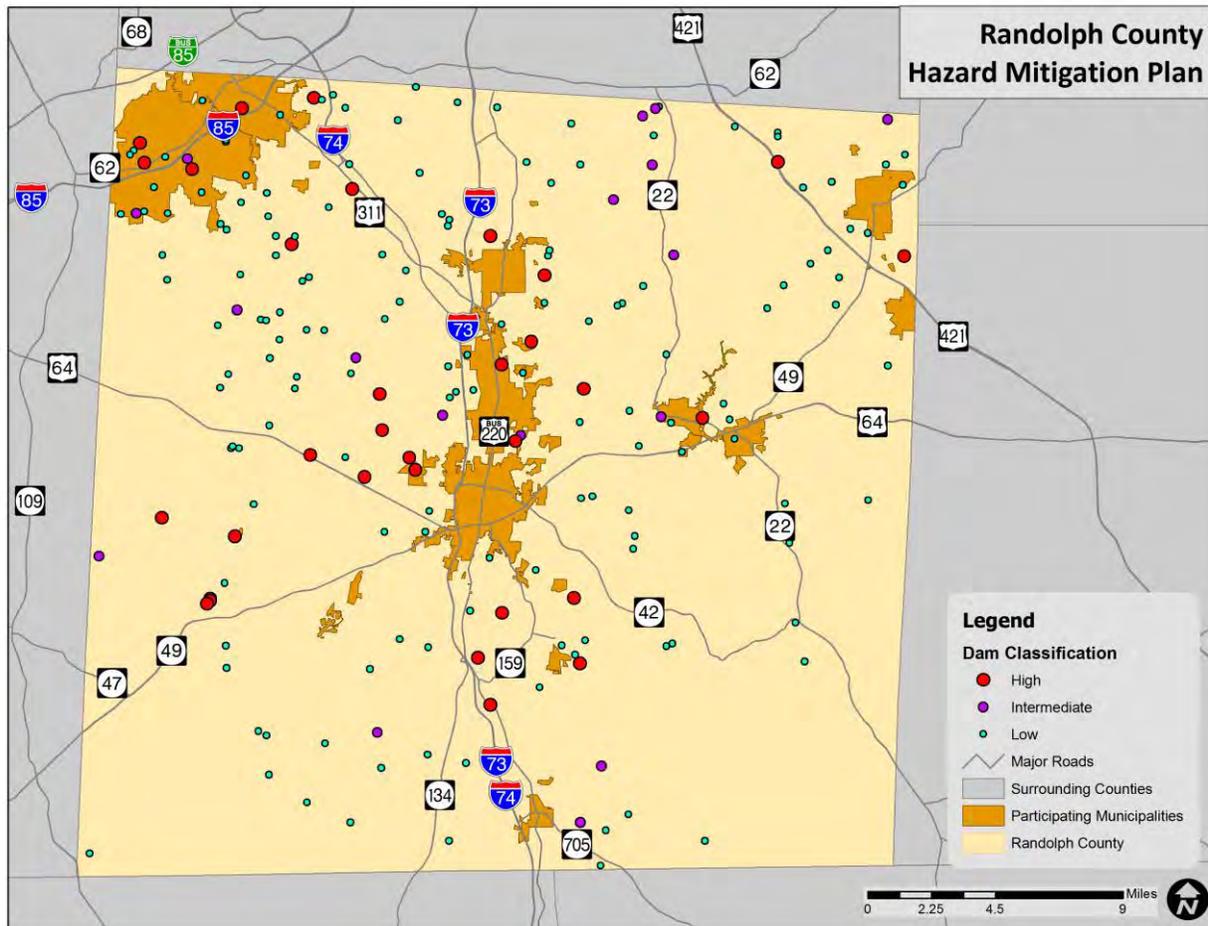
TABLE 5.31: RANDOLPH COUNTY HIGH HAZARD DAM LOCATION (2015)

Dam Name	Hazard Potential	Surface Area (acres)	Max Capacity (Ac-ft)	Owner Type
Archdale				
Bouldin Dam	High	6.0	54	Private
Asheboro				
Mccrary Lake Dam	High	9.6	96	Local Gov
John Bunch Lake Dam	High	25.0	471	Local Gov
Richardson Lake Dam	High	7.0	45	Private
Franklinville				
Hughes Dam	Low	4.0	39	Private
Liberty				
<i>None Reported</i>	--	--	--	--
Ramseur				
Ramseur Water Supply Dam	High	90.0	1,872	Local Gov
Randleman				
<i>None Reported</i>	--	--	--	--
Seagrove				
<i>None Reported</i>	--	--	--	--
Staley				
<i>None Reported</i>	--	--	--	--
Trinity				
Colonial Ctr. Club Dam Lower	High	16.8	212	Private
Bob Cat Acres Lake Dam	High	9.0	99	Private
Joe Lambeth Dam	High	5.0	24	Private
Unincorporated Area				
Schoonbeck Lake Dam	High	10.0	190	Private
King Dam	High	4.0	50	Private
Shaw-Hudson Lake Dam	High	5.0	50	Private
Farlow Lake Dam	High	20.0	134	Private
Lucas Lake Dam	High	236.0	6,840	Utility
Asheboro Country Club Lake Dam	High	19.3	273	Private
Beard Lake Dam	High	6.0	58	Private
Cox Lake Dam	High	45.0	432	Private
Randleman City Lake Dam	High	19.0	174	Local Gov
Overman Lake Dam	High	12.0	167	Private
King Lake Dam	High	4.0	53	Private
Robert L. Reece Lake Dam	High	600.0	13,000	Local Gov
Holly Ridge Golf Links Dam No. 1	High	11.0	120	Private
Lower Zoo Dam	High	10.0	137	State
Bullins Lake Dam	High	1.5	11	Private
Randleman Dam	High	3070.0	121,200	Private
Dodson Lake Dam	High	35.0	502	Private
Ingold Dam	High	2.4	23	Private
Woodman Dam	High	3.5	22	Private

Dam Name	Hazard Potential	Surface Area (acres)	Max Capacity (Ac-ft)	Owner Type
Upper Toms Creek Nursery Dam	High	1.7	19	Private
Middle Toms Creek Nursery Dam	High	1.5	20	Private
Lower Toms Creek Nursery Dam	High	2.5	29	Private
Pinewood Country Club Dam	High	2.0	34	Private
Fox Dam	High	4.5	50	Private

Source: North Carolina Division of Energy, Mineral and Land Resources, 2014

FIGURE 5.14: RANDOLPH COUNTY DAM LOCATION AND HAZARD RANKING (2014)



Source: North Carolina Division of Energy, Mineral and Land Resources, 2014

In late 2015, a new dam inventory was published by the Division of Energy, Mineral, and Land Resources. The planning team felt that it was important to include results from this dataset as well as including the 2014 data. The 2015 data showed a significant drop in the total number of dams located in Randolph County. This is presumably because new classifications are currently being developed to identify qualifying dams. The planning team will continue to monitor these changes in future plan

updates. **Table 5.32** and **Figure 5.15** show the dams based on the 2015 data. There are 89 dams in Randolph County according to this data and 29 are classified as high hazard.²²

TABLE 5.32: RANDOLPH COUNTY HIGH HAZARD DAM LOCATION (2015)

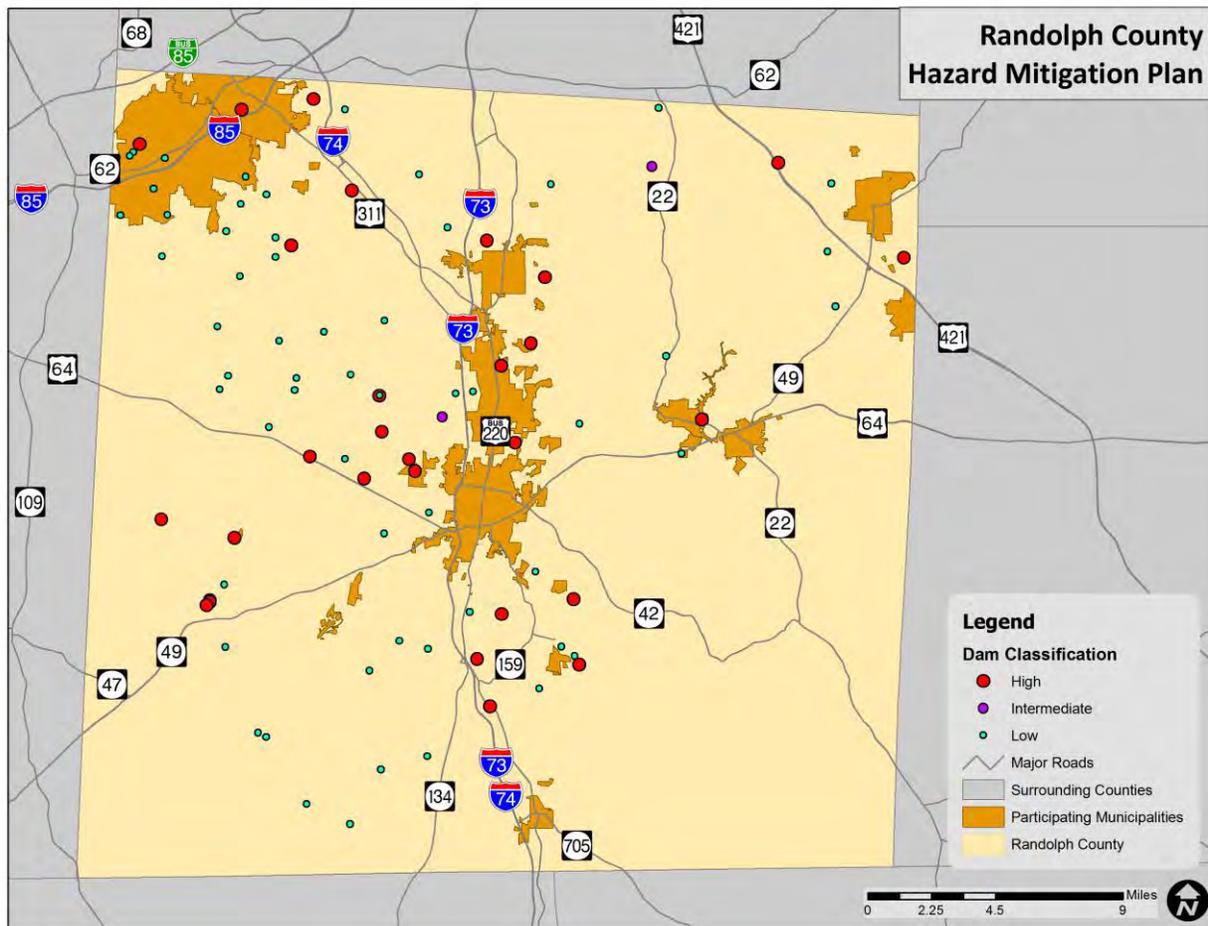
Dam Name	Hazard Potential	Surface Area (acres)	Max Capacity (Ac-ft)	Owner Type
Archdale				
Bouldin Dam	High	6.0	54	Private
Asheboro				
Mccrary Lake Dam	High	9.6	96	Local Government
John Bunch Lake Dam	High	25.0	471	Local Government
Richardson Lake Dam	High	7.0	45	Private
Franklinville				
<i>None Reported</i>	--	--	--	--
Liberty				
<i>None Reported</i>	--	--	--	--
Ramseur				
<i>None Reported</i>	--	--	--	--
Randleman				
<i>None Reported</i>	--	--	--	--
Seagrove				
<i>None Reported</i>	--	--	--	--
Staley				
<i>None Reported</i>	--	--	--	--
Trinity				
Colonial Ctr. Club Dam Lower	High	16.8	212	Private
Unincorporated Area				
Schoonbeck Lake Dam	High	10.0	190	Private
King Dam	High	4.0	50	Private
Ramseur Water Supply Dam	High	90.0	1,872	Local Government
Shaw-Hudson Lake Dam	High	5.0	50	Private
Farlow Lake Dam	High	20.0	134	Private
Lucas Lake Dam	High	236.0	6,840	Utility
Asheboro Country Club Lake Dam	High	19.3	273	Private
Beard Lake Dam	High	6.0	58	Private
Randleman City Lake Dam	High	19.0	174	Local Government
Overman Lake Dam	High	12.0	167	Private
King Lake Dam	High	4.0	53	Private
Dodson Lake Dam	High	35.0	502	Private
Ingold Dam	High	2.4	23	Private
Woodman Dam	High	3.5	22	Private
Upper Toms Creek Nursery Dam	High	1.7	19	Private

²² The October 7, 2015 list of high hazard dams obtained from the North Carolina Division of Energy, Mineral, and Land Resources (<http://www.ncnhp.org/web/lr/dams>) was reviewed and amended by local officials to the best of their knowledge.

Dam Name	Hazard Potential	Surface Area (acres)	Max Capacity (Ac-ft)	Owner Type
Middle Toms Creek Nursery Dam	High	1.5	20	Private
Lower Toms Creek Nursery Dam	High	2.5	29	Private
Pinewood Country Club Dam	High	2.0	34	Private
Fox Dam	High	4.5	50	Private
Robert L. Reece Lake Dam	High	600.0	13,000	Local Government
Holly Ridge Golf Links Dam No. 1	High	11.0	120	Private
Lower Zoo Dam	High	10.0	137	State
Bullins Lake Dam	High	1.5	11	Private
Randleman Dam	High	3070.0	121,200	Private

Source: North Carolina Division of Energy, Mineral and Land Resources, 2015

FIGURE 5.15: RANDOLPH COUNTY DAM LOCATION AND HAZARD RANKING (2015)



Source: North Carolina Division of Energy, Mineral and Land Resources, 2015

5.14.3 Historical Occurrences

There have been no dam breaches reported in Randolph County according the *State of North Carolina Hazard Mitigation Plan* or local officials/records.

5.14.4 Probability of Future Occurrences

Given the current dam inventory and historic data, a dam breach is unlikely (less than 1 percent annual probability) in the future. However, as has been demonstrated in the past, regular monitoring is necessary to prevent these events. No further analysis will be completed in Section 6: *Vulnerability Assessment* as more sophisticated dam breach plans (typically completed by the U.S. Army Corp of Engineers) have been completed for dams of concern in the County.

5.15 FLOOD

5.15.1 Background

Flooding is the most frequent and costly natural hazard in the United States and is a hazard that has caused more than 10,000 deaths since 1900. Nearly 90 percent of presidential disaster declarations result from natural events where flooding was a major component.

Floods generally result from excessive precipitation and can be classified under two categories: general floods (precipitation over a given river basin for a long period of time along with storm-induced wave action) and flash floods (the product of heavy localized precipitation in a short time period over a given location). The severity of a flooding event is typically determined by a combination of several major factors, including stream and river basin topography and physiography, precipitation and weather patterns, recent soil moisture conditions, and the degree of vegetative clearing and impervious surface.

General floods are usually long-term events that may last for several days. The primary types of general flooding include riverine, coastal, and urban flooding. Riverine flooding is a function of excessive precipitation levels and water runoff volumes within the watershed of a stream or river. Coastal flooding is typically a result of storm surge, wind-driven waves, and heavy rainfall produced by hurricanes, tropical storms, and other large coastal storms. Urban flooding occurs where manmade development has obstructed the natural flow of water and decreased the ability of natural groundcover to absorb and retain surface water runoff.

Most flash flooding is caused by slow-moving thunderstorms in a local area or by heavy rains associated with hurricanes and tropical storms. However, flash flooding events may also occur from a dam or levee failure within minutes or hours of heavy amounts of rainfall or from a sudden release of water held by a retention basin or other stormwater control facility. Although flash flooding occurs most often along mountain streams, it is also common in urbanized areas where much of the ground is covered by impervious surfaces.

The periodic flooding of lands adjacent to rivers, streams, and shorelines (land known as a floodplain) is a natural and inevitable occurrence that can be expected to take place based upon established recurrence intervals. The recurrence interval of a flood is defined as the average time interval, in years, expected between a flood event of a particular magnitude and an equal or larger flood. Flood magnitude increases with increasing recurrence interval.

Floodplains are designated by the frequency of the flood that is large enough to cover them. For example, the 10-year floodplain will be covered by the 10-year flood and the 100-year floodplain by the 100-year flood. Flood frequencies, such as the 100-year flood, are determined by plotting a graph of the size of all known floods for an area and determining how often floods of a particular size occur. Another way of expressing the flood frequency is the chance of occurrence in a given year, which is the percentage of the probability of flooding each year. For example, the 100-year flood has a 1 percent chance of occurring in any given year and the 500-year flood has a 0.2 percent chance of occurring in any given year. FEMA and the State of North Carolina Division of Emergency Management have begun recommending the use of the latter term.

5.15.2 Location and Spatial Extent

There are areas in Randolph County that are susceptible to flood events. Special flood hazard areas in Randolph County were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM).²³ This includes Zone AE (1-percent annual chance floodplain with elevation) and Zone X500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 790.0 square miles that make up Randolph County, there are 34.67 square miles of land in Zone AE (1-percent annual chance floodplain/100-year floodplain) and 0.84 square miles of land in Zone X500 (0.2-percent annual chance floodplain/500-year floodplain). The jurisdictional totals are presented below in **Table 5.33**.

TABLE 5.33: SUMMARY OF FLOODPLAIN AREAS IN RANDOLPH COUNTY

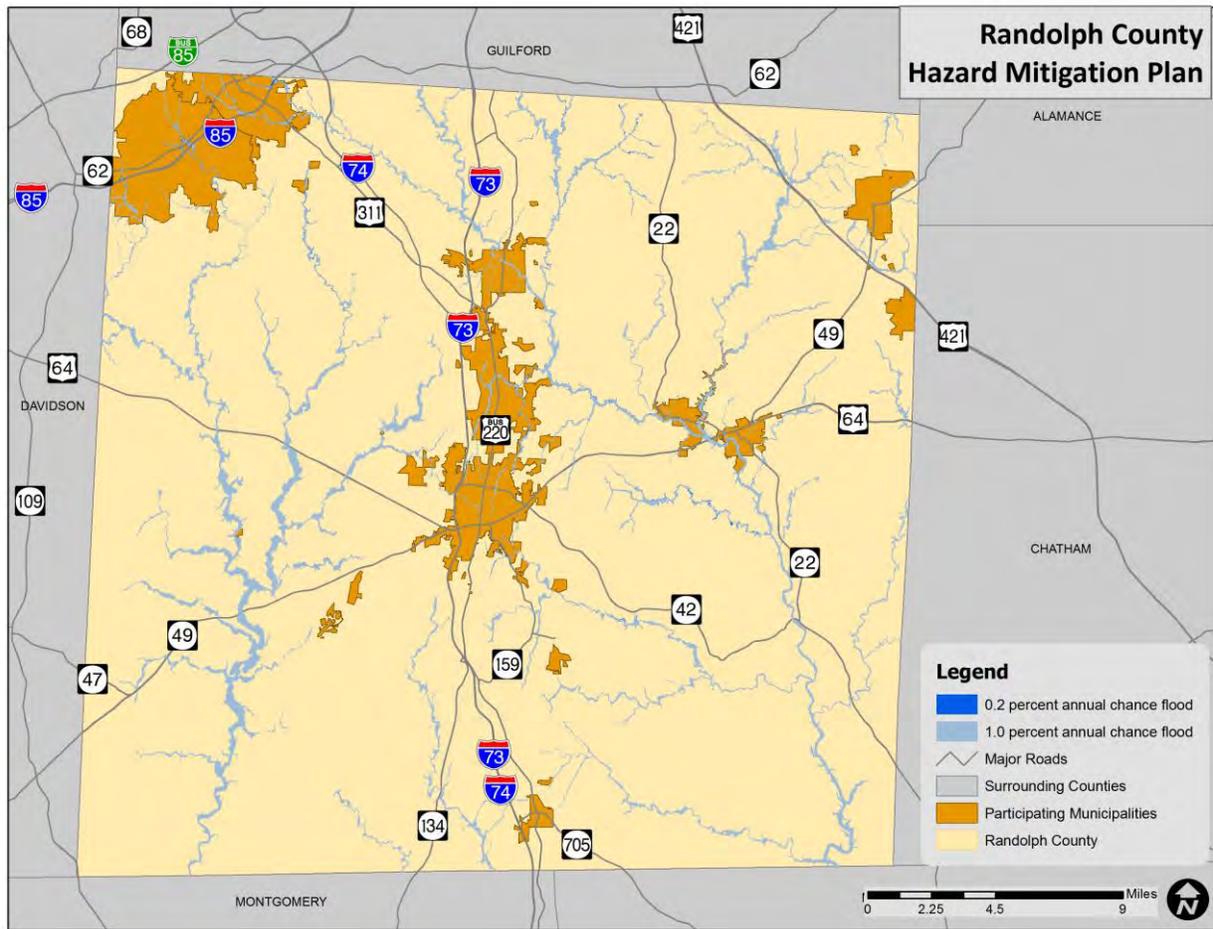
LOCATION	100-YEAR AREA (SQURE MILES)	500-YEAR AREA (SQURE MILES)
City of Archdale	0.63	0.10
City of Asheboro	2.40	0.12
Town of Franklinville	0.59	0.02
Town of Liberty	0.44	0.00
Town of Ramseur	1.26	0.03
City of Randleman	0.71	0.00
Town of Seagrove	0.02	0.00
Town of Staley	0.00	0.00
City of Trinity	0.65	0.09
Unincorporated Area	27.97	0.48
RANDOLPH COUNTY TOTAL	34.67	0.84

Source: Federal Emergency Management Agency/North Carolina Flood Mapping Program

These flood zone values account for 4.5 percent of the total land area in Randolph County. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. **Figure 5.16, Figure 5.17, Figure 5.18, Figure 5.19, Figure 5.20, Figure 5.21, Figure 5.22, Figure 5.23, Figure 5.24, and Figure 5.25** illustrate the location and extent of currently mapped special flood hazard areas for Randolph County and its municipalities based on best available FEMA DFIRM data.

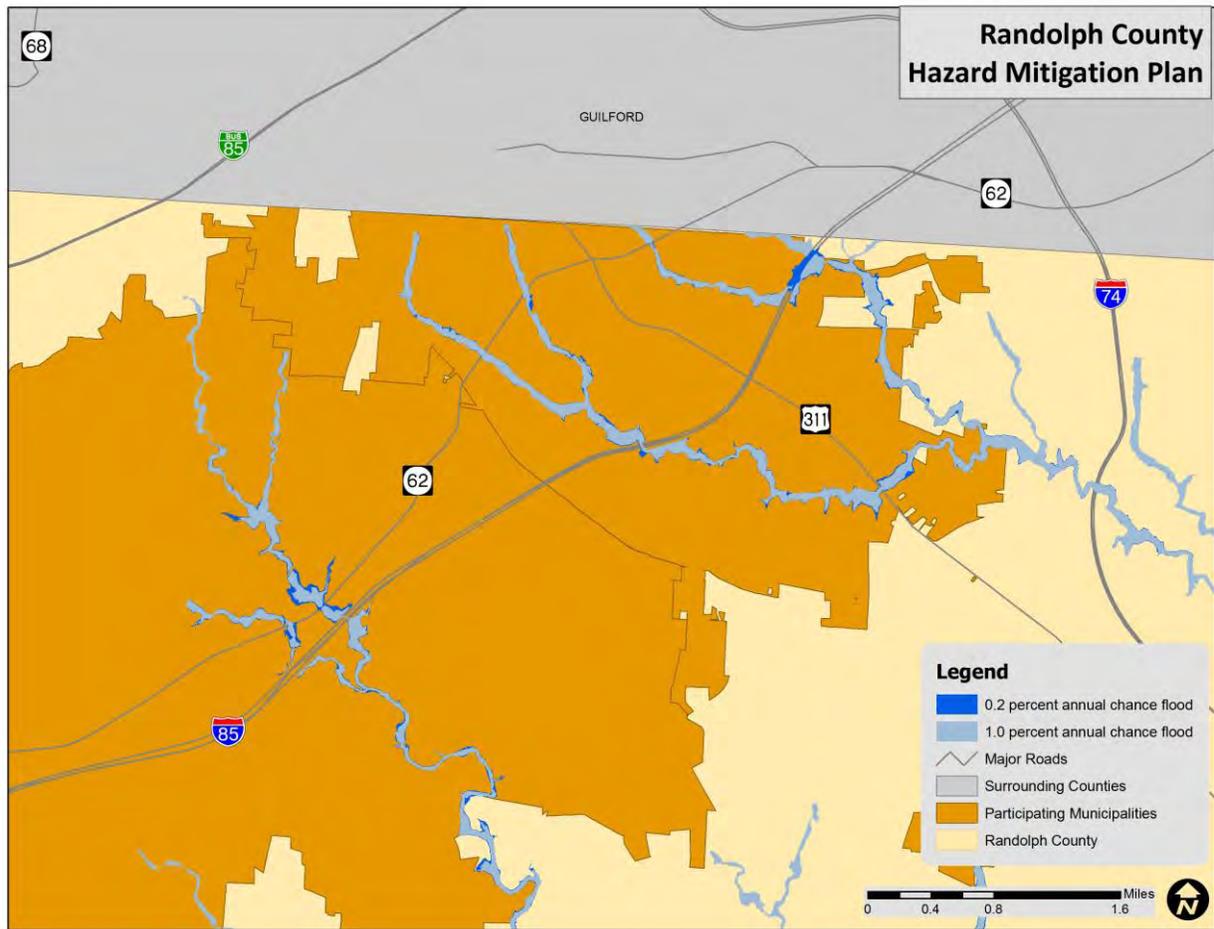
²³The County-level DFIRM used for Randolph County was updated in 2009.

FIGURE 5.16: SPECIAL FLOOD HAZARD AREAS IN RANDOLPH COUNTY



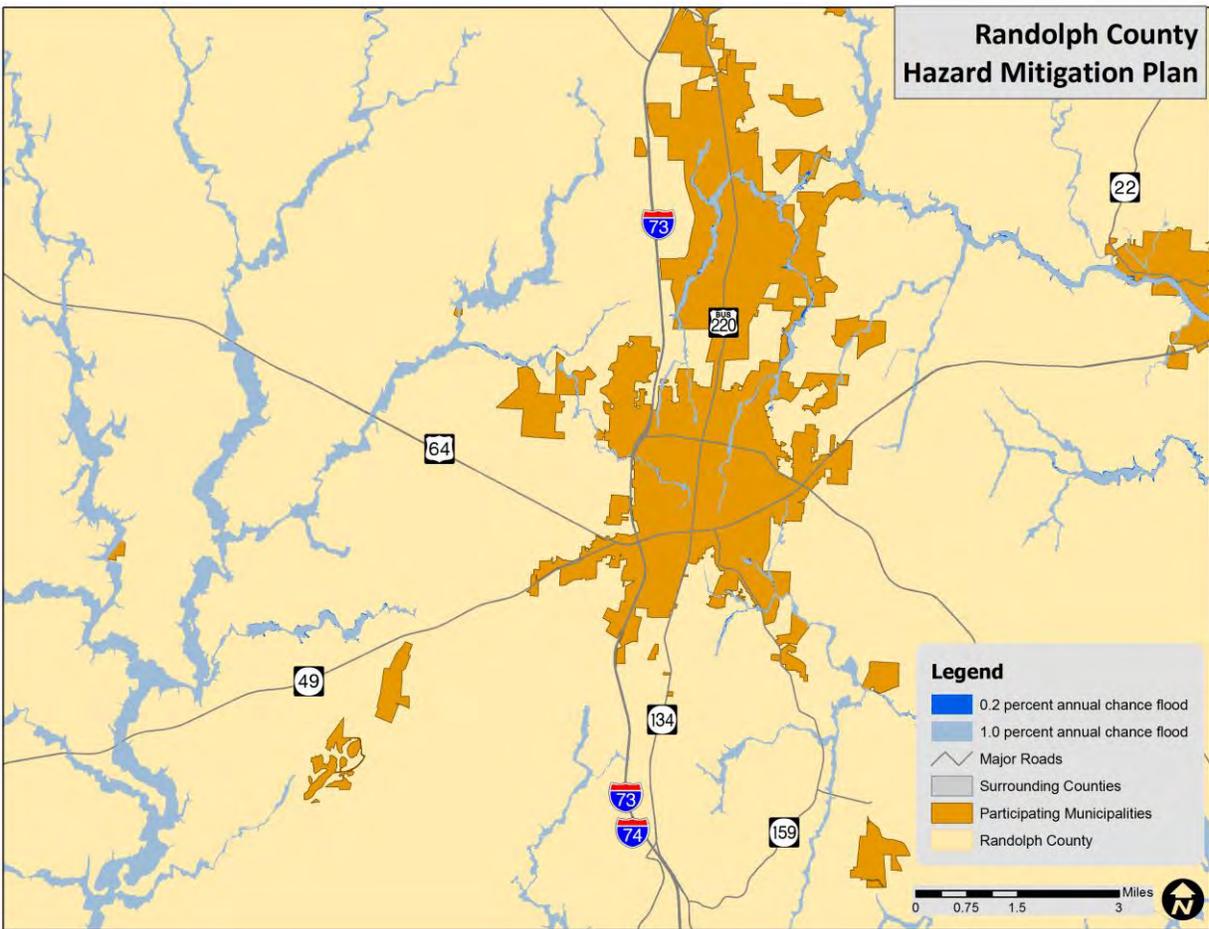
Source: Federal Emergency Management Agency/North Carolina Flood Mapping Program

FIGURE 5.17: SPECIAL FLOOD HAZARD AREAS IN ARCHDALE



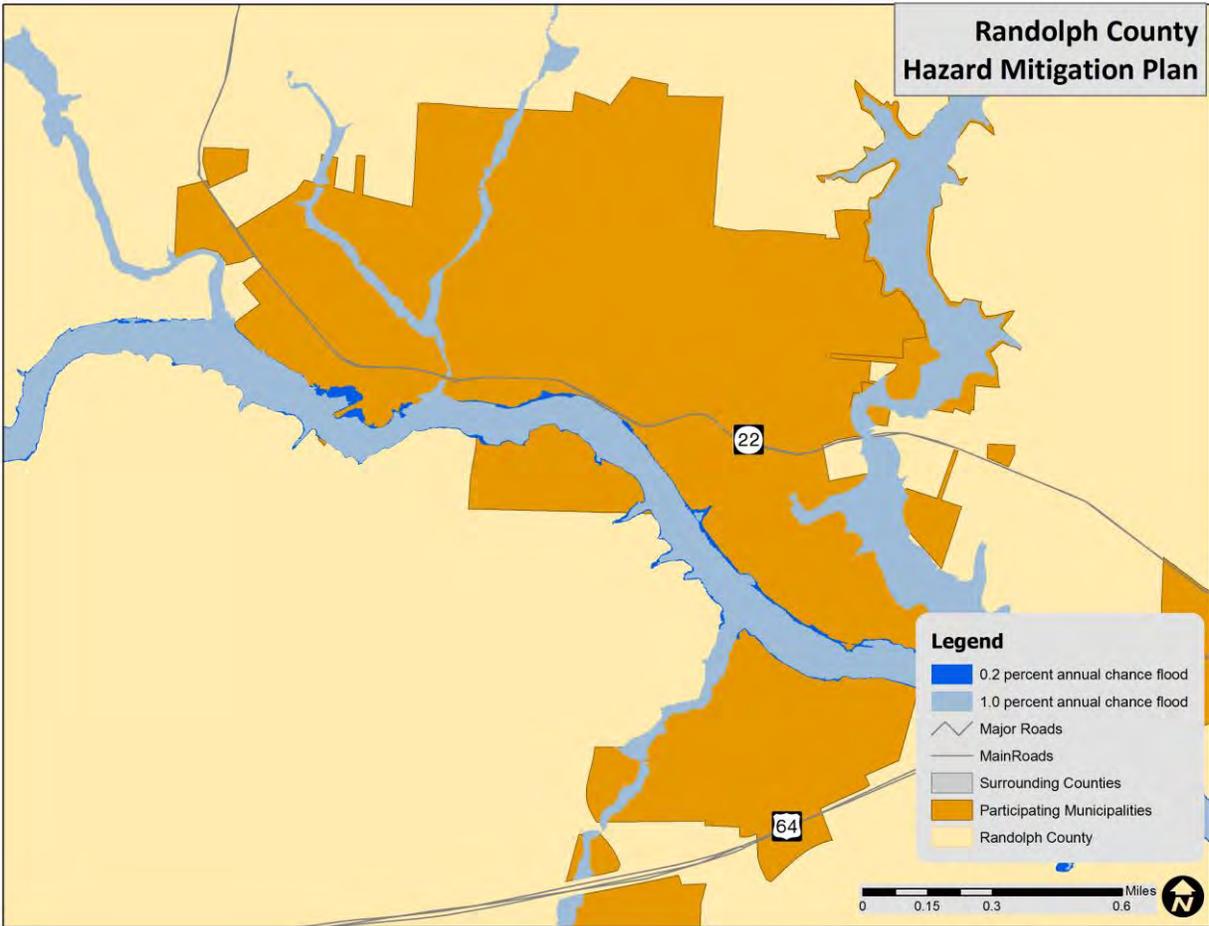
Source: Federal Emergency Management Agency/North Carolina Flood Mapping Program

FIGURE 5.18: SPECIAL FLOOD HAZARD AREAS IN ASHEBORO



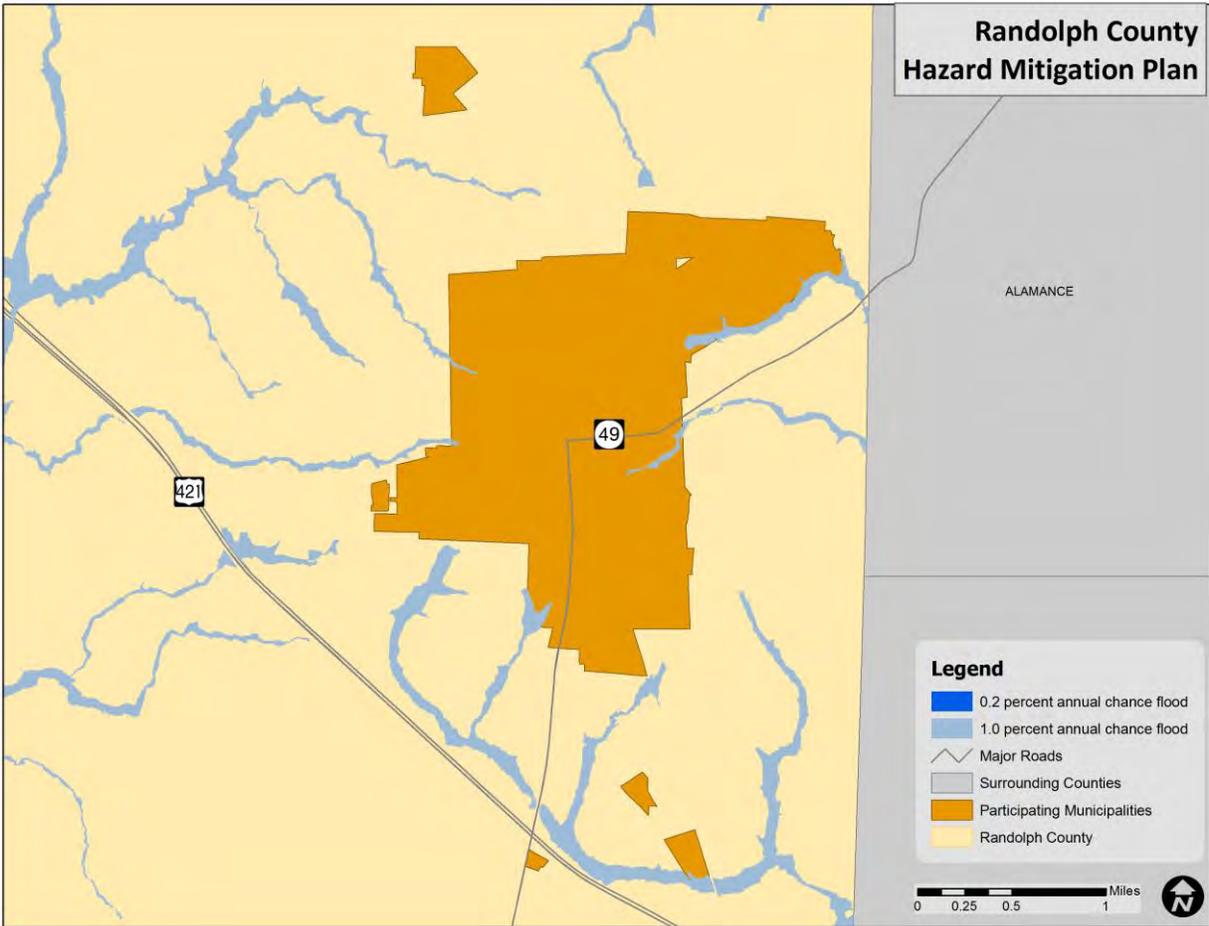
Source: Federal Emergency Management Agency/North Carolina Flood Mapping Program

FIGURE 5.19: SPECIAL FLOOD HAZARD AREAS IN FRANKLINVILLE



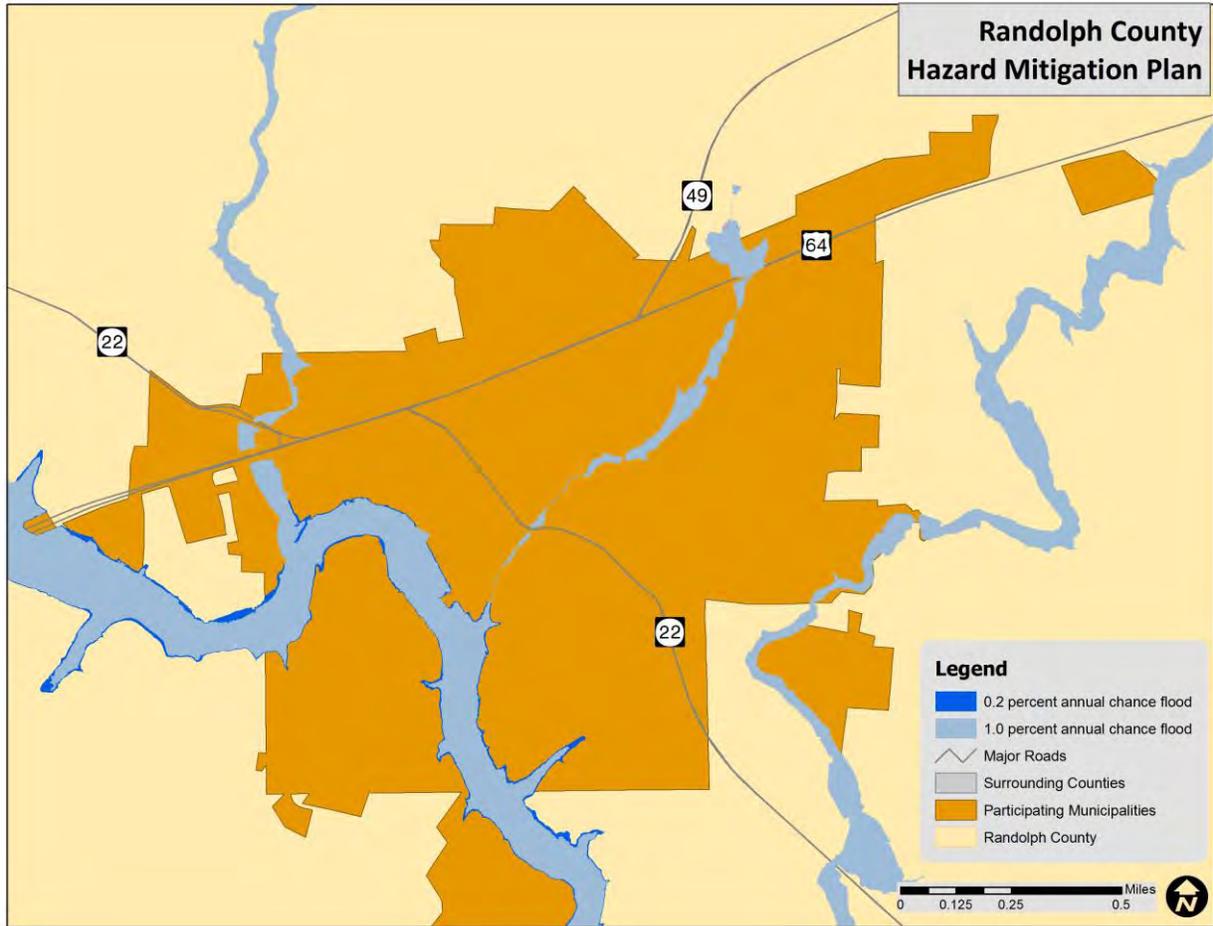
Source: Federal Emergency Management Agency/North Carolina Flood Mapping Program

FIGURE 5.20: SPECIAL FLOOD HAZARD AREAS IN LIBERTY



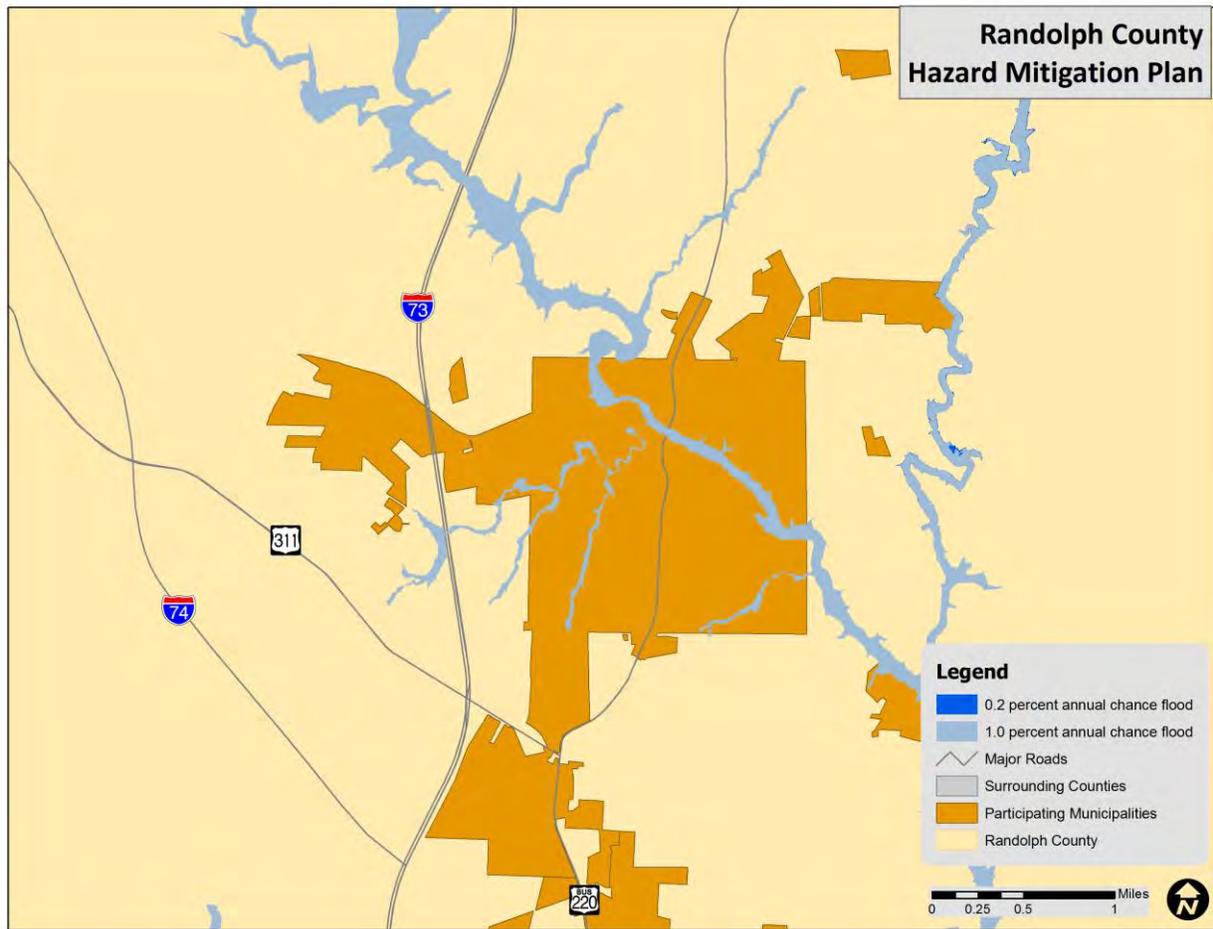
Source: Federal Emergency Management Agency/North Carolina Flood Mapping Program

FIGURE 5.21: SPECIAL FLOOD HAZARD AREAS IN RAMSEUR



Source: Federal Emergency Management Agency/North Carolina Flood Mapping Program

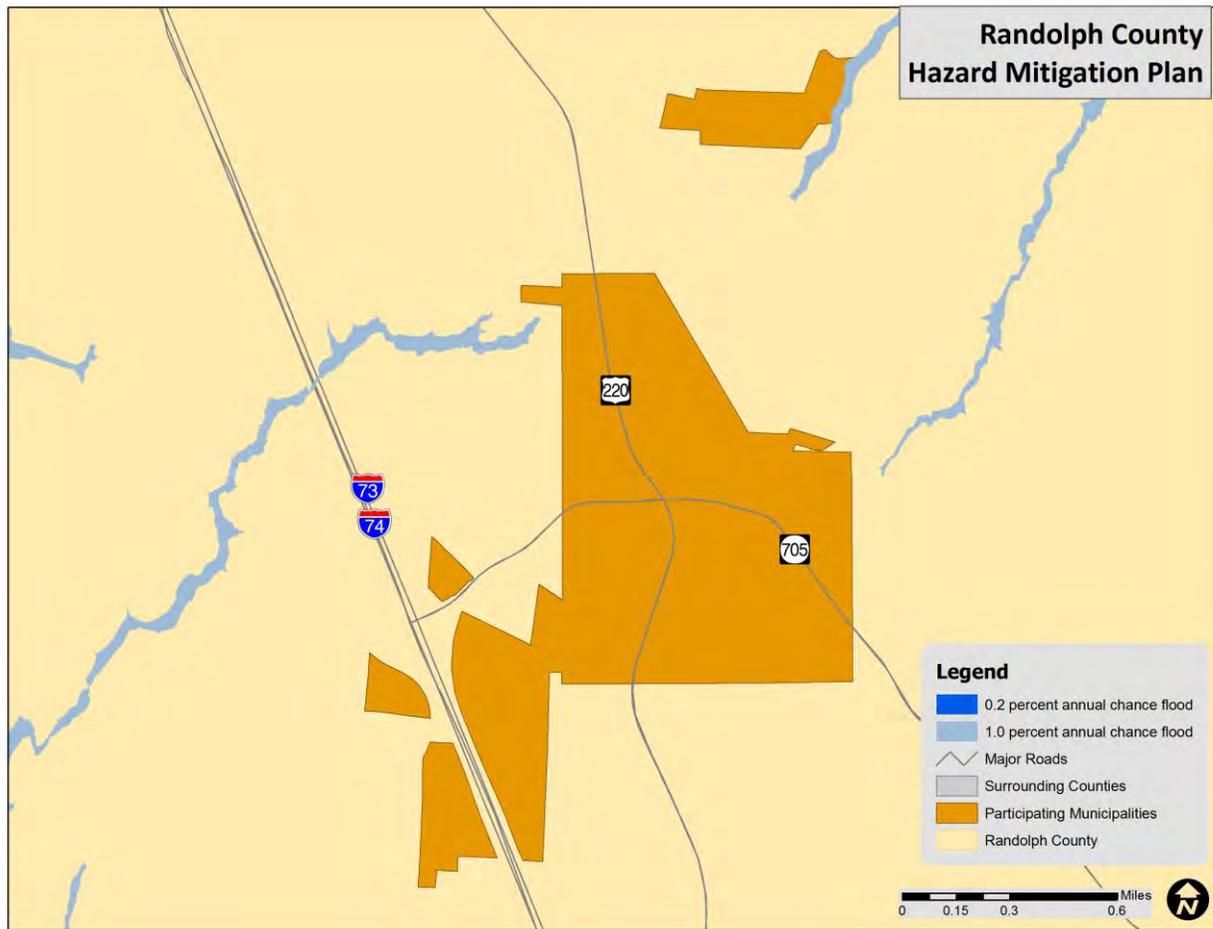
FIGURE 5.22: SPECIAL FLOOD HAZARD AREAS IN RANDLEMAN²⁴



Source: Federal Emergency Management Agency/North Carolina Flood Mapping Program

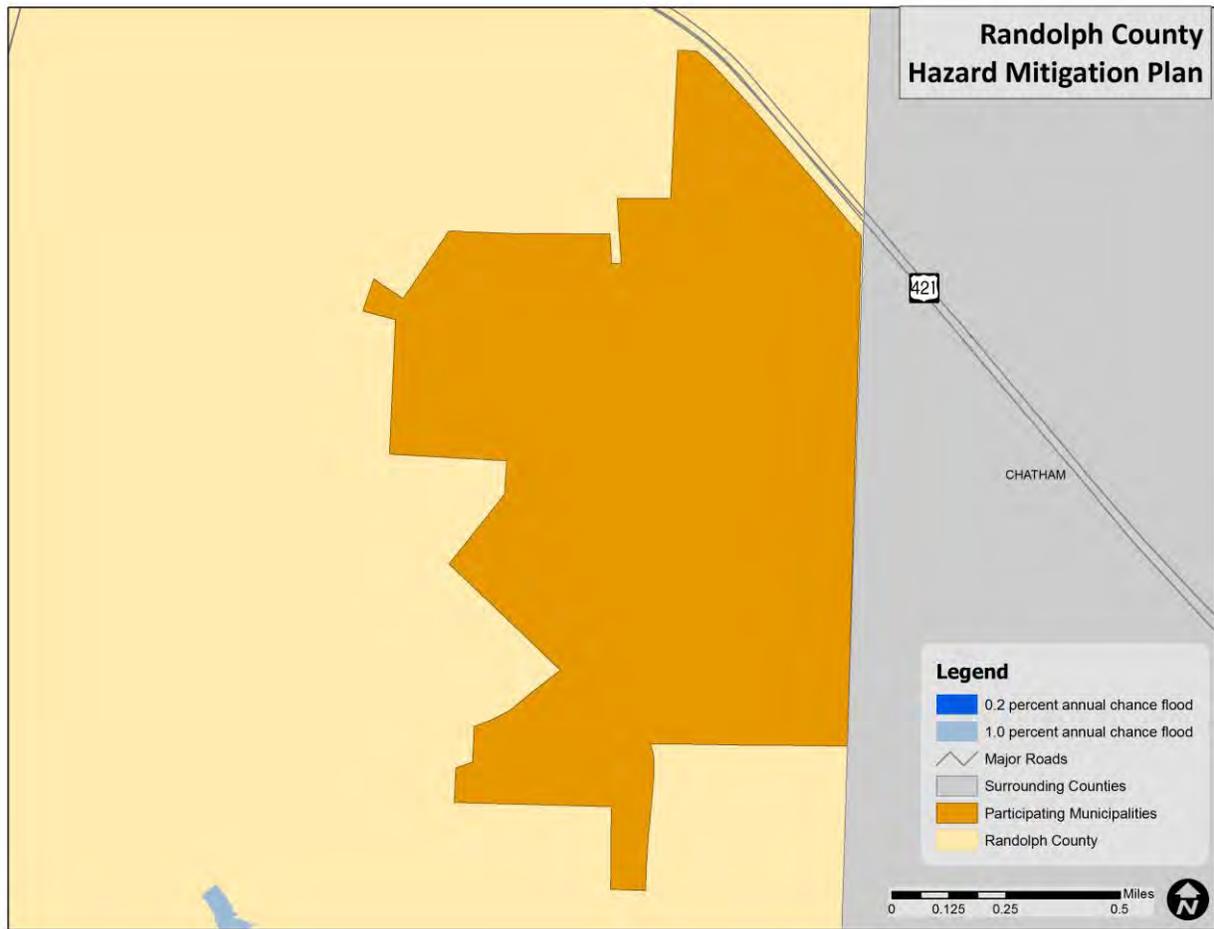
²⁴ It should be noted that the State **did not** make changes to the flood maps based on the Randleman Lake project as it was not complete when the maps were finalized. It is uncertain when the maps will be updated based on this project.

FIGURE 5.23: SPECIAL FLOOD HAZARD AREAS IN SEAGROVE



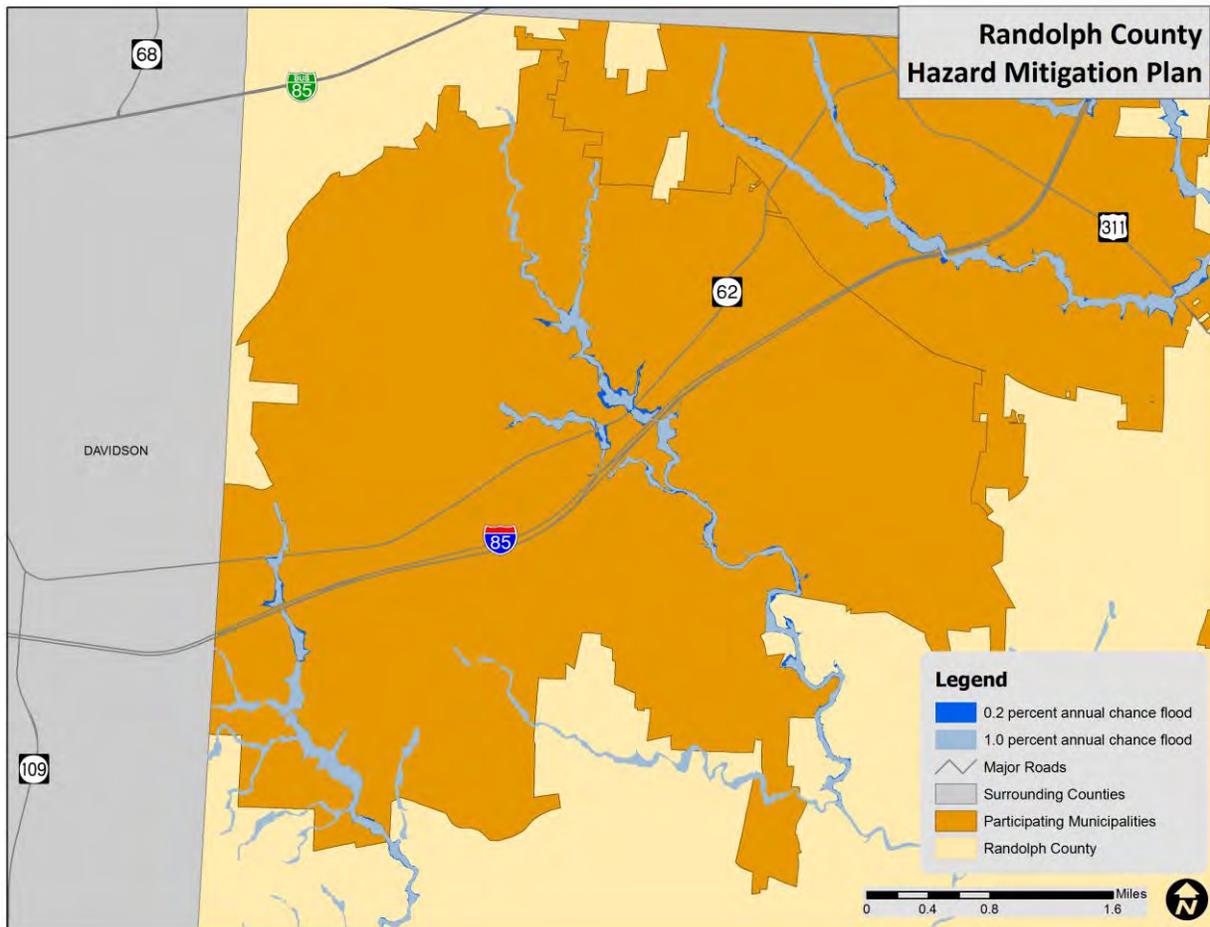
Source: Federal Emergency Management Agency/North Carolina Flood Mapping Program

FIGURE 5.24: SPECIAL FLOOD HAZARD AREAS IN STALEY



Source: Federal Emergency Management Agency/North Carolina Flood Mapping Program

FIGURE 5.25: SPECIAL FLOOD HAZARD AREAS IN TRINITY



Source: Federal Emergency Management Agency/North Carolina Flood Mapping Program

5.15.3 Historical Occurrences

Information from the National Climatic Data Center was used to ascertain historical flood events. The National Climatic Data Center reported a total of thirty-eight events throughout Randolph County since 1996.²⁵ A summary of these events is presented in **Table 5.34**. Although NCDC does not record that these events accounted for any property damage, it is almost certain that there was damage as can be noted in the flood insurance records.²⁶

²⁵ These flood events are only inclusive of those reported by the National Climatic Data Center (NCDC) from 1996 through July 2015. It is likely that additional occurrences have occurred and have gone unreported in Randolph County.

²⁶ Adjusted dollar values were calculated based on the average Consumer Price Index for a given calendar year. This index value has been calculated every year since 1913. For 2015, the November 2015 monthly index was used.

TABLE 5.34: SUMMARY OF FLOOD OCCURRENCES IN RANDOLPH COUNTY

LOCATION	NUMBER OF OCCURRENCES	DEATHS/INJURIES	PROPERTY DAMAGE (2015)	ANNUALIZED PROPERTY LOSS
City of Archdale	2	0/0	\$0	\$0
City of Asheboro	12	0/0	\$0	\$0
Town of Franklinville	0	0/0	\$0	\$0
Town of Liberty	0	0/0	\$0	\$0
Town of Ramseur	1	0/0	\$0	\$0
Town of Randleman	4	0/0	\$0	\$0
Town of Seagrove	1	0/0	\$0	\$0
Town of Staley	0	0/0	\$0	\$0
City of Trinity	0	0/0	\$0	\$0
Unincorporated Area	18	0/0	\$0	\$0
RANDOLPH COUNTY TOTAL	38	0/0	\$0	\$0

Source: National Climatic Data Center

Specific information on flood events for each jurisdiction, including date, type of flooding, and deaths and injuries, can be found in **Table 5.35**.

TABLE 5.35: HISTORICAL FLOOD OCCURRENCES IN RANDOLPH COUNTY

	DATE	TYPE	DEATHS/INJURIES	PROPERTY DAMAGE*
City of Archdale				
ARCHDALE	6/23/2006	Flash Flood	0/0	\$0
ARCHDALE	8/30/2006	Flash Flood	0/0	\$0
City of Asheboro				
ASHEBORO	7/4/2001	Flash Flood	0/0	\$0
ASHEBORO WEST	9/18/2002	Flash Flood	0/0	\$0
ASHEBORO	9/8/2004	Flash Flood	0/0	\$0
ASHEBORO	9/28/2004	Flash Flood	0/0	\$0
ASHEBORO	6/23/2006	Flash Flood	0/0	\$0
ASHEBORO	6/23/2006	Flash Flood	0/0	\$0
ASHEBORO	6/23/2006	Flash Flood	0/0	\$0
ASHEBORO	6/23/2006	Flash Flood	0/0	\$0
ASHEBORO SOUTH	7/5/2008	Flash Flood	0/0	\$0
ASHEBORO WEST	8/27/2008	Flash Flood	0/0	\$0
ASHEBORO SOUTH	6/10/2013	Flash Flood	0/0	\$0
ASHEBORO	7/5/2013	Flash Flood	0/0	\$0
Town of Franklinville				
<i>None Reported</i>	--	--	--	--
Town of Liberty				
<i>None Reported</i>	--	--	--	--
Town of Ramseur				
RAMSEUR	5/12/2007	Flash Flood	0/0	\$0

	DATE	TYPE	DEATHS/INJURIES	PROPERTY DAMAGE*
City of Randleman				
RANDLEMAN	4/28/1997	Flash Flood	0/0	\$0
RANDLEMAN	4/17/1998	Flood	0/0	\$0
RANDLEMAN	6/23/2006	Flash Flood	0/0	\$0
RANDLEMAN	8/27/2008	Flash Flood	0/0	\$0
Town of Seagrove				
SEAGROVE	2/17/1998	Flash Flood	0/0	\$0
Town of Staley				
<i>None Reported</i>	--	--	--	--
City of Trinity				
<i>None Reported</i>	--	--	--	--
Unincorporated Area				
COUNTYWIDE	7/23/1997	Flash Flood	0/0	\$0
RANDOLPH (ZONE)	1/27/1998	Flood	0/0	\$0
SEAGROVE	2/17/1998	Flash Flood	0/0	\$0
SOPHIA	3/19/1998	Flash Flood	0/0	\$0
COUNTYWIDE	9/29/1999	Flash Flood	0/0	\$0
RANDOLPH (ZONE)	3/20/2003	Flood	0/0	\$0
RANDOLPH (ZONE)	4/10/2003	Flood	0/0	\$0
COUNTYWIDE	8/4/2003	Flash Flood	0/0	\$0
COUNTYWIDE	8/9/2003	Flash Flood	0/0	\$0
NORTHWEST PORTION	8/31/2003	Flash Flood	0/0	\$0
MILLBORO	8/27/2008	Flash Flood	0/0	\$0
CENTRAL FALLS	6/18/2009	Flash Flood	0/0	\$0
CHEEKS	6/18/2009	Flash Flood	0/0	\$0
FARMER	1/25/2010	Flash Flood	0/0	\$0
CEDAR FALLS	9/30/2010	Flash Flood	0/0	\$0
ERECT	8/6/2012	Flash Flood	0/0	\$0
FULLERS	8/11/2012	Flash Flood	0/0	\$0
ERECT	3/7/2014	Flood	0/0	\$0

*Property damage is reported in 2015 dollars; All damage may not have been reported.

Source: National Climatic Data Center

5.15.4 Historical Summary of Insured Flood Losses

According to FEMA flood insurance policy records as of November 2015, there have been twenty-two flood losses reported in Randolph County through the National Flood Insurance Program (NFIP) since 1978, totaling almost \$155,000 in claims payments. A summary of these figures for each jurisdiction is provided in **Table 5.36**. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies and for losses in which claims were sought and received. It is likely that many additional instances of flood loss in Randolph County were either uninsured, denied claims payment, or not reported.

TABLE 5.36: SUMMARY OF INSURED FLOOD LOSSES IN RANDOLPH COUNTY

LOCATION	FLOOD LOSSES	CLAIMS PAYMENTS
City of Archdale	8	\$35,157
City of Asheboro	8	\$47,070
Town of Franklinville	0	\$0
Town of Liberty	0	\$0
Town of Ramseur	1	\$5,528
City of Randleman	0	\$0
Town of Seagrove*	--	--
Town of Staley*	--	--
City of Trinity	0	\$0
Unincorporated Area	5	\$67,133
RANDOLPH COUNTY TOTAL	22	\$154,888

*These communities do not participate in the National Flood Insurance Program. Therefore, no values are reported.

Source: Federal Emergency Management Agency, National Flood Insurance Program

5.15.5 Repetitive and Severe Repetitive Loss Properties

FEMA defines a repetitive loss property as any insurable building for which two or more claims of more than \$1,000 were paid by the NFIP within any rolling 10-year period, since 1978. A repetitive loss property may or may not be currently insured by the NFIP. Currently there are over 140,000 repetitive loss properties nationwide.

As of November 2015, there are four non-mitigated repetitive loss properties located in Randolph County, which accounted for sixteen losses and around \$118,000 in claims payments under the NFIP. The average claim amount for these properties is \$7,419. All of the properties are single-family residential buildings. Without mitigation, all of these properties will likely continue to experience flood losses. **Table 5.37** presents detailed information on repetitive loss properties and NFIP claims for Randolph County.

TABLE 5.37: REPETITIVE LOSS PROPERTIES IN RANDOLPH COUNTY

LOCATION	NUMBER OF PROPERTIES	TYPE OF PROPERTY	NUMBER OF LOSSES	BUILDING PAYMENT	CONTENT PAYMENT	TOTAL PAYMENT	AVERAGE PAYMENT
City of Archdale	3	Single-family residential	14	\$91,616	\$20,301	\$111,917	\$7,994
City of Asheboro	0	--	0	\$0	\$0	\$0	\$0
Town of Franklinville	0	--	0	\$0	\$0	\$0	\$0
Town of Liberty	0	--	0	\$0	\$0	\$0	\$0
Town of Ramseur	0	--	0	\$0	\$0	\$0	\$0
City of Randleman	0	--	0	\$0	\$0	\$0	\$0
Town of Seagrove*	0	--	0	\$0	\$0	\$0	\$0
Town of Staley*	--	--	--	--	--	--	--
City of Trinity	0	--	0	\$0	\$0	\$0	\$0
Unincorporated Area	1	Single-family	2	\$5,183	\$1,600	\$6,784	\$3,392

LOCATION	NUMBER OF PROPERTIES	TYPE OF PROPERTY	NUMBER OF LOSSES	BUILDING PAYMENT	CONTENT PAYMENT	TOTAL PAYMENT	AVERAGE PAYMENT
		residential					
RANDOLPH COUNTY TOTAL	4		16	\$96,799	\$21,901	\$118,701	\$7,419

*These communities do not participate in the National Flood Insurance Program. Therefore, no values are reported.

Source: National Flood Insurance Program

5.15.6 Probability of Future Occurrences

Flood events will remain a threat in Randolph County, and the probability of future occurrences will remain highly likely (100 percent annual probability). The probability of future flood events based on magnitude and according to best available data is illustrated in the figure above, which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain) and the 0.2-percent annual chance flood (500-year floodplain).

It can be inferred from the floodplain maps, previous occurrences, and repetitive loss properties that risk varies throughout Randolph County. For example, the City of Asheboro has more floodplain and thus likely has more property at risk of flood than the other municipalities. Mitigation actions may be warranted, particularly for repetitive loss properties.

Other Hazards

5.16 WILDFIRE

5.16.1 Background

A wildfire is any outdoor fire (i.e. grassland, forest, brush land) that is not under control, supervised, or prescribed.²⁷ Wildfires are part of the natural management of forest ecosystems but may also be caused by human factors.

Nationally, over 80 percent of forest fires are started by negligent human behavior such as smoking in wooded areas or improperly extinguishing campfires. The second most common cause for wildfire is lightning. In North Carolina, a majority of fires are caused by debris burning.

There are three classes of wildland fires: surface fire, ground fire, and crown fire. A surface fire is the most common of these three classes and burns along the floor of a forest, moving slowly and killing or damaging trees. A ground fire (muck 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. Wildfires are usually signaled by dense smoke that fills the area for miles around.

Wildfire probability depends on local weather conditions, outdoor activities such as camping, debris burning, construction, and the degree of public cooperation with fire prevention measures. Drought

²⁷ Prescription burning, or "controlled burn," undertaken by land management agencies is the process of igniting fires under selected conditions, in accordance with strict parameters.

conditions and other natural hazards (such as tornadoes, hurricanes, etc.) increase the probability of wildfires by producing fuel in both urban and rural settings.

Many individual homes and cabins, subdivisions, resorts, recreational areas, organizational camps, businesses, and industries are located within high wildfire hazard areas. Furthermore, the increasing demand for outdoor recreation places more people in wildlands during holidays, weekends, and vacation periods. Unfortunately, wildland residents and visitors are rarely educated or prepared for wildfire events that can sweep through the brush and timber and destroy property within minutes.

Wildfires can result in severe economic losses as well. Businesses that depend on timber, such as paper mills and lumber companies, experience losses that are often passed along to consumers through higher prices and sometimes jobs are lost. The high cost of responding to and recovering from wildfires can deplete State resources and increase insurance rates. The economic impact of wildfires can also be felt in the tourism industry if roads and tourist attractions are closed due to health and safety concerns.

State and local governments can impose fire safety regulations on home sites and developments to help curb wildfire. Land treatment measures such as fire access roads, water storage, helipads, safety zones, buffers, firebreaks, fuel breaks, and fuel management can be designed as part of an overall fire defense system to aid in fire control. Fuel management, prescribed burning, and cooperative land management planning can also be encouraged to reduce fire hazards.

5.16.2 Location and Spatial Extent

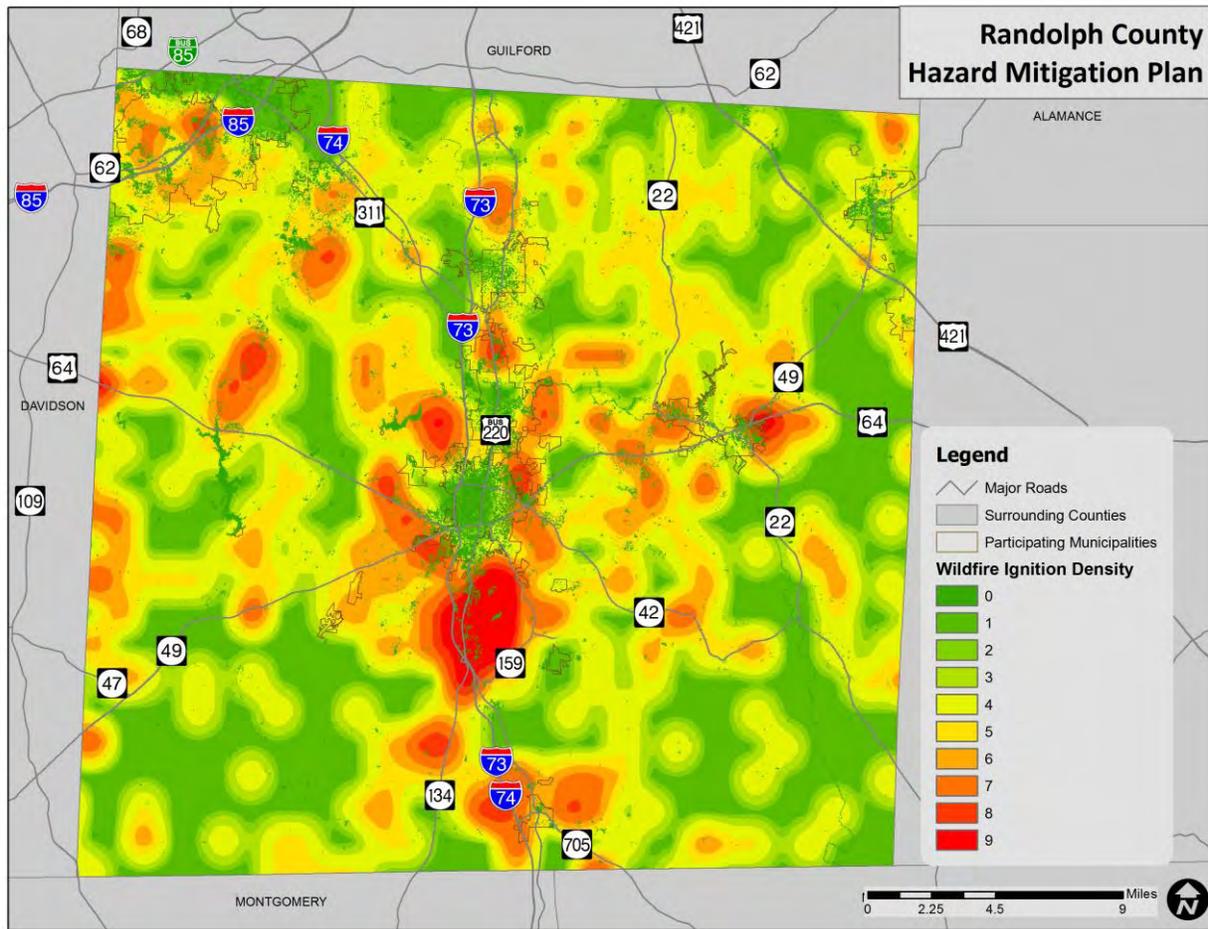
The entire County is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the wildland-urban interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas. The Wildfire Ignition Density data shown in the figure below gives an indication of historic location of wildfires in Randolph County.

5.16.3 Historical Occurrences

Figure 5.26 shows the Wildfire Ignition Density in Randolph County based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and the likelihood of a wildfire igniting in an area. Occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map. This is measured in the number of fires per year per 1,000 acres.²⁸

²⁸ Southern Wildfire Risk Assessment, 2014.

FIGURE 5.26: WILDFIRE IGNITION DENSITY IN RANDOLPH COUNTY



Source: Southern Wildfire Risk Assessment

Based on data from the North Carolina Division of Forest Resources (NCDNR) from 2005 to 2014, Randolph County experienced an average of fifty-four wildfires annually which burned a combined ninety-five acres per year. The data indicates that most of these fires are small, averaging 1.7 acres per fire. **Table 5.38** lists the number of reported wildfire occurrences in the County between the years 2005 and 2014.

TABLE 5.38: HISTORICAL WILDFIRE OCCURRENCES IN RANDOLPH COUNTY

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Randolph County										
Number of Fires	34	87	87	40	18	30	53	49	61	83
Number of Acres	161.4	103.0	101.8	83.8	39.0	30.7	48.6	123.6	185.7	69.1

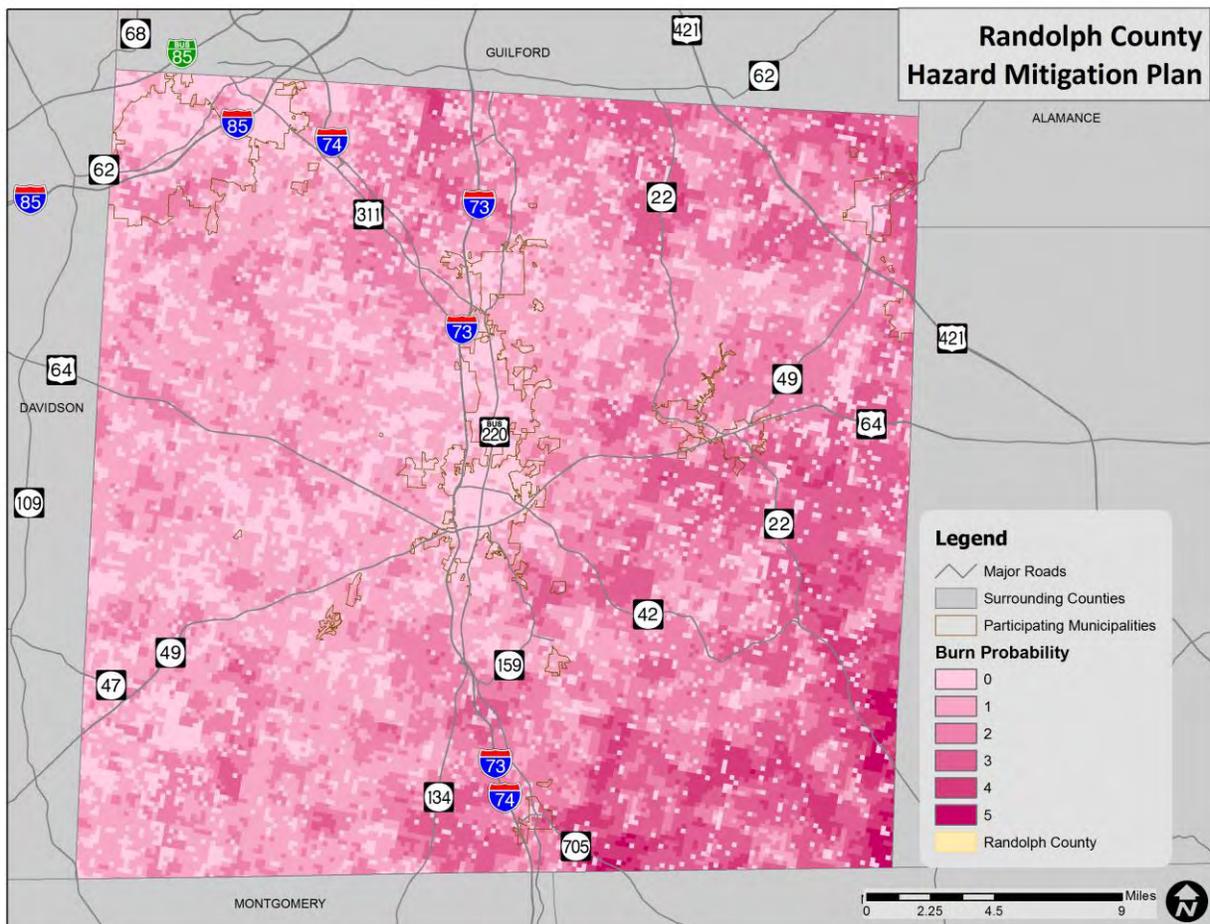
Source: North Carolina Division of Forest Resources

5.16.4 Probability of Future Occurrences

Wildfire events will be an ongoing occurrence in Randolph County. **Figure 5.27** shows that there is some probability a wildfire will occur throughout the County. However, the likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small in size but could increase due local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk.

For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to Randolph County for future wildfire events is likely (between 10 and 100 percent annual probability).

FIGURE 5.27: BURN PROBABILITY IN RANDOLPH COUNTY



Source: Southern Wildfire Risk Assessment

5.17 SOLAR FLARE

5.17.1 Background

According to NOAA, a solar flare is a large outburst of electromagnetic radiation from the Sun that can last from minutes to several hours. They are caused by large scale eruptions of magnetic flux known as coronal mass ejections (CMEs). These CMEs cause X-rays and extreme ultraviolet light to ionize in the Earth's atmosphere and impact the day-side of the planet by enhancing the absorption power of the ionosphere. In normal conditions, the ionosphere reflects radio waves, which allows for long distance radio communication without having a clear line-of-sight between the transmitter and the receiver.

However, when the absorption power of the ionosphere is enhanced by the activities of a solar flare, nearly all radio waves are absorbed and radio communication is reduced or impossible. These types of events are often referred to as radio blackouts and can have a drastic impact on communications, especially for emergency services officials who rely on radio communication. In addition, these events can disrupt GPS navigation systems, airline communications, military and environmental satellites, and electrical power grids.²⁹

Solar flares are classified physically on a logarithmic scale that increases in intensity by ten times at each new level. The scale is based on the intensity of the flare in a one minute averaged NOAA/GOES XRS instrument's 0.1-0.8 nm spectral band. The scale measures five levels of intensity with "A" flares as the least intense, followed by "B" flares, "C" flares, "M" flares, and "X" flares as the largest. The naming scale corresponds with descriptors for each event: "C" flares are considered to be "Common," "M" flares are "Medium," and "X" flares are "Extreme."

In addition to the physical classification of the solar flare itself, NOAA has also developed a five-level scale to classify the radio blackout itself. **Table 5.39** shows the radio blackout scale and provides descriptions of the typical solar flare intensity that is associated with each scale of radio blackout.

TABLE 5.39: NOAA RADIO BLACKOUT SCALE

SCALE	DESCRIPTION	EFFECT	PHYSICAL MEASURE	AVERAGE FREQUENCY (1 CYCLE = 11 YEARS)
R 5	Extreme	<p>HF Radio: Complete HF (high frequency) radio blackout on the entire sunlit side of the Earth lasting for a number of hours. This results in no HF radio contact with mariners and en route aviators in this sector.</p> <p>Navigation: Low-frequency navigation signals used by maritime and general aviation systems experience outages on the sunlit side of the Earth for many hours, causing loss in positioning. Increased satellite navigation errors in positioning for several hours on the sunlit side of Earth, which may spread into the night side.</p>	X20 (2×10^{-3})	Less than 1 per cycle

²⁹ NOAA. The Serendipitous Discovery of Solar Flares. http://www.noaa.gov/features/02_monitoring/1859solarstorm.html

SCALE	DESCRIPTION	EFFECT	PHYSICAL MEASURE	AVERAGE FREQUENCY (1 CYCLE = 11 YEARS)
R 4	Severe	HF Radio: HF radio communication blackout on most of the sunlit side of Earth for one to two hours. HF radio contact lost during this time. Navigation: Outages of low-frequency navigation signals cause increased error in positioning for one to two hours. Minor disruptions of satellite navigation possible on the sunlit side of Earth.	X10 (10 ⁻³)	8 per cycle (8 days per cycle)
R 3	Strong	HF Radio: Wide area blackout of HF radio communication, loss of radio contact for about an hour on sunlit side of Earth. Navigation: Low-frequency navigation signals degraded for about an hour.	X1 (10 ⁻⁴)	175 per cycle (140 days per cycle)
R 2	Moderate	HF Radio: Limited blackout of HF radio communication on sunlit side, loss of radio contact for tens of minutes. Navigation: Degradation of low-frequency navigation signals for tens of minutes.	M5 (5 x 10 ⁻⁵)	350 per cycle (300 days per cycle)
R 1	Minor	HF Radio: Weak or minor degradation of HF radio communication on sunlit side, occasional loss of radio contact. Navigation: Low-frequency navigation signals degraded for brief intervals.	M1 (10 ⁻⁵)	2000 per cycle (950 days per cycle)

Source: Space Weather Prediction Center, National Oceanic and Atmospheric Administration, <http://www.swpc.noaa.gov/noaa-scales-explanation>

5.17.2 Location and Spatial Extent

Because these events occur on a global scale and could have wide-ranging impacts on the entire dayside of the planet simultaneously, all areas of the County are considered to be equally susceptible to a solar flare.

5.17.3 Historical Occurrences

There is a relatively extensive history of solar flares being observed in the United States, but the first observation of a solar flare was in England in 1859 when Richard Carrington observed what is still considered the largest solar flare in recorded history. This event, now known as the Carrington event, was a critical discovery as it connected solar flares with many of the impacts that we recognize they cause today. In the direct aftermath of Carrington's discovery, the Earth was engulfed in a magnetic storm that created auroras all over the sky, caused compass needles to spin uncontrollably, and prevented telegraph operators from sending messages. These early observations of impacts from solar flares would lay the groundwork for recognizing future impacts from solar flare events such as the disruption of communications systems and electrical power.

Although there has not been another solar flare on the magnitude of the Carrington event in the last 150 years, there have been a number of large events that have impacted various areas of the Country and the world. Several of these events are described below and it should be noted that since solar flares could have effects anywhere in the world, similar impacts could be expected in Randolph County.

August 4, 1972: A major solar storm reportedly caused a voltage surge on telephone lines in Illinois as reported by AT&T. This resulted in a temporary shutdown of communications lines for around thirty minutes. This was one of the first storms that scientists were able to predict with some degree of accuracy.

March 13, 1989: Known as the Quebec Blackout Storm, this event knocked out power to the electric grid of the Hydro-Quebec Power Authority. Roughly six million people were impacted as they lost electricity and thus, in many cases, their source of heat. Power companies restored power within about nine hours, but the event was considered very close to a large-scale disaster.

July 14, 2000: The Bastille Day Flare was an X5.7 class flare that was the largest on record since the 1989 event. This event was considered probably the most well-observed solar flare event on record and helped astronomers better understand the causes of solar flares and the sun's cycle of activity.

5.17.4 Probability of Future Occurrences

Based on historic observations of major events and the knowledge of the Sun's roughly eleven year cycle of activity, a major solar flare event that has impacts on Earth is considered likely (between 10 and 100 percent annual probability).

5.18 NUCLEAR POWER PLANT EMERGENCY

5.18.1 Background

A nuclear and radiation accident is defined by the International Atomic Energy Agency (IAEA) as "an event that has led to significant consequences to people, the environment or the facility. Often, this type of incident results from damage to the reactor core of a nuclear power plant which can release radioactivity into the environment. The degree of exposure from nuclear accidents has varied from serious to catastrophic.

By some estimates, over 50 percent of nuclear accidents that have ever occurred were in the United States.³⁰ However, it is also important to note that generally, nuclear accidents are a rare occurrence. Many incidents are extremely well known due to their large-scale impact and serious effects on people and the environment.

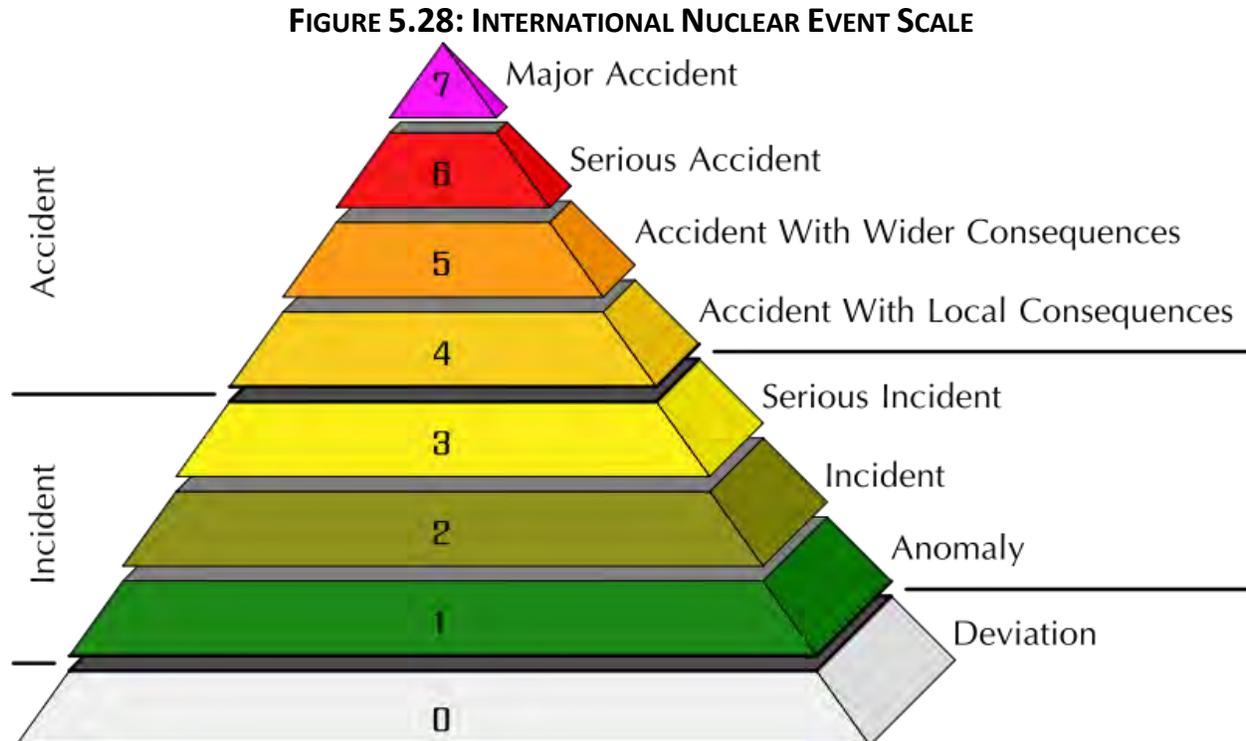
One of the most notorious accidents in the United States was the Three Mile Island accident which occurred in 1979 and released small amounts of radioactive gases and iodine into the environment. Although no deaths have been directly attributed to the accident, it invoked a strong public reaction and demonstrated the potential dangers associated with nuclear power generation.

Shearon Harris Nuclear Power Plant, which is the plant located closest to Randolph County, is a 2,948 megawatt power plant that began commercial operation in 1987. It has pressurized water reactors and operates with a very high level of security.

³⁰ Benjamin K. Sovacool. A Critical Evaluation of Nuclear Power and Renewable Electricity in Asia *Journal of Contemporary Asia*, Vol. 40, No. 3, August 2010, pp. 393–400.

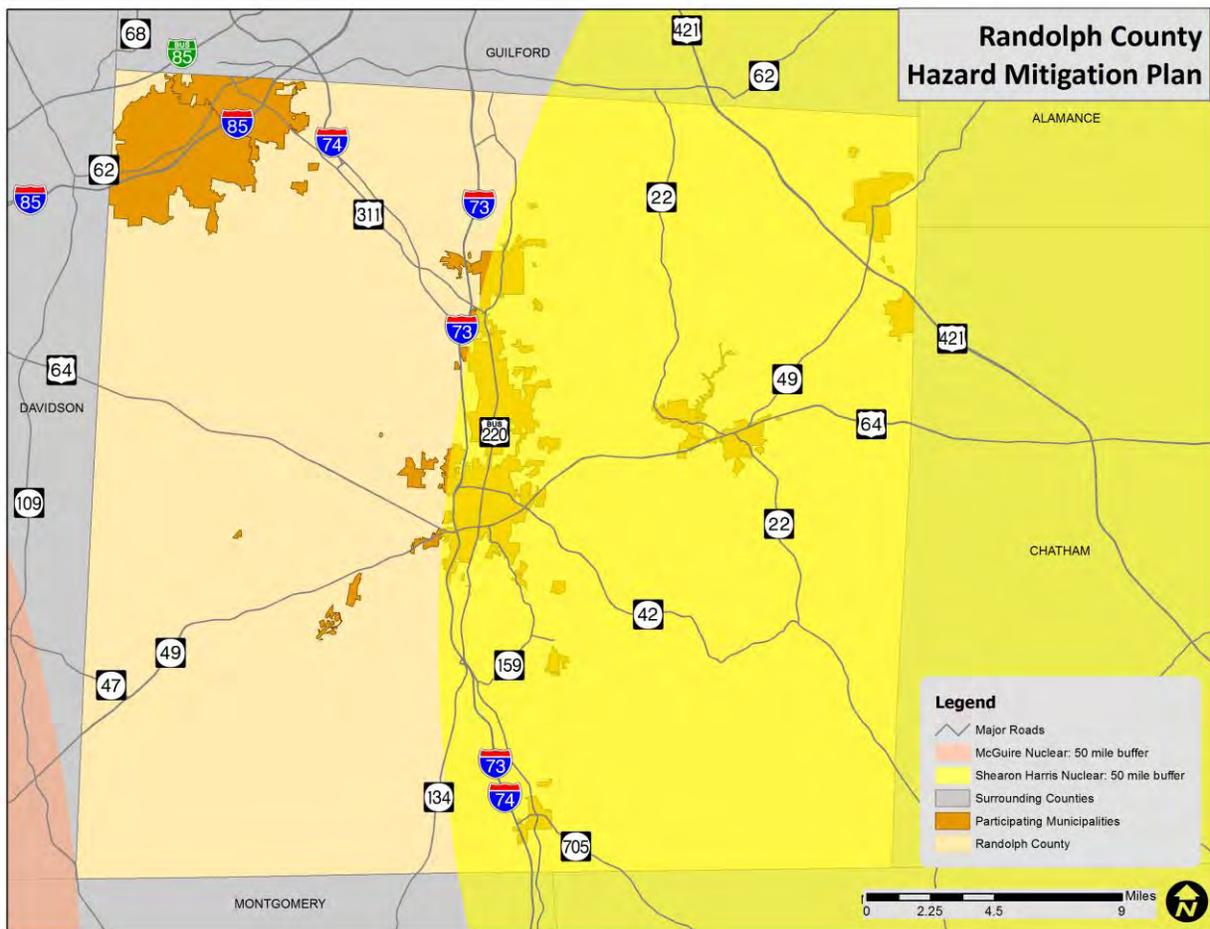
5.18.2 Location and Spatial Extent

The eastern portion of the County is at risk to a nuclear incident. Areas in this part of the County are susceptible due to their relative proximity to the Shearon Harris Power Plant. The IAEA has developed a scale called the International Nuclear and Radiological Event Scale (INES) which provides a quantitative means of assessing the extent of a nuclear event. This scale, like the MMI used for earthquakes, is logarithmic which means that each increasing level on the scale represents an event ten times more severe than the previous level (Figure 5.28).



Source: International Atomic Energy Agency, <http://www-ns.iaea.org/tech-areas/emergency/ines.asp>

The Nuclear Regulatory Commission (NRC) defines two emergency planning zones around nuclear plants. Areas located within ten miles of the station are considered to be within the zone of highest risk to a nuclear incident and this radius is the designated evacuation radius recommended by the NRC. Within the ten-mile zone, the primary concern is exposure to and inhalation of radioactive contamination. The most concerning effects in the secondary fifty-mile zone are related to ingestion of food and liquids that may have been contaminated. None of the County is located within the ten-mile radius of the power plant; however, a portion of the County is located within this fifty-mile radius which is still considered to be at some risk from a nuclear incident (Figure 5.29).

FIGURE 5.29: NUCLEAR POWER PLANT INCIDENT HAZARD ZONES IN RANDOLPH COUNTY

Source: International Atomic Energy Agency

5.18.3 Historical Occurrences

Although there have been no major nuclear events at the Shearon Harris Nuclear Power Plant, there is some possibility that one could occur as there have been incidents in the past in the United States at other facilities and at facilities around the world.

5.18.4 Probability of Future Occurrences

A nuclear event is a very rare occurrence in the United States due to the intense regulation of the industry. There have been incidents in the past, but it is considered unlikely (less than 1 percent annual probability).

5.19 TERROR THREAT

5.19.1 Background

Terrorism is defined in the United States Code of Federal Regulations as “the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.”³¹ Academic literature identifies some overarching political goals that terrorism seeks to achieve, including spreading anxiety and alarm among immediate victims, families, and the general public; eliminating opponents and destroying symbolic targets; and generating direct damage on society, such as affecting business confidence. In the following sections, some general background information about terrorism is presented prior to the County’s hazard identification and risk assessment findings.

There are two general types of terrorist groups: network and hierarchical. The type of organization a group adopts largely depends on how long the group has existed. More recently developed groups tend to organize or adapt to the possibilities of the network model. Older, more established groups lean toward the hierarchical structure and are often more associated with violence of a political nature.³² Terrorist acts can be committed by large, formally organized groups with terrorist cells in different parts of the world or they can originate from smaller groups or individuals from a small city or domestic “homegrown” location. In the United States, terrorists that are “homegrown” do not belong to a defined group, may operate very effectively “under the radar,” and may pose the biggest threat initially at the local level.³³

5.19.2 Location and Spatial Extent

A terror threat could potentially occur at any location in the County. However, the very definition of a terrorist event indicates that it is most likely to be targeted at a critical or symbolic resource, location, or event. Ensuring and protecting the continuity of critical infrastructure and key resources (CIKR) of the United States is essential to the Nation’s security, public health and safety, economic vitality, and way of life. CIKR includes physical and/or virtual systems or assets that, if damaged, would have a detrimental impact on national security, including large-scale human casualties, property destruction, economic disruption, and significant damage to morale and public confidence. **Table 5.40** lists the U.S. Department of Homeland Security’s (DHS) identified main critical infrastructure sectors.

³¹ U.S. Code of Federal Regulations. 23 C.F.R. Section 0.85

³² Terrorism Research. *Terrorist groups*. Retrieved December 27, 2011, from <http://www.terrorism-research.com/groups/>

³³ *Ibid.*

TABLE 5.40: U.S. DEPARTMENT OF HOMELAND SECURITY CRITICAL INFRASTRUCTURE SECTORS

<ul style="list-style-type: none"> ▪ Agriculture and Food ▪ Banking and Finance ▪ Chemical ▪ Commercial Facilities ▪ Communications ▪ Critical Manufacturing ▪ Dams ▪ Defense Industrial Base ▪ Emergency Services ▪ Energy 	<ul style="list-style-type: none"> ▪ Government Facilities ▪ Healthcare and Public Health ▪ Information Technology ▪ National Monuments and Icons ▪ Nuclear Reactors, Materials, and Waste ▪ Postal and Shipping ▪ Transportation Systems ▪ Water
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Source: Department of Homeland Security, <https://www.dhs.gov/critical-infrastructure-sectors>

Although all critical facilities (see Section 6: *Vulnerability Assessment*) are at a heightened level of risk in Randolph County, there are several facilities and events in the County that have been identified as the likely primary targets. Randolph County Emergency Management maintains a list of facilities and events at elevated risk of terror threat.

5.19.3 Historical Occurrences

Although there have been no major terror events in Randolph County, there is some possibility that one could occur in the future as there have been incidents in the United States in the past and there are several facilities and events that could be potential targets.

5.19.4 Probability of Future Occurrences

Randolph County has had no recorded terrorist events. Due to no recorded incidents against the County, the probability of future occurrences of a terrorist attack is unlikely (less than 1 percent annual probability).

5.20 PUBLIC HEALTH/INFECTIOUS DISEASE THREAT

5.20.1 Background

People

Communicable, or infectious, diseases are conditions that result in clinically evident illness which are transmissible directly from one person to another or indirectly through vectors such as insects, air, water, blood or other objects. The impact of communicable disease can range from the mild effects of the common cold to the extreme lethality of pneumonic plague or anthrax. The public health system in the United States was developed in large part as a response to the often urgent need to respond to or prevent outbreaks of communicable diseases. Through public health methods of disease reporting, vaccinations, vector control, and effective treatments, most communicable diseases are well controlled in the United States and Randolph County. However, control systems can fail and when people come together from locations outside of the County, State, and the country, and outbreaks can occur, even in

the most modern of communities. In this section, some of the more significant potential communicable disease concerns are described.

The threats discussed in this section usually do not occur on a regular basis, though some are more frequent. The diseases described herein do not originate from intentional exposure (such as through terrorist actions) but do present significant issues and concerns for the public health community. There are numerous infectious diseases that rarely, if ever, occur in Randolph County, such as botulism or bubonic plague. Some highly dangerous diseases which could potentially be used as biological weapons, such as anthrax, pneumonic plague, and smallpox, are safely housed and controlled in laboratory settings such as at the Centers for Disease Control and Prevention (CDC). Other diseases have not (yet) mutated into a form that can infect humans, or otherwise lie dormant in nature.

There have been two significant viral outbreaks from emerging diseases in recent years of both national and international importance. The West Nile Virus is a virus that typically is passed to humans or animals by mosquitoes. Severe Acute Respiratory Syndrome (SARS) is a respiratory syndrome that is transmitted by airborne droplets. While both of these conditions caused a great deal of public health concern when they were first identified, SARS has virtually all but disappeared, while West Nile Virus occurs with low frequency and causes serious disease in only a very small percentage of cases.

Other communicable diseases pose a greater threat to the residents of Randolph County. Some of the infectious diseases of greatest concern include influenza, particularly in a pandemic form, as well as norovirus, and multiple antibiotic-resistant tuberculosis. Even in one of its normal year-to-year variants, influenza (commonly referred to as “flu”) can result in serious illness and even death in young children, the elderly, and immune-compromised persons. There is always the potential risk of the emergence of influenza in one of the pandemic H1N1 forms, such as in the “Spanish Flu” outbreak of 1918-19, which killed over 50 million people worldwide. Every year, Randolph County sees hundreds of cases of influenza, leading to hundreds of hours of lost productivity in businesses due to sick employees. A vaccine for influenza is produced every year and, according to the CDC, is highly effective in preventing the disease.

Norovirus is recognized as the leading cause of foodborne-disease outbreaks in the United States. The virus can cause diarrhea, vomiting, and stomach pain, and is easily spread from person to person through contaminated food or water and by surface to surface contact. Especially vulnerable populations to this virus include those living or staying in nursing homes and assisted living facilities and other healthcare facilities such as hospitals. Norovirus could also be a threat in the event of large public gatherings such as sporting events, concerts, festivals, and so forth. Randolph County and the State of North Carolina experience numerous norovirus outbreaks every year. No vaccine or treatment exists for the Norovirus, making it especially dangerous for the public in the event of an outbreak.

Tuberculosis (TB) is a bacterial infection that originates from airborne exposure. Currently there are only a couple of new tuberculosis cases in Randolph County each year. However, multiple drug-resistant strains, and even new extreme drug-resistant strains, are showing up with increasing frequency, so it is possible TB is a disease that could become a cause of greater concern in coming years.

Public health threats can occur at any time and can have varying impacts. Discussions between public health professionals, planning officials, and first response agencies are essential in order to facilitate safe, effective, and collaborative efforts toward outbreaks.

Livestock/Agriculture

Plants and animals can also be impacted by infectious disease outbreaks. Livestock are susceptible to various diseases including avian flu, classical swine fever, mad cow disease, and hand, foot, and mouth disease, while crops may be impacted by pests and crop diseases. The outcome of such an outbreak could be devastating, resulting in loss of livestock and crops, disruption of the agriculture industry, and decreased food production.

5.20.2 Location and Spatial Extent

Due to the nature of a public health/infectious disease event, it would be difficult to predict a precise location where this type of event would occur. Moreover, a large-scale event may have impacts that spread throughout the County. Therefore, all areas in Randolph County are considered equally susceptible to public health/infectious diseases.

5.20.3 Historical Occurrences

People

In 2003, the SARS outbreak that began in Southeast Asia began showing up in the United States. There was a single confirmed case of SARS in North Carolina in 2003, with eight suspected cases, as described by the North Carolina Division of Public Health.

An outbreak of the West Nile Virus first began in the United States in 1999. No cases have been reported in Randolph County; however, most cases in North Carolina have been reported from the Piedmont counties. Across North Carolina, seven cases were reported in seven counties in 2012 and forty-three cases were reported in twenty-six counties from 2003 to 2012.

As stated previously, influenza, norovirus, and tuberculosis are regularly occurring health issues in Randolph County. With the exception of tuberculosis, these conditions are not legally reportable to County or State public health agencies, so data on disease incidence is not readily available. However, these diseases are monitored through local epidemiological surveillance systems in hospitals and health departments, and any potential outbreaks are investigated promptly.

During events involving outbreaks, as stated in NCGS § 130A – 145, the State Health Director and a local health director are empowered to exercise quarantine and isolation authority. Quarantine and isolation authority shall be exercised only when and so long as the public health is endangered, all other reasonable means for correcting the problem have been exhausted, and no less restrictive alternative exists.

Livestock/Agriculture

Avian flu outbreaks can occur among poultry from time to time in the US. According to the World Organization for Animal Health, between 1997 and 2014, the US experienced one outbreak of highly pathogenic avian influenza in commercial poultry that was restricted to one poultry farm. (There are two types of avian flu; one is low pathogenic and the other is highly pathogenic. Pathogenicity refers to the ability of the virus to produce disease.) Beginning in 2015, the virus has been detected in some US commercial poultry flocks, but no cases have been reported in Randolph County.

The USDA reports that there have been several instances of pest and plant disease activities in the US; however, none have impacted Randolph County.

There have been no other recent reports of significant disease events in the US or Randolph County.

5.20.4 Probability of Future Occurrences

Due to some recent incidents that have been recorded in Randolph County, future occurrences are considered possible (between 1 and 10 percent annual probability).

Conclusions

5.21 CONCLUSIONS ON HAZARD RISK

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its “How-to” guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

5.21.1 Hazard Extent

Table 5.41 describes the extent of each natural hazard identified for Randolph County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

TABLE 5.41: EXTENT OF RANDOLPH COUNTY HAZARDS

Atmospheric Hazards	
Drought	Drought extent is defined by PDSI classifications which include Extremely Moist, Very Moist, Mid-Range, Moderate Drought, Severe Drought, and Extreme Drought classifications. According to the PDSI classifications, the most severe drought condition is Extreme. Randolph County has received this ranking three times over the fourteen-year reporting period.
Hailstorm	Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Randolph County was 2.75 inches (reported on August 29, 1987). It should be noted that future events may exceed this.
Heat Wave/Extreme Heat	The extent of extreme heat can be defined by the maximum temperature reached. The highest temperature recorded in Randolph County is 105 degrees Fahrenheit (reported on August 18, 1988).
Hurricane/Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5. The greatest classification of hurricanes to traverse directly through Randolph County was Hurricane Fran which reached a maximum wind speed of one-hundred knots (Category 3) in the County’s seventy-five mile buffer.
Lightning	According to the Vaisala flash density map, Randolph County is located in an area that experiences one to eight lightning flashes per square kilometer per year. It should be noted that future lightning occurrences may exceed these figures.

Severe Thunderstorm/ High Wind	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. The strongest recorded wind event in Randolph County was reported on June 30, 1998 at one hundred knots (approximately 115 mph). It should be noted that future events may exceed these historical occurrences.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA as well as the Fujita/Enhanced Fujita Scale. The greatest magnitude reported in Randolph County was an F3 (reported on October 7, 1965). It should be noted that an EF5 tornado is possible.
Winter Storm and Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). The greatest twenty-four-hour snowfall reported in the County was twenty-four inches on March 2, 1927. Due to unpredictable variations in snowfall throughout the County, extent totals will vary for each participating jurisdiction and reliable data on snowfall totals is not abundantly available.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale and the Modified Mercalli Intensity (MMI) scale and the distance of the epicenter from Randolph County. According to data provided by the National Geophysical Data Center, the greatest earthquake to impact the County had a MMI of VII (very strong) and an unknown Richter Scale measurement. However, a corresponding Richter Scale magnitude is < 6.1. This event was reported on September 1, 1886 and the epicenter of this earthquake was located 312.0 km away.
Landslide	As noted above in the landslide profile, there is no extensive history of landslides in Randolph County and landslide events typically occur in isolated areas. This provides a challenge when trying to determine an accurate extent for the landslide hazard. However, when using USGS landslide susceptibility index, extent can be measured with incidence, which is low throughout the majority of the County except for a small area in the southeastern portion which has moderate incidence. There is also moderate susceptibility throughout the entire County.
Land Subsidence/ Sinkhole	The extent of land subsidence can be defined by the measurable rate of subsidence that occurs. There are no subsidence rate records located in Randolph County nor is there any significant historical record of events. The largest potential event might be as large as 10,000 cubic yards.
Hydrologic Hazards	
Dam and Levee Failure	Dam failure extent is defined using the North Carolina Division of Energy, Mineral, and Land Resources criteria. Of the eighty-nine dams in Randolph County, twenty-nine are classified as high hazard.

Flood	<p>Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 4.5 percent of the total land area in Randolph County. It should also be noted that local officials recall flooding depths of at least four to six feet in some historic events and this is loosely corroborated by NCDC narrative records.</p> <p>Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many jurisdictions. The greatest peak discharge recorded for the region was reported on September 18, 1945. Water reached a discharge of 43,000 cubic feet per second and the stream crest height was recorded at 34.04 feet. Additional peak discharge readings and crest heights are in the table below.</p> <table border="1"> <thead> <tr> <th>LOCATION/JURISDICTION</th> <th>DATE</th> <th>PEAK DISCHARGE (CFS)</th> <th>GAGE HEIGHT (FT)</th> </tr> </thead> <tbody> <tr> <td>Deep River near Randleman, NC</td> <td>9/25/1947</td> <td>20,000</td> <td>32.20</td> </tr> <tr> <td>Muddy Creek near Archdale, NC</td> <td>6/28/1938</td> <td>2,180</td> <td>10.46</td> </tr> <tr> <td>Deep River at Ramseur, NC</td> <td>9/18/1945</td> <td>43,000</td> <td>34.04</td> </tr> <tr> <td>Uwharrie River near Trinity, NC</td> <td>7/17/1941</td> <td>2,190</td> <td>7.00</td> </tr> </tbody> </table>	LOCATION/JURISDICTION	DATE	PEAK DISCHARGE (CFS)	GAGE HEIGHT (FT)	Deep River near Randleman, NC	9/25/1947	20,000	32.20	Muddy Creek near Archdale, NC	6/28/1938	2,180	10.46	Deep River at Ramseur, NC	9/18/1945	43,000	34.04	Uwharrie River near Trinity, NC	7/17/1941	2,190	7.00
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Other Hazards																					
Wildfire	<p>Wildfire data was provided by the North Carolina Division of Forest Resources and is reported annually by County from 2005-2014.</p> <p>Analyzing the data indicates the following wildfire hazard extent for the County.</p> <ul style="list-style-type: none"> The greatest number of fires to occur in any year was 157 in 2001. The greatest number of acres to burn in a single year occurred in 2013 when 185.70 acres were burned. <p>Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the County.</p>																				
Solar Flare	<p>Although there is not an extensive history of solar flares occurring and specifically impacting Randolph County, reports from historic events outside of the County are useful and can indicate roughly the extent that might be anticipated. Based on these historic events, it is possible that the County could be impacted by an "X" class solar flare that would rate as an R5 on the radio blackout scale and would disrupt radio contact, communications equipment, and power supply for several hours.</p>																				
Nuclear Power Plant Emergency	<p>Although there is no history of a nuclear accident at the Shearon Harris Power Plant, other events across the globe and in the United States in particular indicate that an event is possible. Since several national and international events were Level 7 events on the INES, the potential for a Level 7 event at Shearon Harris is possible.</p>																				
Terror Threat	<p>There is no history of terror threats in Randolph County; however, it is possible that one of these events could occur. If this were to take place, the magnitude of the event could range on the scale of critical damage with many fatalities and injuries to the population.</p>																				

Public
Health/Infectious
Disease Threat

A public health/infectious disease threat could have a large-scale effect throughout the County and may cause illness in many people. Possible impacts from a disease threat depend largely on the impacted population, but might include anything from absenteeism and loss of productivity in the workplace to death or serious illness to humans or livestock. A serious disease threat could affect many thousands of people.

5.21.2 Priority Risk Index

In order to draw some meaningful planning conclusions on hazard risk for Randolph County, the results of the hazard profiling process were used to generate Countywide hazard classifications according to a “Priority Risk Index” (PRI). The purpose of the PRI is to categorize and prioritize all potential hazards for Randolph County as high, moderate, or low risk. Combined with the asset inventory and quantitative vulnerability assessment provided in the next section, the summary hazard classifications generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for the jurisdictions in Randolph County to consider as part of their proposed mitigation strategy.

The prioritization and categorization of identified hazards for Randolph County is based principally on the PRI, a tool used to measure the degree of risk for identified hazards in a particular planning area. The PRI is used to assist the Randolph County Hazard Mitigation Planning Team in gaining consensus on the determination of those hazards that pose the most significant threat to the County based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective planning tool for classifying and prioritizing hazard risks in Randolph County based on standardized criteria.

The application of the PRI results in numerical values that allow identified hazards to be ranked against one another (the higher the PRI value, the greater the hazard risk). PRI values are obtained by assigning varying degrees of risk to five categories for each hazard (probability, impact, spatial extent, warning time, and duration). Each degree of risk has been assigned a value (1 to 4) and an agreed upon weighting factor³⁴, as summarized in **Table 5.42**. To calculate the PRI value for a given hazard, the assigned risk value for each category is multiplied by the weighting factor. The sum of all five categories equals the final PRI value, as demonstrated in the example equation below:

$$\text{PRI VALUE} = [(\text{PROBABILITY} \times .30) + (\text{IMPACT} \times .30) + (\text{SPATIAL EXTENT} \times .20) + (\text{WARNING TIME} \times .10) + (\text{DURATION} \times .10)]$$

According to the weighting scheme and point system applied, the highest possible value for any hazard is 4.0. When the scheme is applied for Randolph County, the highest PRI value is 3.1 (severe thunderstorm/high wind). Prior to being finalized, PRI values for each identified hazard were reviewed and accepted by the members of the Hazard Mitigation Planning Team.

³⁴ The Hazard Mitigation Planning Team, based upon any unique concerns or factors for the planning area, may adjust the PRI weighting scheme during future plan updates.

TABLE 5.42: PRIORITY RISK INDEX FOR RANDOLPH COUNTY

PRI CATEGORY	DEGREE OF RISK			ASSIGNED WEIGHTING FACTOR
	LEVEL	CRITERIA	INDEX VALUE	
Probability	Unlikely	Less than 1% annual probability	1	30%
	Possible	Between 1 and 10% annual probability	2	
	Likely	Between 10 and 100% annual probability	3	
	Highly Likely	100% annual probability	4	
Impact	Minor	Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities.	1	30%
	Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one day.	2	
	Critical	Multiple deaths/injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one week.	3	
	Catastrophic	High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.	4	
Spatial Extent	Negligible	Less than 1% of area affected	1	20%
	Small	Between 1 and 10% of area affected	2	
	Moderate	Between 10 and 50% of area affected	3	
	Large	Between 50 and 100% of area affected	4	
Warning Time	More than 24 hours	Self explanatory	1	10%
	12 to 24 hours	Self explanatory	2	
	6 to 12 hours	Self explanatory	3	
	Less than 6 hours	Self explanatory	4	
Duration	Less than 6 hours	Self explanatory	1	10%
	Less than 24 hours	Self explanatory	2	
	Less than one week	Self explanatory	3	
	More than one week	Self explanatory	4	

5.21.3 Priority Risk Index Results

Table 5.43 summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this section, as well as input from the Hazard Mitigation Planning Team. The results were then used in calculating PRI values and making final determinations for the risk assessment.

TABLE 5.43: SUMMARY OF PRI RESULTS FOR RANDOLPH COUNTY

HAZARD	CATEGORY/DEGREE OF RISK					
	PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	PRI SCORE
Atmospheric Hazards						
Drought	Likely	Minor	Large	More than 24 hours	More than 1 week	2.5
Heat Wave/Extreme Heat	Possible	Minor	Large	More than 24 hours	Less than 1 week	2.1
Hailstorm	Highly Likely	Minor	Moderate	6 to 12 hours	Less than 6 hours	2.5
Hurricane/Tropical Storm	Likely	Critical	Large	More than 24 hours	Less than 24 hours	2.9
Lightning	Highly Likely	Limited	Negligible	6 to 12 hours	Less than 6 hours	2.4
Severe Thunderstorm/ High Wind	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	3.1
Tornado	Likely	Critical	Small	Less than 6 hours	Less than 6 hours	2.7
Winter Storm and Freeze	Highly Likely	Limited	Moderate	More than 24 hours	Less than 1 week	2.8
Geologic Hazards						
Earthquake	Possible	Minor	Moderate	Less than 6 hours	Less than 6 hours	2.0
Landslide	Unlikely	Limited	Small	6 to 12 hours	Less than 24 hours	1.8
Land Subsidence/Sinkhole	Unlikely	Minor	Negligible	More than 24 hours	More than 1 week	1.3
Hydrologic Hazards						
Dam and Levee Failure	Possible	Critical	Small	Less than 6 hours	Less than 6 hours	2.4
Flood	Highly Likely	Limited	Small	6 to 12 hours	Less than 1 week	2.8
Other Hazards						
Wildfire	Likely	Minor	Moderate	Less than 6 hours	Less than 1 week	2.5
Nuclear Power Plant Emergency	Unlikely	Limited	Small	6 to 12 hours	More than 1 week	2.0
Solar Flare	Likely	Limited	Small	Less than 6 hours	Less than 24 hours	2.5
Terror Threat	Unlikely	Critical	Negligible	Less than 6 hours	Less than 1 week	2.1
Public Health/Infectious Disease Threat	Possible	Critical	Moderate	12 to 24 hours	Less than 1 week	2.6

5.22 FINAL DETERMINATIONS

The conclusions drawn from the hazard profiling process for Randolph County, including the PRI results and input from the Hazard Mitigation Planning Team, resulted in the classification of risk for each

identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk (**Table 5.44**). For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Randolph County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately, and is described in Section 6: *Vulnerability Assessment*. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates.

TABLE 5.44: CONCLUSIONS ON HAZARD RISK FOR RANDOLPH COUNTY

HIGH RISK	Severe Thunderstorm/High Wind Hurricane/Tropical Storm Winter Storm and Freeze Flood Tornado
MODERATE RISK	Public Health/Infectious Disease Threat Drought Hailstorm Wildfire Solar Flare Dam and Levee Failure
LOW RISK	Lightning Heat Wave/Extreme Heat Terror Threat Nuclear Power Plant Emergency Earthquake Landslide Land Subsidence/Sink Hole

SECTION 6

VULNERABILITY ASSESSMENT

This section identifies and quantifies the vulnerability of the jurisdictions within Randolph County to the significant hazards identified in the previous sections (*Hazard Identification* and *Hazard Profiles*). It consists of the following subsections:

- ❖ 6.1 Overview;
- ❖ 6.2 Methodology;
- ❖ 6.3 Explanation of Data Sources;
- ❖ 6.4 Asset Inventory;
- ❖ 6.5 Vulnerability Assessment Results; and
- ❖ 6.6 Conclusions on Hazard Vulnerability.

44 CFR Requirement

44 CFR Part 201.6(c)(2)(ii): The risk assessment shall include a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. The description shall include an overall summary of each hazard and its impact on the community. The plan should describe vulnerability in terms of: (A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; (B) An estimate of the potential losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate; (C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

6.1 OVERVIEW

This section builds upon the information provided in Section 4: *Hazard Identification* and Section 5: *Hazard Profiles* by identifying and characterizing an inventory of assets in Randolph County. In addition, the potential impact and expected amount of damages caused to these assets by each identified hazard event is assessed. The primary objective of the vulnerability assessment is to quantify exposure and the potential loss estimates for each hazard. In doing so, Randolph County and the participating jurisdictions may better understand their unique risks to identified hazards and be better prepared to evaluate and prioritize specific hazard mitigation actions.

This section begins with an explanation of the methodology applied to complete the vulnerability assessment, followed by a summary description of the asset inventory as compiled for jurisdictions in Randolph County. The remainder of this section focuses on the results of the assessment conducted.

6.2 METHODOLOGY

This vulnerability assessment was conducted using three distinct methodologies: (1) A stochastic risk assessment; (2) a geographic information system (GIS)-based analysis; and (3) a risk modeling software analysis. Each approach provides estimates for the potential impact of hazards by using a common,

systematic framework for evaluation, including historical occurrence information provided in the *Hazard Identification* and *Hazard Profiles* sections. A brief description of the three different approaches is provided on the following pages.

6.2.1 Stochastic Risk Assessment

The stochastic risk assessment methodology was applied to analyze hazards of concern that were outside the scope of hazard risk models and the GIS-based risk assessment. This involves the consideration of annualized loss estimates and impacts of current and future buildings and populations. Annualized loss is the estimated long-term weighted average value of losses to property in any single year in a specified geographic area (i.e., municipal jurisdiction or County). This methodology is applied primarily to hazards that do not have geographically-definable boundaries and are therefore excluded from spatial analysis through GIS. A stochastic risk methodology was used for the following hazards:

- ❖ Dam and Levee Failure;
- ❖ Drought;
- ❖ Hailstorm;
- ❖ Heat Wave/Extreme Heat;
- ❖ Land Subsidence/Sinkhole;
- ❖ Lightning;
- ❖ Public Health/Infectious Disease Threat;
- ❖ Severe Thunderstorm/High Wind;
- ❖ Solar Flare;
- ❖ Terror Threat;
- ❖ Tornado; and
- ❖ Winter Storm and Freeze.

All of the natural hazards listed above are considered to have the potential to affect all current and future buildings and all populations, either because they are atmospheric and will have similar effects County-wide or because they are human-caused/technological hazards which are often unpredictable and do not have a defined area in which they are more likely to occur. **Table 6.1** provides information about all improved property in Randolph County that is vulnerable to these hazards. For all hazards, annualized loss estimates were determined using the best available data on historical losses from sources including NOAA’s National Climatic Data Center records, the previous *Randolph County Multi-Jurisdictional Hazard Mitigation Plan*, and local knowledge. Annualized loss estimates were generated by totaling the amount of property damage over the period of time for which records were available and calculating the average annual loss. Given the standard weighting analysis, losses can be readily compared across hazards providing an objective approach for evaluating mitigation alternatives.

For the human-caused/technological hazards, no data with historical property damages was available. Therefore a detailed vulnerability assessment could not be completed for these hazards at this time.

The results for these hazards are found near the end of this section in **Table 6.15**.

6.2.2 GIS-Based Analysis

Other hazards have specified geographic boundaries that permit additional analysis using Geographic Information Systems (GIS). These hazards include:

- ❖ Flood;
- ❖ Landslide;
- ❖ Nuclear Power Plant Emergency; and
- ❖ Wildfire.

The objective of the GIS-based analysis was to determine the estimated vulnerability of buildings, critical facilities, and populations for the identified hazards in Randolph County using best available geospatial data. Digital data was collected from local, regional, state, and national sources for hazards and buildings. This included local tax assessor records for individual parcels and buildings and geo-referenced point locations for identified assets (critical facilities and infrastructure, special populations, etc.) when available. ESRI® ArcGIS™ 10.2.2 was used to assess hazard vulnerability utilizing digital hazard data, as well as local parcel data. Using these data layers, hazard vulnerability can be quantified by estimating the assessed building value for parcels determined to be located in identified hazard areas. The results of the analysis provided an estimate of the number of parcels and critical facilities as well as the estimated value of those buildings determined to be potentially at risk to the hazards with delineable geographic hazard boundaries.

6.2.3 Risk Modeling Software Analysis

A risk modeling software was used for the following hazards:

- ❖ Earthquake; and
- ❖ Hurricane/Tropical Storm.

There are several models that exist to model hazards. Hazus-MH was used in this vulnerability assessment to address the aforementioned hazards.

Hazus-MH

Hazus-MH (“Hazus”) is a standardized loss estimation software program developed by FEMA. It is built upon an integrated GIS platform to conduct analysis at a regional level (i.e., not on a structure-by-structure basis). The Hazus risk assessment methodology is parametric, in that distinct hazard and inventory parameters (e.g., wind speed and building types) can be modeled using the software to determine the impact (i.e., damages and losses) on the built environment.

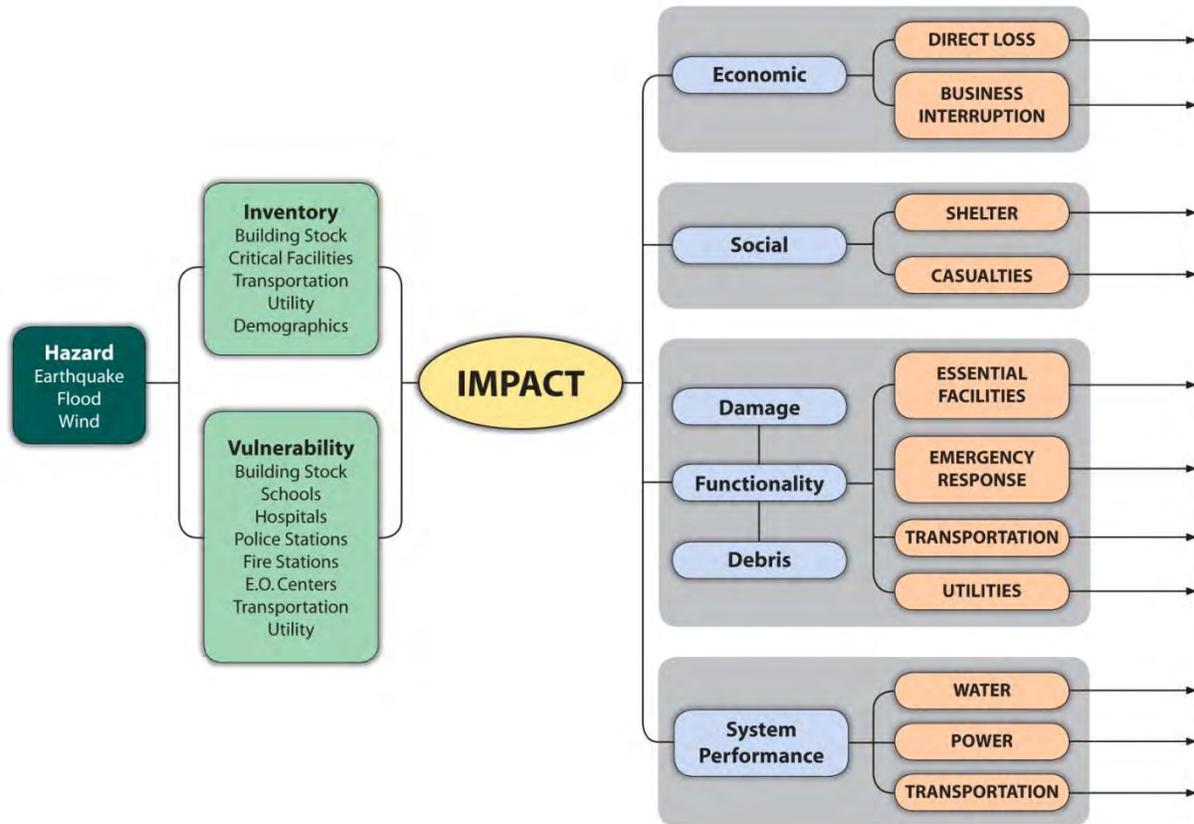
The Randolph County Risk Assessment utilized Hazus-MH to produce hazard damage loss estimations for hazards for the planning area. At the time this analysis was completed, Hazus-MH 2.2 was used to estimate potential damages from the hurricane winds and



earthquake hazards using Hazus-MH methodology. Although the program can also model losses for flood and storm surge, it was not used in this Risk Assessment.

Figure 6.1 illustrates the conceptual model of the Hazus-MH methodology.

FIGURE 6.1: CONCEPTUAL MODEL OF HAZUS-MH METHODOLOGY



Hazus-MH is capable of providing a variety of loss estimation results. In order to be consistent with other hazard assessments, annualized losses are presented when possible. Loss estimates provided in this vulnerability assessment are based on best available data and methodologies. The results are an approximation of risk. These estimates should be used to understand relative risk from hazards and potential losses. Uncertainties are inherent in any loss estimation methodology, arising in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from approximations and simplifications that are necessary for a comprehensive analysis (e.g., incomplete inventories, non-specific locations, demographics, or economic parameters).

All conclusions are presented in “Conclusions on Hazard Vulnerability” at the end of this section.

6.3 EXPLANATION OF DATA SOURCES

Earthquake

Hazus-MH 2.2 (as described above) was used to assess earthquake vulnerability. A level one, probabilistic scenario to estimate annualized loss was utilized. In this scenario, several return periods (events of varying intensities) are run to determine annualized loss. Default Hazus earthquake damage functions and methodology were used to determine the probability of damage. Results are calculated at the 2010 U.S. Census tract level in Hazus and presented at the County level.

Flood

FEMA Digital Flood Insurance Rate Maps (DFIRMs) were used to determine flood vulnerability. DFIRM data can be used in ArcGIS for mapping purposes and they identify several features including floodplain boundaries and base flood elevations. Identified areas on the DFIRM represent some features of Flood Insurance Rate Maps including the one-hundred-year flood areas (1.0-percent annual chance flood) and the 500-year flood areas (0.2-percent annual chance flood). For the vulnerability assessment, local parcel data and critical facilities were overlaid on the one-hundred-year floodplain areas and five-hundred-year floodplain areas. It should be noted that such an analysis does not account for building elevation.

Hurricane and Tropical Storm Wind

Hazus-MH 2.2 (as described above) was used to assess wind vulnerability. For the hurricane wind analysis, a probabilistic scenario was created to estimate the annualized loss damage and probable peak wind speeds in Randolph County. Default Hazus wind speed data, damage functions, and methodology were used in to determine the probability of damage for fifty-, one-hundred-, five-hundred-, and one-thousand-year frequency events (also known as return periods) in the scenario. Results are calculated in Hazus at the 2010 U.S. Census tract level and presented at the County and municipal level.

Landslide

The USGS Landslide Susceptibility Index was used to determine vulnerability to landslides. The risk levels of low, moderate, and high correspond to the Landslide Susceptibility Index where “Low” indicates a zone of Low Incident/High Susceptibility, “Mod” indicates a zone of Moderate Incident/High Susceptibility, and “High” indicates a zone of High Landslide Susceptibility. For the vulnerability assessment, local parcel data and critical facilities were overlaid on the moderate incidence areas.

Nuclear Power Plant Emergency

The data used to determine vulnerability to a nuclear accident in Randolph County is based on the location of the Shearon Harris Nuclear Power Station and buffer radii recommended by the Nuclear Regulatory Commission for emergency management planning in the event of a nuclear accident.

Wildfire

The data used to determine vulnerability to wildfire in Randolph County is based on GIS data called the Southern Wildfire Risk Assessment (SWRA). This data is available on the Southern Wildfire Risk Assessment website and can be downloaded and imported into ArcGIS. A specific layer, known as “Wildland Urban Interface Risk Index” (WUIRI) was used to determine vulnerability of people and property. The WUIRI is presented on a scale of zero to negative nine. It combines data on housing density with the data on the impact and likelihood of a wildfire occurring in a specific area. The primary purpose of the data is to highlight areas of concern that may be conducive to mitigation actions. Due to

the assumptions made, it is not a true probability. However, it does provide a comparison of risk throughout the County.

6.4 ASSET INVENTORY

An inventory of geo-referenced assets within Randolph County and its jurisdictions was compiled in order to identify and characterize those properties potentially at risk to the identified hazards.¹ By understanding the type and number of assets that exist and where they are located in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. Under this assessment, two categories of physical assets were created and then further assessed through GIS analysis. These are presented below in Section 6.4.1.

6.4.1 Physical and Improved Assets

The two categories of physical assets consist of:

1. **Improved Property:** Includes all improved properties in Randolph County according to local parcel data provided by the County. The information has been expressed in terms of the number of parcels and total assessed value of improvements (buildings) that may be exposed to the identified hazards.
2. **Critical Facilities:** Critical facilities vary by jurisdiction and the critical facilities provided by each jurisdiction are used in this section. It should be noted that this listing may not include every important asset located in the County, and it is anticipated that this list may be expanded or adjusted during future plan updates as facility uses change and new structures are identified as critical.

The following tables provide a detailed listing of the geo-referenced assets that have been identified for inclusion in the vulnerability assessment for Randolph County.

Table 6.1 lists the number of parcels, the number of improved parcels, and the total assessed value of improved parcels for participating areas of Randolph County (study area of vulnerability assessment).²

TABLE 6.1: IMPROVED PROPERTY IN RANDOLPH COUNTY

LOCATION	NUMBER OF PARCELS	NUMBER OF IMPROVED PARCELS	TOTAL ASSESSED VALUE OF IMPROVED PARCELS
City of Archdale	4,516	3,908	\$513,255,802
City of Asheboro	9,249	7,463	\$1,090,993,138

¹ While potentially not all-inclusive for the jurisdictions in Randolph County, “geo-referenced” assets include those assets for which specific location data is readily available for connecting the asset to a specific geographic location for purposes of GIS analysis.

² Total assessed values for improvements is based on tax assessor records as joined to digital parcel data. This data does not include dollar figures for tax-exempt improvements such as publicly-owned buildings and facilities. It should also be noted that, due to record keeping, some duplication is possible thus potentially resulting in an inflated value exposure for an area.

LOCATION	NUMBER OF PARCELS	NUMBER OF IMPROVED PARCELS	TOTAL ASSESSED VALUE OF IMPROVED PARCELS
Town of Franklinville	441	276	\$18,623,188
Town of Liberty	1,386	1,065	\$96,833,242
Town of Ramseur	846	649	\$59,783,901
City of Randleman	1,676	1,374	\$143,992,521
Town of Seagrove	219	127	\$15,806,300
Town of Staley	206	143	\$9,808,948
City of Trinity	3,814	2,688	\$334,953,330
Unincorporated Area	54,743	35,531	\$3,667,682,461
RANDOLPH COUNTY TOTAL	77,096	53,224	\$5,951,732,831

Source: Randolph County

Table 6.2, Table 6.3, and Table 6.4 list the critical facilities located in Randolph County as categorized by type. These facilities were identified as primary critical facilities in that they are necessary to maintain government functions and protect the life, health, safety, and welfare of citizens. These facilities were geospatially mapped and used as the basis for further geographic analysis of the hazards that could potentially affect critical facilities. All critical facility information was provided by Randolph County.

TABLE 6.2: EMERGENCY SERVICES CRITICAL FACILITY INVENTORY IN RANDOLPH COUNTY

Location	EMS Stations	Emergency Operations Centers	Fire Stations	Hospitals	Police Stations
Archdale	1	0	1	0	1
Asheboro	1	2	2	1	2
Franklinville	0	0	1	0	1
Liberty	1	0	1	0	0
Ramseur	0	0	1	0	1
Randleman	1	0	1	0	1
Seagrove	0	0	1	0	1
Staley	0	0	1	0	0
Trinity	0	0	3	0	0
Unincorporated Area	4	0	29	0	0
RANDOLPH COUNTY TOTAL	8	2	41	1	7

Source: Randolph County GIS Department

TABLE 6.3: SPECIAL POPULATIONS CRITICAL FACILITY INVENTORY IN RANDOLPH COUNTY

Location	Day Care Facilities	Group Homes	Schools
Archdale	11	0	5
Asheboro	22	17	14
Franklinville	0	0	1
Liberty	4	5	1

Location	Day Care Facilities	Group Homes	Schools
Ramseur	0	5	1
Randleman	6	1	1
Seagrove	0	0	1
Staley	0	0	0
Trinity	0	0	5
Unincorporated Area	26	15	25
RANDOLPH COUNTY TOTAL	69	43	54

Source: Randolph County GIS Department

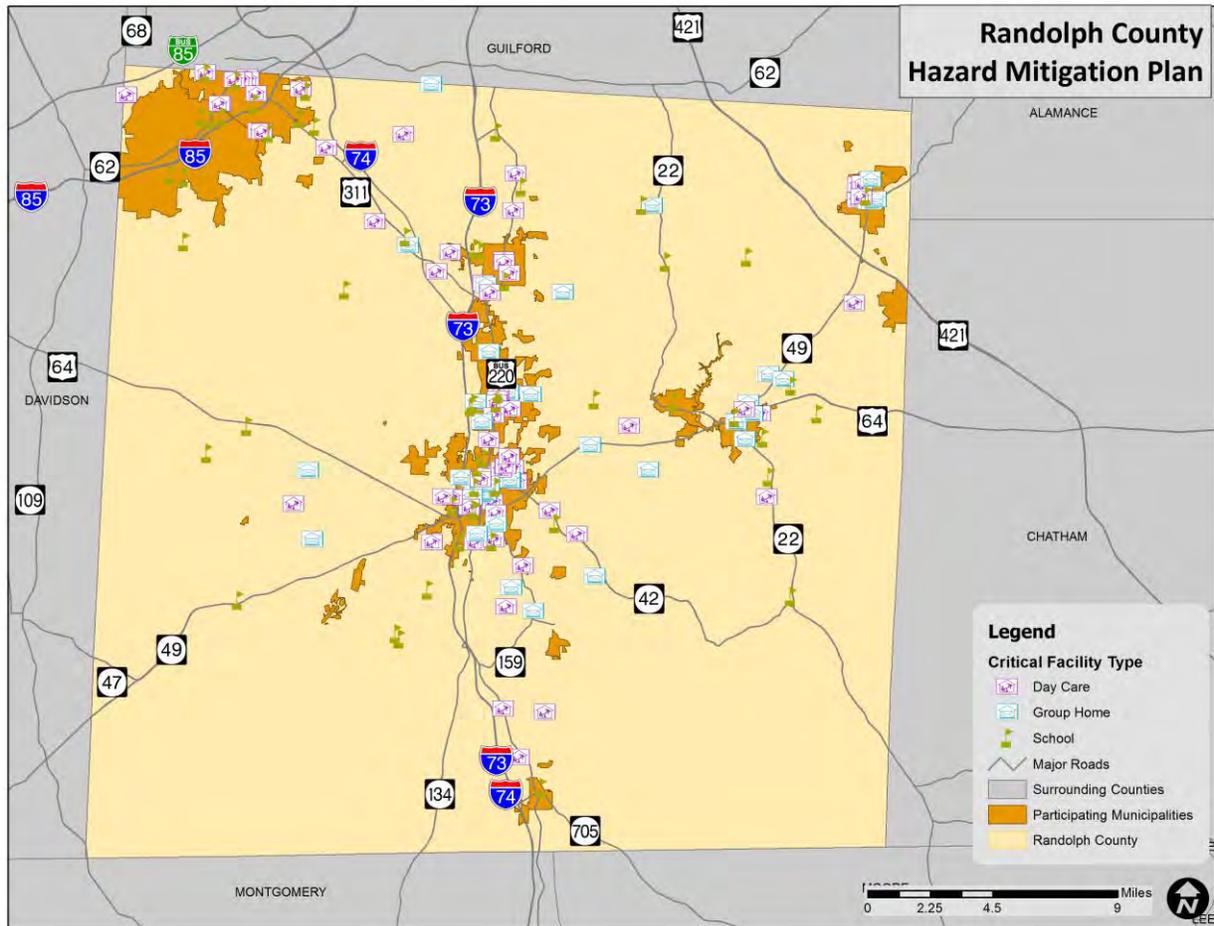
TABLE 6.4: ADMINISTRATIVE/OTHER CRITICAL FACILITY INVENTORY IN RANDOLPH COUNTY

Location	Government/ Administration Buildings	Military Facilities	Parks/ Recreational Facilities	Water/ Wastewater Plants
Archdale	4	0	0	0
Asheboro	25	4	15	3
Franklinville	3	0	0	0
Liberty	4	0	0	0
Ramseur	2	0	0	2
Randleman	5	0	0	0
Seagrove	3	0	0	0
Staley	1	0	0	0
Trinity	2	0	0	0
Unincorporated Area	7	1	1	0
RANDOLPH COUNTY TOTAL	56	5	16	5

Source: Randolph County GIS Department

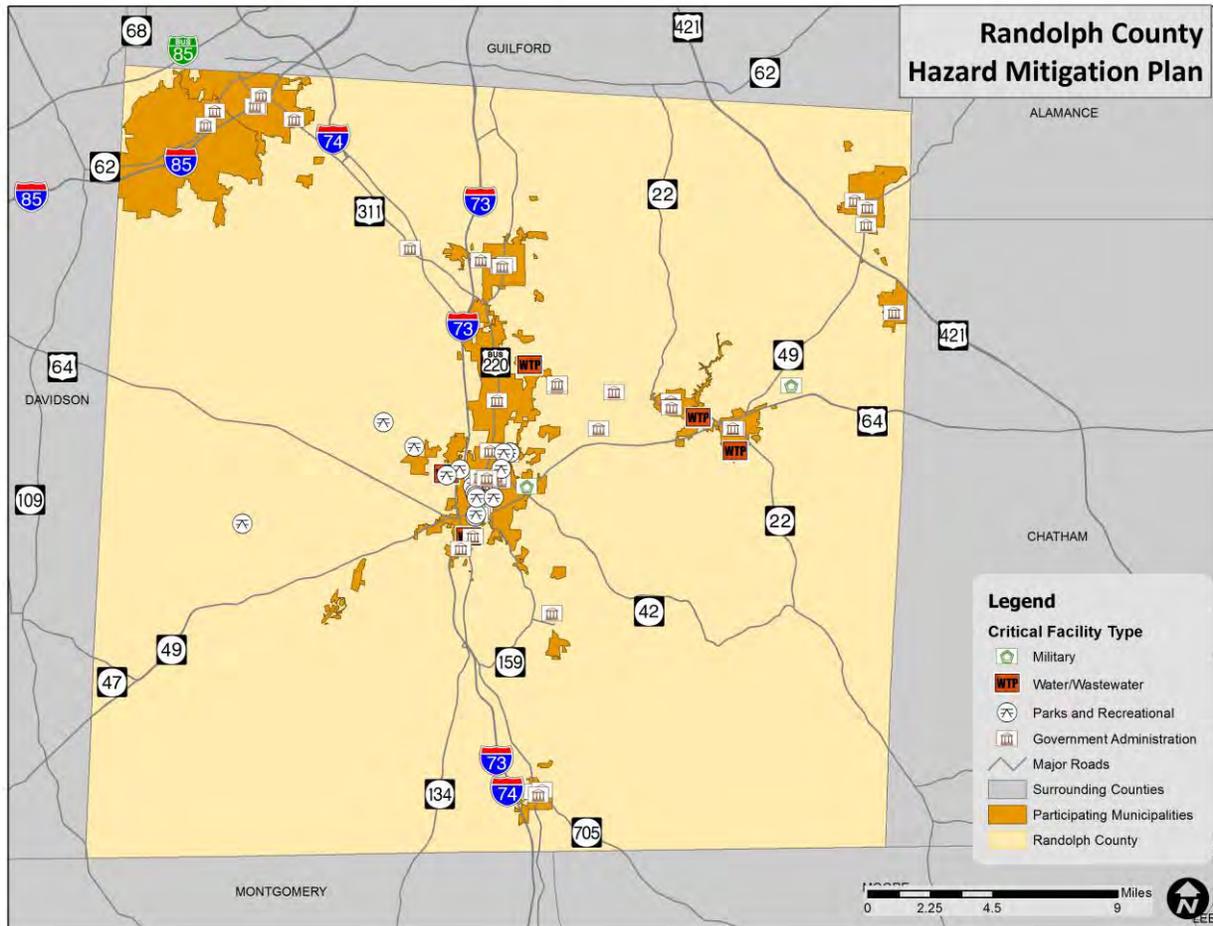
Figure 6.2, Figure 6.3, and Figure 6.4 show the locations of the primary critical facilities in Randolph County. Table 6.16, at the end of this section, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided by local governments.

FIGURE 6.3: SPECIAL POPULATIONS CRITICAL FACILITY LOCATIONS IN RANDOLPH COUNTY



Source: Randolph County

FIGURE 6.4: ADMINISTRATIVE/OTHER CRITICAL FACILITY LOCATIONS IN RANDOLPH COUNTY



Source: Randolph County

6.4.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those particular segments of the resident population in Randolph County that are potentially at risk to these hazards.

Table 6.5 lists the population by jurisdiction according to the 2010 U.S. Census. The total population in Randolph County according to Census data is 141,752 persons. Additional population estimates are presented in Section 3: *Community Profile*.

TABLE 6.5: TOTAL POPULATION IN RANDOLPH COUNTY

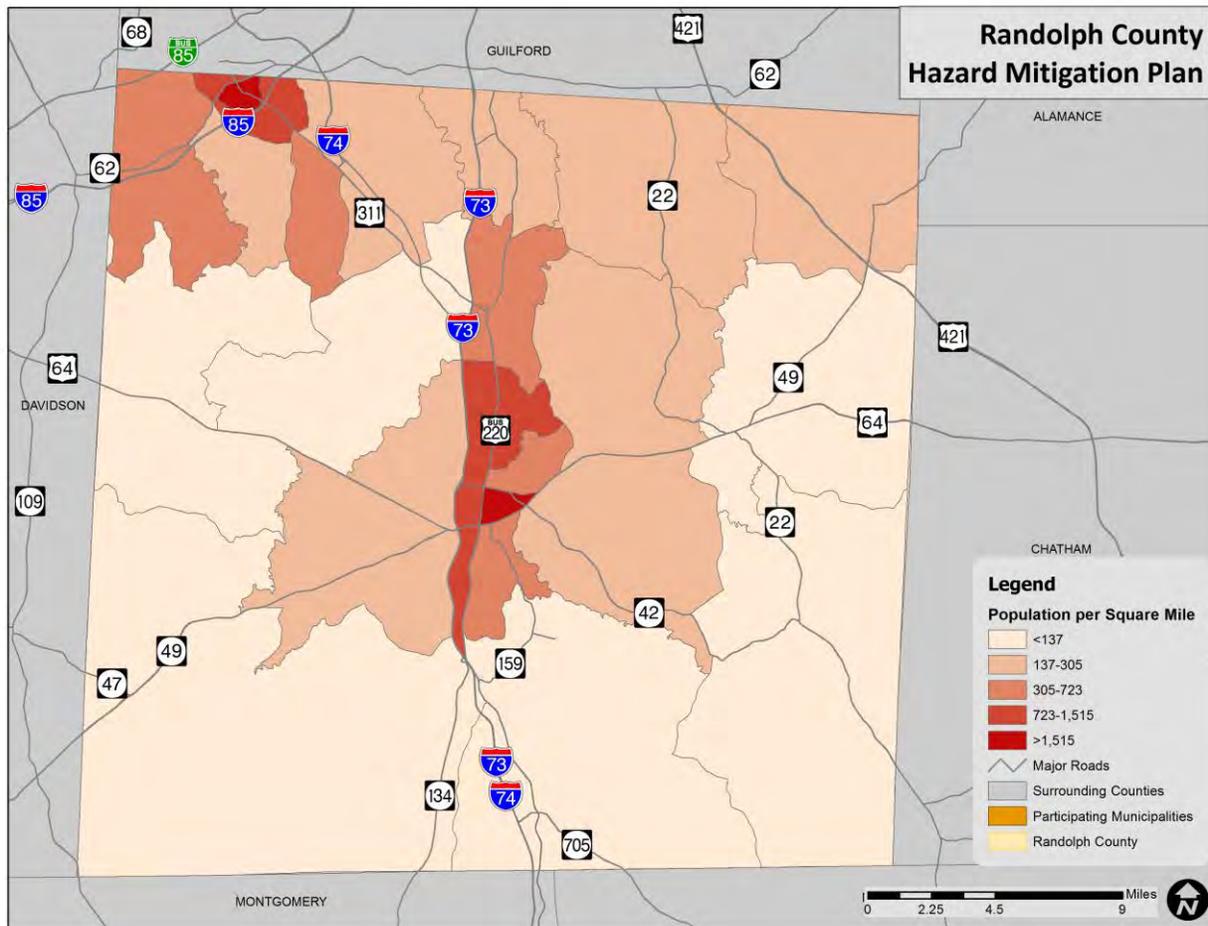
LOCATION	TOTAL 2010 POPULATION
City of Archdale*	11,415
City of Asheboro	25,012
Town of Franklinville	1,164
Town of Liberty	2,656
Town of Ramseur	1,692

LOCATION	TOTAL 2010 POPULATION
City of Randleman	4,113
Town of Seagrove	228
Town of Staley	393
City of Trinity*	6,614
RANDOLPH COUNTY TOTAL	141,752

*The population count for Archdale includes population residing in neighboring counties.
 Note: these populations are not included in the Randolph County total.
 Source: United States Census Bureau, 2010 Census

In addition, **Figure 6.5** illustrates the population density by census tract as it was reported by the 2010 U.S. Census.

FIGURE 6.5: POPULATION DENSITY IN RANDOLPH COUNTY



Source: United States Census Bureau, 2010 Census

6.4.3 Development Trends and Changes in Vulnerability

Since the previous *Multi-Jurisdiction Hazard Mitigation Plan* was approved in 2011, Randolph County has experienced limited growth and development. **Table 6.6** shows the number of building units constructed since 2010 according to the U.S. Census American Community Survey (ACS).

TABLE 6.6: BUILDING COUNTS FOR RANDOLPH COUNTY

JURISDICTION	TOTAL HOUSING UNITS (2014)	UNITS BUILT 2010 OR LATER	% BUILDING STOCK BUILT POST-2010
City of Archdale*	4,787	25	0.52%
City of Asheboro	11,335	70	0.62%
Town of Franklinville	430	11	2.56%
Town of Liberty	1,179	9	0.76%
Town of Ramseur	813	0	0.00%
City of Randleman	2,021	23	1.14%
Town of Seagrove	141	0	0.00%
Town of Staley	177	0	0.00%
City of Trinity	2,975	8	0.27%
Unincorporated area	37,328	440	1.18%
RANDOLPH COUNTY TOTAL	61,186	586	0.96%

*The housing unit count for Archdale includes units located in Guilford County. Note: these housing units are not included in the Randolph County total.

Source: United States Census Bureau, 2010-2014 American Community Survey 5-Year Estimates

Table 6.7 shows population growth estimates for the County and municipalities from 2010 to 2014 based on the ACS five-year estimates.

TABLE 6.7: POPULATION GROWTH FOR RANDOLPH COUNTY

JURISDICTION	POPULATION ESTIMATES (AS OF JULY 1)					% CHANGE 2010-2014
	2010	2011	2012	2013	2014	
City of Archdale*	10,964	11,060	11,205	11,299	11,322	3.16%
City of Asheboro	24,478	24,799	25,109	25,432	25,573	4.28%
Town of Franklinville	1,168	1,264	1,319	1,190	987	-18.34%
Town of Liberty	2,688	2,677	2,665	2,665	2,666	-0.83%
Town of Ramseur	1,671	1,811	2,010	1,874	2,080	19.66%
City of Randleman	4,005	4,051	4,094	4,122	4,143	3.33%
Town of Seagrove	179	176	194	232	249	28.11%
Town of Staley	505	505	590	473	521	3.07%
City of Trinity	6,628	6,631	6,639	6,645	6,648	0.30%
Unincorporated area	87,748	87,942	87,743	88,110	88,087	0.39%
RANDOLPH COUNTY TOTAL	140,034	140,916	141,568	142,042	142,276	1.58%

*The population count for Archdale includes populations residing in Guilford County. Note: these populations are not included in the Randolph County total.

Note: July 1 population estimates were used in this table to allow comparison of annual population counts (April 1 Census estimates were used for all other population counts throughout the *Plan* which is why the counts may differ).

Source: United States Census Bureau, 2005-2010, 2006-2011, 2007-2012, 2008-2013, 2009-2013, and 2010-2014 American Community Survey 5-Year Estimates

Based on the data above, there has been a moderate rate of residential development in the County since 2010. However, the Town of Franklinville and the City of Randleman experienced a slightly higher rate of development compared to the rest of the County, resulting in an increased number of structures that are vulnerable to the potential impacts of the identified hazards. Additionally, there has been some population growth across most of Randolph County, with the Towns of Ramseur and Seagrove experiencing the highest rates of growth when compared to the rest of the County. Since the population has increased across the County, there is now a greater number of people exposed to the identified hazards. Therefore, development and population growth have impacted the County's vulnerability since the previous *Multi-Jurisdictional Hazard Mitigation Plan* was approved and there has been a slight increase in the overall vulnerability.

It is also important to note that as development increases in the future, greater populations and more structures and infrastructure will be exposed to potential hazards if development occurs in the floodplains, wildfire risk areas, or other identified hazard areas.

6.5 VULNERABILITY ASSESSMENT RESULTS

As noted earlier, only hazards with a specific geographic boundary, modeling tool, or sufficient historical data allow for further analysis. Those results are presented here. All other hazards are assumed to impact the entire planning region (drought, hailstorm, heat wave/extreme heat, lightning, severe thunderstorm/high wind, solar flare, tornado, winter storm/freeze) or, due to lack of data, analysis would not lead to credible results (dam/levee failure, land subsidence/sinkhole, terror threat). The total County exposure, and thus risk, was presented in **Table 6.1**.

The annualized loss estimate for all hazards is presented near the end of this section in **Table 6.15**.

The hazards presented in this subsection include: hurricane/tropical storm winds, earthquake, flood, landslide, nuclear power plant emergency, and wildfire.

6.5.1 Hurricane/Tropical Storm

Historical evidence indicates that Randolph County has some risk to the hurricane and tropical storm hazard. There have been three disaster declarations due to hurricanes (Hurricanes Fran, Floyd, and Ivan) in the County. Several tracks have come near or traversed through Randolph County, as shown and discussed in Section 5: *Hazard Profiles*.

Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, high winds, and precipitation, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard.

Hazus-MH 2.2 was used to determine annualized losses for the County as shown below in **Table 6.8**. Hazus-MH reports losses at the U.S. Census tract level, so determining losses at the municipal level was not possible. Losses reported include losses to building, contents, and inventory. However, in the comparative annualized loss figure for the County presented near the end of this section in **Table 6.15**, only losses to buildings are reported in order to best match annualized losses reported for other hazards.

TABLE 6.8: ANNUALIZED LOSS ESTIMATIONS FOR HURRICANE WIND HAZARD

LOCATION	BUILDING LOSS	CONTENTS LOSS	INVENTORY LOSS	TOTAL ANNUALIZED LOSS
Randolph County	\$880,000	\$170,000	\$6,000	\$1,056,000

Source: Hazus-MH 2.2

In addition, probable peak wind speeds were calculated in Hazus. These are shown below in **Table 6.9**.

TABLE 6.9: PROBABLE PEAK HURRICANE/TROPICAL STORM WIND SPEEDS (MPH)

LOCATION	50-YEAR EVENT	100-YEAR EVENT	500-YEAR EVENT	1,000-YEAR EVENT
City of Archdale	63.8	72.0	90.3	98.6
City of Asheboro	66.9	75.5	93.9	101.5
Town of Franklinville	66.1	74.8	93.1	101.4
Town of Liberty	66.1	74.5	92.2	101.4
Town of Ramseur	66.1	74.5	92.2	101.4
City of Randleman	65.3	73.9	91.5	99.8
Town of Seagrove	66.9	75.5	93.9	101.5
Town of Staley	66.9	74.5	92.2	101.4
City of Trinity	6.5	71.7	90.2	98.4
Unincorporated Area	67.3	75.6	94.0	102.7

LOCATION	50-YEAR EVENT	100-YEAR EVENT	500-YEAR EVENT	1,000-YEAR EVENT
MAXIMUM WIND SPEED REPORTED	67.3	75.6	94.0	102.7

Source: Hazus-MH 2.2

Social Vulnerability

Given equal susceptibility across Randolph County, it is assumed that the total population is at risk to the hurricane and tropical storm hazard.

Critical Facilities

Given equal vulnerability across Randolph County, all critical facilities are considered to be at risk. Some buildings may perform better than others in the face of such an event due to construction and age among other factors. Determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation actions for vulnerable structures, including critical facilities, to reduce the impacts of the hurricane wind hazard. A list of specific critical facilities and their associated risk can be found in **Table 6.16** at the end of this section.

In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in Randolph County. Hurricane events can cause substantial damage in their wake including fatalities, extensive debris clean-up, and extended power outages.

6.5.2 Earthquake

Historical evidence indicates that any earthquake activity in the County is likely to inflict minor damage to the planning area. At least five earthquakes are known to have affected Randolph County since 1886, as discussed in Section 5: *Hazard Profiles*.

For the earthquake hazard vulnerability assessment, a probabilistic scenario was created to estimate the annualized loss for the County. The results of the analysis reported at the U.S. Census tract level do not make it feasible to estimate losses at the municipal level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to building damage (structural and non-structural), contents, and inventory. However, like the analysis for hurricanes, the comparative annualized loss figure presented near the end of this section in **Table 6.15** only utilizes building losses in order to provide consistency with the other hazards. **Table 6.10** summarizes the findings.

TABLE 6.10: ANNUALIZED LOSS ESTIMATIONS FOR EARTHQUAKE HAZARD

LOCATION	STRUCTURAL BUILDING LOSS	NON-STRUCTURAL BUILDING LOSS	CONTENTS LOSS	INVENTORY LOSS	TOTAL ANNUALIZED LOSS
Randolph County	\$15,000	\$57,000	\$20,000	\$1,000	\$73,000

Source: Hazus-MH 2.2

Social Vulnerability

It can be assumed that all existing and future populations are at risk to the earthquake hazard.

Critical Facilities

The Hazus probabilistic analysis indicated that no critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor damage, should an event occur. A list of individual critical facilities and their risk can be found in **Table 6.16** at the end of this section.

In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in Randolph County. Minor earthquakes may rattle dishes and cause minimal damage, while stronger earthquakes will result in structural damage as indicated in the Hazus scenario above. Impacts of earthquakes include debris clean-up, service disruption and, in severe cases, fatalities due to building collapse. Specific vulnerabilities for assets will be greatly dependent on their individual design. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates if data becomes available. Furthermore, mitigation actions to address earthquake vulnerability will be considered.

6.5.3 Flood

Historical evidence indicates that Randolph County is susceptible to flood events. A total of thirty-eight flood events have been reported by the National Climatic Data Center and around \$155,000 in claims have been made through the National Flood Insurance Program since its inception in 1978.

In order to assess flood risk, a GIS-based analysis was used to estimate exposure to flood events using Digital Flood Insurance Rate Map (DFIRM) data in combination with local tax assessor records for each of the Randolph County municipalities. The determination of assessed value at-risk (exposure) was calculated using GIS analysis by summing the improved values for parcels and properties that were confirmed to be located within an identified floodplain. **Table 6.11** presents the potential at-risk property. The number of parcels, improved property, and the approximate value are presented.

TABLE 6.11: ESTIMATED EXPOSURE OF PARCELS/BUILDINGS TO THE FLOOD HAZARD

LOCATION	1.0-PERCENT ACF			0.2-PERCENT ACF		
	APPROX. NUMBER OF PARCELS	APPROX. NUMBER IMPROVED PROPERTIES	APPROX. IMPROVED VALUE ³	APPROX. NUMBER OF PARCELS	APPROX. NUMBER IMPROVED PROPERTIES	APPROX. IMPROVED VALUE ⁴
City of Archdale	304	217	\$41,384,036	33	26	\$3,491,967
City of Asheboro	542	399	\$100,557,939	40	23	\$2,063,882
Town of Franklinville	48	31	\$1,412,511	2	1	\$153,275
Town of Liberty	27	19	\$1,744,250	0	0	\$0
Town of Ramseur	88	50	\$7,822,943	2	2	\$131,867
City of Randleman	168	123	\$13,645,104	0	0	\$0
Town of Seagrove	0	0	\$0	0	0	\$0
Town of Staley	0	0	\$0	0	0	\$0
Town of Trinity	262	160	\$31,559,448	11	6	\$646,541
Unincorporated Area	4,910	2,623	\$324,804,793	54	32	\$4,462,849

³ Improved value is estimated based on the improved value associated with parcels that have been identified as being located in the 1.0-percent annual chance floodplain.

⁴ Improved value is estimated based on the improved value associated with parcels that have been identified as being located in the 0.2-percent annual chance floodplain.

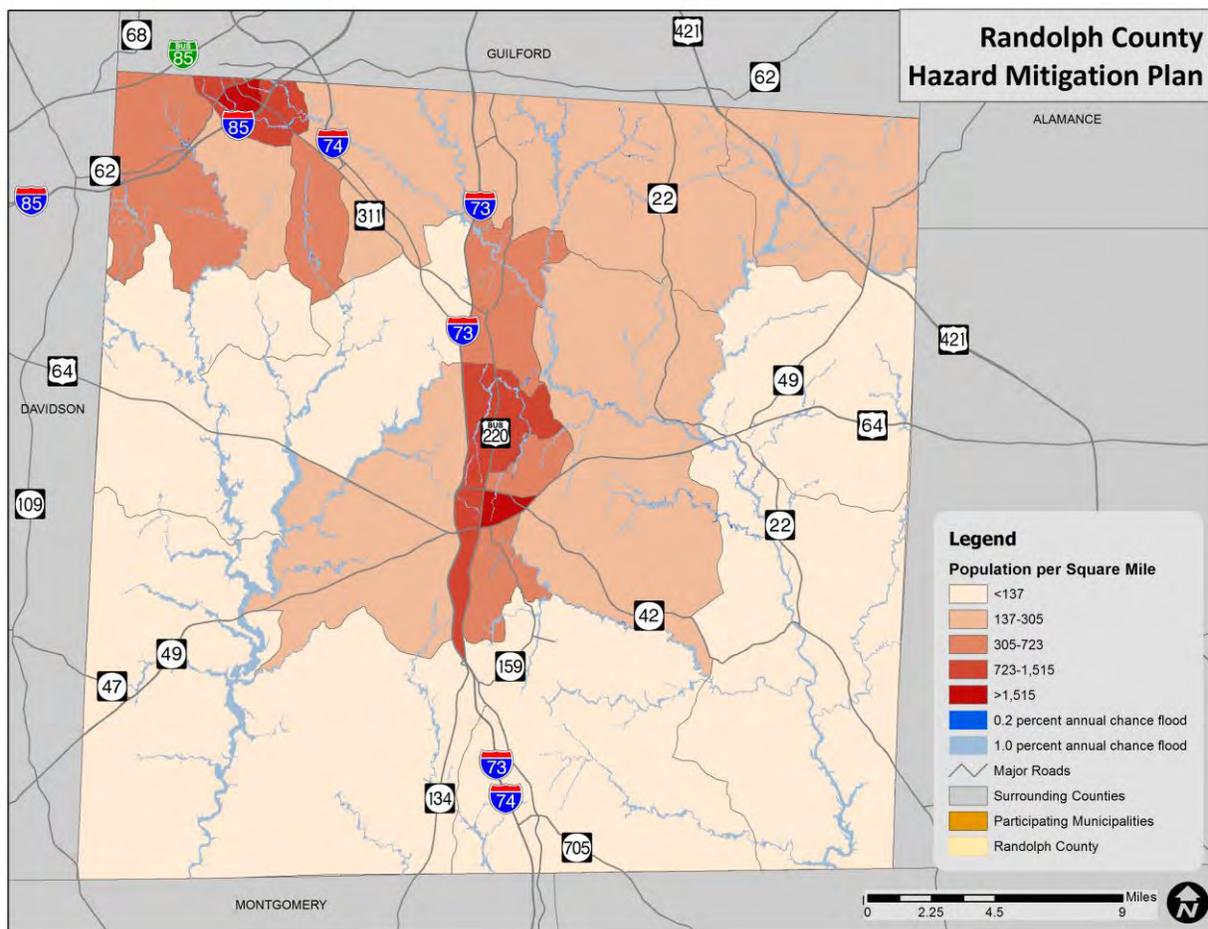
LOCATION	1.0-PERCENT ACF			0.2-PERCENT ACF		
	APPROX. NUMBER OF PARCELS	APPROX. NUMBER IMPROVED PROPERTIES	APPROX. IMPROVED VALUE ³	APPROX. NUMBER OF PARCELS	APPROX. NUMBER IMPROVED PROPERTIES	APPROX. IMPROVED VALUE ⁴
RANDOLPH COUNTY TOTAL	6,349	3,622	\$522,931,024	142	90	\$10,950,381

Source: Federal Emergency Management Agency DFIRM

Social Vulnerability

U.S. Census 2010 population at the tract level was used for analysis to determine where areas of high population concentration intersect with flood prone areas in the County. **Figure 6.6** is presented to gain a better understanding of the at-risk population.

FIGURE 6.6 : POPULATION DENSITY NEAR FLOODPLAINS



Source: Federal Emergency Management Agency/North Carolina Flood Mapping Program, United States Census 2010

Critical Facilities

The critical facility analysis revealed that there are five critical facilities located in the either the 1.0-percent annual chance or 0.2-percent annual chance floodplain. In the 1.0-percent annual chance floodplain there are four facilities. Two of these facilities are parks/recreational facilities which in some

cases are preferably located within the floodplain. The other two facilities are a day care and a government/administration building. There is only one facility located in the 0.2-percent annual chance floodplain: a post office. A list of specific critical facilities and their associated risk can be found in **Table 6.16** at the end of this section.

In conclusion, a flood has the potential to impact many existing and future buildings, facilities, and populations in Randolph County, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. As noted, the floodplains used in this analysis include the 100-year and 500-year FEMA-regulated floodplain boundaries. It is certainly possible that more severe events could occur beyond these boundaries or urban (flash) flooding could impact additional structures. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

6.5.4 Landslide

Steeper topography in some areas of Randolph County makes the planning area susceptible to landslides. Although no landslide incidents have been reported in the County, it should be noted that the North Carolina Geologic Survey (NCGS) emphasized the dataset provided was incomplete. Therefore, there may be additional historical landslide occurrences that were not reported.

In order to complete the vulnerability assessment for landslides in Randolph County, GIS analysis was used. The potential dollar value of exposed property can be determined using the USGS Landslide Susceptibility Index (detailed in Section 5: *Hazard Profiles*), County level tax parcel data, and GIS analysis. **Table 6.12** presents the potential at-risk property where available. Only a portion of the County is identified as being in a moderate incidence/susceptibility area by the USGS landslide data. This incidence level was used to identify an area of concern for the analysis below.

TABLE 6.12: TOTAL POTENTIAL AT-RISK PARCELS FOR THE LANDSLIDE HAZARD

LOCATION	MODERATE INCIDENCE/MODERATE SUSCEPTIBILITY AREA		
	APPROX. NUMBER OF PARCELS	APPROX. NUMBER IMPROVED PROPERTIES	APPROX. IMPROVED VALUE ⁵
City of Archdale	0	0	\$0
City of Asheboro	0	0	\$0
Town of Franklinville	0	0	\$0
Town of Liberty	0	0	\$0
Town of Ramseur	394	311	\$29,273,733
City of Randleman	0	0	\$0
Town of Seagrove	0	0	\$0
Town of Staley	205	142	\$9,758,568
Town of Trinity	0	0	\$0

⁵ Improved value is estimated based on the improved value associated with parcels that have been identified as being located in the moderate incidence/moderate susceptibility area.

LOCATION	MODERATE INCIDENCE/MODERATE SUSCEPTIBILITY AREA		
	APPROX. NUMBER OF PARCELS	APPROX. NUMBER IMPROVED PROPERTIES	APPROX. IMPROVED VALUE ⁵
Unincorporated Area	5,438	3,068	\$252,497,699
RANDOLPH COUNTY TOTAL	6,037	3,521	\$291,530,000

Source: United States Geological Survey

Social Vulnerability

Given moderate susceptibility across the entire County, it is assumed that the total population is at relatively low risk, though some populations in the eastern part of the County are considered at slightly higher risk due to their location in an area of moderate incidence.

Critical Facilities

Several critical facilities in the County are located in a moderate incidence/susceptibility area, though most are located in an area of low incidence. There are twelve critical facilities located in an area of moderate incidence/susceptibility. This includes three day cares, one government/administration building, four group homes, one military facility, two schools, and one water/wastewater treatment plant. A list of specific critical facilities and their associated risk can be found in **Table 6.16** at the end of this section.

In conclusion, a landslide has the potential to impact all existing and future buildings, facilities, and populations in Randolph County, though areas in the eastern part of the County are at a higher risk than others due to a variety of factors. Specific vulnerabilities for Randolph County assets will be greatly dependent on their individual design and the mitigation measures in place, where appropriate. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates if data becomes available.

6.5.5 Nuclear Power Plant Emergency

The location of Shearon Harris Nuclear Power Plant east of Randolph County demonstrates that the County is at some risk to the effects of a nuclear accident. Although there have not been any major events at this plant in the past, there have been major events at other nuclear stations around the country. Additionally, smaller scale incidents at Shearon Harris Nuclear Power Plant have occurred.

In order to assess nuclear risk, a GIS-based analysis was used to estimate exposure during a nuclear event within each of the risk zones described in *Section 5: Hazard Profiles*. The determination of assessed value at-risk (exposure) was calculated using GIS analysis by summing the total assessed building values for only those improved properties that were confirmed to be located within one of the risk zones. There are no properties in Randolph County located within the ten-mile risk zone, so **Table 6.13** only presents potential at-risk properties in the fifty-mile buffer zone. The number of parcels, improved parcels, and the approximate value of improvements are presented.

TABLE 6.13: ESTIMATED EXPOSURE OF PARCELS/BUILDINGS TO A NUCLEAR ACCIDENT

LOCATION	50-MILE BUFFER		
	APPROX. NUMBER OF PARCELS	APPROX. NUMBER IMPROVED BUILDINGS	APPROX. IMPROVED VALUE OF BUILDINGS ⁶
City of Archdale	0	0	\$0
City of Asheboro	8,967	7,304	\$1,060,223,783
Town of Franklinville	441	276	\$18,623,188
Town of Liberty	1,386	1,065	\$96,833,242
Town of Ramseur	846	649	\$59,783,901
City of Randleman	1,540	1,271	\$121,425,352
Town of Seagrove	219	127	\$15,806,300
Town of Staley	206	143	\$9,808,948
City of Trinity	0	0	\$0
Unincorporated Area	29,914	19,313	\$1,912,254,606
RANDOLPH COUNTY TOTAL	43,519	30,148	\$3,294,759,320

Source: International Atomic Energy Agency

Social Vulnerability

Since areas in the eastern part of the County are within the fifty-mile buffer area, this segment of the population is considered to be at highest risk to a nuclear accident. However, other populations in the County may also be at some risk and it should be noted that all populations in Randolph County are on the edge of the 50-mile (lower risk) buffer.

Critical Facilities

The critical facility analysis revealed that there are a total of 218 critical facilities located in the fifty-mile nuclear buffer area including forty-six day cares, three EMS stations, two EOCs, twenty-two fire stations, forty-eight government/administration buildings, thirty-nine group homes, one hospital, five military facilities, twelve parks and recreational facilities, six police stations, thirty schools, and four water/wastewater treatment plants. A list of specific critical facilities and their associated risk can be found in **Table 6.16** at the end of this section.

In conclusion, a nuclear accident has the potential to impact many existing and future buildings, facilities, and populations in the Randolph County, though areas in the eastern part of the County are at a higher risk than others.

6.5.6 Wildfire

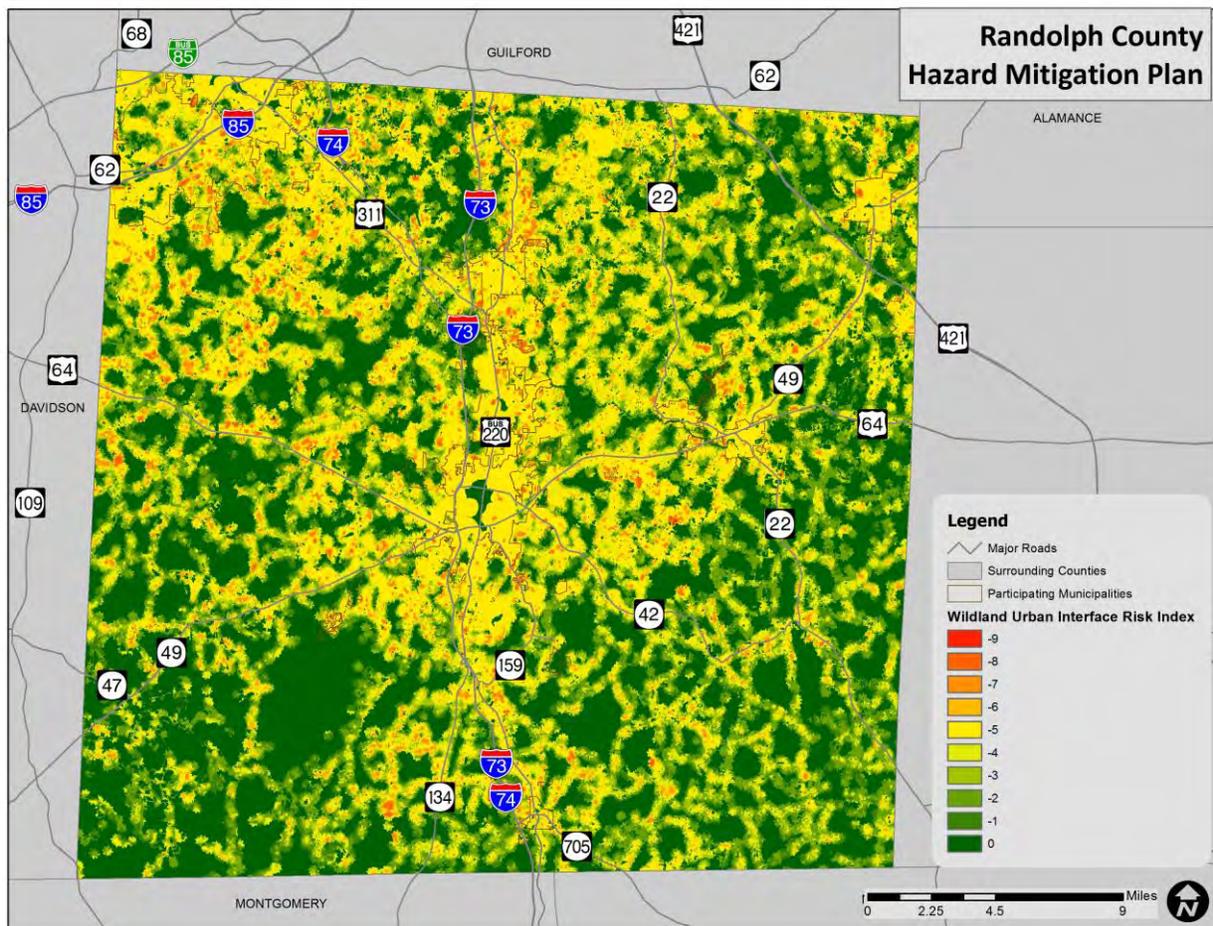
Historical evidence indicates that Randolph County is susceptible to wildfire events. An annual average of fifty-four wildfires were reported by the North Carolina Division of Forest Resources from 2005 to 2014.

⁶ Improved value of buildings is estimated based on the building value associated with parcels that have been identified as being located in the 50-mile buffer since building footprints were not associated with dollar value data.

To estimate exposure to wildfire, the approximate number of parcels and their associated improved value was determined using GIS analysis. For the critical facility analysis, areas of risk were intersected with critical facility locations. **Figure 6.7** shows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). **Figure 6.8** shows the areas of analysis where any grid cell is less than -5. Areas with a value below -5 were chosen to be displayed as areas of risk because this showed the upper echelon of the scale and the areas at highest risk.

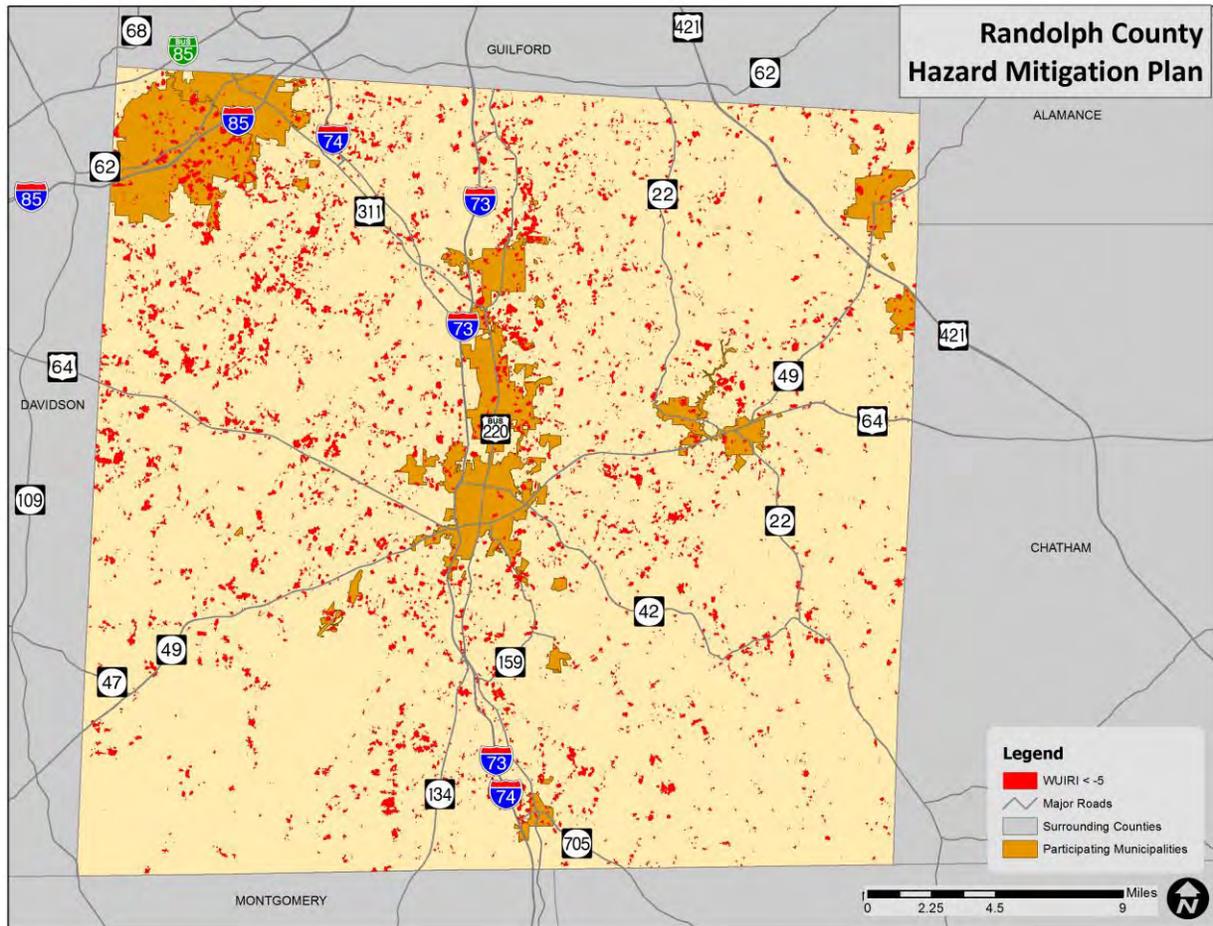
Table 6.14 shows the results of the analysis.

FIGURE 6.7: WUI RISK INDEX AREAS IN RANDOLPH COUNTY



Source: Southern Wildfire Risk Assessment Data

FIGURE 6.8: WILDFIRE RISK AREAS IN RANDOLPH COUNTY



Source: Southern Wildfire Risk Assessment Data

TABLE 6.14: EXPOSURE OF IMPROVED PROPERTY TO WILDFIRE RISK AREAS

LOCATION	HIGH WILDFIRE RISK AREA		
	APPROX. NUMBER OF PARCELS	APPROX. NUMBER OF IMPROVEMENTS	APPROX. IMPROVED VALUE
City of Archdale	156	122	\$23,899,626
City of Asheboro	759	568	\$126,225,168
Town of Franklinville	74	29	\$1,904,876
Town of Liberty	101	80	\$9,745,363
Town of Ramseur	87	53	\$6,570,048
City of Randleman	277	228	\$28,820,007
Town of Seagrove	80	55	\$6,111,535
Town of Staley	51	39	\$3,344,716
City of Trinity	895	583	\$82,914,448
Unincorporated Area	17,679	12,080	\$1,393,045,006
RANDOLPH COUNTY TOTAL	20,159	13,837	\$1,682,580,793

Source: Southern Wildfire Risk Assessment Data

Social Vulnerability

Although not all areas have equal vulnerability, there is some susceptibility across the entire County. It is assumed that the total population is at low to moderate risk to the wildfire hazard. Determining the exact number of people in wildfire risk areas is difficult with existing data and could be misleading.

Critical Facilities

The critical facility analysis revealed that there are fourteen critical facilities located in the wildfire risk area (areas where the WUIRI is less than -5): one day care, two fire stations, two government/administration buildings, two group homes, one military facility, one parks and recreational facility, and five schools. However, it should also be noted, that several factors could impact the spread of a wildfire putting all facilities at some risk. A list of specific critical facilities and their associated risk can be found in **Table 6.16** at the end of this section.

In conclusion, a wildfire event has the potential to impact some existing and future buildings, critical facilities, and populations in Randolph County.

6.6 CONCLUSIONS ON HAZARD VULNERABILITY

The results of this vulnerability assessment are useful in at least three ways:

- ❖ Improving our understanding of the risk associated with the hazards in Randolph County through better understanding of the complexities and dynamics of risk, how levels of risk can be measured and compared, and the myriad of factors that influence risk. An understanding of these relationships is critical in making balanced and informed decisions on managing the risk.
- ❖ Providing a baseline for policy development and comparison of mitigation alternatives. The data used for this analysis presents a current picture of risk in Randolph County. Updating this risk “snapshot” with future data will enable comparison of the changes in risk with time. Baselines of this type can support the objective analysis of policy and program options for risk reduction in the region.
- ❖ Comparing the risk among the hazards addressed. The ability to quantify the risk to all these hazards relative to one another helps in a balanced, multi-hazard approach to risk management at each level of governing authority. This ranking provides a systematic framework to compare and prioritize the very disparate hazards that are present in Randolph County. This final step in the risk assessment provides the necessary information for local officials to craft a mitigation strategy to focus resources on only those hazards that pose the most threat to Randolph County and its municipalities.

Exposure to hazards can be an indicator of vulnerability. Economic exposure can be identified through locally assessed values for improvements (buildings), and social exposure can be identified by estimating the population exposed to each hazard. This information is especially important for decision makers to use in planning for evacuation or other public safety related needs.

The types of assets included in these analyses include all building types in the participating jurisdictions. Specific information about the types of assets that are vulnerable to the identified hazards is included in

each hazard subsection (for example all building types are considered at risk to the winter storm hazard and only residential structures are at risk to repetitive flooding, etc.).

Table 6.15 presents a summary of annualized loss for each hazard in Randolph County. Due to the reporting of hazard damages primarily at the County level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined using the damage reported from historical occurrences at the County level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the County.

TABLE 6.15: ANNUALIZED LOSS FOR RANDOLPH COUNTY*

EVENT	RANDOLPH COUNTY
Atmospheric Hazards	
Drought	Negligible
Hailstorm	Negligible
Heat Wave/Extreme Heat	Negligible
Hurricane/Tropical Storm†	\$880,000
Lightning	\$3,834
Severe Thunderstorm/High Wind	\$36,169
Tornado	\$189,670
Winter Storm and Freeze	\$191,139
Geologic Hazards	
Earthquake†	\$15,000
Landslide	Negligible
Land Subsidence/Sinkhole	Negligible
Hydrologic Hazards	
Dam and Levee Failure	Negligible
Flood	Negligible
Other Hazards	
Wildfire	Negligible
Solar Flare	Negligible
Nuclear Power Plant Emergency	Negligible
Terror Threat	Negligible
Public Health/Infectious Disease Threat	Negligible

*In this table, the term “Negligible” is used to indicate that no property damage for the particular hazard was recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that particular type of event is not well kept or readily available.

†Annualized loss estimate for buildings only from Hazus.

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to atmospheric hazards including drought, hailstorm, heat wave/extreme heat,

hurricane/tropical storm, lightning, severe thunderstorm/high wind, tornado, and winter storm and freeze. All existing and future buildings are also considered vulnerable to several of the other natural hazards such as solar flare, dam and levee failure, and earthquake, as well as the man-made hazards including nuclear power plant emergency, terror threat, and public health/infectious disease threat. Some buildings may be more vulnerable to these hazards based on locations, construction, and building type. **Table 6.16** shows the critical facilities vulnerable to additional hazards analyzed in this section. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an “X”).

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TABLE 6.16: AT-RISK CRITICAL FACILITIES IN RANDOLPH COUNTY

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
		Drought	Hailstorm	Heat Wave/Extreme Heat	Hurricane/Tropical Storm	Lightning	Severe Thunderstorm/High Wind	Tornado	Winter Storm/Freeze	Earthquake	Landslide- Moderate Incidence	Land Subsidence/Sinkhole	Dam/Levee Failure	Flood- 100 year	Flood- 500 year	Wildfire	Solar Flare	Nuclear Power Plan- 50 year	Terror Threat	Public Health/Infectious Disease Threat
ARCHDALE																				
ALPHA ACADEMY @ MAIN	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
BRANDON DAY SCHOOL	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
CHILDREN'S CARE CIRCLE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
LINDAS DAY CARE (4910 ARCHDALE RD)	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
LINDAS DAY CARE (4913 ARCHDALE RD)	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
LITTLE ANGELS CHRISTIAN CARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
LITTLE BLESSINGS INC	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
QUAKER HOUSE AFTER SCHOOL CARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
SEXTON DAYCARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
TRINDALE CHILDRENS-AFTER SCH	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
TRINDALE CHILDRENS CENTER	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
EMS BASE 1	EMS Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
GUIL RAND 20 FIRE DEPT	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
ARCHDALE PUBLIC LIBRARY	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X		X	X

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
		Drought	Hailstorm	Heat Wave/Extreme Heat	Hurricane/Tropical Storm	Lightning	Severe Thunderstorm/High Wind	Tornado	Winter Storm/Freeze	Earthquake	Landslide- Moderate Incidence	Land Subsidence/Sinkhole	Dam/Levee Failure	Flood- 100 year	Flood- 500 year	Wildfire	Solar Flare	Nuclear Power Plan- 50 year	Terror Threat	Public Health/Infectious Disease Threat
CITY OF ARCHDALE	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X		X	X
RANDOLPH CO MAGISTRATE	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X		X	X
US POST OFFICE-ARCHDALE	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X		X	X
ARCHDALE POLICE DEPT	Police Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
ARCHDALE ELEMENTARY SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
ARCHDALE TRINITY MIDDLE SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
BRANDON DAY SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
RANDOLPH COMM COLLEGE (ARCHDALE)	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
TRINDALE ELEM SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
ASHEBORO																				
ABC DAYCARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
BALFOUR CHILD DEVELOPMENT	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
CARING PLACE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
CHILDRENS CENTER	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
EAST SIDE HEAD START CENTER	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
		Drought	Hailstorm	Heat Wave/Extreme Heat	Hurricane/Tropical Storm	Lightning	Severe Thunderstorm/High Wind	Tornado	Winter Storm/Freeze	Earthquake	Landslide- Moderate Incidence	Land Subsidence/Sinkhole	Dam/Levee Failure	Flood- 100 year	Flood- 500 year	Wildfire	Solar Flare	Nuclear Power Plan- 50 year	Terror Threat	Public Health/Infectious Disease Threat
EMMA'S LOVING CARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
GARDEN GATE CHILD CENTER	Day Care	X	X	X	X	X	X	X	X	X		X	X	X			X	X	X	X
GLENNS NURSERY	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
GOSS DAYCARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
HILLS DAYCARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
JULIAS DAY CARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
NEIGHBORS GROVE DAY CARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
PRECIOUS MOMENTS PRE-SCHOOL	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RCSAA ADULT DAYCARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
SHEPHERDS WAY DAY SCHOOL	Day Care	X	X	X	X	X	X	X	X	X		X	X		X		X	X	X	X
SUN-RISE CHILD CARE-CUDDLE HSE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
SUNRISE CHILD CARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
TEDDY BEAR CHILD CARE CENTER	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
THE CHILDRENS CENTER	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
THE LEARNING TREE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
WE CARE DAY CARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
WE CARE DAY CARE 2	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
		Drought	Hailstorm	Heat Wave/Extreme Heat	Hurricane/Tropical Storm	Lightning	Severe Thunderstorm/High Wind	Tornado	Winter Storm/Freeze	Earthquake	Landslide- Moderate Incidence	Land Subsidence/Sinkhole	Dam/Levee Failure	Flood- 100 year	Flood- 500 year	Wildfire	Solar Flare	Nuclear Power Plan- 50 year	Terror Threat	Public Health/Infectious Disease Threat
EMS BASE 4	EMS Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH COUNTY EMERGENCY SERVICES	EOC	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH COUNTY EOC (NEW)	EOC	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
ASHEBORO FIRE DEPT STA-01	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
ASHEBORO FIRE DEPT STA-02	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
CITY OF ASHEBORO	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
DAY/NIGHT SUBSTANCE ABUSE PROG	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
EMPLOYMENT SECURITY	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
FEDERAL BUILDING	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
HUMAN RESOURCES	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
INTENSIVE PROBATION	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
NC CHILD SUPPORT & ENF	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
NC DEPT OF CRIME CONTROL	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
NC DEPT OF REVENUE	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
		Drought	Hailstorm	Heat Wave/Extreme Heat	Hurricane/Tropical Storm	Lightning	Severe Thunderstorm/High Wind	Tornado	Winter Storm/Freeze	Earthquake	Landslide- Moderate Incidence	Land Subsidence/Sinkhole	Dam/Levee Failure	Flood- 100 year	Flood- 500 year	Wildfire	Solar Flare	Nuclear Power Plan- 50 year	Terror Threat	Public Health/Infectious Disease Threat
NC DEPT OF TRANSPORTATION	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
NC LICENSE PLATE AGENCY	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH CO COMMUNICATIONS	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH CO COURTHOUSE (145 WORTH ST)	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH CO COURTHOUSE (176 E SALISBURY ST)	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH CO FAMILY CRISIS	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH CO LIBRARY	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH CO MAINTENANCE (152 N FAYETTEVILLE ST)	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH CO MAINTENANCE (2212 S FAYETTEVILLE ST)	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH CO MENTAL HEALTH (125 S PARK ST)	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH CO MENTAL HEALTH (110 W WALKER AVE)	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH CO MENTAL HEALTH (204 E ACADEMY ST)	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH CO SENIOR ADULTS	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
		Drought	Hailstorm	Heat Wave/Extreme Heat	Hurricane/Tropical Storm	Lightning	Severe Thunderstorm/High Wind	Tornado	Winter Storm/Freeze	Earthquake	Landslide- Moderate Incidence	Land Subsidence/Sinkhole	Dam/Levee Failure	Flood- 100 year	Flood- 500 year	Wildfire	Solar Flare	Nuclear Power Plan- 50 year	Terror Threat	Public Health/Infectious Disease Threat
RANDOLPH CO SHELTERED WORKSHOP	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
SHAW BUILDING	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
VOCATIONAL OPPORTUNITIES	Government Administration	X	X	X	X	X	X	X	X	X		X	X	X			X	X	X	X
ALPHA HOUSE	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
ASHEBORO FRIENDS RETIREMENT HO	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
BURROWS GROUP HOME	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
FAIRMOUNT PLACE	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
FAMILY CRISIS CENTER	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
HOPE HOUSE (RCMH)	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
IRT GUESS	Group Home	X	X	X	X	X	X	X	X	X		X	X		X		X	X	X	X
MAINSTREAM	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
MANGUM HOUSE	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
NORTH HOUSE	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
PARK HAVEN	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
PINEVIEW GROUP HOME	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
PROVIDENCE GROUP HOME	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RUTH HOME	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
		Drought	Hailstorm	Heat Wave/Extreme Heat	Hurricane/Tropical Storm	Lightning	Severe Thunderstorm/High Wind	Tornado	Winter Storm/Freeze	Earthquake	Landslide- Moderate Incidence	Land Subsidence/Sinkhole	Dam/Levee Failure	Flood- 100 year	Flood- 500 year	Wildfire	Solar Flare	Nuclear Power Plan- 50 year	Terror Threat	Public Health/Infectious Disease Threat
SUNBRIDGE OF ASHEBORO	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
VICTORIA HOUSE	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
WILLOW ROAD GROUP HOME	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
Randolph Hospital	Hospital	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
MARINE CORPS RECUITING	Military	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
NATIONAL GUARD ARMORY	Military	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
NAVY RECRUITING	Military	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
US MARINES	Military	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
CITY FIELDS	Parks and Recreational	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
FRAIZER PARK-PICNIC SHELTER	Parks and Recreational	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
HAMMER PARK	Parks and Recreational	X	X	X	X	X	X	X	X	X		X	X	X			X	X	X	X
KIWANIS PARK	Parks and Recreational	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
LAKE REECE RECREATION	Parks and Recreational	X	X	X	X	X	X	X	X	X		X	X				X		X	X
LAKES ROSS MCCRARY & BUNCH	Parks and Recreational	X	X	X	X	X	X	X	X	X		X	X			X	X		X	X
MCCRARY PARK	Parks and Recreational	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER					
		Drought	Hailstorm	Heat Wave/Extreme Heat	Hurricane/Tropical Storm	Lightning	Severe Thunderstorm/High Wind	Tornado	Winter Storm/Freeze	Earthquake	Landslide- Moderate Incidence	Land Subsidence/Sinkhole	Dam/Levee Failure	Flood- 100 year	Flood- 500 year	Wildfire	Solar Flare	Nuclear Power Plan- 50 year	Terror Threat	Public Health/Infectious Disease Threat	
MEMORIAL PARK-NANCE FIELD	Parks and Recreational	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X	
MEMORIAL PARK-PICNIC SHELTER	Parks and Recreational	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X	
MEMORIAL PARK-SWIMMING POOL	Parks and Recreational	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X	
MUNICIPAL GOLF COURSE	Parks and Recreational	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X	
PARK ST PARK	Parks and Recreational	X	X	X	X	X	X	X	X	X		X	X	X				X	X	X	X
PUGH FIELD	Parks and Recreational	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X	
TUCKER ST PARK-PICNIC SHELTER	Parks and Recreational	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X	
WESTWOOD PARK	Parks and Recreational	X	X	X	X	X	X	X	X	X		X	X				X		X	X	
ASHEBORO POLICE DEPT	Police Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X	
ASHEBORO POLICE DEPT-VICE	Police Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X	
ASHEBORO HIGH SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X	
BALFOUR ELEMENTARY SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X	
CHARLES W MCCRARY ELEMENTARY SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X	
DONNA LEE LOFLIN SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X	

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
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EARLY CHILDHOOD DEVELOPMENT CENTER	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
FAYETTEVILLE ST CHRISTIAN SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
GUY B TEACHEY SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
LINDLEY PARK SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
NEIGHBORS GROVE ACADEMY	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
NORTH ASHEBORO MIDDLE SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH COMMUNITY COLLEGE	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH COUNTY EARLY COLLEGE HIGH SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
SOUTH ASHEBORO MIDDLE SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
UWHARRIE CHARTER ACADEMY	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
ASHEBORO WASTEWATER FACILTIES	Water/Wastewater	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
ASHEBORO WATER PLANT	Water/Wastewater	X	X	X	X	X	X	X	X	X		X	X				X		X	X
RANDOLPH CO PUBLIC WORKS	Water/Wastewater	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
FRANKLINVILLE																				
FRANKLINVILLE FIRE DEPT 08	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
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JOHN W CLARK PUBLIC LIBRARY	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
TOWN OF FRANKLINVILLE	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
US POST OFFICE-FRANKLINVILLE	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
FRANKLINVILLE ELEM SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
LIBERTY																				
LIBERTY PRESCHOOL	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
THE CHILDREN'S PLACE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
VERAS BABY HOUSE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
VERAS KIDDIE KARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
EMS BASE 2	EMS Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
NORTHEAST FIRE STATION	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
DAY/NIGHT SUBSTANCE ABUSE PROG	Government Administration	X	X	X	X	X	X	X	X	X		X	X		X		X	X	X	X
LIBERTY PUBLIC LIBRARY	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
TOWN OF LIBERTY	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
US POST OFFICE-LIBERTY	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
BRAXTON FAMILY CARE HOME	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
		Drought	Hailstorm	Heat Wave/Extreme Heat	Hurricane/Tropical Storm	Lightning	Severe Thunderstorm/High Wind	Tornado	Winter Storm/Freeze	Earthquake	Landslide- Moderate Incidence	Land Subsidence/Sinkhole	Dam/Levee Failure	Flood- 100 year	Flood- 500 year	Wildfire	Solar Flare	Nuclear Power Plan- 50 year	Terror Threat	Public Health/Infectious Disease Threat
BROOKWOOD GROUP HOME	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
CAREGIVERS OF LIBERTY #1	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
CAREGIVERS OF LIBERTY #2	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
CAROL LEE FAMILY CARE HOME	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
LIBERTY POLICE DEPARTMENT	Police Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
LIBERTY ELEMENTARY SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RAMSEUR																				
RAMSEUR FIRE DEPT 04	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RAMSEUR LIBRARY	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
TOWN OF RAMSEUR	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
AVB FAMILY CARE HOME	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
BURROWS FAMILY CARE HOME	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
MEADOWOOD GROUP HOME	Group Home	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X
RAMSEUR FAMILY CARE	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
UNIVERSAL HEALTH CARE OF RAMSE	Group Home	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X
RAMSEUR POLICE DEPARTMENT	Police Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
		Drought	Hailstorm	Heat Wave/Extreme Heat	Hurricane/Tropical Storm	Lightning	Severe Thunderstorm/High Wind	Tornado	Winter Storm/Freeze	Earthquake	Landslide- Moderate Incidence	Land Subsidence/Sinkhole	Dam/Levee Failure	Flood- 100 year	Flood- 500 year	Wildfire	Solar Flare	Nuclear Power Plan- 50 year	Terror Threat	Public Health/Infectious Disease Threat
RAMSEUR ELEMENTARY SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RAMSEUR WASTE PLANT	Water/Wastewater	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X
RAMSEUR WATER PLANT	Water/Wastewater	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDLEMAN																				
CENTRAL CATHEDRAL DAY CARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
DOROTHY'S DAY CARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
GOOD SHEPHARD AFTERSCHOOL CARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
HURLEYS DAYCARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
KIDS UNLIMITED	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
WISH UPON A STAR DAYCARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
EMS BASE 5	EMS Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
RANDLEMAN SOPHIA FIRE DEPT	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
CITY OF RANDLEMAN	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDLEMAN PUBLIC LIBRARY	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH CO MENTAL HEALTH	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
		Drought	Hailstorm	Heat Wave/Extreme Heat	Hurricane/Tropical Storm	Lightning	Severe Thunderstorm/High Wind	Tornado	Winter Storm/Freeze	Earthquake	Landslide- Moderate Incidence	Land Subsidence/Sinkhole	Dam/Levee Failure	Flood- 100 year	Flood- 500 year	Wildfire	Solar Flare	Nuclear Power Plan- 50 year	Terror Threat	Public Health/Infectious Disease Threat
US POST OFFICE-RANDLEMAN	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X		X	X
US POST OFFICE-STALEY	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
BROOKSTONE HAVEN	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDLEMAN POLICE DEPARTMENT	Police Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDLEMAN ELEMENTARY SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
SEAGROVE																				
SEAGROVE FIRE DEPT 06	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
SEAGROVE PUBLIC LIBRARY	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
SEAGROVE TOWN HALL	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
US POST OFFICE-SEAGROVE	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
SEAGROVE POLICE DEPT	Police Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
SEAGROVE ELEMENTARY SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
STALEY																				
STALEY FIRE DEPT 07	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
STALEY TOWN HALL	Government Administration	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
		Drought	Hailstorm	Heat Wave/Extreme Heat	Hurricane/Tropical Storm	Lightning	Severe Thunderstorm/High Wind	Tornado	Winter Storm/Freeze	Earthquake	Landslide- Moderate Incidence	Land Subsidence/Sinkhole	Dam/Levee Failure	Flood- 100 year	Flood- 500 year	Wildfire	Solar Flare	Nuclear Power Plan- 50 year	Terror Threat	Public Health/Infectious Disease Threat
TRINITY																				
FAIRGROVE 45 FIRE DEPT	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
GUIL RAND FIRE DEPT 39	Fire Station	X	X	X	X	X	X	X	X	X		X	X			X	X		X	X
GUIL RAND FIRE DEPT 40	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
TRINITY CITY HALL	Government Administration	X	X	X	X	X	X	X	X	X		X	X			X	X		X	X
US POST OFFICE-TRINITY	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X		X	X
BRAXTON CRAVEN MIDDLE SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
HOPEWELL ELEMENTARY	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
NEW HOPE CHRISTIAN SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
TRINITY ELEMENTARY SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
TRINITY HIGH SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
UNINCORPORATED AREA																				
BARBARA'S DAY CARE	Day Care	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X
BRICE & BUDDIES	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
CH OF GOD OF PROPHECY DAYCARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
CHIMNEY LANE DAYCARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
CREATIVE WORLD DAY CARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
		Drought	Hailstorm	Heat Wave/Extreme Heat	Hurricane/Tropical Storm	Lightning	Severe Thunderstorm/High Wind	Tornado	Winter Storm/Freeze	Earthquake	Landslide- Moderate Incidence	Land Subsidence/Sinkhole	Dam/Levee Failure	Flood- 100 year	Flood- 500 year	Wildfire	Solar Flare	Nuclear Power Plan- 50 year	Terror Threat	Public Health/Infectious Disease Threat
DIANA FAMILY DAY CARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
DOROTHY'S TINY TOTS	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
ESTHER COX SMALL CARE HOME	Day Care	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X
FIRST IMPRESSIONS PRESCHOOL	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
GOSPEL BAPT BEGINNERS SCHOOL	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
JENNIFERS LEARNING CENTER	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
KIDDIE LAND AFTER SCHOOL CARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
KIDDIELAND DAY CARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
KIDS DAY OUT DAY CARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
KIDS R US	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
LAURAS BEST OF CARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
MARLBORO FRIENDS DAYCARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
NOAHS ARK PLAYSCHOOL (479 LEWALLEN RD)	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
NOAHS ARK PLAYSCHOOL (2012 OLD FARMER RD)	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
PATS AFTER SCHOOL CARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
PRECIOUS LAMB CHILD DEVELOPMEN	Day Care	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
		Drought	Hailstorm	Heat Wave/Extreme Heat	Hurricane/Tropical Storm	Lightning	Severe Thunderstorm/High Wind	Tornado	Winter Storm/Freeze	Earthquake	Landslide- Moderate Incidence	Land Subsidence/Sinkhole	Dam/Levee Failure	Flood- 100 year	Flood- 500 year	Wildfire	Solar Flare	Nuclear Power Plan- 50 year	Terror Threat	Public Health/Infectious Disease Threat
THE LEARNING CENTER	Day Care	X	X	X	X	X	X	X	X	X		X	X				X		X	X
THE RAINBOW CONNECTION	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
THE STRAWBERRY PATCH CCC	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
TROGDONS DAY CARE	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
VICTORY BAPT CH CHILD DEV CTR	Day Care	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH CO EMS BASE 3	EMS Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH CO EMS BASE 6	EMS Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
RANDOLPH CO EMS BASE 7	EMS Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
RANDOLPH CO EMS BASE 8	EMS Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
BENNETT C5 FIRE DEPT	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
CLIMAX FIRE DEPT 35	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
CLIMAX FIRE DEPT 42	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
COLERIDGE FIRE DEPT 09	Fire Station	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X
COLERIDGE FIRE DEPT STA-10	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
EAST SIDE FIRE DEPT 14	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
EAST SIDE FIRE DEPT 19	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
EAST SIDE FIRE DEPT 24	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
FAIRGROVE FG FIRE DEPT	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
		Drought	Hailstorm	Heat Wave/Extreme Heat	Hurricane/Tropical Storm	Lightning	Severe Thunderstorm/High Wind	Tornado	Winter Storm/Freeze	Earthquake	Landslide- Moderate Incidence	Land Subsidence/Sinkhole	Dam/Levee Failure	Flood- 100 year	Flood- 500 year	Wildfire	Solar Flare	Nuclear Power Plan- 50 year	Terror Threat	Public Health/Infectious Disease Threat
FARMER FIRE DEPT 15	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
FRANKLINVILLE FIRE DEPT 22	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
FRANKLINVILLE FIRE DEPT 44	Fire Station	X	X	X	X	X	X	X	X	X		X	X			X	X	X	X	X
FRANKLINVILLE FIRE DEPT 88	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
GUIL RAND FIRE DEPT 21	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
GUIL RAND FIRE DEPT 41	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
JULIAN FIRE DEPT 36	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
LEVEL CROSS FIRE DEPT 43	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
RANDLEMAN SOPHIA FIRE DEPT 29	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
SOUTHWEST FIRE DEPT 17	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
STALEY FIRE DEPT-STA 27	Fire Station	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X
TABERNACLE FIRE DEPT 18	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
TABERNACLE FIRE DEPT 28	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
ULAH FIRE DEPT 11	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
ULAH FIRE DEPT STA-12	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
ULAH FIRE DEPT 31	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
ULAH FIRE DEPT STA-32	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
WESTSIDE FIRE DEPT 13	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
		Drought	Hailstorm	Heat Wave/Extreme Heat	Hurricane/Tropical Storm	Lightning	Severe Thunderstorm/High Wind	Tornado	Winter Storm/Freeze	Earthquake	Landslide- Moderate Incidence	Land Subsidence/Sinkhole	Dam/Levee Failure	Flood- 100 year	Flood- 500 year	Wildfire	Solar Flare	Nuclear Power Plan- 50 year	Terror Threat	Public Health/Infectious Disease Threat
WESTSIDE FIRE DEPT 16	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
WESTSIDE FIRE DEPT 23	Fire Station	X	X	X	X	X	X	X	X	X		X	X				X		X	X
FOREST SERVICE	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
NC DEPT OF TRANSPORTATION	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH CO ANIMAL SHELTER	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDOLPH CO LANDFILL	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
US POST OFFICE	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
US POST OFFICE-CEDAR FALLS	Government Administration	X	X	X	X	X	X	X	X	X		X	X		X		X	X	X	X
US POST OFFICE-SOPHIA	Government Administration	X	X	X	X	X	X	X	X	X		X	X				X		X	X
A TOUCH FROM THE HEART	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
ANN'S PLACE	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
ASHE HOUSE	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
BRILES FAMILY CARE HOME	Group Home	X	X	X	X	X	X	X	X	X		X	X			X	X		X	X
CAROLINA CARE LLC	Group Home	X	X	X	X	X	X	X	X	X		X	X				X		X	X
CAVINNESS CARE GROUP HOME	Group Home	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
		Drought	Hailstorm	Heat Wave/Extreme Heat	Hurricane/Tropical Storm	Lightning	Severe Thunderstorm/High Wind	Tornado	Winter Storm/Freeze	Earthquake	Landslide- Moderate Incidence	Land Subsidence/Sinkhole	Dam/Levee Failure	Flood- 100 year	Flood- 500 year	Wildfire	Solar Flare	Nuclear Power Plan- 50 year	Terror Threat	Public Health/Infectious Disease Threat
CEDAR RIDGE FAMILY CARE HOME	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
COUNTRY CLUB ASST LIVING	Group Home	X	X	X	X	X	X	X	X	X		X	X				X		X	X
COUNTRY MANOR FAMILY CARE HOME	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
HUDSON FAMILY CARE HOME	Group Home	X	X	X	X	X	X	X	X	X		X	X				X		X	X
ISLEY FAMILY CARE HOME	Group Home	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X	X
ROLLING HILLS FAMILY CARE	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
SOUTHWEST IRT GROUP HOME	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
TIMBERLEA	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
WILSON FAMILY CARE CENTER	Group Home	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
US ARMY	Military	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X
LAKE LUCAS	Parks and Recreational	X	X	X	X	X	X	X	X	X		X	X				X		X	X
CALVARY CHRISTIAN SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
COLERIDGE ELEM SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X
DOVE CHRISTIAN ACADEMY	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
EASTERN RANDOLPH HIGH SCHOOL	School	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X
EMERGENCY SERVICES TRAINING CT	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
		Drought	Hailstorm	Heat Wave/Extreme Heat	Hurricane/Tropical Storm	Lightning	Severe Thunderstorm/High Wind	Tornado	Winter Storm/Freeze	Earthquake	Landslide- Moderate Incidence	Land Subsidence/Sinkhole	Dam/Levee Failure	Flood- 100 year	Flood- 500 year	Wildfire	Solar Flare	Nuclear Power Plan- 50 year	Terror Threat	Public Health/Infectious Disease Threat
FAITH CHRISTIAN SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
FARMER ELEMENTARY SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X			X	X		X	X
GRAYS CHAPEL ELEM SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
JOHN LAWRENCE ELEMENTARY SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
LEVEL CROSS CHRISTIAN SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
LEVEL CROSS ELEMENTARY	School	X	X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X
MT CALVARY CHRISTIAN SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
NEW MARKET ELEMENTARY	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
NORTHEAST MIDDLE SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
PROVIDENCE GROVE HIGH SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X
RANDLEMAN HIGH SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
RANDLEMAN MIDDLE SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
SOUTHEASTERN RANDOLPH MIDDLE SCHOOL	School	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X
SOUTHMONT ELEMENTARY SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
SOUTHWEST RANDOLPH HIGH	School	X	X	X	X	X	X	X	X	X		X	X			X	X		X	X

SECTION 6: VULNERABILITY ASSESSMENT

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEO			HYDRO			OTHER				
		Drought	Hailstorm	Heat Wave/Extreme Heat	Hurricane/Tropical Storm	Lightning	Severe Thunderstorm/High Wind	Tornado	Winter Storm/Freeze	Earthquake	Landslide- Moderate Incidence	Land Subsidence/Sinkhole	Dam/Levee Failure	Flood- 100 year	Flood- 500 year	Wildfire	Solar Flare	Nuclear Power Plan- 50 year	Terror Threat	Public Health/Infectious Disease Threat
SOUTHWEST RANDOLPH MIDDLE SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
TABERNACLE ELEM SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
UWHARRIE MIDDLE SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
WHEATMORE HIGH SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X
YOUTH UNLIMITED SCHOOL	School	X	X	X	X	X	X	X	X	X		X	X				X		X	X

SECTION 7

CAPABILITY ASSESSMENT

This section of the *Plan* discusses the capability of the jurisdictions in Randolph County to implement hazard mitigation activities. It consists of the following four subsections:

- ❖ 7.1 What is a Capability Assessment?
- ❖ 7.2 Conducting the Capability Assessment;
- ❖ 7.3 Capability Assessment Findings; and
- ❖ 7.4 Conclusions on Local Capability.

7.1 WHAT IS A CAPABILITY ASSESSMENT?

The purpose of conducting a capability assessment is to determine the ability of a local jurisdiction to implement a comprehensive mitigation strategy and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs, or projects.¹ As in any planning process, it is important to try to establish which goals, objectives, and/or actions are feasible based on an understanding of the organizational capacity of those agencies or departments tasked with their implementation. A capability assessment helps to determine which mitigation actions are practical, and likely to be implemented over time, given a local government’s planning and regulatory framework, level of administrative and technical support, amount of fiscal resources, and current political climate.

A capability assessment has two primary components: 1) an inventory of a local jurisdiction’s relevant plans, ordinances, or programs already in place and 2) an analysis of its capacity to carry them out. Careful examination of local capabilities will detect any existing gaps, shortfalls, or weaknesses with ongoing government activities that could hinder proposed mitigation activities and possibly exacerbate community hazard vulnerability. A capability assessment also highlights the positive mitigation measures already in place or being implemented at the local government level, which should continue to be supported and enhanced through future mitigation efforts.

The capability assessment completed for Randolph County and its municipalities serves as a critical planning step and an integral part of the foundation for designing an effective hazard mitigation strategy. Coupled with the Risk Assessment, the Capability Assessment helps identify and target meaningful mitigation actions for incorporation in the Mitigation Strategy portion of the *Randolph County Multi-jurisdictional Hazard Mitigation Plan*. It not only helps establish the goals and objectives for the county to pursue under this Plan, but it also ensures that those goals and objectives are realistically achievable under given local conditions.

¹ While the Final Rule for implementing the Disaster Mitigation Act of 2000 does not require a local capability assessment to be completed for local hazard mitigation plans, it is a critical step in developing a mitigation strategy that meets the needs of the region while taking into account their own unique abilities. The Rule does state that a community’s mitigation strategy should be “based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools” (44 CFR, Part 201.6(c)(3)).

7.2 CONDUCTING THE CAPABILITY ASSESSMENT

In order to facilitate the inventory and analysis of local government capabilities for Randolph County and its municipalities, a detailed Capability Assessment Survey was completed for each of the participating jurisdictions based on the information found in the existing *Hazard Mitigation Plan* and local government websites. The survey questionnaire compiled information on a variety of “capability indicators” such as existing local plans, policies, programs, or ordinances that contribute to and/or hinder the jurisdictions’ ability to implement hazard mitigation actions. Other indicators included information related to the communities’ fiscal, administrative, and technical capabilities, such as access to local budgetary and personnel resources for mitigation purposes. The current political climate, an important consideration for any local planning or decision making process, was also evaluated with respect to hazard mitigation.

At a minimum, survey results provide an extensive inventory of existing local plans, ordinances, programs, and resources that are in place or under development in addition to their overall effect on hazard loss reduction. However, the survey instrument can also serve to identify gaps, weaknesses, or conflicts that the county and local jurisdictions can recast as opportunities for specific actions to be proposed as part of the hazard mitigation strategy.

The information collected in the survey questionnaire was incorporated into a database for further analysis. A general scoring methodology² was then applied to quantify each jurisdiction’s overall capability. According to the scoring system, each capability indicator was assigned a point value based on its relevance to hazard mitigation.

Using this scoring methodology, a total score and an overall capability rating of “high,” “moderate,” or “limited” could be determined according to the total number of points received. These classifications are designed to provide nothing more than a general assessment of local government capability. The results of this capability assessment provide critical information for developing an effective and meaningful mitigation strategy.

7.3 CAPABILITY ASSESSMENT FINDINGS

The findings of the capability assessment are summarized in this Plan to provide insight into the relevant capacity of the jurisdictions in Randolph County to implement hazard mitigation activities. All information is based upon the review of the existing *Hazard Mitigation Plan* and local government websites through the Capability Assessment Survey and input provided by local government officials during meetings of the Randolph County Hazard Mitigation Planning Team.

7.3.1 Planning and Regulatory Capability

Planning and regulatory capability is based on the implementation of plans, ordinances, and programs that demonstrate a local jurisdiction’s commitment to guiding and managing growth, development, and redevelopment in a responsible manner while maintaining the general welfare of the community. It includes emergency response and mitigation planning, comprehensive land use planning, and transportation planning; the enforcement of zoning or subdivision ordinances and building codes that

²The scoring methodology used to quantify and rank the jurisdictions’ capability can be found in Appendix B.

regulate how land is developed and structures are built; as well as protecting environmental, historic, and cultural resources in the community. Although some conflicts can arise, these planning initiatives generally present significant opportunities to integrate hazard mitigation principles and practices into the local decision making process.

This assessment is designed to provide a general overview of the key planning and regulatory tools and programs that are in place or under development for the jurisdictions in Randolph County along with their potential effect on loss reduction. This information will help identify opportunities to address existing gaps, weaknesses, or conflicts with other initiatives in addition to integrating the implementation of this Plan with existing planning mechanisms where appropriate.

Table 7.1 provides a summary of the relevant local plans, ordinances, and programs already in place or under development for the jurisdictions in Randolph County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the *Randolph County Multi-jurisdictional Hazard Mitigation Plan*.

TABLE 7.1: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

PLANNING/REGULATORY TOOL	RANDOLPH COUNTY	CITY OF ARCHDALE	CITY OF ASHEBORO	TOWN OF FRANKLINVILLE	TOWN OF LIBERTY	TOWN OF RAMSEUR	CITY OF RANDLEMAN	TOWN OF SEAGROVE	TOWN OF STALEY	CITY OF TRINITY
Hazard Mitigation Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Comprehensive Land Use Plan	✓	✓	✓	✓	✓	✓	✓			✓
Floodplain Management Plan										
Open Space Management Plan (Parks & Rec/Greenway Plan)	✓						✓			✓
Stormwater Management Plan/Ordinance		✓								✓
Natural Resource Protection Plan	✓									
Flood Response Plan										
Emergency Operations Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Continuity of Operations Plan	✓									
Evacuation Plan										
Disaster Recovery Plan										

PLANNING/REGULATORY TOOL	RANDOLPH COUNTY	CITY OF ARCHDALE	CITY OF ASHEBORO	TOWN OF FRANKLINVILLE	TOWN OF LIBERTY	TOWN OF RAMSEUR	CITY OF RANDLEMAN	TOWN OF SEAGROVE	TOWN OF STALEY	CITY OF TRINITY
Capital Improvements Plan	✓		✓							✓
Economic Development Plan	✓							✓		
Historic Preservation Plan										
Flood Damage Prevention Ordinance	✓	✓	✓	✓	✓	✓	✓			✓
Zoning Ordinance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Subdivision Ordinance	✓	✓	✓	✓	✓	✓	✓			✓
Unified Development Ordinance	✓			✓						
Post-Disaster Redevelopment Ordinance										
Building Code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fire Code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
National Flood Insurance Program (NFIP)	✓	✓	✓	✓	✓	✓	✓			✓
NFIP Community Rating System										

A more detailed discussion on the County's planning and regulatory capability follows.

7.3.2 Emergency Management

Hazard mitigation is widely recognized as one of the four primary phases of emergency management. The three other phases include preparedness, response, and recovery. In reality, each phase is interconnected with hazard mitigation, as **Figure 7.1** suggests. Opportunities to reduce potential losses through mitigation practices are most often implemented before disaster strikes, such as the elevation of flood prone structures or the continuous enforcement of policies that prevent and regulate development that is vulnerable to hazards due to its location, design, or other characteristics. Mitigation opportunities will also be presented during immediate preparedness or response activities, such as installing storm shutters in advance of a hurricane, and certainly during the long-term recovery and redevelopment process following a hazard event.

FIGURE 7.1: THE FOUR PHASES OF EMERGENCY MANAGEMENT



Planning for each phase is a critical part of a comprehensive emergency management program and a key to the successful implementation of hazard mitigation actions. As a result, the Capability Assessment Survey asked several questions across a range of emergency management plans in order to assess the participating jurisdictions' willingness to plan and their level of technical planning proficiency.

Hazard Mitigation Plan: A Hazard Mitigation Plan represents a community's blueprint for how it intends to reduce the impact of natural and human-caused hazards on people and the built environment. The essential elements of a hazard mitigation plan include a risk assessment, capability assessment, and mitigation strategy.

- ❖ Randolph County has previously adopted a Hazard Mitigation Plan. Each participating municipality was included in the County's plan.

Disaster Recovery Plan: A Disaster Recovery Plan serves to guide the physical, social, environmental, and economic recovery and reconstruction process following a disaster. In many instances, hazard mitigation principles and practices are incorporated into local disaster recovery plans with the intent of capitalizing on opportunities to break the cycle of repetitive disaster losses. Disaster recovery plans can also lead to the preparation of disaster redevelopment policies and ordinances to be enacted following a hazard event.

- ❖ Neither the County nor any of the participating municipalities have adopted a disaster recovery plan. They should consider developing a plan to guide the recovery and reconstruction process following a disaster.

Emergency Operations Plan: An Emergency Operations Plan outlines responsibilities and the means by which resources are deployed during and following an emergency or disaster.

- ❖ Randolph County maintains an Emergency Operations Plan through the County Department of Emergency Services. All nine participating municipalities have adopted the County plan.
- ❖ Archdale, Asheboro, and Randleman have also adopted municipal-level emergency operations or emergency response plans.

Continuity of Operations Plan: A Continuity of Operations Plan establishes a chain of command, line of succession, and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster event.

- ❖ Randolph County has developed a County Continuity of Operations Plan.
- ❖ None of the municipal jurisdictions within Randolph County have developed a continuity of operations plan for their jurisdiction.

Flood Response Plan: A Flood Response Plan establishes procedures for responding to a flood emergency including coordinating and facilitating resources to minimize the impacts of flood.

- ❖ Neither the County nor any of the participating municipalities have adopted a flood response plan.

7.3.3 General Planning

The implementation of hazard mitigation activities often involves agencies and individuals beyond the emergency management profession. Stakeholders may include local planners, public works officials, economic development specialists, and others. In many instances, concurrent local planning efforts will help to achieve or complement hazard mitigation goals, even though they are not designed as such. Therefore, the Capability Assessment Survey also asked questions regarding general planning capabilities and the degree to which hazard mitigation is integrated into other on-going planning efforts in Randolph County.

Comprehensive Land Use Plan: A Comprehensive Land Use Plan establishes the overall vision for what a community wants to be and serves as a guide for future governmental decision making. Typically a comprehensive plan contains sections on demographic conditions, land use, transportation elements, and community facilities. Given the broad nature of the plan and its regulatory standing in many communities, the integration of hazard mitigation measures into the comprehensive plan can enhance the likelihood of achieving risk reduction goals, objectives, and actions.

- ❖ Randolph County has adopted a County Growth Management Plan.
- ❖ Each of the participating municipalities, except the Towns of Seagrove and Staley, has adopted a municipal land use or land development plan.

Capital Improvements Plan: A Capital Improvements Plan guides the scheduling of spending on public improvements. A capital improvements plan can serve as an important mechanism for guiding future development away from identified hazard areas. Limiting public spending in hazardous areas is one of the most effective long-term mitigation actions available to local governments.

- ❖ Randolph County and the Cities of Asheboro and Trinity have capital improvement plans in place.

Historic Preservation Plan: A Historic Preservation Plan is intended to preserve historic structures or districts within a community. An often overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards and the identification of

ways to reduce future damages. This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of harm's way.

- ❖ Neither the County nor any of the participating municipalities have developed a historic preservation plan.

Zoning Ordinance: Zoning represents the primary means by which land use is controlled by local governments. As part of a community's police power, zoning is used to protect the public health, safety, and welfare of those in a given jurisdiction that maintains zoning authority. A zoning ordinance is the mechanism through which zoning is typically implemented. Since zoning regulations enable municipal governments to limit the type and density of development, a zoning ordinance can serve as a powerful tool when applied in identified hazard areas.

- ❖ Randolph County and all nine participating municipalities have adopted zoning ordinances.

Subdivision Ordinance: A Subdivision Ordinance is intended to regulate the development of residential, commercial, industrial, or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development.

- ❖ Randolph County and each participating municipality, except the Towns of Seagrove and Staley, have adopted subdivision ordinances.

Building Codes, Permitting, and Inspections: Building codes regulate construction standards. In many communities, permits and inspections are required for new construction. Decisions regarding the adoption of building codes (that account for hazard risk), the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community.

- ❖ North Carolina has a State compulsory building code, which applies throughout the State; however, jurisdictions may adopt codes if approved as providing adequate minimum standards. The county and all nine participating municipalities have adopted a building code.
- ❖ Randolph County provides building inspection services for all unincorporated areas of the County and through contractual agreements for all municipalities except the City of Asheboro.
- ❖ The City of Asheboro is responsible for enforcement of the building code within its planning jurisdiction.

The adoption and enforcement of building codes by local jurisdictions is routinely assessed through the Building Code Effectiveness Grading Schedule (BCEGS) program developed by the Insurance Services Office, Inc. (ISO).³ In North Carolina, the North Carolina Department of Insurance assesses the building codes in effect in a particular community and how the community enforces its building codes *with special emphasis on mitigation of losses from natural hazards*. The results of BCEGS assessments are

³ Participation in BCEGS is voluntary and may be declined by local governments if they do not wish to have their local building codes evaluated.

routinely provided to ISO's member private insurance companies, which in turn may offer ratings credits for new buildings constructed in communities with strong BCEGS classifications. The concept is that communities with well-enforced, up-to-date codes should experience fewer disaster-related losses and, as a result, should have lower insurance rates.

In conducting the assessment, ISO collects information related to personnel qualification and continuing education as well as the number of inspections performed per day. This type of information combined with local building codes is used to determine a grade for that jurisdiction. The grades range from 1 to 10 with a BCEGS grade of 1 representing exemplary commitment to building code enforcement and a grade of 10 indicating less than minimum recognized protection.

Specific BCEGS rating for the participating jurisdictions can be obtained by contacting the department for building inspections within that jurisdiction.

7.3.4 Floodplain Management

Flooding represents the greatest natural hazard facing the nation. At the same time, the tools available to reduce the impacts associated with flooding are among the most developed when compared to other hazard-specific mitigation techniques. In addition to approaches that cut across hazards such as education, outreach, and the training of local officials, the National Flood Insurance Program (NFIP) contains specific regulatory measures that enable government officials to determine where and how growth occurs relative to flood hazards. Participation in the NFIP is voluntary for local governments; however, program participation is strongly encouraged by FEMA as a first step for implementing and sustaining an effective hazard mitigation program. It is therefore used as part of this assessment as a key indicator for measuring local capability.

In order for a county or municipality to participate in the NFIP, they must adopt a local flood damage prevention ordinance that requires jurisdictions to follow established minimum building standards in the floodplain. These standards require that all new buildings and substantial improvements to existing buildings will be protected from damage by a one hundred-year flood event and that new development in the floodplain will not exacerbate existing flood problems or increase damage to other properties.

A key service provided by the NFIP is the mapping of identified flood hazard areas. Once completed, the Flood Insurance Rate Maps (FIRMs) are used to assess flood hazard risk, regulate construction practices, and set flood insurance rates. FIRMs are an important source of information to educate residents, government officials, and the private sector about the likelihood of flooding in their community.

Table 7.2 provides NFIP policy and claim information for each participating jurisdiction in Randolph County.

TABLE 7.2: NFIP POLICY AND CLAIM INFORMATION

JURISDICTION	DATE JOINED NFIP	CURRENT EFFECTIVE MAP DATE	NFIP POLICIES IN FORCE	INSURANCE IN FORCE	CLOSED CLAIMS	TOTAL PAYMENTS TO DATE
RANDOLPH COUNTY†	07/16/81	03/16/09	32	\$6,581,400	5	\$67,133

JURISDICTION	DATE JOINED NFIP	CURRENT EFFECTIVE MAP DATE	NFIP POLICIES IN FORCE	INSURANCE IN FORCE	CLOSED CLAIMS	TOTAL PAYMENTS TO DATE
City of Archdale	07/16/81	03/16/09	29	\$4,454,300	8	\$35,157
City of Asheboro	07/16/81	03/16/09	50	\$6,967,100	8	\$47,070
Town of Franklinville	07/01/87	03/16/09(M)	0	\$0	0	\$0
Town of Liberty	03/25/08	03/16/09	1	\$350,000	0	\$0
Town of Ramseur	03/01/87	03/16/09	3	\$660,000	1	\$5,528
City of Randleman	07/01/87	03/16/09	5	\$505,000	0	\$0
Town of Seagrove*	--	03/16/09	--	--	--	--
Town of Staley*	--	--	--	--	--	--
City of Trinity	05/18/05	03/16/09	8	\$1,872,200	0	\$0

†Includes unincorporated areas of county only

*Community does not participate in the NFIP

(M) – No Elevation Determined – All Zone A, C and X

Source: NFIP Community Status information as of 2/9/16; NFIP claims and policy information as of 11/30/15

All jurisdictions listed above that are participants in the NFIP will continue to comply with all required provisions of the program and will work to adequately comply in the future utilizing a number of strategies. For example, the jurisdictions will coordinate with NCEM and FEMA to develop maps and regulations related to special flood hazard areas within their jurisdictional boundaries and, through a consistent monitoring process, will design and improve their floodplain management program in a way that reduces the risk of flooding to people and property.

The Town of Staley does not participate in the NFIP because it currently does not have any identified flood hazard areas within its jurisdiction. The Town of Seagrove also does not participate in the NFIP due to lack of available funding and/or political support in Seagrove.

Community Rating System: An additional indicator of floodplain management capability is the active participation of local jurisdictions in the Community Rating System (CRS). The CRS is an incentive-based program that encourages counties and municipalities to undertake defined flood mitigation activities that go beyond the minimum requirements of the NFIP by adding extra local measures to provide protection from flooding. All of the eighteen creditable CRS mitigation activities are assigned a range of point values. As points are accumulated and reach identified thresholds, communities can apply for an improved CRS class rating. Class ratings, which range from ten to one, are tied to flood insurance premium reductions as shown in **Table 7.3**. As class rating improves (the lower the number the better), the percent reduction in flood insurance premiums for NFIP policyholders in that community increases.

TABLE 7.3: CRS PREMIUM DISCOUNTS, BY CLASS

CRS CLASS	PREMIUM REDUCTION
1	45%

CRS CLASS	PREMIUM REDUCTION
2	40%
3	35%
4	30%
5	25%
6	20%
7	15%
8	10%
9	5%
10	0

Source: FEMA

Community participation in the CRS is voluntary. Any community that is in full compliance with the rules and regulations of the NFIP may apply to FEMA for a CRS classification better than class 10. The CRS application process has been greatly simplified over the past several years based on community comments. Changes were made with the intent to make the CRS more user-friendly and make extensive technical assistance available for communities who request it.

- ❖ Neither the County nor any of the participating municipalities currently participate in the CRS. Participation in the CRS program should be considered as a mitigation action by all of the jurisdictions. The program would be most beneficial to the Cities of Archdale and Asheboro and Randolph County since they have a combined 111 NFIP policies in place.

Flood Damage Prevention Ordinance: A Flood Damage Prevention Ordinance establishes minimum building standards in the floodplain with the intent to minimize public and private losses due to flood conditions.

- ❖ All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. The County and each participating municipality, except the Towns of Seagrove and Staley, participate in the NFIP and they all have adopted flood damage prevention regulations.

Floodplain Management Plan: A Floodplain Management Plan (or a flood mitigation plan) provides a framework for action regarding corrective and preventative measures to reduce flood-related impacts.

- ❖ Neither the County nor any of the participating municipalities have adopted floodplain management plans.

Open Space Management Plan: An Open Space Management Plan is designed to preserve, protect, and restore largely undeveloped lands in their natural state and to expand or connect areas in the public domain such as parks, greenways, and other outdoor recreation areas. In many instances, open space management practices are consistent with the goals of reducing hazard losses, such as the preservation of wetlands or other flood-prone areas in their natural state in perpetuity.

- ❖ Randolph County participated in the development of the Piedmont Triad Regional Open Space Strategy which identifies a wide variety of key conservation opportunities across the region as

well as a strategy meant to serve as the foundation for future conservation planning efforts within the county.

- ❖ Randolph County and the Cities of Randleman and Trinity have adopted parks and recreation master plans.

Stormwater Management Plan: A Stormwater Management Plan is designed to address flooding associated with stormwater runoff. The stormwater management plan is typically focused on design and construction measures that are intended to reduce the impact of more frequently occurring minor urban flooding.

- ❖ Although neither the County nor any of the participating municipalities have stormwater management plans in place, the Cities of Archdale and Trinity have adopted stormwater management ordinances.
- ❖ Many of the other participating municipalities have adopted stormwater regulations through various ordinances (such as a zoning, subdivision, or watershed protection ordinance), including the Cities of Asheboro and Randleman and the Towns of Franklinville, Liberty, and Ramseur.

7.3.5 Administrative and Technical Capability

The ability of a local government to develop and implement mitigation projects, policies, and programs is directly tied to its ability to direct staff time and resources for that purpose. Administrative capability can be evaluated by determining how mitigation-related activities are assigned to local departments and if there are adequate personnel resources to complete these activities. The degree of intergovernmental coordination among departments will also affect administrative capability for the implementation and success of proposed mitigation activities.

Technical capability can generally be evaluated by assessing the level of knowledge and technical expertise of local government employees, such as personnel skilled in using Geographic Information Systems (GIS) to analyze and assess community hazard vulnerability. The Capability Assessment Survey was used to capture information on administrative and technical capability through the identification of available staff and personnel resources.

Table 7.4 provides a summary of the capability assessment results for Randolph County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill.

TABLE 7.4: RELEVANT STAFF/PERSONNEL RESOURCES

STAFF/PERSONNEL RESOURCE	RANDOLPH COUNTY	CITY OF ARCHDALE	CITY OF ASHEBORO	TOWN OF FRANKLINVILLE	TOWN OF LIBERTY	TOWN OF RAMSEUR	CITY OF RANDLEMAN	TONW OF SEAGROVE	TOWN OF STALEY	CITY OF TRINITY
Planners with knowledge of land development/land management practices	✓	✓	✓				✓			✓
Engineers or professionals trained in construction practices related to buildings and/or infrastructure	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Planners or engineers with an understanding of natural and/or human-caused hazards	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Emergency Manager	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Floodplain Manager	✓	✓	✓	✓	✓	✓	✓			✓
Land Surveyors			✓							
Scientists familiar with the hazards of the community	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Staff with education or expertise to assess the community's vulnerability to hazards	✓	✓	✓	✓	✓	✓	✓		✓	✓
Personnel skilled in GIS and/or Hazus	✓	✓	✓				✓			✓
Resource development staff or grant writers										

Credit for having a Floodplain Manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed Floodplain Administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing Hazard Mitigation Plan's Planning Committee.

7.3.6 Fiscal Capability

The ability of a local government to take action is often closely associated with the amount of money available to implement policies and projects. This may take the form of outside grant funding awards or locally-based revenue and financing. The costs associated with mitigation policy and project

implementation vary widely. In some cases, policies are tied primarily to staff time or administrative costs associated with the creation and monitoring of a given program. In other cases, direct expenses are linked to an actual project, such as the acquisition of flood-prone homes, which can require a substantial commitment from local, state, and federal funding sources.

The Capability Assessment Survey was used to capture information on the county's fiscal capability through the identification of locally available financial resources.

Table 7.5 provides a summary of the results for Randolph County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds).

TABLE 7.5: RELEVANT FISCAL RESOURCES

FISCAL TOOL/RESOURCE	RANDOLPH COUNTY	CITY OF ARCHDALE	CITY OF ASHEBORO	TOWN OF FRANKLINVILLE	TOWN OF LIBERTY	TOWN OF RAMSEUR	CITY OF RANDLEMAN	TOWN OF SEAGROVE	TOWN OF STALEY	CITY OF TRINITY
Capital Improvement Programming	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Community Development Block Grants (CDBG)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special Purpose Taxes (or taxing districts)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gas/Electric Utility Fees										
Water/Sewer Fees		✓	✓	✓	✓	✓	✓	✓		✓
Stormwater Utility Fees										✓
Development Impact Fees										
General Obligation, Revenue, and/or Special Tax Bonds										
Partnering Arrangements or Intergovernmental Agreements	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Other: HMGP, PDM, FMA, NFIP, buy out programs, Earthquake Hazard Reduction Grants, SBA, and other state programs and non-governmental sources, etc.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

7.3.7 Political Capability

One of the most difficult capabilities to evaluate involves the political will of a jurisdiction to enact meaningful policies and projects designed to reduce the impact of future hazard events. Hazard mitigation may not be a local priority or may conflict with or be seen as an impediment to other goals of the community, such as growth and economic development. Therefore, the local political climate must be considered in designing mitigation strategies as it could be the most difficult hurdle to overcome in accomplishing their adoption and implementation.

The Capability Assessment Survey was used to capture information on political capability of Randolph County. The previous *Hazard Mitigation Plan* was reviewed for general examples of local political capability, such as guiding development away from identified hazard areas, restricting public investments or capital improvements within hazard areas, or enforcing local development standards that go beyond minimum state or federal requirements (i.e., building codes, floodplain management, etc.).

- ❖ The previous *Multi-Jurisdiction Hazard Mitigation Plan* identified existing ordinances that address natural hazards or are related to hazard mitigation such as flood damage prevention, watershed protection, soil erosion and sediment control, stormwater management, zoning, and subdivision.
- ❖ Randolph County is currently a participant in the NFIP and has adopted the required Flood Damage Prevention Ordinance. The Unified Development Ordinance also includes stormwater management regulations, sedimentation and erosion control,⁴ stream buffer requirements,⁵ and watershed protection standards. This demonstrates to some extent both favorable political support and a willingness to adopt hazard mitigation efforts in an active manner.

7.4 CONCLUSIONS ON LOCAL CAPABILITY

In order to form meaningful conclusions on the assessment of local capability, a quantitative scoring methodology was designed and applied to results of the Capability Assessment Survey. This methodology, further described in Appendix B, attempts to assess the overall level of capability of Randolph County to implement hazard mitigation actions.

The overall capability to implement hazard mitigation actions varies among the participating jurisdictions. For planning and regulatory capability, the majority of the jurisdictions are in the moderate range. There is also some variation in the administrative and technical capability among the jurisdictions with larger jurisdictions generally having greater staff and technical resources. All of jurisdictions are in the limited to moderate range for fiscal capability.

Table 7.6 shows the results of the capability assessment using the designed scoring methodology. The capability score is based on the information found in the existing *Hazard Mitigation Plan* and readily

⁴ The City of Asheboro noted that the NC DEQ is the agency that reviews sedimentation/erosion control permits rather than the city.

⁵ The City of Asheboro noted that its stream buffer requirements are specific to Watershed and Flood Hazard Areas and are not citywide.

available on the jurisdictions' government websites. This information was reviewed by all jurisdictions and each jurisdiction provided feedback on the information included in the capability assessment. Local government input was vital to identifying capabilities. According to the assessment, the average local capability score for all jurisdictions is 29.7, which falls into the moderate capability ranking.

TABLE 7.6: CAPABILITY ASSESSMENT RESULTS

JURISDICTION	OVERALL CAPABILITY SCORE	OVERALL CAPABILITY RATING
RANDOLPH COUNTY	44	High
City of Archdale	34	Moderate
City of Asheboro	35	Moderate
Town of Franklinville	28	Moderate
Town of Liberty	27	Moderate
Town of Ramseur	27	Moderate
City of Randleman	34	Moderate
Town of Seagrove	16	Limited
Town of Staley	15	Limited
City of Trinity	37	Moderate

As previously discussed, one of the reasons for conducting a Capability Assessment is to examine local capabilities to detect any existing gaps or weaknesses within ongoing government activities that could hinder proposed mitigation activities and possibly exacerbate community hazard vulnerability. These gaps or weaknesses have been identified for each jurisdiction in the tables found throughout this section. The participating jurisdictions used the Capability Assessment as part of the basis for the Mitigation Actions that are identified in Section 9; therefore, each jurisdiction addresses their ability to expand on and improve their existing capabilities through the identification of their Mitigation Actions.

7.4.1 Linking the Capability Assessment with the Risk Assessment and the Mitigation Strategy

The conclusions of the Risk Assessment and Capability Assessment serve as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, the Hazard Mitigation Planning Team considered not only each jurisdiction's level of hazard risk, but also their existing capability to minimize or eliminate that risk.

SECTION 8

MITIGATION STRATEGY

This section of the *Plan* provides the blueprint for the participating jurisdictions in Randolph County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Randolph County Hazard Mitigation Planning Team and the findings and conclusions of the *Capability Assessment* and *Risk Assessment*. It consists of the following five subsections:

- ❖ 8.1 Introduction;
- ❖ 8.2 Mitigation Goals;
- ❖ 8.3 Identification and Analysis of Mitigation Techniques;
- ❖ 8.4 Selection of Mitigation Techniques for Randolph County ; and
- ❖ 8.5 Plan Update Requirement.

8.1 INTRODUCTION

The intent of the *Mitigation Strategy* is to provide Randolph County with the goals that will serve as guiding principles for future mitigation policy and project administration, along with an analysis of mitigation techniques available to meet those goals and reduce the impact of identified hazards. It is designed to be comprehensive, strategic, and functional in nature.

- ❖ In being *comprehensive*, the development of the strategy includes a thorough review of all hazards and identifies extensive mitigation measures intended to not only reduce the future impacts of high risk hazards, but also to help the region achieve compatible economic, environmental, and social goals.
- ❖ In being *strategic*, the development of the strategy ensures that all policies and projects proposed for implementation are consistent with pre-identified, long-term planning goals.
- ❖ In being *functional*, each proposed mitigation action is linked to established priorities and assigned to specific departments or individuals responsible for their implementation with target completion deadlines. When necessary, funding sources are identified that can be used to assist in project implementation.

The first step in designing the *Mitigation Strategy* includes the identification of mitigation goals. Mitigation goals represent broad statements that are achieved through the implementation of more specific mitigation actions. These actions include both hazard mitigation policies (such as the regulation of land in known hazard areas through a local ordinance) and hazard mitigation projects that seek to address specifically targeted hazard risks (such as the acquisition and relocation of a repetitive loss structure).

The second step involves the identification, consideration, and analysis of available mitigation measures to help achieve the identified mitigation goals. This is a long-term, continuous process sustained through the development and maintenance of this *Plan*. Alternative mitigation measures will continue to be

considered as future mitigation opportunities are identified, as data and technology improve, as mitigation funding becomes available, and as this Plan is maintained over time.

The third and last step in designing the *Mitigation Strategy* is the selection and prioritization of specific mitigation actions for Randolph County and its municipalities (provided separately in Section 9: *Mitigation Action Plan*). The County and each participating jurisdiction has its own *Mitigation Action Plan (MAP)* that reflects the needs and concerns of that jurisdiction. The *MAP* represents an unambiguous and functional plan for action and is considered to be the most essential outcome of the mitigation planning process.

The *MAP* includes a prioritized listing of proposed hazard mitigation actions (policies and projects) for Randolph County and its municipalities to complete. Each action has accompanying information, such as those departments or individuals assigned responsibility for implementation, potential funding sources, and an estimated target date for completion. The *MAP* provides those departments or individuals responsible for implementing mitigation actions with a clear roadmap that also serves as an important tool for monitoring success or progress over time. The cohesive collection of actions listed in the *MAP* can also serve as an easily understood menu of mitigation policies and projects for those local decision makers who want to quickly review the recommendations and proposed actions of the *Hazard Mitigation Plan*.

In preparing each *Mitigation Action Plan* for Randolph County, officials considered the overall hazard risk and capability to mitigate the effects of hazards as recorded through the *Risk and Capability Assessment* process in addition to meeting the adopted mitigation goals and unique needs of the community.

8.1.1 Mitigation Action Prioritization

Prioritization of the proposed mitigation actions was based on the following six factors:

- ❖ Effect on overall risk to life and property;
- ❖ Ease of implementation;
- ❖ Political and community support;
- ❖ A general economic cost/benefit review;¹
- ❖ Funding availability; and
- ❖ Continued compliance with the NFIP.

¹ Only a general economic cost/benefit review was considered by the Hazard Mitigation Planning Team through the process of selecting and prioritizing mitigation actions. Mitigation actions with “high” priority were determined to be the most cost effective and most compatible with the participating jurisdictions’ unique needs. Actions with a “moderate” priority were determined to be cost-effective and compatible with jurisdictional needs, but may be more challenging to complete administratively or fiscally than “high” priority actions. Actions with a “low” priority were determined to be important community needs, but the community likely identified several potential challenges in terms of implementation (e.g. lack of funding, technical obstacles). A more detailed cost/benefit analysis will be applied to particular projects prior to the application for or obligation of funding, as appropriate.

The point of contact for each jurisdiction helped coordinate the prioritization process by reviewing each action and working with the lead agency/department responsible to determine a priority for each action using the six factors listed above.

Using these criteria, actions were classified as high, moderate, or low priority by the participating jurisdiction officials.

8.2 MITIGATION GOALS

44 CFR Requirement

44 CFR Part 201.6(c)(3)(i): The mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

The primary goal of all local governments is to promote the public health, safety, and welfare of its citizens. In keeping with this standard, Randolph County and the participating municipalities have developed five goal statements for local hazard mitigation planning in the County. In developing these goals, the previous *Hazard Mitigation Plan* was reviewed to determine if the goals remained applicable. The existing goals were presented, reviewed, voted on, and accepted by the Hazard Mitigation Planning Team (all of the goals remain unchanged). Each goal, purposefully broad in nature, serves to establish parameters that were used in developing mitigation actions. The Randolph County Mitigation Goals are presented in **Table 8.1**. Consistent implementation of actions over time will ensure that community goals are achieved.

TABLE 8.1: RANDOLPH COUNTY MITIGATION GOALS

	GOAL
Goal #1	Enhance local government capability to lessen the impacts of all natural hazards.
Goal #2	Identify and protect critical services, buildings, facilities, and infrastructure that are at risk of damage due to natural hazards and to undertake cost-effective mitigation measures to minimize loss.
Goal #3	Develop an effective public awareness/education/outreach program for natural hazards the County and municipalities are most likely to experience.
Goal #4	Protect persons and property as well as reduce damage and loss to existing community assets.
Goal #5	Ensure disaster resistant future development.

8.3 IDENTIFICATION AND ANALYSIS OF MITIGATION TECHNIQUES

44 CFR Requirement

44 CFR Part 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 effect of each hazard, with particular emphasis on new and existing buildings and infrastructure.

In formulating the *Mitigation Strategy* for Randolph County, a wide range of activities were considered in order to help achieve the established mitigation goals in addition to addressing any specific hazard concerns. These activities were discussed during the Randolph County Hazard Mitigation Planning Team meetings. In general, all activities considered by the Hazard Mitigation Planning Team can be classified under one of the following six broad categories of mitigation techniques: Prevention, Property Protection, Natural Resource Protection, Structural Projects, Emergency Services, and Public Awareness and Education. These are discussed in detail below.

8.3.1 Prevention

Preventative activities are intended to keep hazard problems from getting worse and are typically administered through government programs or regulatory actions that influence the way land is developed and buildings are built. They are particularly effective in reducing a community's future vulnerability, especially in areas where development has not occurred or capital improvements have not been substantial. Examples of preventative activities include:

- ❖ Planning and zoning;
- ❖ Building codes;
- ❖ Open space preservation;
- ❖ Floodplain regulations;
- ❖ Stormwater management regulations;
- ❖ Drainage system maintenance;
- ❖ Capital improvements programming; and
- ❖ Riverine/fault zone setbacks.

8.3.2 Property Protection

Property protection measures involve the modification of existing buildings and structures to help them better withstand the forces of a hazard or removal of the structures from hazardous locations. Examples include:

- ❖ Acquisition;
- ❖ Relocation;
- ❖ Building elevation;
- ❖ Critical facilities protection;
- ❖ Retrofitting (e.g., windproofing, floodproofing, seismic design techniques, etc.);
- ❖ Safe rooms, shutters, shatter-resistant glass; and
- ❖ Insurance.

8.3.3 Natural Resource Protection

Natural resource protection activities reduce the impact of natural hazards by preserving or restoring natural areas and their protective functions. Such areas include floodplains, wetlands, steep slopes, and

sand dunes. Parks, recreation, or conservation agencies and organizations often implement these protective measures. Examples include:

- ❖ Floodplain protection;
- ❖ Watershed management;
- ❖ Riparian buffers;
- ❖ Forest and vegetation management (e.g., fire resistant landscaping, fuel breaks, etc.);
- ❖ Erosion and sediment control;
- ❖ Wetland preservation and restoration;
- ❖ Habitat preservation; and
- ❖ Slope stabilization.

8.3.4 Structural Projects

Structural mitigation projects are intended to lessen the impact of a hazard by modifying the environmental natural progression of the hazard event through construction. They are usually designed by engineers and managed or maintained by public works staff. Examples include:

- ❖ Reservoirs;
- ❖ Dams/levees/dikes/floodwalls;
- ❖ Diversions/detention/retention;
- ❖ Channel modification; and
- ❖ Storm sewers.

8.3.5 Emergency Services

Although not typically considered a “mitigation” technique, emergency service measures do minimize the impact of a hazard event on people and property. These commonly are actions taken immediately prior to, during, or in response to a hazard event. Examples include:

- ❖ Warning systems;
- ❖ Evacuation planning and management;
- ❖ Emergency response training and exercises;
- ❖ Sandbagging for flood protection; and
- ❖ Installing temporary shutters for wind protection.

8.3.6 Public Education and Awareness

Public education and awareness activities are used to advise residents, elected officials, business owners, potential property buyers, and visitors about hazards, hazardous areas, and mitigation techniques they can use to protect themselves and their property. Examples of measures to educate and inform the public include:

- ❖ Outreach projects;
- ❖ Speaker series/demonstration events;
- ❖ Hazard map information;
- ❖ Real estate disclosure;
- ❖ Library materials;
- ❖ School children educational programs; and
- ❖ Hazard expositions.

8.4 SELECTION OF MITIGATION TECHNIQUES FOR RANDOLPH COUNTY

In order to determine the most appropriate mitigation techniques for the communities in Randolph County, the Hazard Mitigation Planning Team thoroughly reviewed and considered the findings of the *Capability Assessment* and *Risk Assessment* to determine the best activities for their respective communities. Other considerations included the effect of each mitigation action on overall risk to life and property, its ease of implementation, its degree of political and community support, its general cost-effectiveness, and funding availability (if necessary).

8.5 PLAN UPDATE REQUIREMENT

In keeping with FEMA requirements for plan updates, the Mitigation Actions identified in the previous plans were evaluated to determine their 2016 implementation status. Updates on the implementation status of each action are provided. The mitigation actions provided in Section 9: *Mitigation Action Plan* include the mitigation actions from the previous plans as well as any new mitigation actions proposed through the 2016 planning process.

SECTION 9

MITIGATION ACTION PLAN

This section includes the listing of the mitigation actions proposed by the participating jurisdictions in Randolph County. It consists of the following two subsections:

- ❖ 9.1 Overview; and
- ❖ 9.2 Mitigation Action Plans.

44 CFR Requirement

44 CFR Part 201.6(c)(3)(iii): The mitigation strategy shall include an action plan describing how the actions identified in paragraph (c)(2)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction.

9.1 OVERVIEW

As described in the previous section, the *Mitigation Action Plan*, or *MAP*, provides a functional plan of action for each jurisdiction. It is designed to achieve the mitigation goals established in Section 8: *Mitigation Strategy* and will be maintained on a regular basis according to the plan maintenance procedures established in Section 10: *Plan Maintenance*.

Each proposed mitigation action has been identified as an effective measure (policy or project) to reduce hazard risk for Randolph County. Each action is listed in the *MAP* in conjunction with background information such as hazard(s) addressed and relative priority. Other information provided in the *MAP* includes potential funding sources to implement the action should funding be required (not all proposed actions are contingent upon funding). Most importantly, implementation mechanisms are provided for each action, including the designation of a lead agency or department responsible for carrying the action out as well as a timeframe for its completion. These implementation mechanisms ensure that the *Randolph County Multi-Jurisdictional Hazard Mitigation Plan* remains a functional document that can be monitored for progress over time. The proposed actions are not listed in priority order, though each has been assigned a priority level of “high,” “moderate,” or “low” as described below and in Section 8 (page 8.2).

The *Mitigation Action Plan* is organized by mitigation strategy category (Prevention, Property Protection, Natural Resource Protection, Structural Projects, Emergency Services, or Public Education and Awareness). The following are the key elements described in the *Mitigation Action Plan*.

- ❖ Hazard(s) Addressed—Hazard which the action addresses.
- ❖ Relative Priority—High, moderate, or low priority as assigned by the jurisdiction.
- ❖ Lead Agency/Department—Department responsible for undertaking the action.
- ❖ Potential Funding Sources—Local, State, or Federal sources of funds are noted here, where applicable.
- ❖ Implementation Schedule—Date by which the action the action should be completed. More information is provided when possible.

- ❖ Implementation Status (2016)—Indication of completion, progress, deferment, or no change since the previous plan. If the action is new, that will be noted here.

9.2 MITIGATION ACTION PLANS

The mitigation actions proposed by each of the participating jurisdictions are listed in 10 individual *MAPs* on the following pages. **Table 9.1** shows the location of each jurisdiction’s *MAP* within this section as well as the number of mitigation actions proposed by each jurisdiction.

TABLE 9.1: INDIVIDUAL *MAP* LOCATIONS

LOCATION	PAGE	NUMBER OF MITIGATION ACTIONS
Randolph County	9:3	17
City of Archdale	9:9	19
City of Asheboro	9:14	18
Town of Franklinville	9:21	13
Town of Liberty	9:24	9
Town of Ramseur	9:29	13
City of Randleman	9:32	18
Town of Seagrove	9:36	10
Town of Staley	9:39	10
City of Trinity	9:42	17

Randolph County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Prevention							
P-1	Planning and EM will coordinate the collection and storage of damage assessment information such as type of hazard, location of hazard occurrence, when it occurred, death or injury, property damages, in digitized form, and in one central location for easy retrieval. Information Planning Specialist is responsible for collection and maintenance of database.	All	High	Randolph County Planning Department/ Information Specialist and Emergency Management	Local	2021	Up-to-date. Randolph County EM and Planning collect these events as they occur and will continue to carry out this practice going forward, looking at ways to improve the damage assessment and information collection process in the coming years.
P-2	Identify and map mobile home parks by GIS and information specialist at the county level.	All	Low	Randolph County Planning	Local	Complete	Randolph County Planning & Zoning has this information on file.
P-3	Identify potential inundation areas downstream of high hazard dams.	Dam and Levee Failure	Moderate	Randolph County Planning and Emergency Management	Local	2016-2017	All owners of high and medium hazard dams were required to submit Emergency Action Plans with inundation maps to NC Dam Safety effective March 2015. Randolph County is currently awaiting the approval process at the State level and will be given this data as each EAP is approved.
P-4	Look into funding for and developing program to clear debris from culverts and storm drains in priority floodplains.	Flood	Low	Randolph County Public Works	Local, plus other funding to be identified	Delete	Randolph County does not have personnel or equipment for this task. NCDOT performs this action as needed, however currently it is not prioritized by floodplain.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
P-5	Adopt countywide policy as part of the Unified Development Ordinance: wherever possible preserve natural wetlands, designate conservation corridors, especially along streams through acquisition or conservation easements.	All	High	Randolph County Planning	Local	Complete	Ordinance adopted.
P-6	Looking into safe growth management strategies for development downstream of dams. Will incorporate into overall Countywide Growth Management Plan.	All	High	Randolph County Planning	Local	Delete	This could be a strategy looked into in the future as EAP are received from Dam Safety, but currently the action will be deleted from the plan.
Property Protection							
PP-1	For any interested homeowners located in floodplain areas, the county will consider applying for mitigation grant funding to acquire or elevate the homes on a strictly voluntary basis for the homeowner.	Flood	Moderate	Randolph County Emergency Management	FEMA, NCEM	2021	New Action
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Develop a plan for alternate communications in the event of loss of 9-1-1 communication system.	All	Moderate	Randolph County Emergency Management	County	2017	New facility currently under construction, scheduled to be completed in 2017.
ES-2	Investigate establishing a mobile command center in the event of loss of the 9-1-1 Center.	All	Moderate	Randolph County Emergency Management	County	Delete	Mobile command center is operational for scene support, but currently we do not have funding to incorporate active 911 operations.
ES-3	Review and revise location of emergency shelters throughout county and municipalities.	All	Moderate	Randolph County Emergency Management	Local	2016	Shelter Annex of Emergency Operations Plan is being developed, to include pet sheltering, in areas where greatest need is anticipated.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
ES-4	Identify and designate at least one emergency shelter in each municipality.	All	Moderate	Randolph County Emergency Management	Local	Delete	Combine with ES-3. Shelter needs are not present in every municipality and logistically not possible.
ES-5	Work with Dam Safety Officials to have emergency plans for high hazard dams filed with the local government.	Dam and Levee Failure	Low	Randolph County Emergency Management, State Dam Safety Office in Winston-Salem	Local	Delete	Covered in P-3
ES-6	Put in place a countywide 9-1-1 reverse call system for location specific warning to public of impending disaster. Will be implemented as part of Emergency Management ongoing program to improve efficiency and effectiveness of department.	All	High	Randolph County Emergency Management	Homeland Security funds	2016	Although the last update of the plan indicated that the county had a reverse 911 system, this is no longer the case and the county is currently seeking a hosted mass notification system for countywide notification.
Public Education and Awareness							
PEA-1	Educate and inform local government and elected officials (decision makers) of the need to consider hazard mitigation in policy and budgetary planning and decision-making processes. Outreach and education is part of job descriptions for Planning and Emergency Management personnel. Staff will incorporate hazard mitigation education into existing programs. Education and outreach goals are written into the Emergency Management Department goals submitted to the State annually.	All	High	Randolph County Emergency Management	Local	2021	Topic is discussed when possible, including public lectures, classroom speaking, etc. Just launched www.ReadyRandolph.org for public outreach. Planning/EM staff would like to retain this action in the plan as they continue to work on improving strategies for informing elected officials of hazard risks.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
PEA-2	Design a seasonal public information/education program targeted to mobile home/manufactured home residents through Central Permit process. Explaining hazards such as high wind events, flooding, and alternative shelters in a storm/high wind/flood. Will distribute information through existing Central Permit process with standard permitting information.	Flood, Severe Thunderstorm, High Wind	High	Randolph County Planning and Emergency Management	Local	2016	Pamphlets are being designed to hand out in Central Permitting, and ongoing public outreach at www.ReadyRandolph.org and social media platforms.
PEA-3	Disseminate information on the benefits of purchasing flood insurance to property owners in flood hazard areas (targeting Caraway Creek floodplain, Uwharrie River, and Little Uwharrie River floodplains). (yearly)	Flood	Moderate	Randolph County Emergency Management	Local	2017	Although some information has been distributed to these areas, the county would like to continue to improve outreach. Mailers to be disseminated as funding allows.
PEA-4	Hold yearly "Flood Hazard Awareness Week" countywide—new program added to existing emergency management outreach education program.	Flood	Moderate	Randolph County Planning and Emergency Management	Local	Delete	Incorporate into PEA-2
Previously Completed Actions							
	EOP originally developed in 1994. Update Emergency Operations Plan.	All	High	Randolph County Emergency Management	NCEM		Completed. The EOP is no longer required to be updated. (Strategy 1B in previous plan)
	Develop recommendation for protecting command centers. Identify alternate command posts.	All	Moderate	Randolph County Emergency Management	Need not anticipated		Completed. These steps were completed as a result of the attacks of September 11, 2001. The alternate command post was identified during the original data collection for the 2004 plan. (Strategy 1C in previous plan)

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
	Procure generators and fuel for alternative sources of power for County School System (1) – at least preferably fixed and waste water treatment plants (4).	Winter Storm, High Wind	Moderate	Randolph County School Finance Director for Facilities & Construction, Randolph County Public Works	County (regular annual budget process)		Completed. There have been 9 generators purchased and installed. (Strategy 2A in previous plan). Local DPR region has purchased 11 mobile generators to help further support this task.
	Obtain and install transfer switches.	Winter Storm, High Wind	Low	Randolph County Emergency Management	Homeland Security grants available		Completed. Three transfer switches have been purchased and installed. (Strategy 2B in previous plan) Local DPR region has purchased transfer switches to help further support this task.
	Consider sign ordinances limiting height or size of signs in certain corridors.	High Wind	Low	Randolph County Planning	Local		Completed. The County Planning Department has had such regulations in place since the zoning ordinance was originally adopted in July, 1987. (Strategy 4A in previous plan)
	Through existing subdivision regulations, encourage that power, cable, and telephone lines be buried.	High Wind, Winter Storm	Moderate	Randolph County Planning	Local		Completed. As part of the development review process, the County Planning Department ensures that the surveyor and developer places an easement on the plat for utilities to be placed underground for any new development. (Strategy 5A in previous plan)

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
	Strengthen floodplain regulation to current standards. (New model regulation.)	Flood	High	Randolph County Planning	Local		Completed. As part of the DFIRM update process, the county was required to update the Flood Damage Prevention Ordinance. This ordinance, based upon the new State Model Regulations, was adopted by the Board of County Commissioners on December 7, 2007. (Strategy 5B in previous plan)
	Create a GIS overlay of abandoned mine locations. When a mine is identified on a plat under review for development, the location of the mine is noted and the mine is investigated to determine the extent of underground workings before the land is developed.	Land Subsidence, Sinkhole	Moderate	Randolph County Planning	n/a		Completed. This data was supplied to the county by the North Carolina Geological Survey. (Strategy 5E in previous plan)

City of Archdale Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Prevention							
P-1	Maintain stormwater management program as part of required Phase II.	Flood	High	Archdale Planning and Stormwater Management	Local	2021	The city has a stormwater management program in place, but it is still working on ways to improve this program so it will retain this action in the plan going forward.
P-2	Maintain emergency water supply through existing local water supply planning process. (Davidson Water and City of High Point).	Drought, Wildfire	High	Archdale City Manager	Local	Complete	The city has agreements in place to maintain emergency water supply through Davidson Water and High Point.
P-3	Maintain comprehensive policy regarding drought management and response as part of existing local water supply planning process.	Drought	High	Archdale Public Works and City Manager	Local	Complete	The city currently has a drought management and response plan in place to maintain local water supply in the event of a drought.
P-4	Define and identify all “critical facilities” if any.	All	Moderate	Archdale Planning and Stormwater Management	Local	Complete	Through the update of this plan, the city has been able to identify all critical facilities.
P-5	Fully assess the vulnerability of each identified critical facility to natural hazards.	All	Moderate	Archdale Planning and Stormwater Management	Local	2018	Although an overall assessment of critical facilities was performed through the planning process, a full assessment of each facility’s vulnerabilities needs to be performed by the city.
P-6	Maintain maps of mobile home parks as part of ongoing planning activities.	All	Low	Archdale Planning and Stormwater Management	Local	Complete	The city and county maintain mapping of the location of all mobile home parks.
P-7	Maintain program for clearing debris from culverts and storm drains in priority areas as part of NPDES Phase II stormwater control standards.	Flood	High	Archdale Planning and Stormwater Management	Local	2021	The city has a program in place for clearing debris from culverts and storm drains, but it is still working on ways to improve this program so it will retain this action in the plan going forward.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
P-8	Identify sites for temporary storage of debris.	Flood	High	Archdale Public Works and Stormwater Management	Local	Complete	The city has previously identified several sites for debris storage and recently added a new site during the ice storm of 2015 that can be reactivated when needed.
P-9	Maintain current floodplain regulation standards.	Flood	High	Archdale Planning and Stormwater Management	Local	2021	The city currently maintains floodplain regulation standards but will need to update its ordinance as changes become necessary or required at the state level.
P-10	In land use plans and development plans: wherever possible preserve natural wetlands, designate conservation corridors, and protect streams by requiring buffering standards or through acquisition of conservation easements. (Stormwater and Watershed Ordinance provide effective standards for continuing maintenance.)	All	High	Archdale Planning and Stormwater Management	Local	2021	Land use and development plans currently preserve natural wetlands and conservation corridors but these plans will be updated again and will need to be updated to continue encouraging the preservation of these natural areas.
Property Protection							
PP-1	For any interested homeowners located in floodplain areas, the county will consider applying for mitigation grant funding to acquire or elevate the homes on a strictly voluntary basis for the homeowner.	Flood	Moderate	Randolph County Emergency Management, City of Archdale	FEMA, NCEM	2021	New Action
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Emergency Services							
ES-1	Identify additional emergency shelter in Archdale.	All	High	Archdale Planning and Stormwater Management	Local	Complete	The city has an emergency shelter identified and, as per the county, it is unlikely that additional shelters will be identified due to logistical restrictions of supporting additional shelters.
ES-2	Create a mobilization plan for response to an emergency.	All	High	All Archdale Departments	Local	Complete	The city has created a mobilization plan that can be implemented during response to an emergency.
ES-3	Establish predefined street detour plans and disbursement of MUTCD (Manual on Uniform Traffic Control Devices) measures in response to an emergency.	All	High	Archdale Public Works	Local	Complete	The city has established street detours and coordinated information to all necessary departments on how this will be implemented during an emergency.
ES-4	Put in place a countywide 9-1-1 reverse call system for location specific warning to public of impending disaster. Will be implemented as part of Emergency Management ongoing program to improve efficiency and effectiveness of department.	All	High	Randolph County Emergency Management	Homeland Security funds	2016	Although the last update of the plan indicated that the county had a reverse 911 system, this is no longer the case and the county is currently seeking a hosted mass notification system for countywide notification.
Public Education and Awareness							
PEA-1	Design a seasonal public information/education program targeted to mobile home/manufactured home residents through Central Permit Process explaining hazards such as high wind events, flooding, and alternative shelters in a storm/high wind event/flood. Pamphlets to be inserted in regular mailings to residents.	Flood, Severe Thunderstorm, High Wind	High	Randolph County Planning (covers Archdale)	Local	2021	Historically, pamphlets have been distributed to mobile home owners in the city, but as there is a high turnover and new techniques are identified for mitigating, this program will need to be updated and re-evaluated. Therefore, this action will remain in the plan.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
PEA-2	Disseminate information on the benefits of purchasing flood insurance.	Flood	High	Archdale Planning and Stormwater Management	Local	2021	The city has disseminated information on the benefits of flood insurance, but as maps are updated and new information becomes available, this distribution of information will need to be continued.
PEA-3	Educate and inform citizens (children and adults) of environmental issues at the Archdale Library through education seminars done on a six week basis.	All	High	Archdale Planning and Stormwater Management	Local	2021	Although citizen information programs have been put on in the past, the city would like to continue to enhance these programs and continue to improve the information distributed during these seminars.
PEA-4	Provide flood insurance awareness through existing stormwater outreach program and permitting process.	Flood	High	Archdale Planning and Stormwater Management	Local	2021	The stormwater management process in place does a good job of making citizens aware of flood insurance requirements, but as new information on flood insurance is available, this will need to be integrated into the process.
Previously Completed Actions							
	Develop stormwater management program as part of required NPDES Phase II.	Flood	High	Archdale Planning Department	Local		Completed. (Strategy 1A in previous plan)
	Identify emergency water supply through existing local water supply planning process.	All	High	Archdale City Manager	Local		Completed. (Strategy 1B in previous plan)
	Develop a comprehensive policy regarding drought management and response as part of existing local water supply planning process.	Drought	High	Archdale Public Works and Manager	Local		Completed. (Strategy 1C in previous plan)

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
	Educate and inform local government and elected officials (decision makers) of the need to consider hazard mitigation in policy and budgetary planning and decision making processes.	All	High	Archdale Planning, Emergency Management, and Public Works	Local		Completed. (Strategy 3A in previous plan)
	Through existing subdivision regulations encourage that power, cable, and telephone lines be buried.	All	Moderate	Archdale Planning	Local		Completed. The city has amended the Land Management Plan and as a part of the Land Management Plan the requirement for utilities to be buried was incorporated. (Strategy 5A in previous plan)

City of Asheboro Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Prevention							
P-1	Build in house GIS capability.	All	High	Asheboro Planning	Local	Completed	The city has built an in-house GIS capability including hiring GIS staff. This action is complete.
P-2	*Changed language* Evaluate the need for measures supplementing NC DEQ requirements regarding storm water control (retention/detention ponds or other storm water measure) on a case-by-case basis for uses that are environmentally sensitive and require a Conditional or Special Use Permit. Review storm water issues and best management practices in consultation with NC DEQ.	Flood	Moderate	Asheboro Planning/NC Department of Environmental Quality	Local	2021	The City of Asheboro is outside the boundaries of the area subject to Phase II storm water requirements. Unless a supplemental condition of a Conditional/Special Use Permit requires a storm water study, reviews concerning water quality and water quantity are under the jurisdiction of NC DEQ. The city will work to continue to evaluate and implement stormwater BMPs in consultation with DEQ.
P-3	Identify and map mobile home parks.	All	Low	Asheboro Planning	Local	2021	This capability exists as needed. Currently the city has identified mobile home parks and can be assembled when required.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
P-4	Look into funding for and developing program to clear debris from culverts and storm drains in priority floodplains.	Flood	Moderate	Asheboro Water Resources and Public Works	Local, plus other funding to be identified	2021	Public Works: Locations, especially those with known problems, are checked before and after major rain/weather events and cleared as necessary. Water Resources: Grant funding to help address storm water issues along Penwood Branch and Hasketts Creek was sought in 2011, however, this funding was not granted. Future funding may be explored if available.
P-5	Existing zoning ordinance to be modified to require ice damage resistant trees along buffers and screens.	Winter Storm	High	Asheboro Planning	Local	2021	The zoning ordinance is periodically updated so that weather damage resistant trees can be selected. Most recently, provisions allowing street trees (located within the public right-of-way) in Planned Unit Developments were adopted. These provisions were careful to select tree species resistant to damage from adverse weather.
P-6	Through existing subdivision regulations, encourage that power, cable, and telephone lines be buried.	All	Moderate	Asheboro Planning	Local	Completed	Unless there is an unusual technical reason why utilities cannot be underground, the Subdivision Ordinance generally requires they be located underground.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
P-7	Strengthen floodplain regulation to current standards. (New model regulation.)	Flood	High	Asheboro Planning	Local	Completed	In 2008, the City's Flood Damage Prevention Ordinance (within Zoning Ordinance) was amended to model language in consultation with NC Department of Crime Control and Public Safety (now Dept. of Public Safety) and as required by FEMA. The City is a participant in the FIRM flood insurance program, which reduces flood insurance premiums for homeowners' living within flood hazard areas.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
P-8	In land use plans and development plans, adopt as city policy): wherever possible preserve natural wetlands, designate conservation corridors, especially along streams through acquisition or conservation easements.	All	High	Asheboro Planning	Local	2021	Through the city's development review process, developers are encouraged to preserve environmentally sensitive areas, such as flood plains. An example in practice are Planned Unit Development provisions, allowing development at a net density equal to a conventional subdivision with more flexible setbacks and minimum lot sizes, reducing the overall footprint of development. This encourages development outside of critical environmental areas. Also, since the 2011 Hazard Mitigation Plan, provisions in the Center City Planning Area have been adopted to allow greater flexibility for arrangement of buildings and other site features, while mandating minimum percentage of pervious surfaces. Future measures to improve land use planning will need to be integrated into planning documents as updates to those documents are implemented.
P-9	Develop a program to clear debris from culverts and storm drains in priority floodplains.	Flood	High	Asheboro Public Works	Local	Completed/Combine with P-4	Combine with P-4. Locations, especially those with known problems, are checked before and after major rain/weather events and cleared as necessary

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Property Protection							
PP-1	Consult with Asheboro Housing Authority to consider buyout and relocation for public housing in floodplains.	Flood	Low	Asheboro City Manager/Planning	Federal funding	2021	This action has not been completed. Will be implemented if required and when/if funds are available. Note: There are only two dwelling units that are partially within the floodplain (431/433 Dunlap St.). Neither have history of flooding.
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Develop municipal Emergency Operations Plan.	All	High	Asheboro City Manager	Local	Completed	An EOP has been developed by the City of Asheboro and is in place. This action is complete.
ES-2	*Changed language* Procure generators and fuel for alternative source of power for: <ul style="list-style-type: none"> ● Water plant ● Water pump 	All	Moderate	Public Works/Water Resources/Finance	Local	2020	This is currently underway for water plant and water pump. Completion is anticipated for water plant and water pump by 2020.
ES-3	Identify and designate at least one emergency shelter in each municipality.	All	Low	Asheboro City Manager, Randolph County Emergency Management	Local	Completed	First Baptist Church, located at 133 North Church Street is currently designated as an emergency shelter.
ES-4	Put in place a countywide 9-1-1 reverse call system for location specific warning to public of impending disaster.	All	Moderate	Randolph County Emergency Management	Homeland Security funds	2016	Randolph County Emergency Services is currently seeking funding for this item.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
ES-5	<u>*Changed language* Ensure residents within flood prone areas are aware of emergency procedures that are in place to ensure their safety.</u>	Flood	Moderate	Asheboro City Manager/Planning	Local	2021	Provision of emergency contact information is provided by Housing Authority to all residents, regardless of location. Due to the limited number of dwellings (2) that are partially located within flood hazard areas, information can be communicated in a simple manner (to existing and future residents) that makes them aware of emergency procedures and contacts. As new information is developed and the city works towards mitigating the risk, the city will continue to improve communication with residents.
Public Education and Awareness							
PEA-1	Educate and inform local government and elected officials (decision makers) of the need to consider hazard mitigation in policy and budgetary planning and decision making processes, through ongoing hazard mitigation planning five year cycle.	All	High	Asheboro City Manager/Planning with assistance from PTCOG	Local	2016	This is completed as needed. On July 14, 2011, the City Council adopted a resolution adopting and in support of the Randolph County Hazard Mitigation Plan. City staff will continue to work towards informing elected officials of the need for mitigation and funding towards that end.
PEA-2	Disseminate information on the benefits of purchasing flood insurance.	Flood	High	Asheboro Planning	Local	2021	This is completed in conjunction with discouraging development in flood hazard areas. The city will continue to encourage the purchase of flood insurance to at-risk residents.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
PEA-3 (New)	Keep the public updated through various media channels (website, newspaper, Public Access Channel 8, Facebook, Twitter, etc.) concerning road and other conditions during times of adverse weather (i.e. snow, freezing rain, etc.).	All	High	Asheboro Planning/Public Information Officer	Local	2021	New Action

Town of Franklinville Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Prevention							
P-1	Develop procedure for recording damage assessment information such as type of hazard, location of hazard occurrence, when it occurred, death or injury, property damaged, narrative description of damage, not just dollar amount, for local use in hazard mitigation and land use planning.	All	High	Randolph County Planning and Emergency Management	Local	2021	Up-to-date. Randolph County EM and Planning collect these events as they occur and will continue to carry out this practice going forward, looking at ways to improve the damage assessment and information collection process in the coming years.
P-2	Work with Ramseur in regular water supply planning process, develop emergency water supply capability.	All	High	Franklinville Town Clerk and Town Council	Local	2017	The town is currently in talks with Ramseur to develop agreements on emergency water supply and planning.
P-3	Strengthen mobile home/manufactured home anchoring requirements.	All	Moderate	Franklinville Town Clerk	Local	2017	The town is working to develop requirements that strengthen the anchoring requirements for mobile homes.
P-4	Store important documents and materials on upper floors of Town Hall.	Flood	High	Franklinville Town Clerk	Local	Delete	The town currently does not plan to implement this action due to challenges with implementation.
P-5	Develop program to clear debris from culverts and storm drains in priority floodplains.	Flood	High	Franklinville Public Works	Local	2018	The town is developing a program to clear debris from culverts and storm drains in priority floodplains and will hope to complete the plan fairly soon.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
P-6	Through existing subdivision regulations, encourage that power, cable, and telephone lines be buried.	All	Moderate	Franklinville Planning	Local	2021	Per availability. The town encourages the burial of power, cable and telephone lines when that option is available to subdivisions. The town will attempt to promote this further and improve implementation in future development.
P-7	Include in land use and development plans as town policy: wherever possible preserve natural wetlands, designate conservation corridors, especially along streams through acquisition or conservation easements.	All	High	Franklinville Planning	Local	Complete	The town includes natural preservation policies in its current land use and development plans.
P-8	Include in land use and development plans: will encourage street interconnectivity in all new subdivisions to allow multiple exit points.	All	High	Franklinville Planning	Local	2021	Although this has been implemented in some cases, the town will push to implement this action in more cases going forward when possible.
Property Protection							
PP-1	For any interested homeowners located in floodplain areas, the county will consider applying for mitigation grant funding to acquire or elevate the homes on a strictly voluntary basis for the homeowner.	Flood	Moderate	Randolph County Emergency Management, Town of Franklinville	FEMA, NCEM	2021	New Action
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Evaluate generators and fuel for alternative sources of power.	All	Moderate	Franklinville Public Works and Emergency Services	Local	Complete	The Public Works Director consistently evaluates generators and alternative power sources.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
ES-2	Identify and designate at least one emergency shelter in town.	All	Moderate	Franklinville Town Clerk with assistance from PTCOG/County Emergency Management	Local	2017	Currently the Franklinville Fire Department has been designated as a shelter by prior adoption. However, current shelter is not adequate so the town will evaluate other options.
ES-3	Put in place a countywide 9-1-1 reverse call system for location specific warning to public of impending disaster. Will be implemented as part of Emergency Management ongoing program to improve efficiency and effectiveness of department.	All	High	Randolph County Emergency Management	Homeland Security funds	2016	Although the last update of the plan indicated that the county had a reverse 911 system, this is no longer the case and the county is currently seeking a hosted mass notification system for countywide notification.
Public Education and Awareness							
PEA-1	Educate and inform local government and elected officials (decision makers) of the need to consider hazard mitigation in policy and budgetary planning and decision making processes.	All	High	Franklinville Town Clerk	Local	Complete	Town staff have developed a program to educate and inform local elected officials of need to include mitigation in future budgeting.
Previously Completed Actions							
	Update flood prevention ordinance.	Flood	High	Franklinville Town Clerk	Local		Completed. Prior to the implementation of the new DFIRM on January 1, 2008, the town was required to update its flood prevention ordinance in order to get in good standing with FEMA and the Flood Insurance Rate programs. (Strategy 1A in previous plan)
	Purchase flood insurance for Franklinville Town Hall.	Flood	High	Franklinville Town Clerk	Local		Completed. The town has purchased flood insurance for the Town Hall. (Strategy 2C in previous plan)

Town of Liberty Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Prevention							
P-1	Employ a planner.	All	High	Liberty Town Manager	Local	2017-2018	The town is currently in the process of trying to hire a planner to help implement many of the mitigation actions in this plan.
P-2	Create planning department.	All	High	Liberty Town Manager	Local	2017-2018	The town is currently in the process of trying to hire a planner and start a planning department to help implement many of the mitigation actions in this plan.
P-3	Develop procedure for recording damage assessment information such as type of hazard, location of hazard occurrence, when it occurred, death or injury, property damaged, narrative description of damage, not just dollar value, for local use in hazard mitigation and land use planning.	All	Moderate	Randolph County Planning and Emergency Management	Local	2018-2019	This is in the process to some degree, but will become the responsibility of the planning department when this department is created, so a more intricate system will be developed once that occurs.
P-4	Develop emergency water supply capability as part of local water supply planning process.	All	High	Liberty Town Manager	Local	2016-2017	This action is currently in progress as the town has secured a grant to add 3 wells to the town's infrastructure. The actual implementation of this action is still pending.
P-5	Consider Urban Forestry Services development.	Winter Storm, High Wind	Low	Liberty Town Manager	Urban and Community Forestry Grant Program	2018-2019	Some action has taken place, but the town will work with county forest service to complete implementation.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Property Protection							
PP-1	For any interested homeowners located in floodplain areas, the county will consider applying for mitigation grant funding to acquire or elevate the homes on a strictly voluntary basis for the homeowner.	Flood	Moderate	Randolph County Emergency Management, Town of Liberty	FEMA, NCEM	2021	New Action
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Contract a public safety officer	All	High	Liberty Town Manager/EM	Local	2016-2017	The town has identified a public safety officer as this is necessary to assure awareness for employee safety. However, there are many improvements that the town needs to implement to ensure goals of position are met.
ES-2	Put in place a countywide 9-1-1 reverse call system for location specific warning to public of impending disaster. Will be implemented as part of Emergency Management ongoing program to improve efficiency and effectiveness of department.	All	High	Randolph County Emergency Management	Homeland Security funds	2016	Although the last update of the plan indicated that the county had a reverse 911 system, this is no longer the case and the county is currently seeking a hosted mass notification system for countywide notification.
Public Education and Awareness							
PEA-1	Educate and information local government and elected officials (decision makers) of the need to consider hazard mitigation policy in budgetary planning and decision making processes.	All	Moderate	Liberty Town Manager with assistance from PTRC	Local	2016-2017	This action is currently in the process of being developed as all town departments are preparing CIPs

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Previously Completed Actions							
	Adopt flood prevention ordinance	Flood	High	Liberty Town Manager	Local		Completed. The town has completed this by adoption by the Town Council. (Strategy 1C in previous plan)
	Update existing Emergency Operations Plan.	All	Moderate	Liberty Town Manager	Local		Completed. The town has completed this by adoption by the Town Council. (Strategy 1D in previous plan)
	Review and amend existing capital improvement plan to ensure capital improvements support mitigating activities and are not counter to hazard mitigation.	All	Low	Liberty Town Manager	Local		Completed. The town has completed this by adoption by the Town Council. (Strategy 1E in previous plan)
	Become National Flood Insurance Program member.	Flood	High	Liberty Town Manager	Local		Completed. The town has completed this by adoption by the Town Council. (Strategy 1F in previous plan)
	Develop and adopt a drought management/water shortage (conservation) ordinance as part of local water supply planning process.	Drought, Wildfire	High	Liberty Town Manager	Local		Completed. The town has completed this by adoption by the Town Council. (Strategy 1I in previous plan)
	Evaluate generators and fuel for alternative sources of power for critical facilities.	All	High	Liberty Town Manager/Finance Officer	Local		Completed. This was completed by the town with the support of the Town Council. (Strategy 2A in previous plan)
	Strengthen mobile home/manufactured home anchoring requirements.	High Wind	Low	Livery Town Manager	Local		Completed. This was accomplished through the efforts of the Randolph County Building Inspections Department since they are responsible for enforcing the Building Code as mandated by the state. As the state changed the Building Code, the county responded by enforcing the code requirements. (Strategy 2B in previous plan)

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
	Design a seasonal public information/education program targeted to mobile home/manufactured home residents through Central Permit Process—explaining hazards such as high wind events, flooding, and alternative shelters in a storm/high wind event/flood through Central Permit Process already in place.	Flood, Severe Thunderstorm, High Wind	High	Randolph County Planning and Emergency Management	Local		Completed. This project is handled by the County Emergency Management and Planning Departments and has been completed. (Strategy 3B in previous plan)
	Identify and map mobile home parks.	All	Moderate	Liberty Town Manager with Randolph County assistance	Local		Completed. This strategy was completed by the county. (Strategy 4A in previous plan)
	Identify and designate at least one emergency shelter in each municipality.	All	High	Liberty Town Manager/ Randolph County Emergency Management	Local		Completed. A shelter has been located in the town. (Strategy 4B in previous plan)
	Develop program to clear debris from culverts and storm drains in priority floodplains.	Flood	High	Liberty Public Works	Local		Completed. A program has been designed for the Public Works Department of the town to clear debris from all storm drains in the town. (Strategy 4D in previous plan)
	Adopt tree planning ordinances or programs and landscaping practices that encourage planting trees which are less susceptible to damage from ice storms.	Winter Storm	Low	Liberty Town Manager	Urban and Community Forestry Grant Program		Completed. The town has adopted a Land Use Ordinance which includes many of the items in this strategy. (Strategy 4E in previous plan)
	Through amendments to existing subdivision regulations, encourage that power, cable, and telephone lines be buried.	All	Moderate	Liberty Town Manager	Local		Completed. This has been included in the town's ordinances. (Strategy 5A in previous plan)
	Include in existing land development plans, adopt as town policy: wherever possible preserve natural wetlands, designate conservation corridors, especially along streams through acquisition or conservation easements.	All	High	Liberty Town Manager	Local		Completed. This has been included in the town's ordinances. (Strategy 5B in previous plan)

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
	Include in existing land development plans, where feasible will encourage street interconnectivity in all new subdivisions to allow multiple access points.	All	Low	Liberty Town Manager	Local		Completed. This has been included in the town's ordinances. (Strategy 5C in previous plan)
	Include in existing land development plans, wherever possible preserve natural wetlands, designate conservation corridors, especially along streams through acquisition or conservation easements.	All	High	Liberty Town Manager	Local		Completed. This has been included in the town's ordinances. (Strategy 5D in previous plan)

Town of Ramseur Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Prevention							
P-1	Update flood prevention ordinance.	Flood	High	Ramseur Administration	Local	2018	Incomplete. Planning and Zoning will begin work on this in 2016.
P-3	Develop emergency water supply capability.	All	High	Ramseur Administration/ Town Council	Local	2018-2019	Incomplete. Ramseur and Suez will begin discussion on available options in 2016
P-4	Develop program to clear debris from culverts and storm drains in priority floodplains.	Flood	High	Ramseur Public Works	Local	Complete	Storm drains are cleaned on a regular basis to maintain a clear path for the water.
P-5	Strengthen mobile home/manufactured home anchoring requirements.	High Wind	Moderate	Ramseur Town Clerk	Local	2018	Need to review. Planning and Zoning will make sure our anchoring ordinances are as up to date as possible.
P-6	Update flood damage prevention ordinance to limit and/or restrict future development in the floodplain.	Flood	Low	Ramseur Administration	Local	2018	Incomplete. Planning and Zoning will begin work on this in 2016
Property Protection							
PP-1	For any interested homeowners located in floodplain areas, the county will consider applying for mitigation grant funding to acquire or elevate the homes on a strictly voluntary basis for the homeowner.	Flood	Moderate	Randolph County Emergency Management, Town of Ramseur	FEMA, NCEM	2021	New Action
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Emergency Services							
ES-1	Evaluate generators and fuel for alternative sources of power.	All	Moderate	Ramseur Public Works	Local	2018	Incomplete: Generators are available to power most pump stations but more generators are needed to service all stations. Generators are serviced annually and maintained throughout the year. Purchase more generators to make sure all pump stations can be powered if outage occurs. Will look at 2016-2017 budget to see if money is available.
ES-2	Install hookups for portable generators at sewer lift stations which do not currently have hookups.	All	Moderate	Ramseur Public Works	Local	2018	Incomplete: Hookups are installed on lift stations but not on the portable generators yet. More information is needed on the generator to know what it is capable of powering is. Hookups are needed on the portable generator and more information needed to be sure it will power the lift stations in need.
ES-3	Identify and designate at least one emergency shelter in town.	All	Moderate	Ramseur Administration/ Randolph County Emergency Management	Local	2017	Incomplete. Ramseur will discuss options on an emergency shelter in 2016.
ES-4	Put in place a countywide 9-1-1 reverse call system for location specific warning to public of impending disaster. Will be implemented as part of Emergency Management ongoing program to improve efficiency and effectiveness of department.	All	High	Randolph County Emergency Management	Homeland Security funds	2016	Although the last update of the plan indicated that the county had a reverse 911 system, this is no longer the case and the county is currently seeking a hosted mass notification system for countywide notification.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Public Education and Awareness							
PEA-1	Educate and inform local government and elected officials (decision makers) of the need to consider hazard mitigation in policy and budgetary planning and decision making processes.	All	High	Ramseur Administration	Local	2017	Incomplete. Will discuss this during the 2016-2017 budget process
PEA-2	Educate and inform residents of the need for and means of hazard mitigation to more effectively protect persons and property from the impacts of natural hazards.	All	High	Ramseur Administration	Local	2017	Incomplete. Ramseur will look at 2016-2017 budget to see if money is available.
Previously Completed Actions							
	Through existing subdivision regulations, encourage that power, cable, and telephone lines be buried.	All	Low	Ramseur Planning	Local		Completed. This strategy was completed as the Town Commissioners adopted these guidelines as part of the update to the Land Use Ordinance. (Strategy 5A in previous plan)
	Adopt as town policy and incorporate into land use plans that wherever possible preserve natural wetlands, designate corridors, especially along streams through acquisitions or conservation easements.	All	Low	Ramseur Planning	Local		Completed. This strategy was completed as the Town Commissioners adopted these guidelines as part of the update to the Land Use Ordinance. (Strategy 5B in previous plan)
	In land use planning documents, where feasible, will encourage street interconnectivity in all new subdivisions to allow multiple access points.	All	Low	Ramseur Planning	Local		Completed. This strategy was completed as the Town Commissioners adopted these guidelines as part of the update to the Land Use Ordinance. (Strategy 5C in previous plan)

City of Randleman Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Prevention							
P-1	Look into Stormwater Management Planning.	Flood	Low	Randleman Planning and Public Works	Local	2021	The town has implemented some efforts at stormwater planning, but will continue to upgrade efforts as its needs change.
P-2	Review capital improvement plan to ensure capital improvements support or consider mitigating activities and are not counter to hazard mitigation.	All	Moderate	Randleman City Manager	Local	2017	The town is currently reviewing its capital improvements plan and working to ensure it considers mitigation activities.
P-3	Continue to develop GIS capability.	All	High	Randleman Planning	Local	2021	The town has some GIS capabilities, but it would like to improve those capabilities and ensure that it is able to use those capabilities towards mitigation.
P-4	County recording damage assessment information for Randleman, such as type of hazard, location of hazard occurrence, when it occurred, death or injury, property damaged, for local use in hazard mitigation and land use planning.	All	Moderate	Randolph County Emergency Management and Planning	County	2021	Up-to-date. Randolph County EM and Planning collect these events as they occur and will continue to carry out this practice going forward, looking at ways to improve the damage assessment and information collection process in the coming years.
P-5	Track floodplain changes impacting the city during infill of Randleman Lake.	Flood	Moderate	Randleman Planning	Local	Delete	This action is no longer relevant.
P-6	Consider amending sign ordinances limiting height or size of signs.	High Wind	Moderate	Randleman Planning	Local	Delete	The town determined that this action may not be feasible in terms of implementation so it is being deleted.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
P-7	Identify potential inundation areas downstream of high hazard dams.	Dam and Levee Failure	Moderate	Randleman Planning/Randolph County Emergency Management	Local	2017-2018	All owners of high and medium hazard dams were required to submit Emergency Action Plans with inundation maps to NC Dam Safety effective March 2015. Randolph County is currently awaiting the approval process at the State level and will be given this data as each EAP is approved.
P-8	Develop program to clear debris from culverts and storm drains in priority floodplains.	Flood	High	Randleman Water Resources and Public Works	Local	2021	The town has a program in place to clear debris, but would like to improve its priority focus going forward.
Property Protection							
PP-1	For any interested homeowners located in floodplain areas, the county will consider applying for mitigation grant funding to acquire or elevate the homes on a strictly voluntary basis for the homeowner.	Flood	Moderate	Randolph County Emergency Management, Town of Randleman	FEMA, NCEM	2021	New Action
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1	Remove Polecat Creek Dam after water supply system change to Randleman Lake.	Flood, Dam and Levee Failure	Moderate	Randleman City Manager	Outside funding to be identified	Delete	This action is no longer relevant.
Emergency Services							
ES-1	Evaluate current capacity of critical services to deal with power outages.	All	Moderate	Randleman City Manager	Local	2020	The town has performed some preliminary evaluation of critical services, but there needs to be more in-depth evaluation so the town will pursue this going forward.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
ES-2	Procure generators and fuel for alternative sources of power for lift stations and boost stations (12) and emergency shelter.	All	High	Randleman City Manager and Finance Officer	Local (incremental in each budget over the next 5 years)	2018-2019	The town has not obtained generators for lift stations and boost stations, so it will continue to work towards including funding in future budgets.
ES-3	Identify and designate at least one emergency shelter in each municipality.	All	Moderate	Randolph County Emergency Management	Local	2016-2017	The town will work towards identifying and designating an emergency shelter by 2017.
ES-6	Put in place a countywide 9-1-1 reverse call system for location specific warning to public of impending disaster. Will be implemented as part of Emergency Management ongoing program to improve efficiency and effectiveness of department.	All	High	Randolph County Emergency Management	Homeland Security funds	2016	Although the last update of the plan indicated that the county had a reverse 911 system, this is no longer the case and the county is currently seeking a hosted mass notification system for countywide notification.
Public Education and Awareness							
PEA-1	Educate and inform local government and elected officials (decision makers) of the need to consider hazard mitigation in policy and budgetary planning and decision making processes.	All	High	Randleman City Manager/Planning with assistance from PTCOG	Local	2016-2017	Town staff have worked on educating elected officials of the need to include mitigation in future budgeting, but as new information becomes available and officials turn over, this process will need to be updated and implemented.
PEA-2	Disseminate information on the benefits of purchasing flood insurance to property owners in flood hazard areas.	Flood	Moderate	Randleman Planning	Local	2016-2017	The town has disseminated information on flood insurance, but there is a need to continually update citizens, especially with any changes to maps, etc.
Previously Completed Actions							
	Update flood prevention ordinance to latest model standard.	Flood	High	Randleman Planning	Local		Completed. With adoption of the 2008 DFIRMs produced by the state, the city adopted the current flood prevention ordinance. (Strategy 1A in previous plan)

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
	Develop and adopt a drought management/water shortage (conservation) ordinance as part of the regular Local Water Supply Planning process.	Drought	High	Randleman City Manager and Water Resources	Local		Completed. The city developed water restrictions for use during times of drought. (Strategy 1F in previous plan)
	Adopt tree planning ordinances or programs and landscaping practices that encourage planting trees less susceptible to damage.	Winter Storm	Low	Randleman Planning	Urban and Community Forestry Grant Program		Completed. This strategy was completed with the adoption of the new subdivision ordinance in August 2008. (Strategy 4F in previous plan)
	Through existing subdivision regulations, encourage that power, cable, and telephone lines be buried.	All	Moderate	Randleman Planning	Local		Completed. This strategy was completed as the city adopted new ordinances in 2008 that addresses these concerns. (Strategy 5A in previous plan)
	Strengthen floodplain regulations to current standards.	Flood	High	Randleman Planning	Local		Completed. This strategy was completed as the city adopted new ordinances in 2008 that address these concerns. (Strategy 5B in previous plan)
	Adopt as City policy through Land Development Plans that wherever possible preserve natural wetlands, designate conservation corridors, especially along streams through acquisition or conservation easements.	All	Moderate	Randleman Planning	Local		Completed. This strategy has been completed as the city adopted new ordinances in 2008 that address these concerns. (Strategy 5C in previous plan)
	Looking into safe growth management strategies for development downstream of dams and incorporate into Land Use Plans.	All	Moderate	Randleman Planning	Local		Completed. This strategy has been completed as the city adopted new ordinances in 2008 that address these concerns. (Strategy 5D in previous plan).

Town of Seagrove Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Prevention							
P-1	Adopt a flood prevention ordinance.	Flood	High	Seagrove Town Clerk	Local	2021	The town has not adopted a flood damage prevention ordinance, but it will look into doing this in conjunction with its NFIP participation status.
P-2	Develop procedure for recording damage assessment information such as type of hazard, location of hazard occurrence, when it occurred, death or injury, property damaged, narrative description of damage (not just \$ value) for local use in hazard mitigation and land use planning.	All	High	Randolph County Emergency Management and Planning (covers all municipalities)	Local	2021	The town has not kept a record of storm damage historically but will work with the county to try to track this information in the future.
P-3	Become an NFIP member.	Flood	High	Seagrove Town Clerk/Town Council	Local	2021	The town is not currently a member of the NFIP, but it will evaluate the merits of implementing this action going forward.
P-4	Develop program to clear debris from culverts and storm drains in priority floodplains.	Flood	Low	Seagrove Public Works	Local	2018	The town currently does not have a program in place to clear debris from culverts/storm drains, so this will be a priority plan to develop.
P-5	Strengthen mobile home/manufactured home anchoring requirements.	High Wind	Low	Seagrove Town Clerk	Local	2020	The town has not made much progress in strengthening its mobile home anchoring requirements, so this will be a focus for the town going forward.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
P-6	Adopt as town policy: wherever possible preserve natural wetlands, designate conservation corridors, especially along streams through acquisition or conservation easements.	All	Low	Seagrove Town Clerk/City Council	Local	2021	The town has not adopted a policy to preserve natural wetlands due to lack of staff availability. The city will continue to pursue natural preservation areas going forward.
Property Protection							
PP-1	For any interested homeowners located in floodplain areas, the county will consider applying for mitigation grant funding to acquire or elevate the homes on a strictly voluntary basis for the homeowner.	Flood	Moderate	Randolph County Emergency Management, Town of Seagrove	FEMA, NCEM	2021	New Action
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Evaluate generators and fuel needs and supply alternative sources of power.	Winter Storm, High Wind	Moderate	Seagrove Town Clerk	Local	2021	Currently the town does not have generators or alternative power sources available due to a lack of available funding. The town will continue to pursue generator funding going forward.
ES-2	Identify and designate at least one emergency shelter in each municipality.	All	High	Seagrove Town Clerk/Randolph County Emergency Management	Local	2021	The town has not designated a shelter location but will work on identifying a shelter in the future.
ES-3	*Changed language* Put in place a countywide 9-1-1 reverse call system for location specific warning to public of impending disaster. Will be implemented as part of Emergency Management ongoing program to improve efficiency and effectiveness of department.	All	High	Randolph County Emergency Management	Homeland Security funds	2016	Although the last update of the plan indicated that the county had a reverse 911 system, this is no longer the case and the county is currently seeking a hosted mass notification system for countywide notification.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Public Education and Awareness							
PEA-1	Educate and inform local government and elected officials (decision makers) of the need to consider hazard mitigation in policy and budgetary planning and decision-making processes.	All	High	Seagrove Town Clerk/PTCOG through hazard mitigation planning process/Randolph County	Local	2021	The town has made some minor efforts to reach out to the public but overall improvements are needed to strengthen information disseminated to the public. The town will work to improve its outreach going forward.

Town of Staley Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Prevention							
P-1	Adopt a flood prevention ordinance.	Flood	High	Staley Town Council	Local	2018	The town is currently studying the county's flood prevention ordinance to determine if it is would be viable to adopt a flood prevention ordinance.
P-2	Develop procedure for recording damage assessment information such as type of hazard, location of hazard occurrence, when it occurred, death or injury, property damaged, narrative description of damage, not just dollar value, for local use in hazard mitigation and land use planning.	All	High	Randolph County Emergency Management and Planning	Local	2021	Although the town has been unable to carry out this action due to a lack of staff, it will work with the county going forward to record and assess damages from storm events.
P-3	Become an NFIP member.	Flood	High	Staley Town Clerk and Town Council	Local	2018	Currently the town does not participate in the NFIP, but it is looking into the costs and benefits of joining.
P-4	Develop program to clear debris from culverts and storm drains in priority floodplains.	Flood	Low	Contract with Volunteer Fire Department	Local	2021	The town is working on "quadranting" off the jurisdictional areas of the town and then developing a process where the debris will be cleared in stages. So far, the town has completed one street.
Property Protection							
PP-1	For any interested homeowners located in floodplain areas, the county will consider applying for mitigation grant funding to acquire or elevate the homes on a strictly voluntary basis for the homeowner.	Flood	Moderate	Randolph County Emergency Management, Town of Staley	FEMA, NCEM	2021	New Action

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Natural Resource Protection							
NRP-1	Wherever possible preserve natural wetlands, designate conservation corridors, especially along streams through acquisition or conservation easements.	All	Low	Planning and Zoning Ordinance	Local	Deleted	The town has re-examined this action and it has been deemed cost-prohibitive.
Structural Projects							
SP-1							
Emergency Services							
ES-1	Evaluate generators and fuel needs to supply alternative sources of power.	All	Moderate	Staley Town Council	Local	2021	The town does not have any generators or alternative power supply options, but the local volunteer fire department has provided this resource previously. The town will evaluate whether purchasing its own generator would be worthwhile.
ES-2	Identify and designate at least one emergency shelter in each municipality.	All	High	Staley Town Council/Randolph County Emergency Management	Local	2021	The town has not been able to identify a shelter on its own, but has worked with the local volunteer fire department in the past on sheltering. The town will continue to evaluate whether identifying a shelter would be beneficial
ES-3	Put in place a countywide 9-1-1 reverse call system for location specific warning to public of impending disaster. Will be implemented as part of Emergency Management ongoing program to improve efficiency and effectiveness of department.	All	High	Randolph County Emergency Management	Homeland Security funds	2016	Although the last update of the plan indicated that the county had a reverse 911 system, this is no longer the case and the county is currently seeking a hosted mass notification system for countywide notification.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Public Education and Awareness							
PEA-1	Educate and inform local government and elected officials (decision makers) of the need to consider hazard mitigation in policy and budgetary planning and decision making processes.	All	High	Staley Town Council	Local	2021	Efforts have been taken by town staff to educate elected officials but there is a need to improve and continue the current efforts. Therefore this action will remain in place.
Previously Completed Actions							
	Strengthen mobile home/manufactured home anchoring requirements.	High Wind	Low	Staley Town Council	Local		Completed. This has been completed since the Town Council amended the Planning and Zoning Ordinance to cover the areas of concern. (Strategy 4D in previous plan)

City of Trinity Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Prevention							
P-1	Develop a Stormwater Management Plan as part of NPDES Phase II program requirements.	Flood	High	Trinity City Manager	Local	Complete	The city developed a stormwater management plan in 2009.
P-2	Review existing capital improvement plan to ensure capital improvements support mitigating activities and are not counter to hazard mitigation.	All	Moderate	Trinity City Manager	Local	Complete	The city reviewed its existing CIP in 2015.
P-3	Update existing zoning ordinance to include considerations for hazard mitigation.	All	High	Trinity City Manager	Local	2016	The city is currently working on updating its zoning ordinance and it will hope to have that completed by 2016.
P-4	Update subdivision ordinance to include considerations for hazard mitigation.	All	High	Trinity City Manager	Local	2016	The city is currently working on updating its subdivision ordinance and it will hope to have that completed by 2016.
P-5	Develop a section of existing Capital Improvement Plan devoted solely to hazard mitigation projects to allow for effective financial management of capital projects which have hazard mitigation ramifications.	All	Moderate	Trinity City Manager	Local	2018	The city is in the process of developing a section of its CIP that will be solely dedicated to hazard mitigation.
P-6	Partner with county to use GIS resources.	All	High	Trinity City Manager	Local	Complete	The city has partnering arrangements in place with the county for GIS.
P-7	Develop procedure for recording damage assessment information such as type of hazard, location of hazard occurrence, when it occurred, death or injury, property damaged for local use in hazard mitigation and land use planning.	All	High	Randolph County Emergency Management and Planning	Local	2021	Although the city does not carry out this action on its own, it has and will work with the county going forward to record and assess damages from storm events.
P-8	Strengthen mobile home anchoring requirements.	All	High	Trinity Planning	Local	2021	The city will need to evaluate its policies regarding mobile home anchoring and will work to improve those as needed.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
P-9	Identify and map mobile home parks.	All	Moderate	Trinity City Manger	Local	Complete	The city has identified and mapped all of its mobile home parks.
P-10	Develop program to clear debris from culverts and storm drains in priority floodplains.	Flood	High	Trinity Water Resources and Public Works	Local	2021	The city has cleared debris from culverts and storm drains in the past, but is in the process of developing a program to implement this action going forward.
P-11	Include in land use plans to consider street connectivity in all new subdivisions to allow for multiple access points.	All	Low	Trinity City Manager and Planning	Local	Complete	Street connectivity has been included in the Subdivision Ordinance as a requirement for new subdivisions.
Property Protection							
PP-1	For any interested homeowners located in floodplain areas, the county will consider applying for mitigation grant funding to acquire or elevate the homes on a strictly voluntary basis for the homeowner.	Flood	Moderate	Randolph County Emergency Management; City of Trinity	FEMA, NCEM	2021	New Action
Natural Resource Protection							
NRP-1							
Structural Projects							
SP-1							
Emergency Services							
ES-1	Look into need for emergency water supply capability as part of regular local water supply planning process.	All	High	Trinity City Manager	Local	Complete	The city has partnered with Davidson Water and these measures have been put in place by them.
ES-2	Put in place a countywide 9-1-1 reverse call system for location specific warning to public of impending disaster. Will be implemented as part of Emergency Management ongoing program to improve efficiency and effectiveness of department.	All	High	Randolph County Emergency Management	Homeland Security funds	2016	Although the last update of the plan indicated that the county had a reverse 911 system, this is no longer the case and the county is currently seeking a hosted mass notification system for countywide notification.

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
Public Education and Awareness							
PEA-1	Educate and inform local government and elected officials (decision makers) of the need to consider hazard mitigation in policy and budgetary planning and decision-making processes.	All	High	Trinity City Manager	Local	2021	The city's staff has provided information for elected officials, but would like to continue this process regularly at annual budget meetings so this action will remain in place.
PEA-2	Disseminate information on the benefits of purchasing flood insurance to property owners in flood hazard areas. Insert as envelope stuffers in regular mailings to residents.	All	High	Trinity City Manager	Local	2021	The city has developed a bi-annual newsletter that disseminates information to the public on flood insurance, but it would like to improve and continue its efforts to reach out to homeowners who may want to purchase insurance.
PEA-3	Hold yearly "Flood Hazard Awareness Week."	Flood	Low	Randolph County Emergency Management and Planning	Local	2021	The city has not held annual Flood Hazard Awareness weeks, but will look towards implementing that action over the next several years.
Previously Completed Actions							
	Employ a planner.	All	High	Trinity City Manager	Local		Completed. The city hired a Town Planner. (Strategy 1A in previous plan)
	Create Planning Department.	All	High	Trinity City Manager and City Council	Local		Completed. The city created a Planning Department. (Strategy 1B in previous plan)
	Adopt flood prevention ordinance.	Flood	High	Trinity City Manager	Local		Completed. The city adopted the flood prevention ordinance in 2004 and again 2007. (Strategy 1C in previous plan)
	Update land use plan.	All	High	Trinity City Manager	Local		Completed. The Comprehensive Land Development Plan was adopted on February 2, 2007. (Strategy 1D in previous plan)

SECTION 9: MITIGATION ACTION PLAN

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2016)
	Become National Flood Insurance Program Member.	Flood	High	Trinity City Manager	Local		Completed. The city joined the NFIP on October 13, 2005. (Strategy 1J in previous plan)
	Procure generators and fuel for alternative sources of power for administrative building.	All	Low	Trinity City Manager	Local		Completed. Two natural gas generators for the city buildings have been purchased. (Strategy 2A in previous plan)
	Identify and designate at least one emergency shelter in each municipality.	All	Moderate	Trinity City Manager, Randolph County Emergency Management	Local		Completed. A shelter has now been located in the city. (Strategy 4B in previous plan)
	Through existing subdivision regulations, encourage that power, cable, and telephone lines be buried.	All	High	Trinity City Manager and Planning	Local		Completed. The City Council approved an amendment to the subdivision ordinance that required the placement of underground utilities. (Strategy 5A in previous plan)
	Include in land use plan as citywide policy, wherever possible preserve natural wetlands, designate conservation corridors, especially along streams through acquisition or conservation easements.	All	High	Trinity City Manager and Planning	Local		Completed. The Land Development Plan now encourages preservation of sensitive areas for open space and greenways. (Strategy 5C in previous plan)
	Consider amending subdivision ordinance to allow clustering to maximize density while preserving high hazard areas.	All	High	Trinity City Manager and Planning	Local		Completed. The Development Ordinance now allows for clustering of development to preserve sensitive areas. (Strategy 5D in previous plan)

SECTION 10

PLAN MAINTENANCE

This section discusses how the Randolph County *Mitigation Strategy* and *Mitigation Action Plan* will be implemented and how the *Randolph County Multi-jurisdictional Hazard Mitigation Plan* will be evaluated and enhanced over time. This section also discusses how the public will continue to be involved in a sustained hazard mitigation planning process. It consists of the following four subsections:

- ❖ 10.1 Monitoring and Evaluating the Previous Plan;
- ❖ 10.2 Implementation and Integration;
- ❖ 10.3 Monitoring, Evaluation, and Enhancement; and
- ❖ 10.4 Continued Public Involvement.

44 CFR Requirement

44 CFR Part 201.6(c)(4)(i):

The plan shall include a plan maintenance process that includes a section describing the method and schedule of monitoring, evaluating and updating the mitigation plan within a five-year cycle.

44 CFR Part 201.6(c)(4)(ii):

The plan maintenance process 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, when appropriate.

10.1 MONITORING AND EVALUATING THE PREVIOUS PLAN

Since the previous plan was adopted, each jurisdiction has worked to ensure that mitigation was integrated into local activities and that the mitigation plan was appropriately implemented. The participants jointly outlined a process in the previous mitigation plan for monitoring and evaluating the *Plan* throughout the interim period between plan updates.

All participants were ultimately successful in implementing the monitoring and evaluation processes that were outlined in previous plan as all ten jurisdictions participated in annual meetings to discuss the mitigation plan and the priorities that were outlined in it. The specific process is outlined below with an explanation of how the monitoring and evaluating process was carried out as well as any changes that were identified that would be useful to implement during the next update.

Randolph County

The *Randolph County Multi-jurisdictional Hazard Mitigation Plan* included a review process and progress report on the *Plan*. This review process was carried out by a representative of each jurisdiction to evaluate progress on the *Plan*. During this review process, the Hazard Mitigation Task Force, which was composed of the representative from each jurisdiction, used an evaluation form to assess whether their jurisdiction achieved certain benchmarks and what problems were encountered in terms of implementing the *Plan*.

Once the progress and issues were documented, the Task Force made recommendations for changes to the *Plan* and the overall evaluation process. Although there were some minor revisions made to the *Plan* during the interim update period, there were few major revisions identified during this time and the Task Force generally agreed that the *Plan* was on course and that the monitoring and evaluating process itself was sufficient to ensure implementation of the *Plan*.

The planning team noted that reporting was done on the progress of the *Plan* through the interim review period as the planning team held annual meetings wherein the entire Task Force met to discuss progress on the plan. However, one area of deficiency was that the planning team was uncertain exactly what should be on the agenda of the meeting. Going forward, the planning team will look to address that deficiency by focusing on evaluating the plan's mitigation actions and determining what has been achieved with regard to those actions and what still needs to be accomplished. This meeting will include monitoring, evaluating, and updating the *Plan*.

10.2 IMPLEMENTATION AND INTEGRATION

Each agency, department, or other partner participating under the *Randolph County Multi-jurisdictional Hazard Mitigation Plan* is responsible for implementing specific mitigation actions as prescribed in the *Mitigation Action Plan*. Every proposed action listed in the *Mitigation Action Plan* is assigned to a specific "lead" agency or department in order to assign responsibility and accountability and increase the likelihood of subsequent implementation.

In addition to the assignment of a local lead department or agency, an implementation time period or a specific implementation date has been assigned in order to assess whether actions are being implemented in a timely fashion. When applicable, potential funding sources have been identified for proposed actions listed in the *Mitigation Action Plan*.

The participating jurisdictions will integrate this *Hazard Mitigation Plan* into relevant city and county government decision-making processes or mechanisms, where feasible. This includes integrating the requirements of the *Hazard Mitigation Plan* into other local planning documents, processes, or mechanisms, such as comprehensive or capital improvement plans, when appropriate. The members of the Randolph County Hazard Mitigation Planning Team will remain charged with ensuring that the goals and mitigation actions of new and updated local planning documents for their agencies or departments are consistent with, or do not conflict with, the goals and actions of the *Hazard Mitigation Plan* and will not contribute to increased hazard vulnerability in Randolph County.

Since the previous plan was adopted, each jurisdiction has worked to integrate the *Hazard Mitigation Plan* into other planning mechanisms where applicable/feasible. Examples of how this integration has occurred have been documented in the Implementation Status discussion provided for each of the mitigation actions found in Section 9. Specific examples of how integration has occurred include:

- ❖ Integrating the mitigation plan into reviews and updates of floodplain management ordinances;
- ❖ Integrating the mitigation plan into reviews and updates of emergency operations plans;
- ❖ Integrating information in the mitigation plan into county Geographic Information Systems; and

- ❖ Integrating the mitigation plan into the local reserve fund through identification of mitigation actions that require local funding.

Opportunities to further integrate the requirements of this *Plan* into other local planning mechanisms shall continue to be identified through future meetings of the Hazard Mitigation Planning Team and the review process described herein. Although it is recognized that there are many possible benefits to integrating components of this Plan into other local planning mechanisms, the development and maintenance of this stand-alone *Randolph County Multi-jurisdictional Hazard Mitigation Plan* is deemed by the Hazard Mitigation Planning Team to be the most effective and appropriate method to implement local hazard mitigation actions at this time.

10.3 MONITORING, EVALUATION, AND ENHANCEMENT

Periodic revisions and updates of the *Hazard Mitigation Plan* are required to ensure that the goals of the *Plan* are kept current, taking into account potential changes in hazard vulnerability and mitigation priorities. In addition, revisions may be necessary to ensure that the *Plan* is in full compliance with applicable federal and state regulations. Periodic evaluation of the *Plan* will also ensure that specific mitigation actions are being reviewed and carried out according to the *Mitigation Action Plan*.

The Hazard Mitigation Planning Team shall meet once every year to evaluate the progress attained and to revise, where needed, the activities set forth in the *Plan*. This meeting shall be held in the month upon which final plan approval is attained; however, it may be necessary to schedule in the month prior or after in any given year, depending on the schedules of local officials. The findings and recommendations of the Planning Team will be documented in the form of a report that can be shared with interested municipalities, the County, and other stakeholders. The Hazard Mitigation Planning Team will also meet following any disaster events warranting a reexamination of the mitigation actions being implemented or proposed for future implementation. This will ensure that the *Plan* is continuously updated to reflect changing conditions and needs within Randolph County. The Randolph County Emergency Management Coordinator will be responsible for reconvening the Hazard Mitigation Planning Team for these reviews.

Five Year Plan Review

The *Plan* will be thoroughly reviewed by the Hazard Mitigation Planning Team every five years to determine whether there have been any significant changes in Randolph County that may, in turn, necessitate changes in the types of mitigation actions proposed. New development in identified hazard areas, an increased exposure to hazards, an increase or decrease in capability to address hazards, and changes to federal or state legislation are examples of factors that may affect the necessary content of the *Plan*.

The *Plan* review provides Randolph County/municipal officials with an opportunity to evaluate those actions that have been successful and to explore the possibility of documenting potential losses avoided due to the implementation of specific mitigation measures. The *Plan* review also provides the opportunity to address mitigation actions that may not have been successfully implemented as assigned. The Randolph County Emergency Management Coordinator will be responsible for reconvening the Hazard Mitigation Planning Team and conducting the five-year review.

During the five-year plan review process, the following questions will be considered as criteria for assessing the effectiveness and appropriateness of the *Plan*.

- ❖ Do the goals address current and expected conditions?
- ❖ Has the nature or magnitude of risks changed?
- ❖ Are the current resources appropriate for implementing the *Plan*?
- ❖ Are there implementation problems, such as technical, political, legal or coordination issues with other agencies?
- ❖ Have the outcomes occurred as expected?
- ❖ Did county departments participate in the *Plan* implementation process as assigned?

Following the five-year review, any revisions deemed necessary will be summarized and implemented according to the reporting procedures and plan amendment process outlined herein. Upon completion of the review and update/amendment process, the *Randolph County Multi-jurisdictional Hazard Mitigation Plan* will be submitted to the State Hazard Mitigation Officer at the North Carolina Division of Emergency Management (NCDEM) for final review and approval in coordination with the Federal Emergency Management Agency (FEMA).

Because the *Plan* update process can take several months to complete, and because Federal funding may be needed to update the *Plan*, it is recommended that the five-year review process begin at the beginning of the third year after the *Plan* was last approved. This will allow the participants in the *Randolph County Multi-Jurisdictional Hazard Mitigation Plan* to organize in order to seek Federal funding if necessary and complete required plan update documentation before the *Plan* expires at the end of the fifth year.

Disaster Declaration

Following a disaster declaration, the *Randolph County Multi-jurisdictional Hazard Mitigation Plan* will be revised as necessary to reflect lessons learned or to address specific issues and circumstances arising from the event. It will be the responsibility of the Randolph County Emergency Management Coordinator to reconvene the Hazard Mitigation Planning Team and ensure the appropriate stakeholders are invited to participate in the *Plan* revision and update process following declared disaster events.

Reporting Procedures

The results of the five-year review will be summarized by the Hazard Mitigation Planning Team in a report that will include an evaluation of the effectiveness of the *Plan* and any required or recommended changes or amendments. The report will also include an evaluation of implementation progress for each of the proposed mitigation actions, identifying reasons for delays or obstacles to their completion along with recommended strategies to overcome them.

Plan Amendment Process

Upon the initiation of the amendment process, representatives from Randolph County and the participating municipalities will forward information on the proposed change(s) to all interested parties including, but not limited to, all directly affected county/municipal departments, residents, and businesses. Information will also be forwarded to the North Carolina Division of Emergency

Management. This information will be disseminated in order to seek input on the proposed amendment(s) for no less than a 45-day review and comment period.

At the end of the 45-day review and comment period, the proposed amendment(s) and all comments will be forwarded to the Hazard Mitigation Planning Team for final consideration. The Hazard Mitigation Planning Team will review the proposed amendment along with the comments received from other parties, and, if acceptable, the committee will submit a recommendation for the approval and adoption of changes to the *Plan*.

In determining whether to recommend approval or denial of a Plan amendment request, the following factors will be considered by the Hazard Mitigation Planning Team:

- ❖ There are errors, inaccuracies, or omissions made in the identification of issues or needs in the *Plan*.
- ❖ New issues or needs have been identified which are not adequately addressed in the *Plan*.
- ❖ There has been a change in information, data, or assumptions from those on which the *Plan* is based.

Upon receiving the recommendation from the Hazard Mitigation Planning Team, and prior to adoption of the *Plan*, the participating jurisdictions will hold a public hearing. The governing bodies of each participating jurisdiction will review the recommendation from the Hazard Mitigation Planning Team (including the factors listed above) and any oral or written comments received at the public hearing. Following that review, the governing bodies will take one of the following actions:

- ❖ Adopt the proposed amendments as presented;
- ❖ Adopt the proposed amendments with modifications;
- ❖ Refer the amendments request back to the Hazard Mitigation Planning Team for further revision; and
- ❖ Defer the amendment request back to the Hazard Mitigation Planning Team for further consideration and/or additional hearings.

Incorporation into Existing Planning Documents

The Randolph County Hazard Mitigation Planning Team intends to make available to all of Randolph County and its municipalities a process by which the requirements of this *Hazard Mitigation Plan* will be incorporated into other plans. During the planning process for new and updated local planning documents, such as a comprehensive plan, capital improvements plan, or emergency management plan to name a few examples, the Emergency Services Department will provide a copy of the *Randolph County Multi-jurisdictional Hazard Mitigation Plan* to the advisory committee of each relevant planning document. The Emergency Services Department will advise the advisory committee members to ensure that all goals and strategies of new and updated local planning documents are consistent with the *Hazard Mitigation Plan* and will not increase hazard vulnerability in the jurisdictions.

This process will be carried out for each of the planning documents described in *Section 7: Capability Assessment* of this document. It should also be noted that most jurisdictions within the County are participants in the County-level version of each type of plan and do not have stand-alone municipal plans of their own. Therefore, when the Emergency Services Department shares and advises on the

Hazard Mitigation Plan, they are acting on behalf of the municipalities. It should be further noted that due to the smaller size of many municipalities, municipal representatives of the Hazard Mitigation Planning Team are often the same person who participates in the update of comprehensive plans, zoning ordinances, and other planning documents. As such, much of the engrained knowledge these officials have gained from participating in the hazard mitigation planning process is transferred to these processes.

Therefore, each municipality's process for integrating the *Hazard Mitigation Plan* into other planning mechanisms is the same as the county-level process because these planning mechanisms are carried out as Countywide plans or ordinances and each community's stake in each process is intricately linked.

10.4 CONTINUED PUBLIC INVOLVEMENT

44 CFR Requirement
44 CFR Part 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.

Public participation is an integral component to the mitigation planning process and will continue to be essential as this Plan evolves over time. As described above, significant changes or amendments to the *Plan* shall require a public hearing prior to any adoption procedures.

Other efforts to involve the public in the maintenance, evaluation, and revision process will also be made. These efforts include:

- ❖ Advertising meetings of the Hazard Mitigation Planning Team in local newspapers, public bulletin boards and/or county and municipal office buildings;
- ❖ Designating willing and voluntary citizens and private sector representatives as official members of the Hazard Mitigation Planning Team;
- ❖ Utilizing local media to update the public on any maintenance and/or periodic review activities taking place;
- ❖ Utilizing the websites of participating jurisdictions to advertise any maintenance and/or periodic review activities taking place; and
- ❖ Keeping copies of the *Plan* in public locations.

APPENDIX A

PLAN ADOPTION

This appendix includes the local adoption resolutions for each of the participating jurisdictions.

APPENDIX B

PLANNING TOOLS

This appendix includes the following:

1. List of Recommended Stakeholders
2. Blank Public Participation Survey
3. GIS Data Inventory Sheet
4. Scoring Criteria for Capability Assessment
5. Blank Mitigation Action Worksheet

In establishing a planning team, you want to ensure that you have a broad range of backgrounds and experiences represented. Below are some suggestions for agencies to include in a planning team. There are many organizations, both governmental and community-based, that should be included when creating a local team. In addition, state organizations can be included on local teams, when appropriate, to serve as a source of information and to provide guidance and coordination.

Use the checklist as a starting point for forming your team. Check the boxes beside any individuals or organizations that you have in your community/state that you believe should be included on your planning team so you can follow up with them.

Task A. Create the planning team – Suggestions for team members. Date: _____

Local/Tribal

- Administrator/Manager's Office
- Budget/Finance Office
- Building Code Enforcement Office
- City/County Attorney's Office
- Economic Development Office
- Emergency Preparedness Office
- Fire and Rescue Department
- Hospital Management
- Local Emergency Planning Committee
- Planning and Zoning Office
- Police/Sheriff's Department
- Public Works Department
- Sanitation Department
- School Board
- Transportation Department
- Tribal Leaders

Special Districts and Authorities

- Airport and Seaport Authorities
- Business Improvement District(s)
- Fire Control District
- Flood Control District
- Redevelopment Agencies
- Regional/Metropolitan Planning Organization(s)
- School District(s)
- Transit/Transportation Agencies

Others

- Architectural/Engineering/Planning Firms
- Citizen Corps
- Colleges/Universities
- Land Developers
- Major Employers/Businesses
- Professional Associations
- Retired Professionals

State

- Adjutant General's Office (National Guard)
- Board of Education
- Building Code Office
- Climatologist
- Earthquake Program Manager
- Economic Development Office
- Emergency Management Office/State Hazard Mitigation Officer
- Environmental Protection Office
- Fire Marshal's Office
- Geologist
- Homeland Security Coordinator's Office
- Housing Office
- Hurricane Program Manager
- Insurance Commissioner's Office
- National Flood Insurance Program Coordinator
- Natural Resources Office
- Planning Agencies
- Police
- Public Health Office
- Public Information Office
- Tourism Department

Non-Governmental Organizations (NGOs)

- American Red Cross
- Chamber of Commerce
- Community/Faith-Based Organizations
- Environmental Organizations
- Homeowners Associations
- Neighborhood Organizations
- Private Development Agencies
- Utility Companies
- Other Appropriate NGOs

PUBLIC PARTICIPATION SURVEY FOR HAZARD MITIGATION PLANNING

We need your help!

Randolph County is currently engaged in a planning process to become less vulnerable to natural disasters, and your participation is important to us!

The county, along with participating local jurisdictions and other participating partners, is now working to prepare a multi-jurisdictional *Hazard Mitigation Plan*. The purpose of this Plan is to identify and assess our community's natural hazard risks and determine how to best minimize or manage those risks. Upon completion, the Plan will represent a comprehensive multi-jurisdictional *Hazard Mitigation Plan* for the county.

This survey questionnaire provides an opportunity for you to share your opinions and participate in the mitigation planning process. The information you provide will help us better understand your hazard concerns and can lead to mitigation activities that should help lessen the impact of future hazard events.

Please help us by completing this survey by January 12, 2016 and returning it to:

Ryan Wiedenman, Atkins 1616 E Millbrook Road, Suite 310 Raleigh, NC 27609

Surveys can also be faxed to: (919) 876-6848 or emailed to ryan.wiedenman@atkinglobal.com

If you have any questions regarding this survey or would like to learn about more ways you can participate in the development of the *Randolph County Hazard Mitigation Plan*, please contact Atkins, planning consultant for the project. You may reach Ryan Wiedenman (Atkins) at 919-431-5295 or by email at ryan.wiedenman@atkinglobal.com.

1. Where do you live?

- Unincorporated Randolph County
- Archdale
- Asheboro
- Franklinville
- Liberty
- Ramseur
- Randleman
- Seagrove
- Staley
- Trinity
- Other: _____

2. Have you ever experienced or been impacted by a disaster?

- Yes
- No

a. If “Yes,” please explain:

3. How concerned are you about the possibility of our community being impacted by a disaster?

- Extremely concerned
- Somewhat concerned
- Not concerned

4. Please select the one hazard you think is the *highest threat* to your neighborhood:

- | | |
|---|---|
| <input type="checkbox"/> Dam / Levee Failure | <input type="checkbox"/> Land Subsidence / Sink Holes |
| <input type="checkbox"/> Drought | <input type="checkbox"/> Landslide |
| <input type="checkbox"/> Earthquake | <input type="checkbox"/> Lightning |
| <input type="checkbox"/> Flood | <input type="checkbox"/> Severe Thunderstorm |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Tornado |
| <input type="checkbox"/> Heat Wave / Extreme Heat | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Hurricane / Tropical Storm | <input type="checkbox"/> Winter Storm / Freeze |

5. Please select the one hazard you think is the *second highest threat* to your neighborhood:

- | | |
|---|---|
| <input type="checkbox"/> Dam / Levee Failure | <input type="checkbox"/> Land Subsidence / Sink Holes |
| <input type="checkbox"/> Drought | <input type="checkbox"/> Landslide |
| <input type="checkbox"/> Earthquake | <input type="checkbox"/> Lightning |
| <input type="checkbox"/> Flood | <input type="checkbox"/> Severe Thunderstorm |
| <input type="checkbox"/> Hailstorm | <input type="checkbox"/> Tornado |
| <input type="checkbox"/> Heat Wave / Extreme Heat | <input type="checkbox"/> Wildfire |
| <input type="checkbox"/> Hurricane / Tropical Storm | <input type="checkbox"/> Winter Storm / Freeze |

6. Is there another hazard not listed above that you think is a wide-scale threat to your neighborhood?

- Yes (please explain): _____
- No

7. Is your home located in a floodplain?

- Yes
- No
- I don't know

8. Do you have flood insurance?

- Yes
- No
- I don't know

a. If "No," why not?

- Not located in floodplain
- Too expensive
- Not necessary because it never floods
- Not necessary because I'm elevated or otherwise protected
- Never really considered it
- Other (please explain): _____

9. Have you taken any actions to make your home or neighborhood more resistant to hazards?

- Yes
- No

a. If "Yes," please explain:

10. Are you interested in making your home or neighborhood more resistant to hazards?

- Yes
- No

11. Do you know what office to contact regarding reducing your risks to hazards in your area?

- Yes
- No

12. What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards?

- Newspaper
- Television
- Radio
- Internet
- Mail
- Public workshops/meetings
- School meetings
- Other (please explain): _____

13. In your opinion, what are some steps your local government could take to reduce or eliminate the risk of future hazard damages in your neighborhood?

14. Are there any other issues regarding the reduction of risk and loss associated with hazards or disasters in the community that you think are important?

15. A number of community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories. Please tell us how important you think each one is for your community to consider pursuing.

Category	Very Important	Somewhat Important	Not Important
<p><u>1. Prevention</u> Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain regulations.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><u>2. Property Protection</u> Actions that involve the modification of existing buildings to protect them from a hazard or removal from the hazard area. Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><u>3. Natural Resource Protection</u> Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples include: floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><u>4. Structural Projects</u> Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include dams, levees, detention/retention basins, channel modification, retaining walls, and storm sewers.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><u>5. Emergency Services</u> Actions that protect people and property during and immediately after a hazard event. Examples include warning systems, evacuation planning, emergency response training, and protection of critical emergency facilities or systems.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><u>6. Public Education and Awareness</u> Actions to inform citizens about hazards and the techniques they can use to protect themselves and their property. Examples include outreach projects, school education programs, library materials, and demonstration events.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

THANK YOU FOR YOUR PARTICIPATION!

This survey may be submitted anonymously; however, if you provide us with your name and contact information below we will have the ability to follow up with you to learn more about your ideas or concerns (optional):

Name: _____

Address: _____

Phone: _____ **E-Mail:** _____

GIS Data Request Sheet
Randolph County Multi-Jurisdictional Hazard Mitigation Plan

Data requested	Available?	Received?	Potential Sources
Tax Parcel Data			Tax Assessor
<i>including replacement value</i>			
Building Footprints			Tax Assessor/GIS office
Critical Facilities (in GIS or list form with addresses)			Tax Assessor/GIS office
examples include:			
government buildings			
hospitals			
senior care			
police/fire/EMS/EOC			
locally significant buildings			
schools			
Local hazard studies			public works, natural resources, planning
examples include:			
Flood Studies (HEC-RAS, Risk MAP)			
Local Hazard History Articles			
Areas of Concern Studies			

If you have any questions, please contact:

Ryan Wiedenman

ryan.wiedenman@gmail.com

919-431-5295

Points System for Capability Ranking

<p>0-19 points = Limited overall capability 20-39 points = Moderate overall capability 40-68 points = High overall capability</p>
--

I. Planning and Regulatory Capability (Up to 43 points)

Yes = 3 points

Under Development = 1 point

Included under County plan/code/ordinance/program = 1 point

No = 0 points

- Hazard Mitigation Plan
- Comprehensive Land Use Plan
- Floodplain Management Plan
- National Flood Insurance Program
- NFIP Community Rating System

Yes = 2 points

Under Development = 1 point

Included under County plan/code/ordinance/program = 1 point

No = 0 points

- Open Space Management Plan / Parks & Recreation Plan
- Stormwater Management Plan
- Natural Resource Protection Plan
- Flood Response Plan
- Emergency Operations Plan
- Continuity of Operations Plan
- Evacuation Plan
- Disaster Recovery Plan
- Flood Damage Prevention Ordinance
- Post-disaster Redevelopment / Reconstruction Ordinance

Yes = 1 point

No = 0 points

- Capital Improvements Plan
- Economic Development Plan
- Historic Preservation Plan
- Zoning Ordinance
- Subdivision Ordinance
- Unified Development Ordinance
- Building Code
- Fire Code

II. Administrative and Technical Capability (Up to 15 points)

Yes = 2 points

Service provided by County = 1 point

No = 0 points

- Planners with knowledge of land development and land management practices
- Engineers or professionals trained in construction practices related to buildings and/or infrastructure
- Planners or engineers with an understanding of natural and/or human-caused hazards
- Emergency manager
- Floodplain manager

Yes = 1 point

No = 0 points

- Land surveyors
- Scientist familiar with the hazards of the community
- Staff with education or expertise to assess the community's vulnerability to hazards
- Personnel skilled in Geographical Information Systems (GIS) and/or Hazus
- Resource development staff or grant writers

III. Fiscal Capability (Up to 10 points)

Yes = 1 point

No = 0 points

- Capital Improvement Programming
- Community Development Block Grants (CDBG)
- Special Purpose Taxes (or tax districts)
- Gas / Electric Utility Fees
- Water / Sewer Fees
- Stormwater Utility Fees
- Development Impact Fees
- General Obligation / Revenue / Special Tax Bonds
- Partnering arrangements or intergovernmental agreements
- Other

MITIGATION ACTION WORKSHEETS

Mitigation Action Worksheets are used to identify potential hazard mitigation actions that participating jurisdictions in Randolph County will consider to reduce the negative effects of identified hazards. The worksheets provide a simple yet effective method of organizing potential actions in a user-friendly manner that can easily be incorporated into the County's Hazard Mitigation Plan.

The worksheets are to be used as part of a strategic planning process and are designed to be:

- a.) completed electronically (worksheets and instructions will be e-mailed to members of the Hazard Mitigation Planning Team following the Mitigation Strategy Workshop);
- b.) reviewed with your department/organization for further consideration; and
- c.) returned according to the contact information provided below.

Please return all completed worksheets no later than February 19, 2016 to:

Ryan Wiedenman, Project Manager Atkins

Electronic copies may be e-mailed to: ryan.wiedenman@atkinsglobal.com

Hard copies may be faxed to: 919-876-6848 (Attn: Ryan Wiedenman)

INSTRUCTIONS

Each mitigation action should be considered to be a separate local project, policy or program and each individual action should be entered into a separate worksheet. By identifying the implementation requirements for each action, the worksheets will help lay the framework for engaging in distinct actions that will help reduce the community's overall vulnerability and risk. Detailed explanations on how to complete the worksheet are provided below.

Proposed Action: Identify a specific action that, if accomplished, will reduce vulnerability and risk in the impact area. Actions may be in the form of local policies (i.e., regulatory or incentive-based measures), programs or structural mitigation projects and should be consistent with any pre-identified mitigation goals and objectives.

Site and Location: Provide details with regard to the physical location or geographic extent of the proposed action, such as the location of a specific structure to be mitigated, whether a program will be citywide, countywide or regional, etc.

History of Damages: Provide a brief history of any known damages as it relates to the proposed action and the hazard(s) being addressed. For example, the proposed elevation of a repetitive loss property should include an overview of the number of times the structure has flooded, total dollar amount of damages if available, etc.

Hazard(s) Addressed: List the hazard(s) the proposed action is designed to mitigate against.

Category: Indicate the most appropriate category for the proposed action as discussed during the Mitigation Strategy Workshop (Prevention; Property Protection; Natural Resource Protection; Structural Projects; Emergency Services; Public Education and Awareness).

Priority: Indicate whether the action is a "high" priority, "moderate" priority or "low" priority based generally on the following criteria:

1. Effect on overall risk to life and property
2. Ease of implementation / technical feasibility
3. Project costs versus benefits
4. Political and community support
5. Funding availability

Estimated Cost: If applicable, indicate what the total cost will be to accomplish this action. This amount will be an estimate until actual final dollar amounts can be determined. Some actions (such as ordinance revisions) may only cost “local staff time” and should be noted so.

Potential Funding Sources: If applicable, indicate how the cost to complete the action will be funded. For example, funds may be provided from existing operating budgets or general funds, a previously established contingency fund, a cost-sharing federal or state grant program, etc.

Lead Agency/Department Responsible: Identify the local agency, department or organization that is best suited to implement the proposed action.

Implementation Schedule: Indicate when the action will begin and when the action is expected to be completed. Remember that some actions will require only a minimal amount of time, while others may require a long-term or continuous effort.

Comments: This space is provided for any additional information or details that may not be captured under the previous headings.

MITIGATION ACTION	
Proposed Action:	
BACKGROUND INFORMATION	
Site and Location:	
History of Damages:	

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	
Category:	
Priority (High, Moderate, Low):	
Estimated Cost:	
Potential Funding Sources:	
Lead Agency/Department Responsible:	
Implementation Schedule:	

COMMENTS

APPENDIX C

LOCAL MITIGATION PLAN REVIEW TOOL

LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The Regulation Checklist provides a summary of FEMA’s evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan’s strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool*.

Jurisdiction: Randolph County (Archdale, Asheboro, Franklinville, Liberty, Ramseur, Randleman, Seagrove, Staley, Trinity, and Unincorporated Randolph County)	Title of Plan: Randolph County Multi-Jurisdictional Hazard Mitigation Plan	Date of Plan: March 2016
Local Point of Contact:	Address:	
Title:		
Agency:		
Phone Number:		
	E-Mail:	

State Reviewer:	Title:	Date:
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FEMA Reviewer:	Title:	Date:
Date Received in FEMA Region <i>(insert #)</i>		
Plan Not Approved		
Plan Approvable Pending Adoption		
Plan Approved		

**SECTION 1:
REGULATION CHECKLIST**

INSTRUCTIONS: The Regulation Checklist must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the Plan by Element/sub-element and to determine if each requirement has been ‘Met’ or ‘Not Met.’ The ‘Required Revisions’ summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is ‘Not Met.’ Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, Regulation Checklist.

1. REGULATION CHECKLIST	Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)			
ELEMENT A. PLANNING PROCESS			
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Section 2; App. D		
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Section 2.4-2.7; App. D		
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Section 2.6-2.7; App. B; App. D		
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Section 7.3		
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Section 10.4		
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Section 10.3		
<u>ELEMENT A: REQUIRED REVISIONS</u>			
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT			
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Section 4; Section 5		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Section 5			
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Section 5; Section 6			
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	Section 5.15.5 (Table 5.36)			
<u>ELEMENT B: REQUIRED REVISIONS</u>				
ELEMENT C. MITIGATION STRATEGY				
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Section 7			
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Section 5.15.4 (Table 5.35); Section 7.3.4 (Table 7.2)			
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Section 8.2			
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Section 8.3-8.4; Section 9.2			
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Section 8.1.1; Section 9.2			
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Section 7.3.1 (Table 7.1); Section 10.1-10.2			
<u>ELEMENT C: REQUIRED REVISIONS</u>				
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)				
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Section 6.4.3			
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Section 2.8; Section 8.5; Section 9.2			

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))		Section 5.22 (Table 5.43); Section 9.2		
<u>ELEMENT D: REQUIRED REVISIONS</u>				
ELEMENT E. PLAN ADOPTION				
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))		App. A		
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))		App. A		
<u>ELEMENT E: REQUIRED REVISIONS</u>				
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)				
F1.				
F2.				
<u>ELEMENT F: REQUIRED REVISIONS</u>				

SECTION 2: PLAN ASSESSMENT

INSTRUCTIONS: The purpose of the Plan Assessment is to offer the local community more comprehensive feedback to the community on the quality and utility of the plan in a narrative format. The audience for the Plan Assessment is not only the plan developer/local community planner, but also elected officials, local departments and agencies, and others involved in implementing the Local Mitigation Plan. The Plan Assessment must be completed by FEMA. The Assessment is an opportunity for FEMA to provide feedback and information to the community on: 1) suggested improvements to the Plan; 2) specific sections in the Plan where the community has gone above and beyond minimum requirements; 3) recommendations for plan implementation; and 4) ongoing partnership(s) and information on other FEMA programs, specifically RiskMAP and Hazard Mitigation Assistance programs. The Plan Assessment is divided into two sections:

1. Plan Strengths and Opportunities for Improvement
2. Resources for Implementing Your Approved Plan

Plan Strengths and Opportunities for Improvement is organized according to the plan Elements listed in the Regulation Checklist. Each Element includes a series of italicized bulleted items that are suggested topics for consideration while evaluating plans, but it is not intended to be a comprehensive list. FEMA Mitigation Planners are not required to answer each bullet item, and should use them as a guide to paraphrase their own written assessment (2-3 sentences) of each Element.

The Plan Assessment must not reiterate the required revisions from the Regulation Checklist or be regulatory in nature, and should be open-ended and to provide the community with suggestions for improvements or recommended revisions. The recommended revisions are suggestions for improvement and are not required to be made for the Plan to meet Federal regulatory requirements. The italicized text should be deleted once FEMA has added comments regarding strengths of the plan and potential improvements for future plan revisions. It is recommended that the Plan Assessment be a short synopsis of the overall strengths and weaknesses of the Plan (no longer than two pages), rather than a complete recap section by section.

Resources for Implementing Your Approved Plan provides a place for FEMA to offer information, data sources and general suggestions on the overall plan implementation and maintenance process. Information on other possible sources of assistance including, but not limited to, existing publications, grant funding or training opportunities, can be provided. States may add state and local resources, if available.

A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

How does the Plan go above and beyond minimum requirements to document the planning process with respect to:

- *Involvement of stakeholders (elected officials/decision makers, plan implementers, business owners, academic institutions, utility companies, water/sanitation districts, etc.);*
- *Involvement of Planning, Emergency Management, Public Works Departments or other planning agencies (i.e., regional planning councils);*
- *Diverse methods of participation (meetings, surveys, online, etc.); and*
- *Reflective of an open and inclusive public involvement process.*

Element B: Hazard Identification and Risk Assessment

In addition to the requirements listed in the Regulation Checklist, 44 CFR 201.6 Local Mitigation Plans identifies additional elements that should be included as part of a plan's risk assessment. The plan should describe vulnerability in terms of:

- 1) *A general description of land uses and future development trends within the community so that mitigation options can be considered in future land use decisions;*
- 2) *The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; and*
- 3) *A description of potential dollar losses to vulnerable structures, and a description of the methodology used to prepare the estimate.*

How does the Plan go above and beyond minimum requirements to document the Hazard Identification and Risk Assessment with respect to:

- *Use of best available data (flood maps, HAZUS, flood studies) to describe significant hazards;*
- *Communication of risk on people, property, and infrastructure to the public (through tables, charts, maps, photos, etc.);*
- *Incorporation of techniques and methodologies to estimate dollar losses to vulnerable structures;*
- *Incorporation of Risk MAP products (i.e., depth grids, Flood Risk Report, Changes Since Last FIRM, Areas of Mitigation Interest, etc.); and*
- *Identification of any data gaps that can be filled as new data became available.*

Element C: Mitigation Strategy

How does the Plan go above and beyond minimum requirements to document the Mitigation Strategy with respect to:

- *Key problems identified in, and linkages to, the vulnerability assessment;*
- *Serving as a blueprint for reducing potential losses identified in the Hazard Identification and Risk Assessment;*
- *Plan content flow from the risk assessment (problem identification) to goal setting to mitigation action development;*
- *An understanding of mitigation principles (diversity of actions that include structural projects, preventative measures, outreach activities, property protection measures, post-disaster actions, etc);*
- *Specific mitigation actions for each participating jurisdictions that reflects their unique risks and capabilities;*
- *Integration of mitigation actions with existing local authorities, policies, programs, and resources; and*
- *Discussion of existing programs (including the NFIP), plans, and policies that could be used to implement mitigation, as well as document past projects.*

Element D: Plan Update, Evaluation, and Implementation (Plan Updates Only)

How does the Plan go above and beyond minimum requirements to document the 5-year Evaluation and Implementation measures with respect to:

- *Status of previously recommended mitigation actions;*
- *Identification of barriers or obstacles to successful implementation or completion of mitigation actions, along with possible solutions for overcoming risk;*
- *Documentation of annual reviews and committee involvement;*
- *Identification of a lead person to take ownership of, and champion the Plan;*
- *Reducing risks from natural hazards and serving as a guide for decisions makers as they commit resources to reducing the effects of natural hazards;*
- *An approach to evaluating future conditions (i.e. socio-economic, environmental, demographic, change in built environment etc.);*
- *Discussion of how changing conditions and opportunities could impact community resilience in the long term; and*
- *Discussion of how the mitigation goals and actions support the long-term community vision for increased resilience.*

B. Resources for Implementing Your Approved Plan

Ideas may be offered on moving the mitigation plan forward and continuing the relationship with key mitigation stakeholders such as the following:

- *What FEMA assistance (funding) programs are available (for example, Hazard Mitigation Assistance (HMA)) to the jurisdiction(s) to assist with implementing the mitigation actions?*
- *What other Federal programs (National Flood Insurance Program (NFIP), Community Rating System (CRS), Risk MAP, etc.) may provide assistance for mitigation activities?*
- *What publications, technical guidance or other resources are available to the jurisdiction(s) relevant to the identified mitigation actions?*
- *Are there upcoming trainings/workshops (Benefit-Cost Analysis (BCA), HMA, etc.) to assist the jurisdictions(s)?*
- *What mitigation actions can be funded by other Federal agencies (for example, U.S. Forest Service, National Oceanic and Atmospheric Administration (NOAA), Environmental Protection Agency (EPA) Smart Growth, Housing and Urban Development (HUD) Sustainable Communities, etc.) and/or state and local agencies?*

SECTION 3:
MULTI-JURISDICTION SUMMARY SHEET (OPTIONAL)

INSTRUCTIONS: For multi-jurisdictional plans, a Multi-jurisdiction Summary Spreadsheet may be completed by listing each participating jurisdiction, which required Elements for each jurisdiction were 'Met' or 'Not Met,' and when the adoption resolutions were received. This Summary Sheet does not imply that a mini-plan be developed for each jurisdiction; it should be used as an optional worksheet to ensure that each jurisdiction participating in the Plan has been documented and has met the requirements for those Elements (A through E).

MULTI-JURISDICTION SUMMARY SHEET												
#	Jurisdiction Name	Jurisdiction Type (city/borough/ township/ village, etc.)	Plan POC	Mailing Address	Email	Phone	Requirements Met (Y/N)					
							A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Requirements
1	Randolph County	County										
2	Archdale	City										
3	Asheboro	City										
4	Franklinville	Town										
5	Liberty	Town										
6	Ramseur	Town										
7	Randleman	City										
8	Seagrove	Town										
9	Staley	Town										

MULTI-JURISDICTION SUMMARY SHEET

#	Jurisdiction Name	Jurisdiction Type (city/borough/ township/ village, etc.)	Plan POC	Mailing Address	Email	Phone	Requirements Met (Y/N)					
							A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Requirements
10	Trinity	City										

APPENDIX D

PLANNING PROCESS DOCUMENTATION

This appendix includes:

1. Meeting Agendas
2. Meeting Minutes
3. Meeting Sign-In Sheets
4. Public Survey Advertisement Screen Shots
5. Public Survey Results
6. Surrounding County Contact Email

AGENDA

Randolph County Hazard Mitigation Plan Update

November 12, 2015

725 McDowell Road, Asheboro NC 27205

2:00 PM- 4:00 PM

1) Overview of Mitigation Planning

- i) What is Mitigation and Why Do We Plan?
- ii) History of Mitigation Planning

2) Scope of Work

3) Timeframes for Plan Development

4) Roles and Responsibilities

5) Initiate Data Collection

- i) Risk Assessment Information
- ii) GIS Data

6) Next Steps

AGENDA

Randolph County Hazard Mitigation Plan Mitigation Strategy Meeting

February 5, 2016

10:00 AM – Noon

Randolph County Office Building
725 McDowell Road, Asheboro, NC

- 1) Introductions**
- 2) Mitigation Refresher**
- 3) Project Schedule**
- 4) Risk Assessment Findings**
 - a) Hazard History and Profiles
 - b) Conclusions on Risk: PRI
- 5) Capability Assessment Findings**
 - a) Indicators
 - b) Results
- 6) Public Involvement Activities**
- 7) Mitigation Strategy**
 - a) Current Goals/Actions
 - b) New Actions
 - c) Discussion
- 8) Next Steps**
 - a) Mitigation Actions
- 9) Questions, Issues, or Concerns**

ATKINS

Meeting Minutes
Randolph County Multi-Jurisdictional Hazard Mitigation Plan
Project Kickoff Meeting
November 12, 2015

Mr. Ryan Wiedenman, the project consultant, started the meeting by welcoming the representatives from the County, participating municipal jurisdictions, and other stakeholders. He introduced himself and explained that he worked with Atkins, a firm that has developed hazard mitigation plans in many areas throughout the country.

Mr. Wiedenman led the kickoff meeting and began by providing an overview of the items to be discussed at the meeting and briefly reviewed each of the handouts that were distributed in the meeting packets (agenda, project description, and presentation slides). He then provided a brief overview of mitigation and discussed the Disaster Mitigation Act of 2000 and NC Senate Bill 300.

He gave a list of the participating jurisdictions for the multi-jurisdictional plan, noting all local governments in the county are participating in the existing county-level hazard mitigation plan. This plan expires in the summer of 2016, so the Planning Team will plan to develop a draft to submit to FEMA by February of 2016.

Mr. Wiedenman then explained the six different categories of mitigation techniques (emergency services, prevention, natural resource protection, structural projects, public education and awareness, and property protection) and gave examples of each. This explanation culminated with an Ice Breaker Exercise for the attendees.

Mr. Wiedenman instructed attendees on how to complete the exercise. Attendees were given an equal amount of fictitious FEMA money and asked to spend it in the various mitigation categories. Money could be thought of as grant money that communities received towards mitigation. Attendees were asked to target their money towards areas of mitigation that are of greatest concern for their community. Ideally, the exercise helps pinpoint areas of mitigation that the community may want to focus on when developing mitigation grants. Once completed, Mr. Wiedenman presented the Ice Breaker Exercise results which were:

- Prevention- \$155
- Emergency Services- \$130
- Public Education and Awareness- \$67
- Property Protection- \$64
- Natural Resource Protection- \$36
- Structural Projects- \$23

Mr. Wiedenman then discussed the key objectives and structure of the planning process and explained the specific tasks to be accomplished for this project, including the planning process, risk assessment, vulnerability assessment, capability assessment, mitigation strategy and action plan, plan maintenance procedures, and documentation. The project schedule was presented along with the project staffing chart, which demonstrates the number of experienced individuals that will be working on this project. The data collection needs and public outreach efforts were also discussed.

Mr. Wiedenman then reviewed the roles and responsibilities of Atkins, participating jurisdictions, and stakeholders. The presentation concluded with a discussion of the next steps to be taken in the project development, which included discussing data collection efforts, continuing public outreach, and the next meeting for the HMPT.

The meeting was opened for questions and comments and there were no major questions or comments.

Mr. Wiedenman thanked everyone for attending and identified himself and the Randolph County Emergency Management Coordinator as the first points of contact for any questions or issues. The meeting was adjourned.

Meeting Minutes
Randolph County Hazard Mitigation Plan
Mitigation Strategy Meeting
February 5, 2016

Mr. Ryan Wiedenman with Atkins welcomed everyone to the meeting and reminded attendees who he was and that Atkins was the consultant hired to assist with developing the Hazard Mitigation Plan for the county.

Mr. Wiedenman initiated the meeting with a review of the meeting handouts, which included an agenda, presentation slides, proposed goals for the plan, and mitigation actions from the county's existing plan. Mr. Wiedenman reviewed the project schedule and stated that a draft of the Hazard Mitigation Plan would be presented to the Hazard Mitigation Planning Team at the end of February/early March.

Mr. Wiedenman then presented the findings of the risk assessment, starting with a review of the Presidential Disaster Declarations that have impacted the county. He then explained the process for preparing Hazard Profiles and discussed how each hazard falls into one of four categories: Atmospheric, Geologic, Hydrologic, and Other. He indicated that each hazard must be evaluated and then profiled and assessed to determine a relative risk for each hazard.

Mr. Wiedenman reviewed the Hazard Profiles and the following bullets summarize the information presented:

Atmospheric Hazards

- DROUGHT. There have been eleven years (out of the past fourteen, 2000-2013) where drought conditions have been reported as moderate to extreme in Randolph County and future occurrences are likely.
- EXTREME HEAT. There has been 1 recorded extreme heat event reported by the National Climatic Data Center (NCDC) since 1996. Heat extents of 105 degrees indicate that extreme heat is a hazard of concern for the county. Future occurrences are possible.
- HAILSTORM. There have been 90 recorded events since 1950. Future occurrences are highly likely.
- HURRICANES AND TROPICAL STORMS. NOAA data shows that 58 storm tracks have come within 75 miles of Randolph County since 1850. Future occurrences are likely.
- LIGHTNING. NCDC data indicates 6 recorded lightning events since 1999; however, the Vaisala National Lightning Detection Network indicates the county is in an area that experiences 2-8 flashes per square kilometer per year. Future occurrences highly likely.
- THUNDERSTORM WIND. There have been 224 severe thunderstorm events reported since 1950 with \$1.0 million in reported property damages. Three injuries have been reported. Future occurrences are highly likely.

- **TORNADOES.** There have been 15 recorded tornado events reported in the county since 1950. \$11.6 million in property damages. 1 death and 6 injuries have been reported. Future occurrences are likely.
- **WINTER STORM.** There have been 53 recorded winter weather events in Randolph County since 1996 resulting in \$3.6 million in reported property damages. Future occurrences are highly likely.

Geologic Hazards

- **EARTHQUAKES.** There have been 4 recorded earthquake events in Randolph County since 1850. The strongest had a recorded magnitude of VII MMI. Future occurrences are possible.
- **LANDSLIDE.** There have not been any recorded landslide events in the county according to the USGS. Most of the county is in an area of low incidence, but parts of the eastern county are in a moderate incidence area. Future occurrences are possible.
- **LAND SUBSIDENCE.** There have been no recorded land subsidence events and the USGS indicates that the soils in the county are generally not susceptible to subsidence. However, the county noted that during the last plan update, the state had indicated that the county had some areas of risk due to abandoned mining practices in localized areas. Future occurrences unlikely.

Hydrologic Hazards

- **DAM FAILURE.** No past incidents have been recorded. Future occurrences are unlikely and damage would be highly localized. There are 29 dams classified as high-hazard in the county.
- **FLOOD.** There have been 38 flood events recorded in Randolph County since 1996 per NCDC. There have been 22 NFIP losses since 1978 and approximately \$119,000 in claims. 4 severe repetitive loss properties in the county account for 16 of the recorded losses. Future occurrences are highly likely.

Other Hazards

- **WILDFIRE.** There is an average of 54 wildfires per year reported in Randolph County. Future occurrences are likely, but major events are not common.
- **NUCLEAR POWER PLANT EMERGENCY.** No large-scale nuclear events have been reported and future occurrences are unlikely. The eastern half of the county is located within the Shearon Harris 50 mile Ingestion Exposure Pathway Zone.
- **SOLAR FLARE.** There have been no major solar flare incidents in the county, but these events can occur at any time and any place in the world. The likelihood of a major event is relatively low, but future occurrences of some lower levels are likely.
- **TERROR THREAT.** There have been no historic terror events in the county, but several facilities were identified as potential targets and confirmed by the Planning Team. The likelihood of a major event is relatively low.

The results of the hazard identification process were used to generate a Priority Risk Index (PRI), which categorizes and prioritizes potential hazards as high, moderate, or low risk based on probability, impact, spatial extent, warning time, and duration. The highest PRI was assigned to Thunderstorm/High Wind followed by Hurricane/Tropical Storm, Winter Storm, Flood, and Tornado.

In the ensuing discussion of the overall risk assessment, Hazard Mitigation Planning Team members indicated that they felt the Dam/Levee hazard was a greater threat than indicated by the results. They felt this was a Moderate level threat to the county. In addition, the Planning Team recommended adding a hazard not initially identified in the Kickoff Meeting: Public Health/Infectious Disease. The project consultant indicated that he would add the hazard and work to collect information on its risks.

In concluding the review of Hazard Profiles, Mr. Wiedenman stated if anyone had additional information for the hazard profiles, or had concerns with any of the data presented, they should call or email him.

Mr. Wiedenman presented the Capability Assessment Findings. Atkins has developed a scoring system that was used to rank the participating jurisdictions in terms of capability in four major areas (Planning and Regulatory, Administrative and Technical, Fiscal, and Political). Important capability indicators include National Flood Insurance Program (NFIP) participation, Building Code Effective Grading Schedule (BCEGS) score, Community Rating System (CRS) participation, and the Local Capability Assessment Survey conducted by Atkins.

Mr. Wiedenman reviewed the Relevant Plans and Ordinances, Relevant Staff/Personnel Resources, and Relevant Fiscal Resources. All of these categories were used to rate the overall capability of the county and jurisdictions. Most jurisdictions are in the moderate range for Planning and Regulatory Capability and in the limited range for Fiscal Capability. There is variation between the jurisdictions for Administrative and Technical Capability, mainly with respect to availability staff skilled in GIS. Based upon the scoring methodology developed by Atkins, it was determined that most of the participating jurisdictions have moderate capability to implement hazard mitigation programs and activities, though the county has a high capability.

After presenting the capability results, the county indicated that there were several areas where the county had stronger capability than shown in the results. After the meeting, the county identified that a COOP was in place for the county and that several of the municipalities had stormwater utilities in place. The consultant agreed to make those changes to the capability assessment scores.

Mr. Wiedenman also discussed the results of the public participation survey that was posted on the county's website and advertised locally by several municipalities. As of the meeting date, 286 responses had been received. Mr. Wiedenman explained that this was a very strong response rate and that there had been a lot of feedback from the public. Based on preliminary survey results, respondents felt that Winter Storm/Freeze posed the greatest threat to their neighborhood, followed by Severe Thunderstorm and Tornado. 78 percent of the respondents were interested in making their homes more resistant to hazards. However, 72 percent don't know who to contact regarding reducing their risks to hazards.

Mr. Wiedenman then reminded team members of the results of the icebreaker exercise from the first Hazard Mitigation Team meeting, where attendees were given "money" to spend on various hazard mitigation techniques. The results were very similar to the responses by the public in terms of where money for mitigation should be spent.

Mr. Wiedenman gave an overview of Mitigation Strategy Development and presented the existing goals for the plan and explained that Atkins recommended keeping the goals as they are. The Hazard Mitigation Team accepted the existing goals for the plan. Mr. Wiedenman then provided an overview and examples of suggested mitigation actions tailored for Randolph County. Mr. Wiedenman then asked the county and the municipalities to provide a status update for their existing mitigation actions (completed, deleted, or deferred) by February 19, 2016. Mr. Wiedenman also asked planning team members to include any new mitigation actions by the same date.

Mr. Wiedenman thanked the group for taking the time to attend and explained that if team members had any issues or questions about the planning process or their next steps, they could contact him or the county's Emergency Management Coordinator. The meeting was adjourned.

**Randolph County Hazard Mitigation Plan
Project Kickoff Meeting**

November 12, 2015

2:00PM-4:00PM

Name	Organization	Position	Phone Number	E-mail Address
Fred de Friess	NC Zoo	Zoo Security Chief	336 879-7543	Fred.defriess@ NCZoo.org
Donovan Davis	Rand Co Emerg Services	Chief	336 318-6943	Donovan.davis@ randolphcountync.gov
Zelo Holden	City of Archdale	Planning Dir	(336)434-7333	zholden@ archdale-nc.gov
Matt Talbott	Liberty Fire Dept	Chief	215-3261	
Roy Lynch	Town of Liberty	Town Manager	622-4276	roylynch@rtelco.net
Cathryn Davis	County	Risk Manager	318-6619	cathryn.davis@ randolphcountync.gov
Manty Trotter	Randolph County School System	Asst. Superintendent of Operations	318-6283	mtrotter@ randolph.k12.nc.us
Robert A Graves	RCC	Dir. of Safety & Emerg. Prep.	633-0210	ragraves@randolph. edu

**Randolph County Hazard Mitigation Plan
Project Kickoff Meeting**

November 12, 2015

2:00PM-4:00PM

Name	Organization	Position	Phone Number	E-mail Address
MICHAEL ROWLAND	RANDOLPH	IT DIRECTOR	318-6314	MICHAEL.ROWLAND@ RANDOLPHCOUNTY.NC.GOV
Paxton Arthurs	Rand. Co.	Public Works	318-6605	<u>Paxton.Arthurs@</u>
Erik Beard	Randolph Co. Emergency Services	ES/FMO	318-6946	erik.beard@randolphcounty nc.gov
Amanda Varner	Rand Co.	Clerk	318-6301	amanda.varner@ randolphcounty.nc.gov
JOHN OGBURN	ASHEBORO	CITY MGR	626-1200x213	john.ogburn@ ci.asheboro.nc.us
Terry Van Vliet	Con. Gov.	Vet Srvs Dir	318 6909	tmvanvliet@Co, randolph.nc.us
Lewis Schirloff	Rand Co E-S	Deputy Chief	318-6945	lewis.schirloff@ randolphcounty.nc.gov
EVAN I. GRADY	Rand. Co. Public Health	Preparedness Coordinator	336 318 6248	evan.grady@ randolphcounty.nc.gov

**Randolph County Hazard Mitigation Plan
Project Kickoff Meeting**

November 12, 2015

2:00PM-4:00PM

Name	Organization	Position	Phone Number	E-mail Address
MICHAEL SMITH	CITY OF RANDLEMAN	FIRE MARSHAL	336.736.7899	MSMITH@CITYOFRANDLEMAN.COM
Nick Holcomb	City of Randleman	City Manager	336-495-7528	nholcomb@cityofrandleman.com
Tim Mangum	Randolph County Planning	Planning Info Spec.	336 318-6552	Tim.Mangum@randolphcountync.gov
John Evans	City of Asheboro Community Development Division	Assistant CD Director	336-626-1201 Ext. 225	jevans@ci.asheboro.nc.us
Jared Byrd	Randolph County Emergency Management	EM Coordinator	336-318-6913	Jared.byrd@randolphcountync.gov
KAREN Auman	NC Zoo	Safety Officer	336-879-7303	Karen.Auman@nczoo.org
D J Senegas	City of Archdale	PE, RWLE	336-434-7344	dseenas@archdale-nc.gov
Brad Rice	Asheboro City Schools	Assistant Superintendent	336-625-5104	brice@asheboro.k12.nc.us

**Randolph County Hazard Mitigation Plan
Hazard Mitigation Planning Team Mitigation Strategy Meeting**

**February 5, 2016
10:00 AM - 12:00 PM**

Name	Organization	Position	Phone Number	E-mail Address
Donovan Davis	Rand Co. EM	Director	318-6943	
Roy Lynch	Liberty	Manager	622-4276	
Lewis Schurdt	Rand Co EM	Deputy Director	318-6945	
Terry VanVleet	Vet Srvs	VSO Director	318-6909	
Jared Byrd	Randolph EM	EM Coordinator	336-318-6913	jared.byrd@randolphcountync.gov
Matthew Needham	Randolph Comm. College	Director of Safety	336-633-0210	MNeedham@Randolph.edu
MICHAEL SMITH	RANDOLPHMAN FD	FIRE MARSHAL	336-736-7897	MSMITH@CITY OF RANDOLPHMAN.COM
Susan Hayes	Public Health	Director	336 318 6217	susan.hayes@randolphcountync.gov

**Randolph County Hazard Mitigation Plan
Hazard Mitigation Planning Team Mitigation Strategy Meeting**

February 5, 2016
10:00 AM - 12:00 PM

Name	Organization	Position	Phone Number	E-mail Address
Fred deFries	NC Zoo	Chief Ranger	336-879-7543	fred.defries@nczoo.org
MICHAEL ROWLAND	RANDOLPH	IT DIRECTOR	336-318-6314	MICHAEL.ROWLAND@RANDOLPHCOUNTYNC.GOV
Erik Beard	Randolph Co. E.S.	FIRE MARSHAL	318-6946	Erik.beard@randolphcountync.gov
Tara Aker	Rand. Cty. Health Dept	Asst. Health Director	318-6213	Tara.Aker@randolphcountync.gov
John L. Evans	City of Ashboro	Asst. Community Development Director	336-626-1201 x225	jevans@ci.ashboro.nc.us
Linda Smith	Randolph Co IT	GIS Analyst Programmer	336-318-6312	linda.smith@randolphcountync.gov
Debra Hill	Jay	Administrator	336-318-6531	Debra.Hill@randolphcountync.gov
John Reid	SHERIFF'S OFFICE	LT. COLONEL	336-318-6699	john.reid@randolphcountync.gov

**Randolph County Hazard Mitigation Plan
Hazard Mitigation Planning Team Mitigation Strategy Meeting**

February 5, 2016
10:00 AM - 12:00 PM

Name	Organization	Position	Phone Number	E-mail Address
Perry Conner	Town of Franklinville	Mayor	336-549-4908	pconner@triad.rr.com
Cathryn Davis	RC Admin	Risk Manager	318-6619	cathryn.davis@randolphcounty.nc.gov
Tim Margum	RC Planning	Planning Info Spec	318-6552	
Paxton Arthurs	RC Public Works	Director	(336) 318-6605	Paxton.Arthurs@~
Reid Ried	NC DOT	County Maint. Engineer	336-318-4050	rried@ncdot.gov

**Randolph County Hazard Mitigation Plan
Individual Municipal-Level Meetings**

Name	Position	Municipality	Phone Number	E-mail Address
Timothy "Frosty" York	Public Works	Town of Ramseur	336-776-7373	N/A
Bobby Hatley	Water Billing Clerk	Town of Ramseur	336-234-4111	townoframseur@triadinc.com
Morganne Kirkman	Clerk / Finance Officer	Town of Ramseur	336 324-4111	townoframseur@triadinc.com
Mark Grose	Water Plant Operator	Suez	336 303-6982	mark.grose@Suez-na.com
Robert Hesselmeier	Commissioner	Town of Ramseur	336-963-7433	

**Randolph County Hazard Mitigation Plan
Individual Municipal-Level Meetings**

met on 2/9/16 and
worked on our portion of
Hazard Mitigation Plan.

Name	Position	Municipality	Phone Number	E-mail Address
Karen Scotton	MAYOR	STALEY	(336) 622-2054	krscotton@hotmail.com
Jangy Cobb	Mayor Pro-Tem	Staley	(336) 622-4655	hapnana@gmail.com
Jant Lambert	Commissioner	Staley	336-622-1879	jllambert166@hotmail.com
Lori Lynn Langley Rollins	Commissioner	Staley	336-622-5138	langleychicks@yahoo.com
Sten Rollins	Commissioner	Staley	336-622-2131	SRollinsSr.48@gmail.com
Marilyn Jones	Commissioner	Staley	336 301.5275	

Randolph County

Gently rolling hills, river valleys, and forest land characterize Randolph County's 790 square miles. It is the 11th largest county in North Carolina... more...

Your Government

Boards & Commissions
Budget Information
Central Permitting
Cities & Towns
County Commissioners
County Manager
Ordinances, Policies & Procedures
Policy Goals
Service Areas

eServices

Confined Inmates
Deadbeat Parents
GIS Mapping
GovDeals.com
Library Online Catalog
nixle.com
Real Property
Register of Deeds
Restaurant Grades
Tax Bill Lookup

Quick Links

A-Z Directory
About Randolph County
Clerk of Court
Departments
Disaster Preparedness
e-Services
Employment
Featured Links
Forms
Holiday Closings

Visitor

About Randolph County
Featured Links
Heart of NC Visitors Bureau
Historic Landmarks
NC Zoo
Randolph County Quilt Trail
Restaurant Grades

Search

Upcoming Events

Saturday, November 21

Fill the Ambulance [\(details\)](#)

Thursday & Friday, November 26 & 27

County Offices Closed for Thanksgiving Holiday

Thursday, December 3

Public Hearing - Proposed Landfill [\(details\)](#)

Saturday, December 5

Fill the Ambulance [\(details\)](#)

Monday, December 7

Commissioners Meeting

Saturday, December 12

Fill the Ambulance [\(details\)](#)

Current Events

Elections

[2015 Municipal Election Results](#)

Historical flags

Historical flags will be flying at the Randolph County Historic Courthouse that have significance for our county and region. [\(flag details\)](#)

Announcements

Welcome to Randolph County's home page on the World Wide Web! Our web site is an opportunity for citizens living in our county and around the world to access information and to obtain the latest news and public updates about Randolph County and its government.

Randolph County Strategic Plan



The board of County Commissioners recently approved a countywide Strategic Planning process that will focus on the impact of "Public Health, Safety, and Well-Being" in the County and local governments during the next 20 years.

[Visit our Strategic Plan page for details.](#)

We need your input!

Randolph County is currently engaged in a planning process to become less vulnerable to natural disasters, and your participation is important to us!

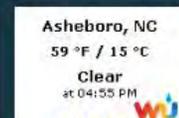
The survey provides an opportunity for you to share your opinions and participate in the mitigation planning process. The information you provide will help us better understand your hazard concerns and can lead to mitigation activities that should help lessen the impact of future hazard events.

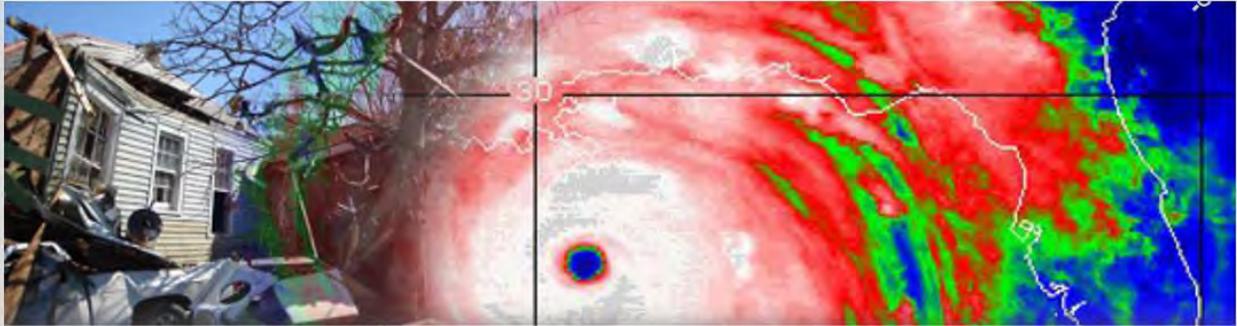
[Survey link.](#)

Know a Centenarian?



The Randolph County Board of Commissioners wishes to honor our centenarians. [\(details...\)](#)





Hazard Mitigation Planning

We are updating our Hazard Mitigation Plan. Take our survey!



Preparedness

Find out more information on how to prepare for disasters.

[Find Out More ▶](#)



Randolph County LEPC

More information on the Randolph County Local Emergency Planning Committee

[Learn More ▶](#)



Hazard Mitigation Update Project

We are updating our Hazard Mitigation Plan, and need your input!

[Take our survey! ▶](#)



Licensed Care Facility Readiness Survey

If you are a licensed care facility, take our readiness survey (use password provided in letter mailed to your facility).

[More Info ▶](#)



Randolph County Emergency Services

Published by Jared Byrd [?] · November 13 at 8:41am · Edited · 🌐

We need your help! We are in the process of updating the Randolph County Hazard Mitigation Plan and need your input. What kind of natural disasters are you concerned with, and what can we do about it?

Click to take our 5-minute survey!

Public Participation Survey for Hazard Mitigation Planning (Randolph County)

Public Participation Survey for Hazard Mitigation Planning (Randolph County).

[SURVEYGIZMO.COM](https://www.surveymonkey.com)

3,067 people reached

Boost Post



👍 Like 💬 Comment ➦ Share

Nathan Jackson, Karen Auman, Betty Brown and 7 others like this.

27 shares



Write a comment...



Randolph County Hazard Mitigation Plan

Public Participation Survey Results



August 2015 Storm Event in Randolph County
Photo Source: WNCT

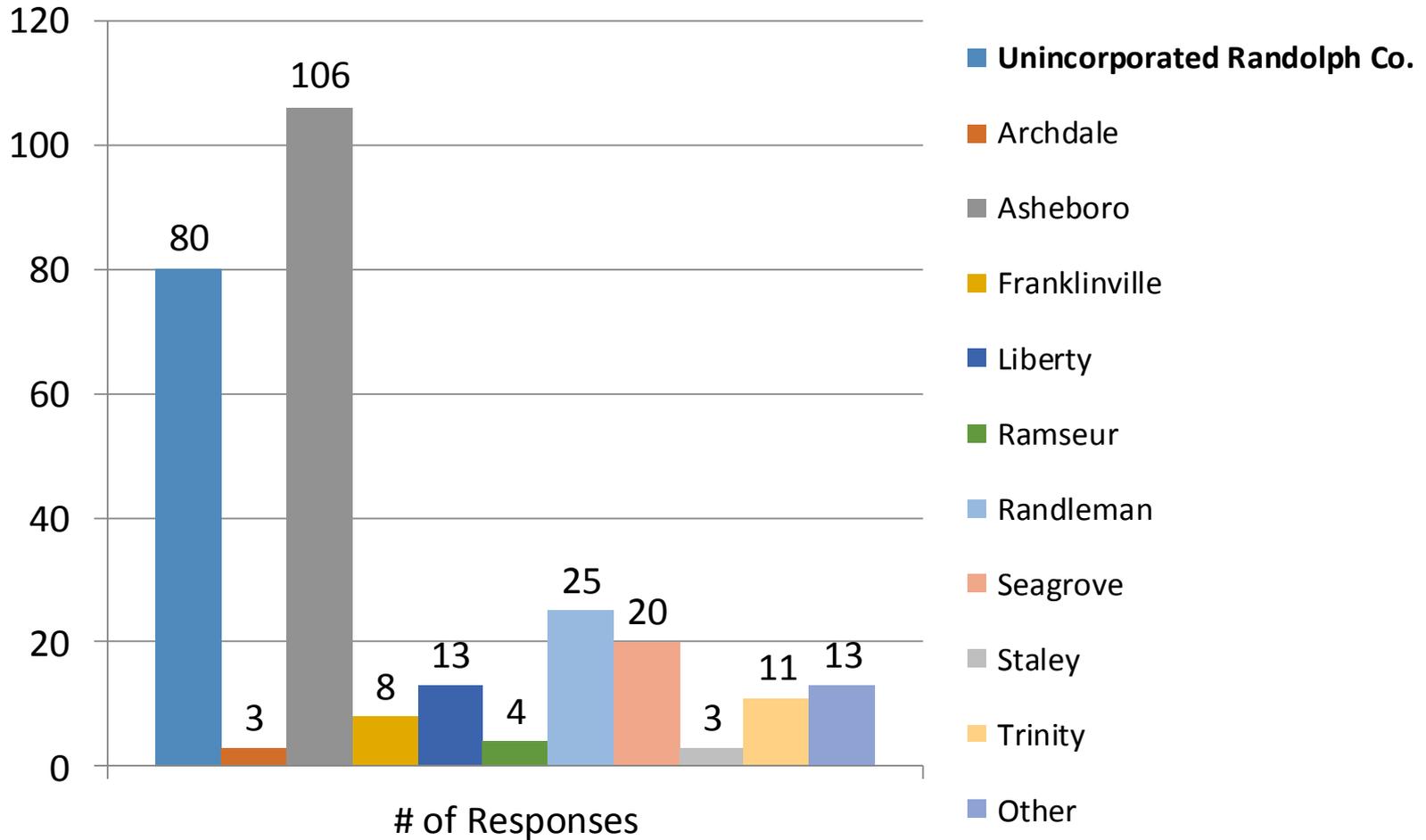
Public Participation Survey

- Provides an opportunity for the public to share opinions and participate in the planning process
- Link to survey posted on county website
- 286 completed surveys received

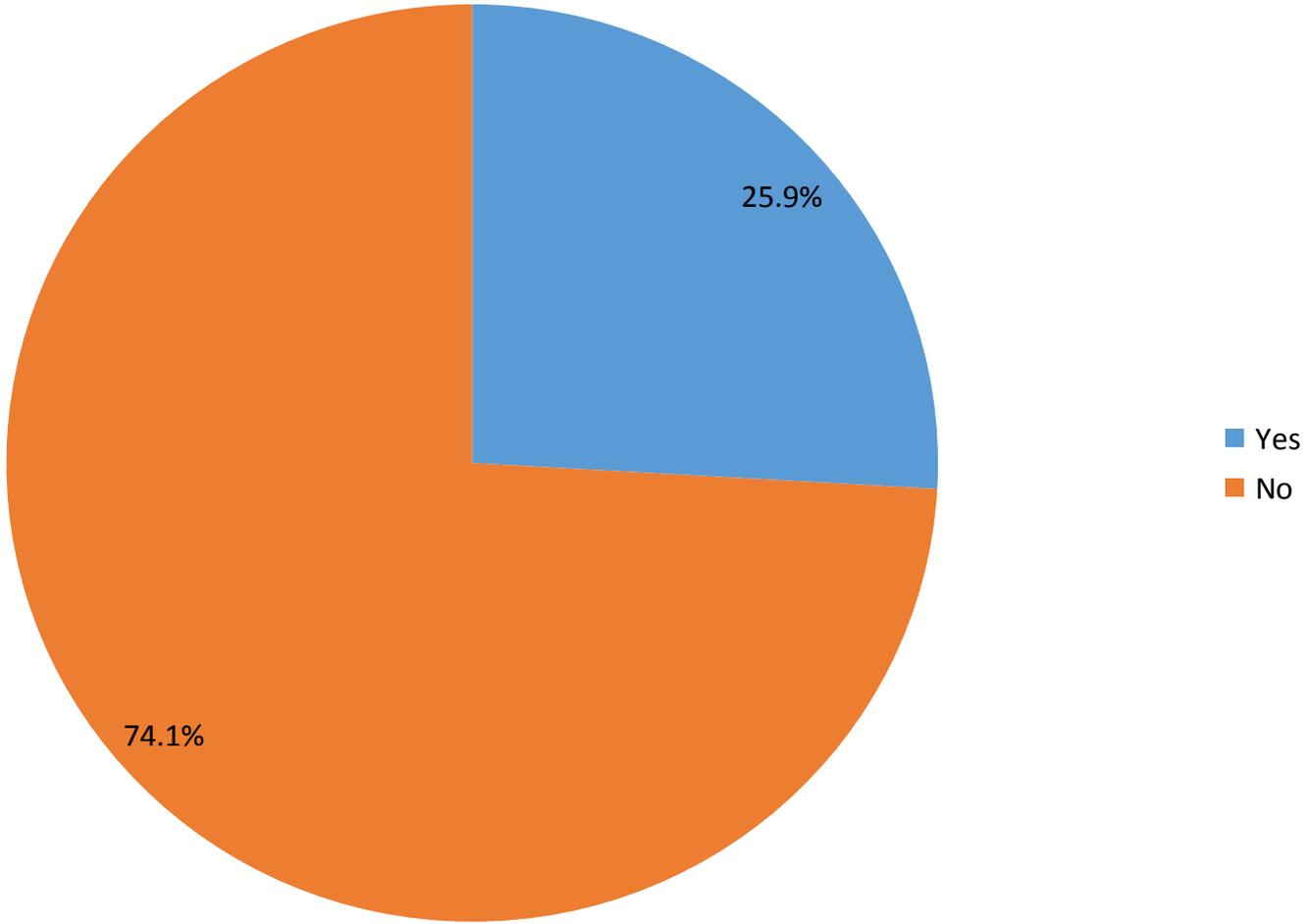
Public Participation Survey Highlights

- 78% of respondents are interested in making their homes more resistant to hazards
- 22% have already taken action to make their homes more hazard resistant
- 72% do not know who to contact regarding risk reduction

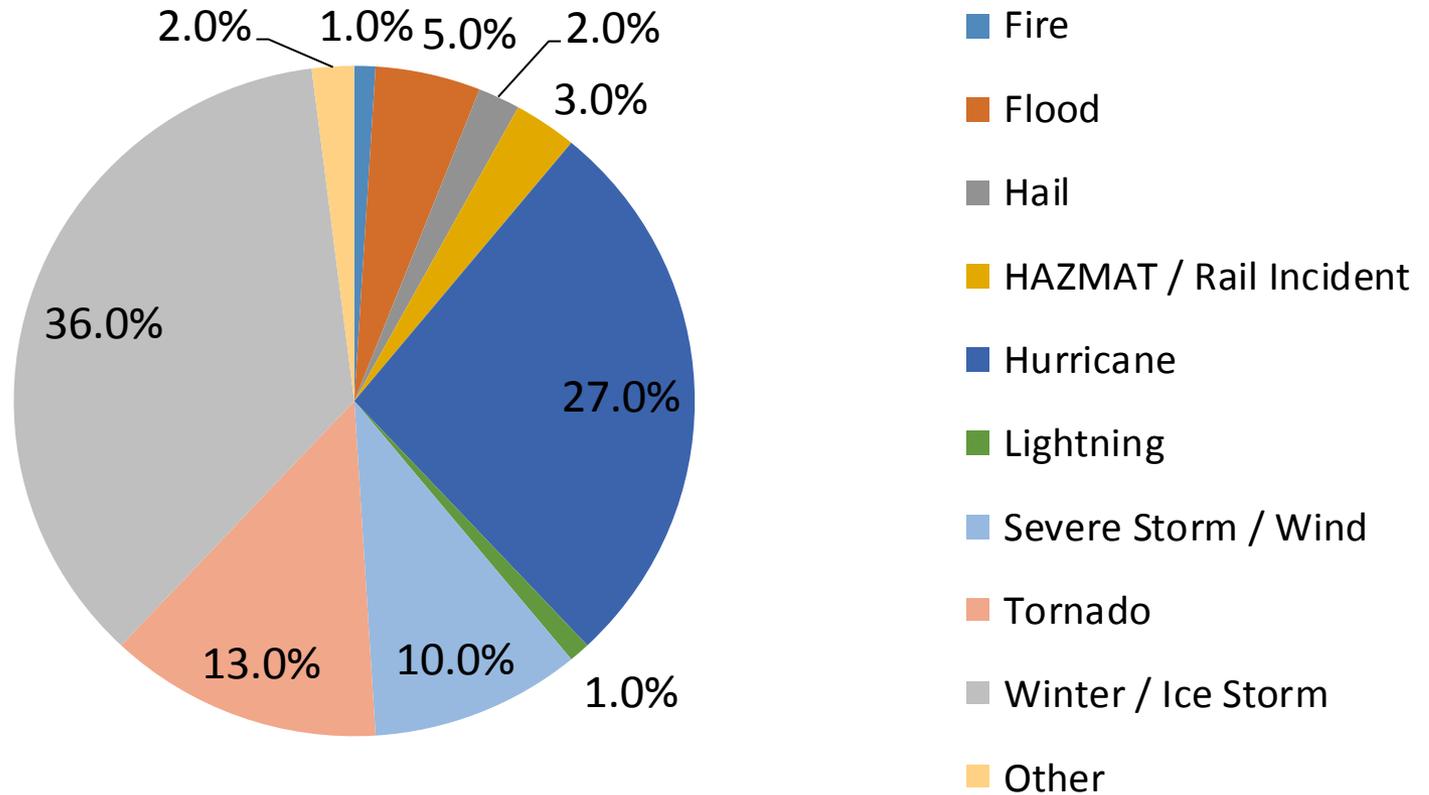
1. Where do you live?



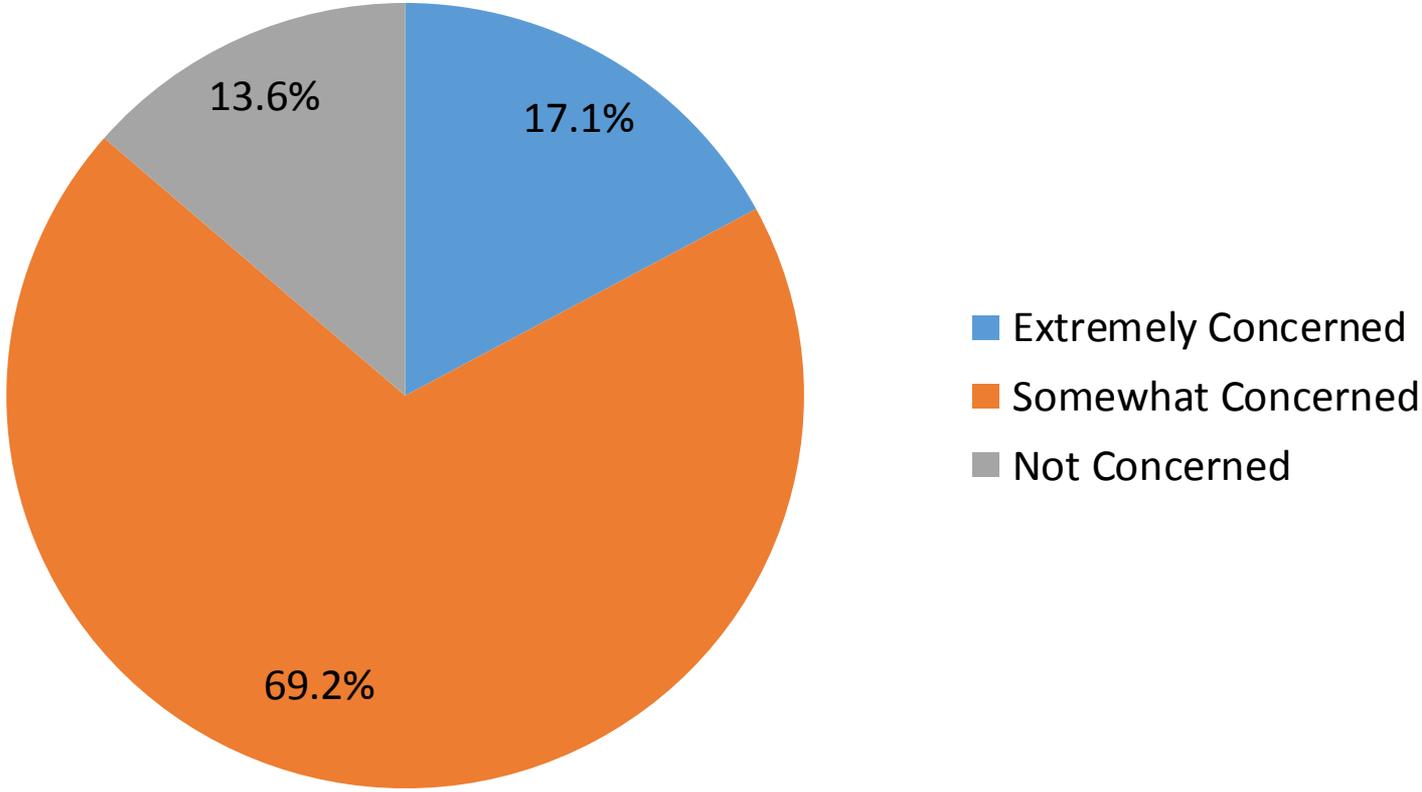
2. Have you experienced a disaster?



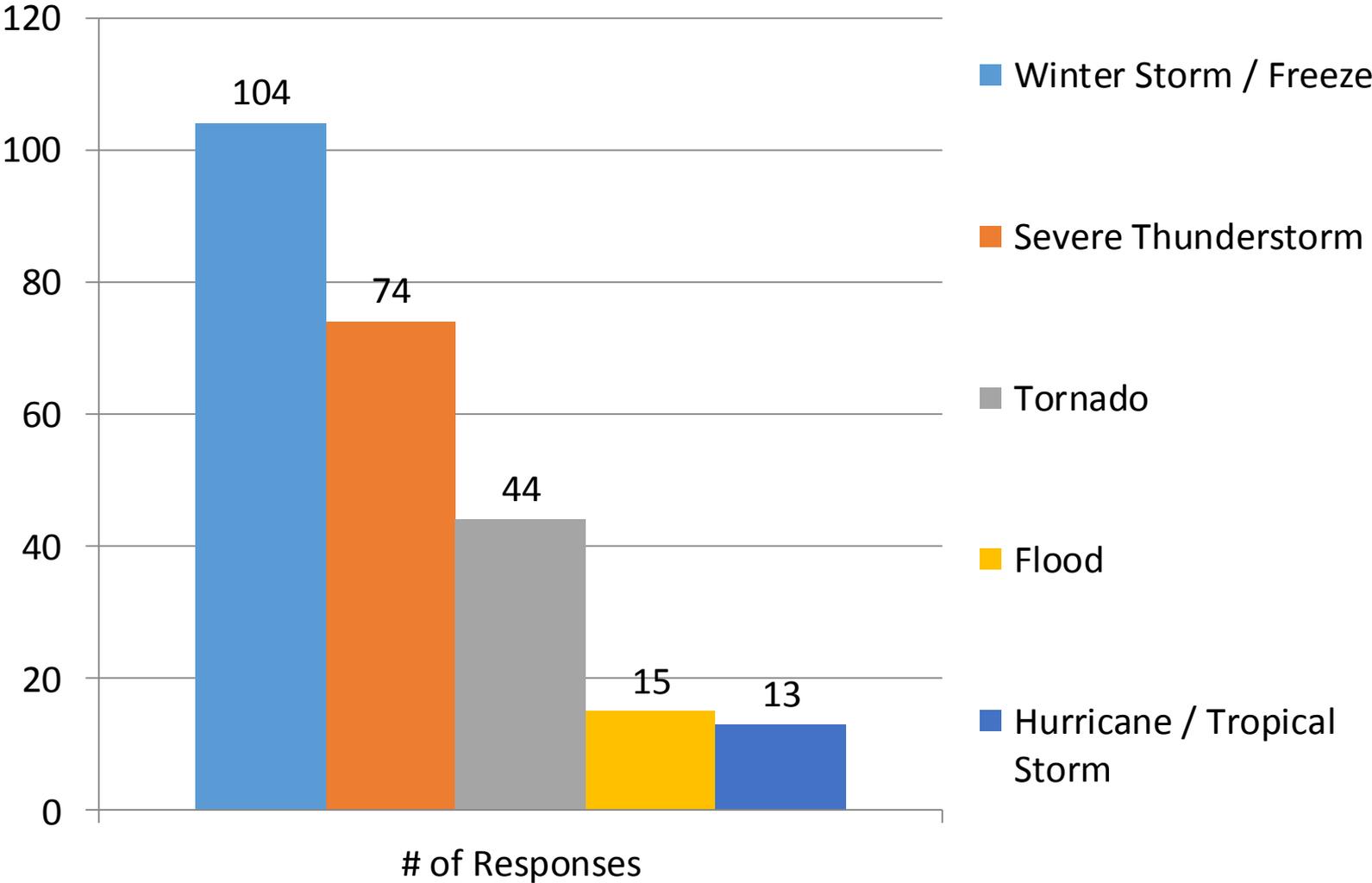
2. Examples of disasters experienced



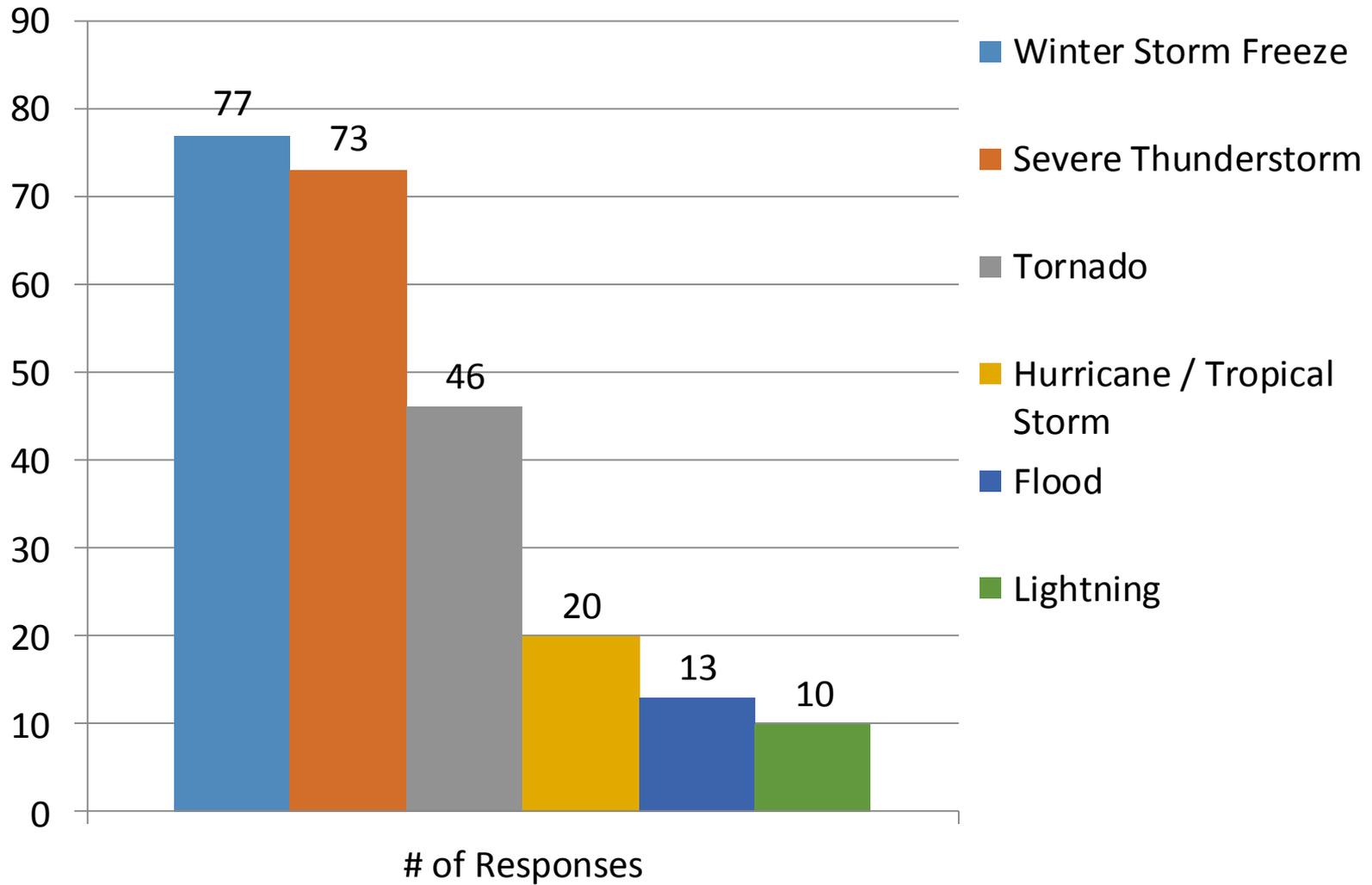
3. How concerned about possibility of disaster?



4. Highest hazard threat?



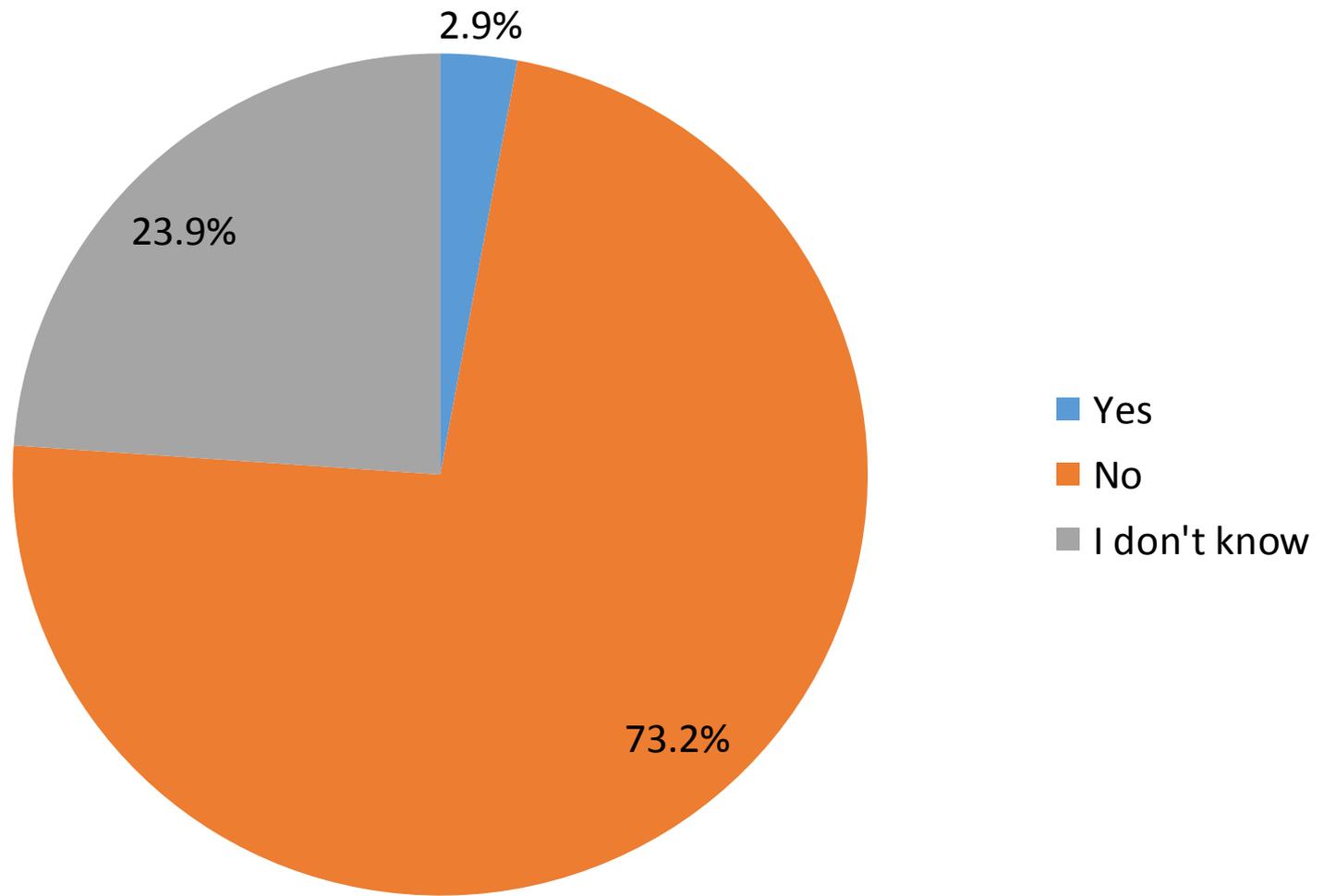
5. Second highest hazard threat?



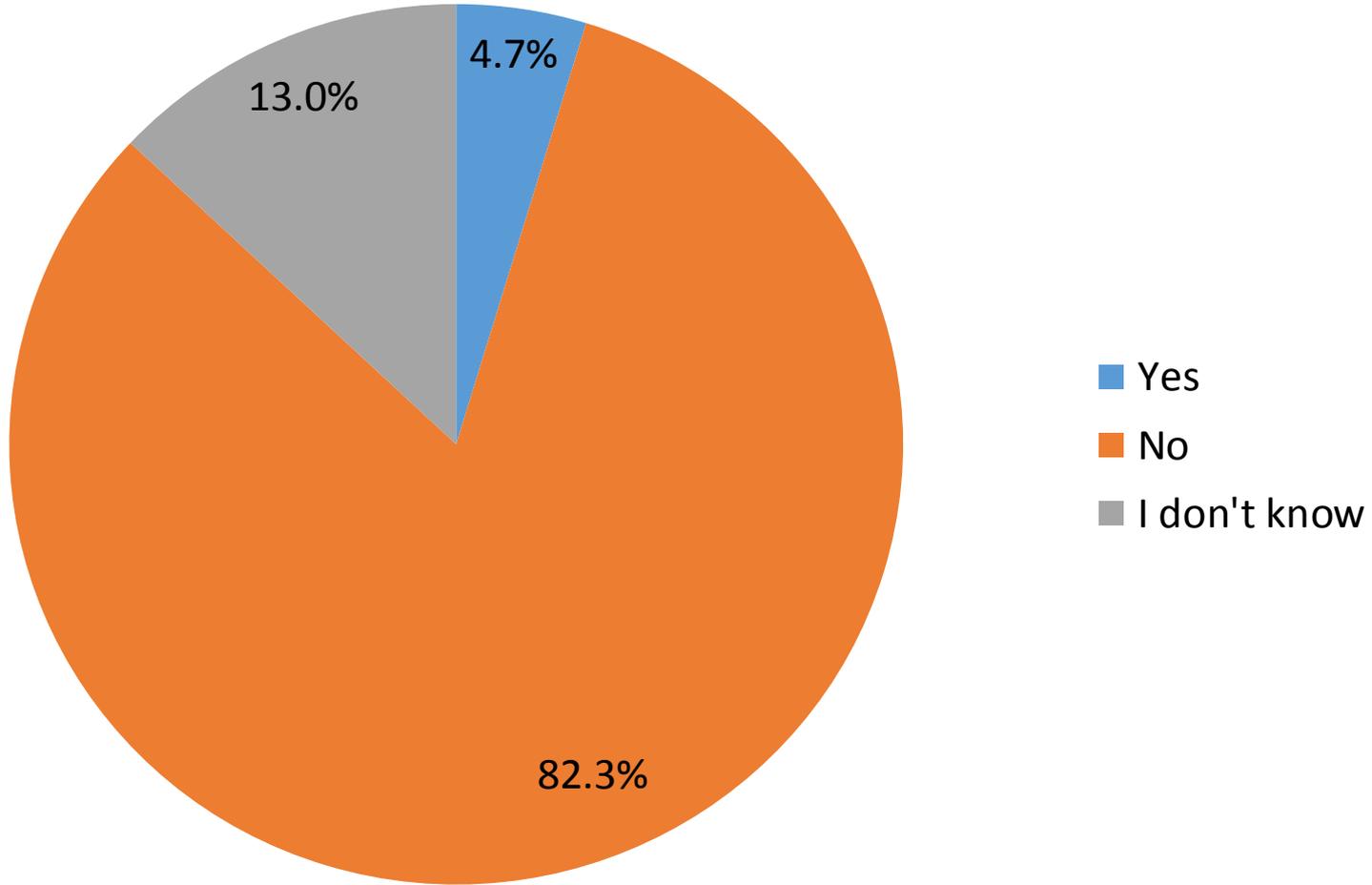
6. Other hazards not listed?

- High winds
- HAZMAT incident / chemical spill
- Terrorism
- Nuclear incident
- Electromagnetic pulse (EMP)
- Tree damage

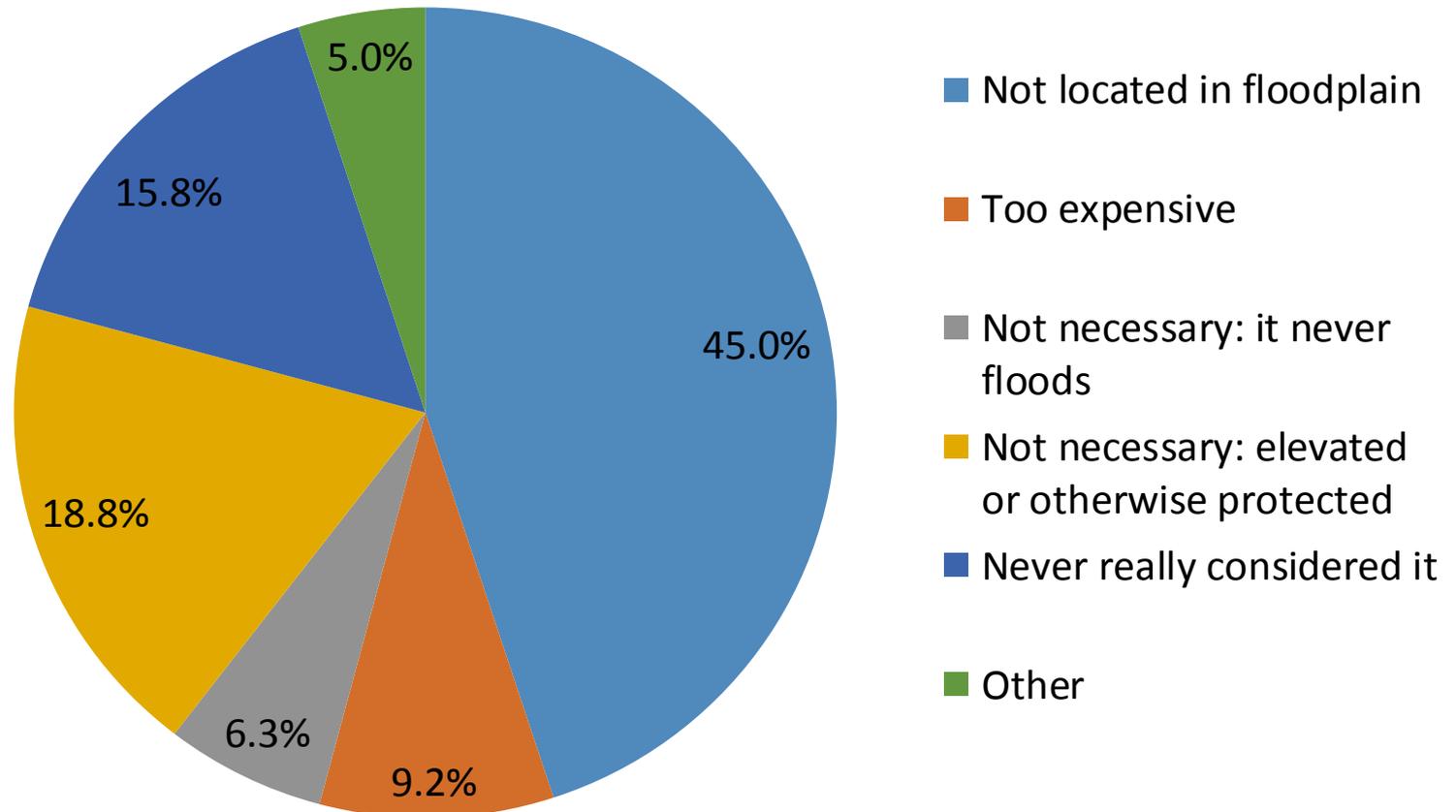
7. Is your home in a floodplain?



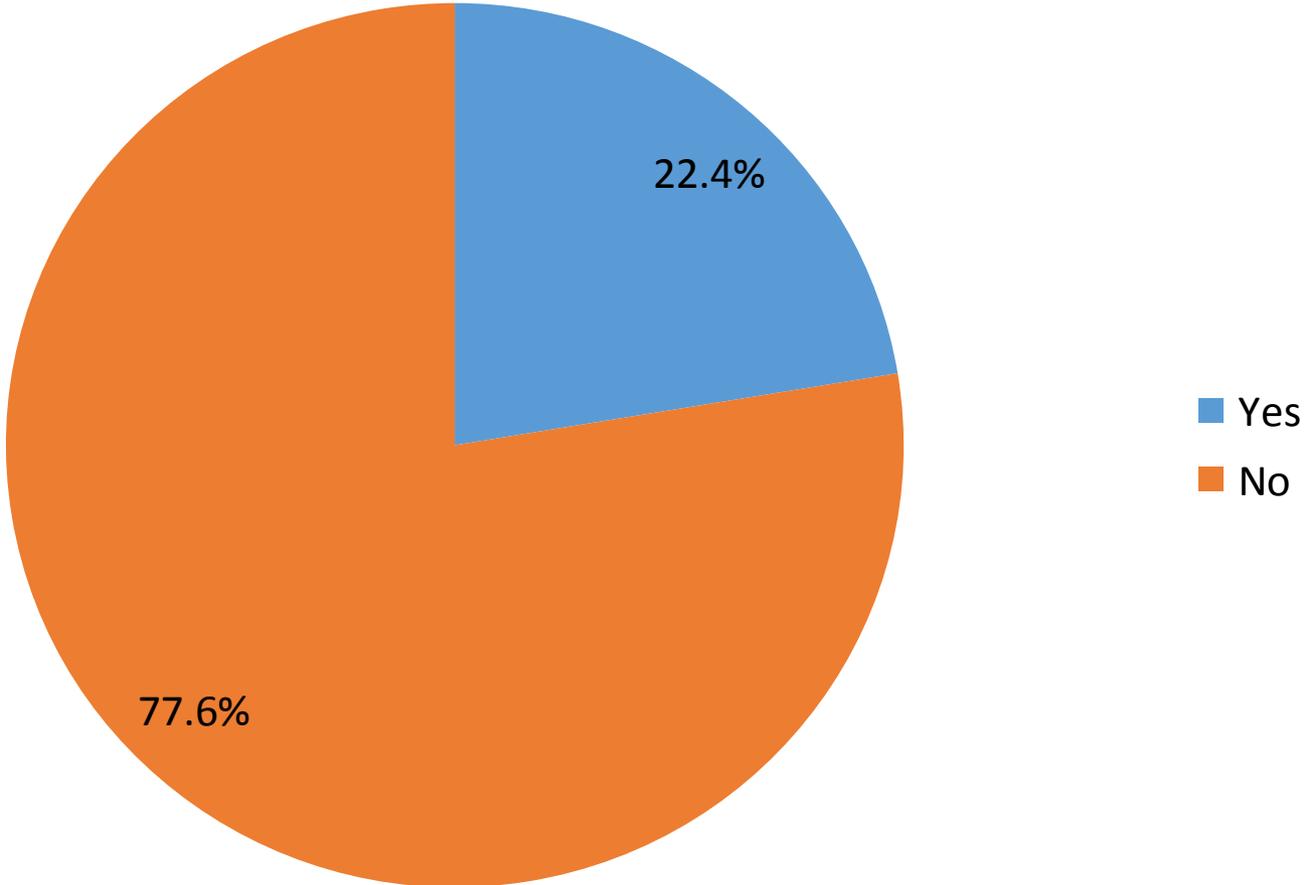
8. Do you have flood insurance?



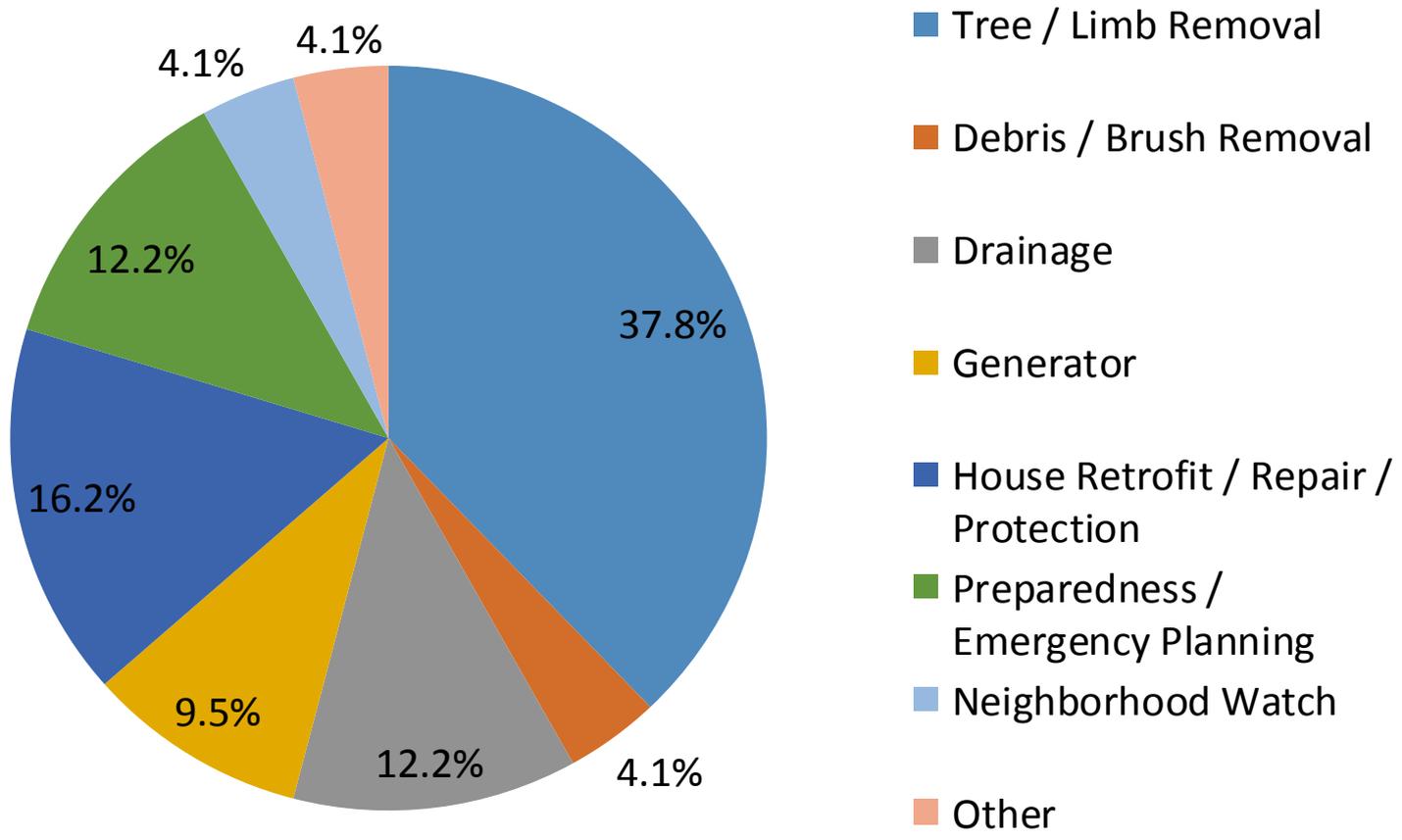
8. Why no flood insurance?



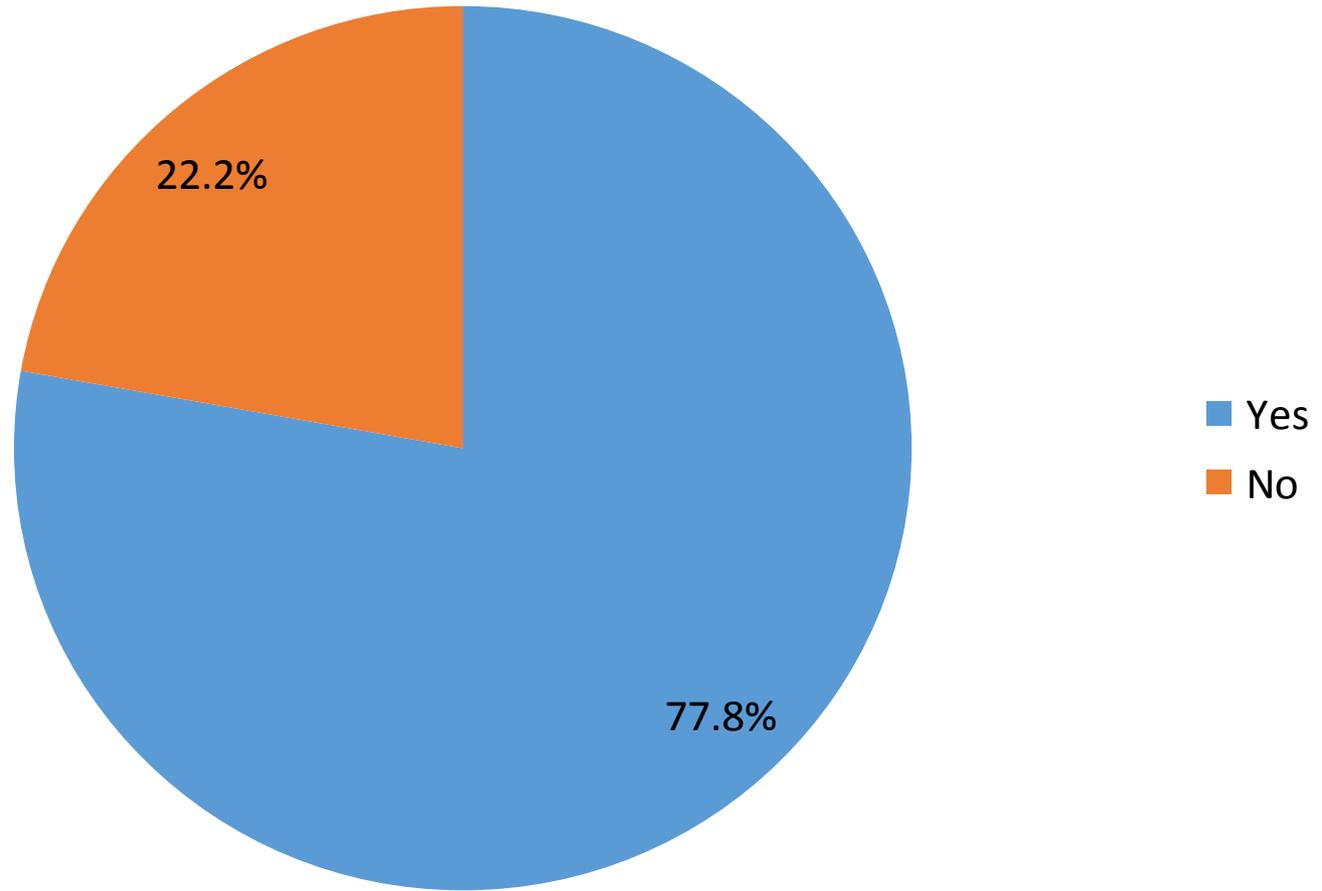
9. Taken action to be more hazard resistant?



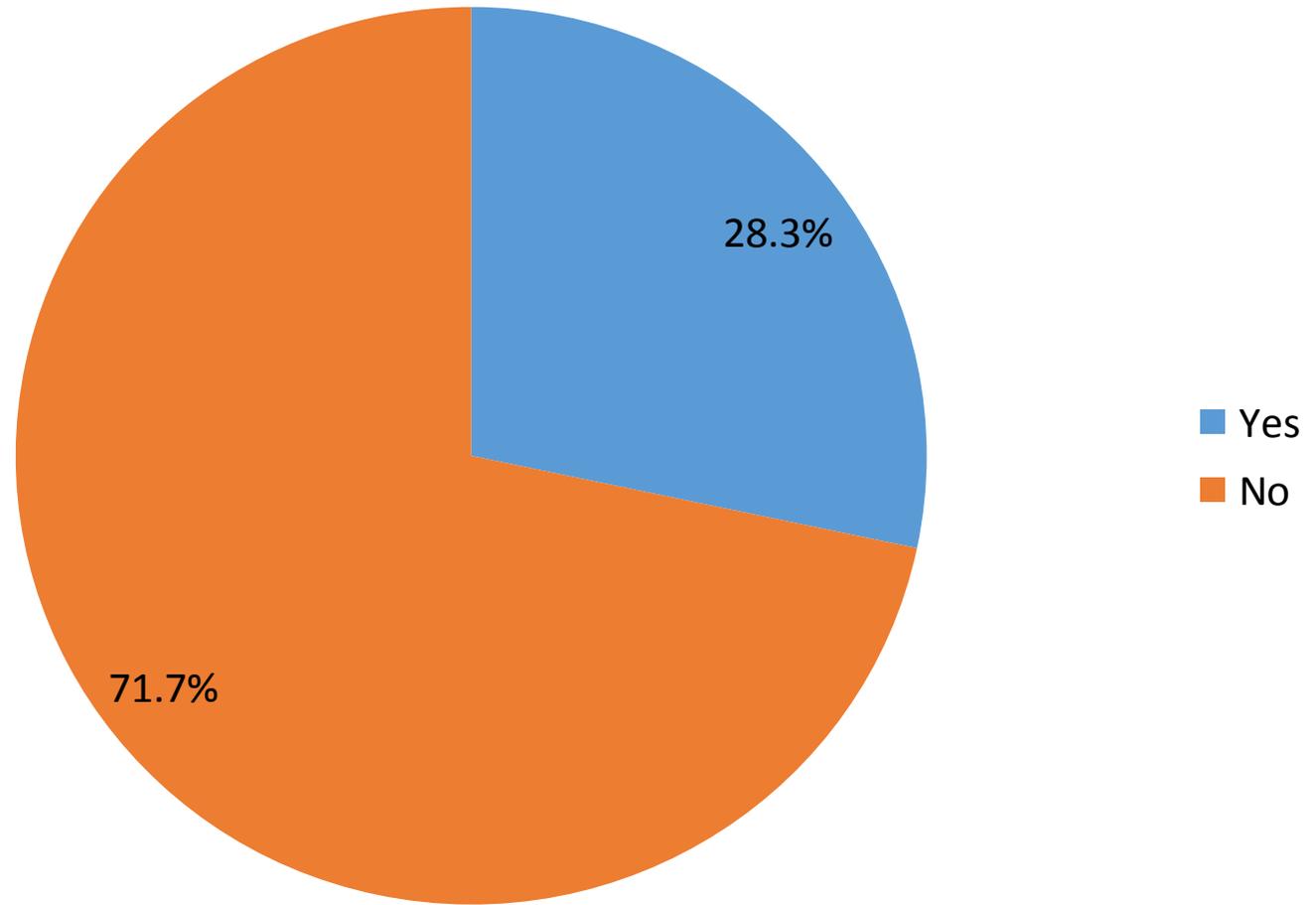
9. Examples of actions taken



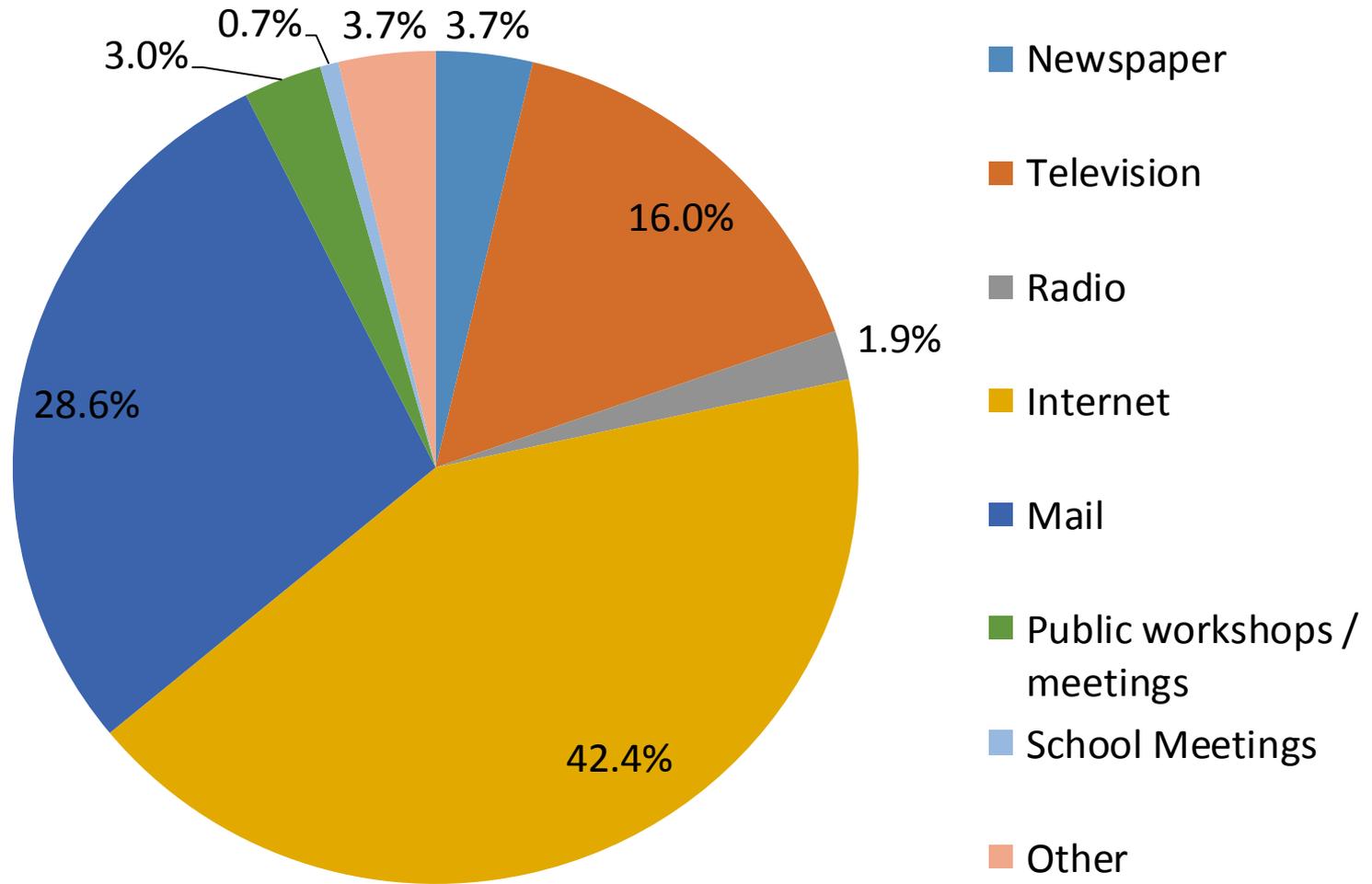
10. Interested in being more hazard resistant?



11. Know who to contact for reducing risks?



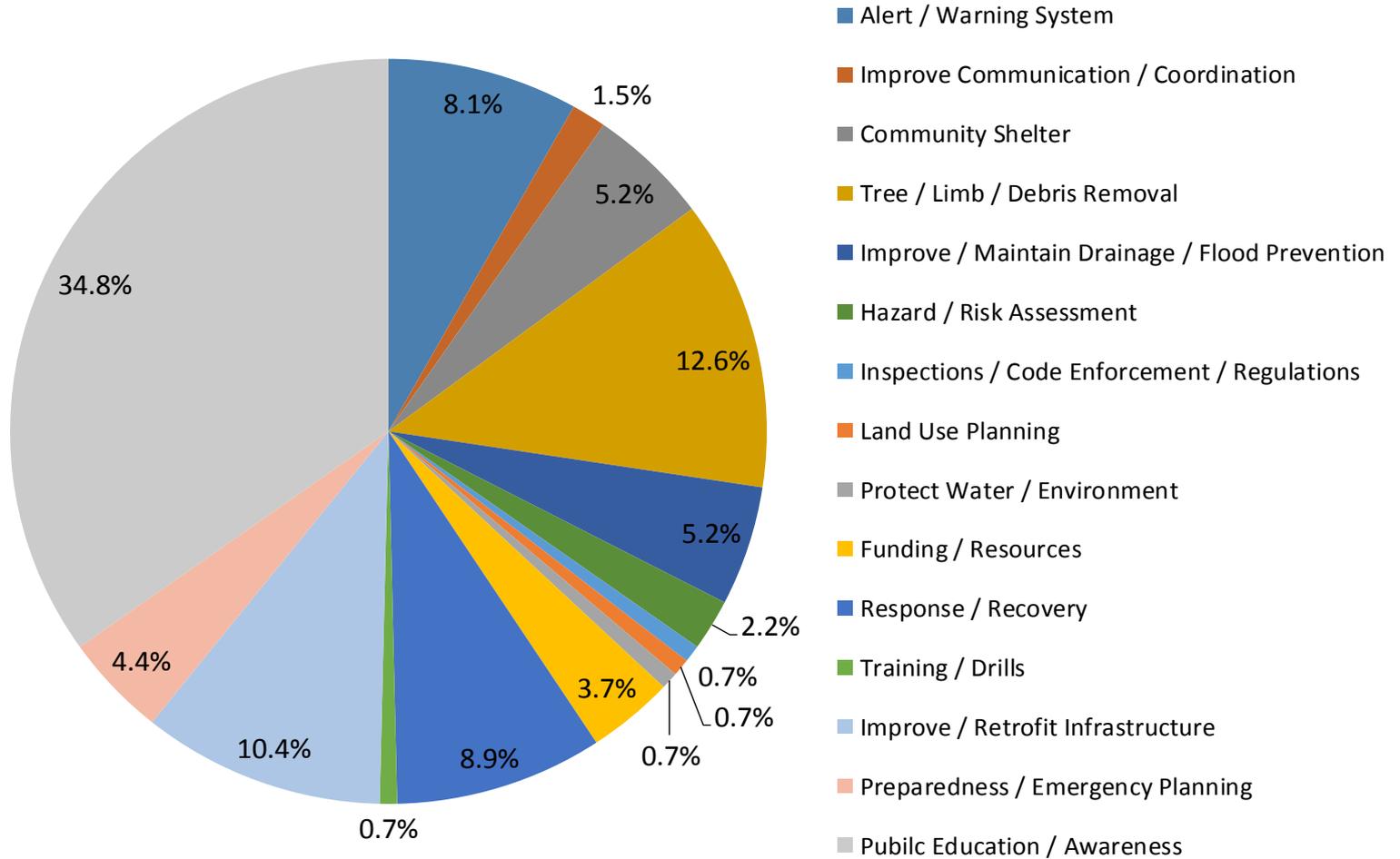
12. Most effective way to receive information?



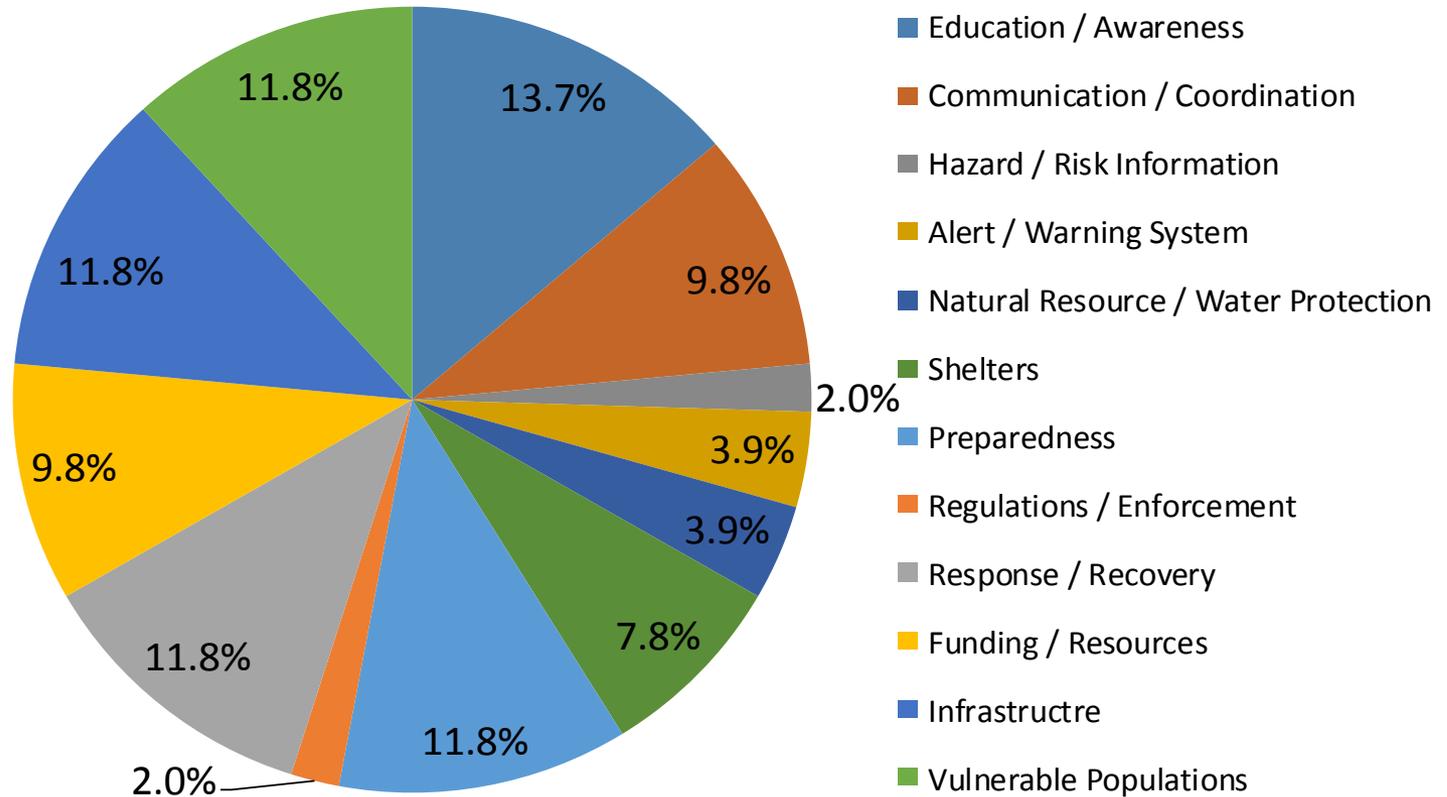
12. Other ways to receive information

- Email
- Social media
- Printed guide
- Work
- Text message

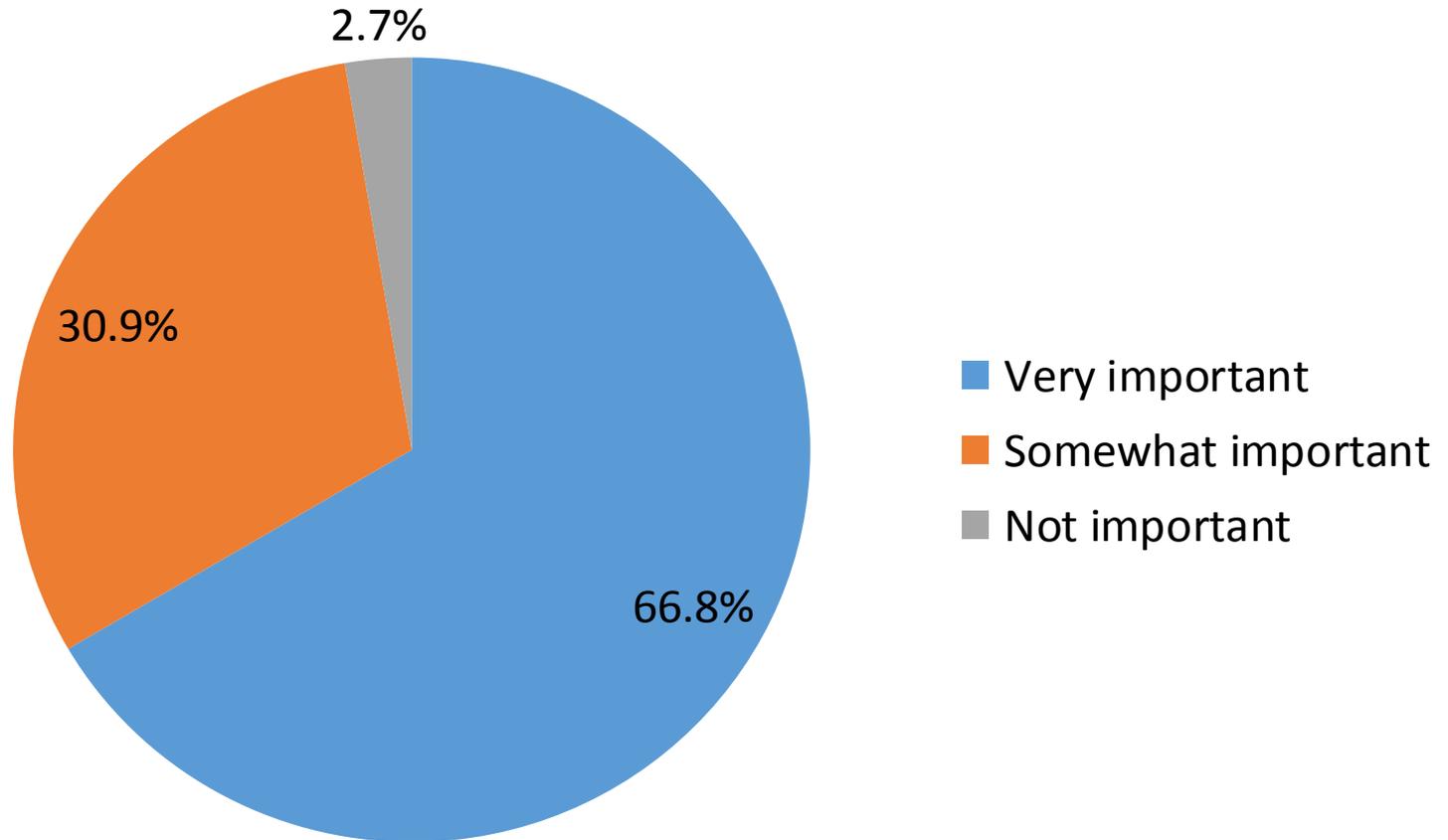
13. Steps local gov't could take to reduce risk



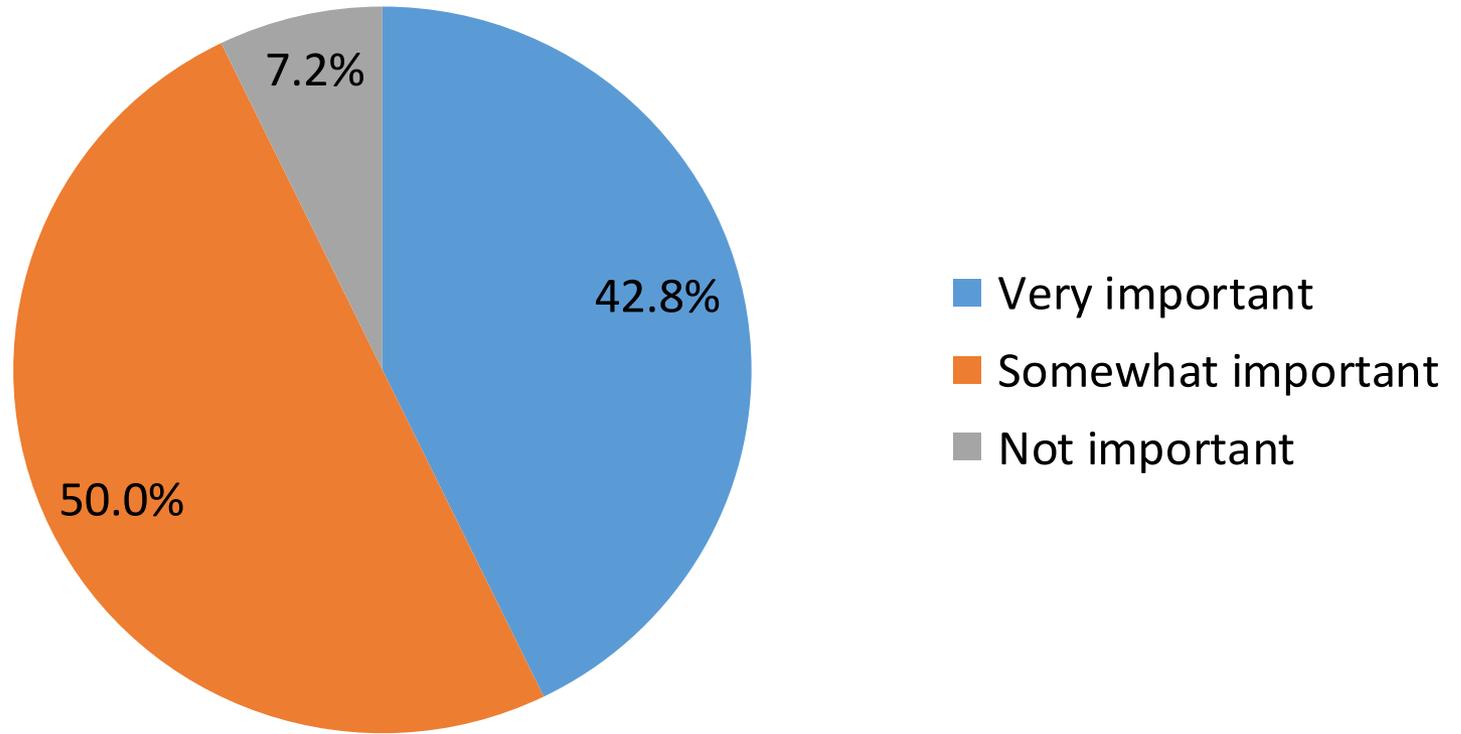
14. Other issues regarding risk and loss



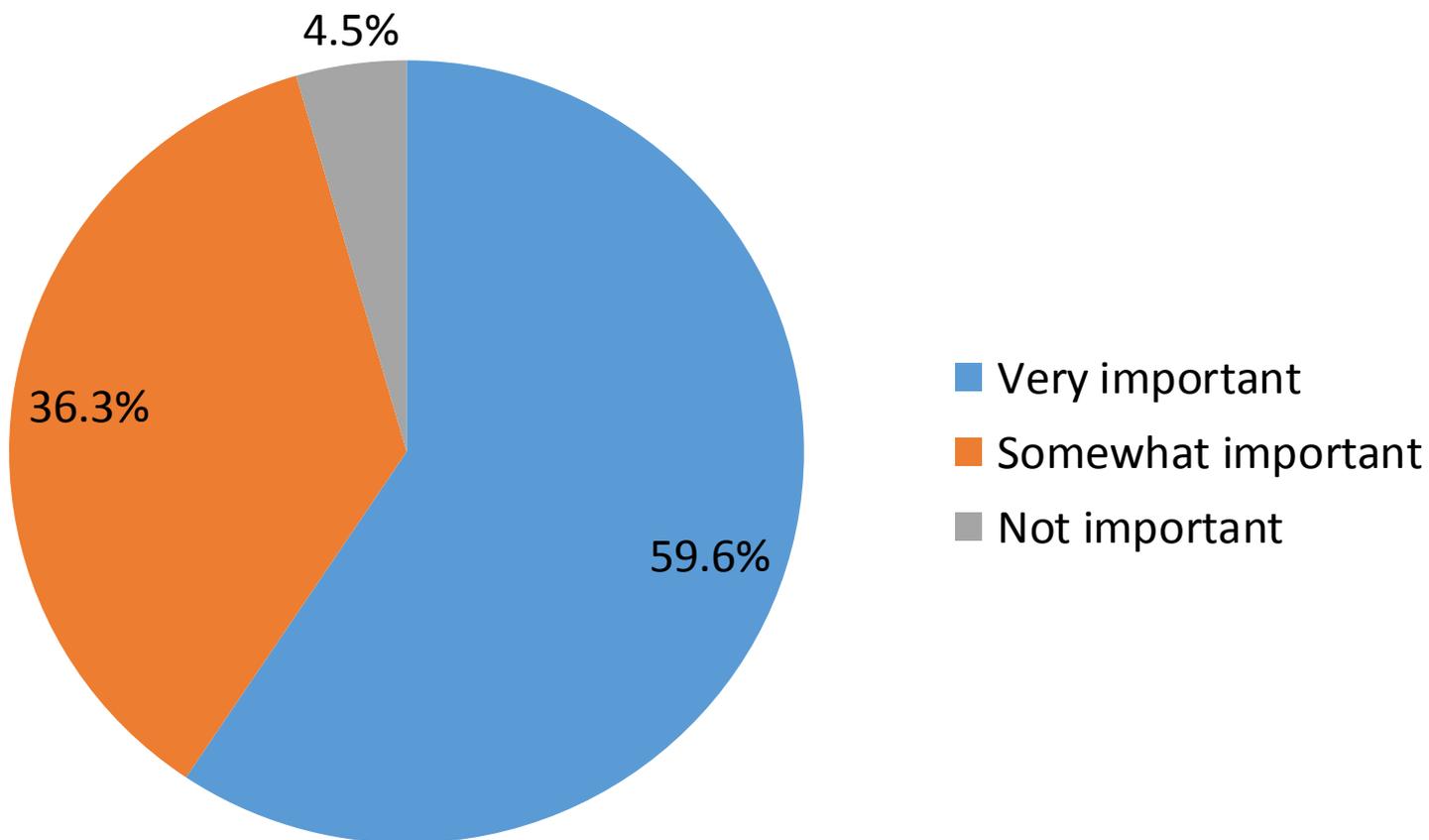
15. Mitigation Actions: Prevention



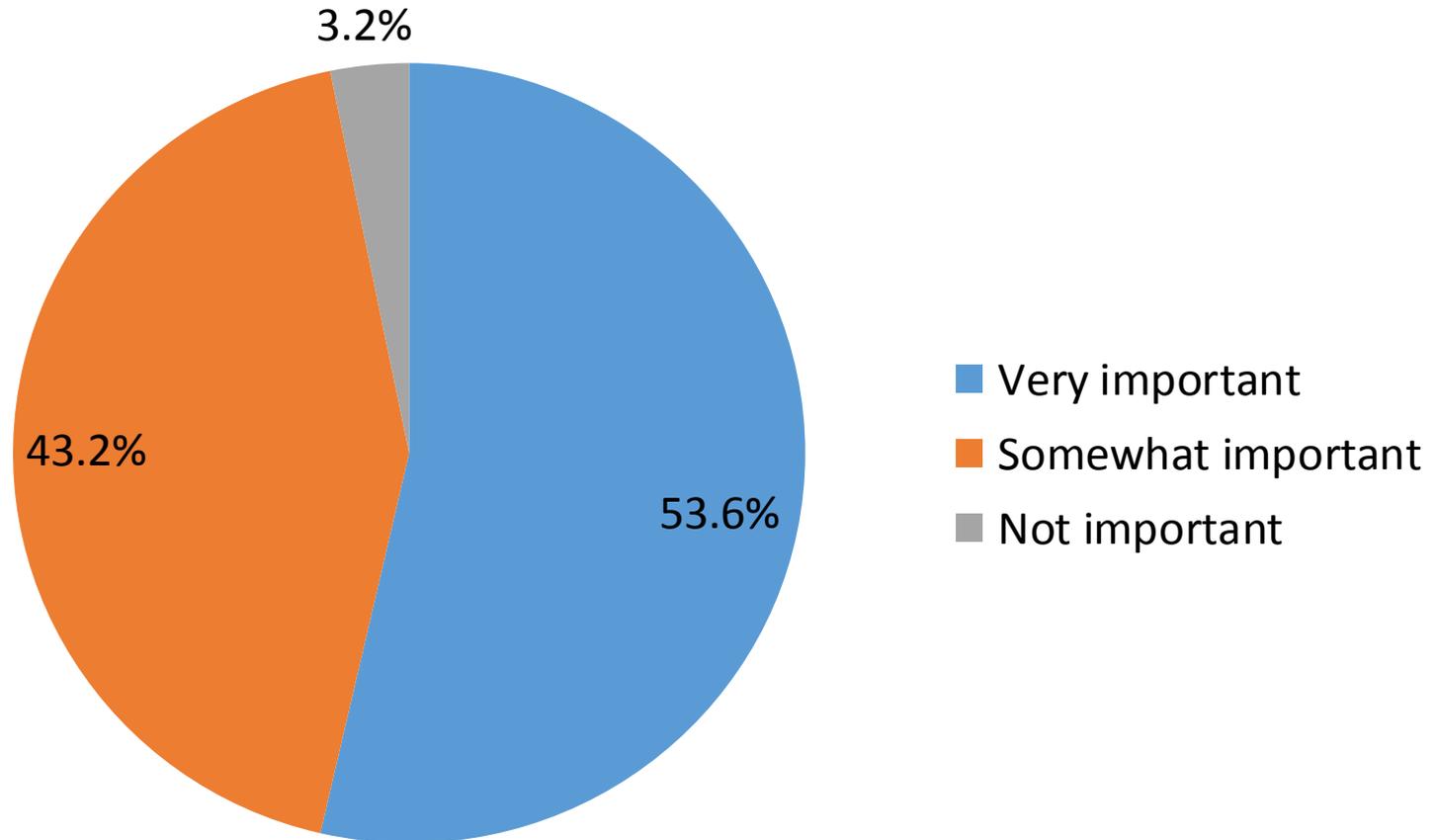
15. Mitigation Actions: Property Protection



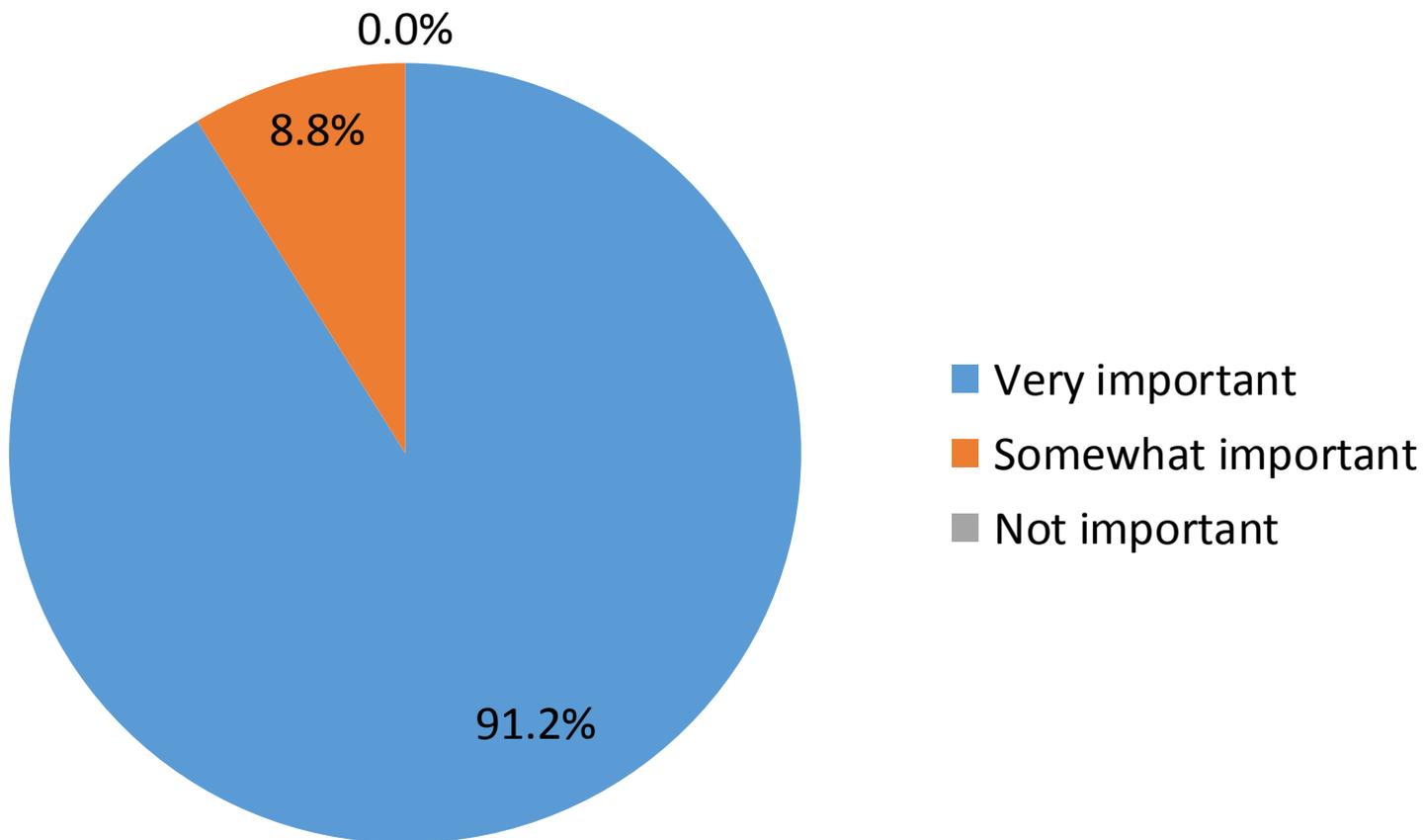
15. Mitigation Actions: Natural Resource Protection



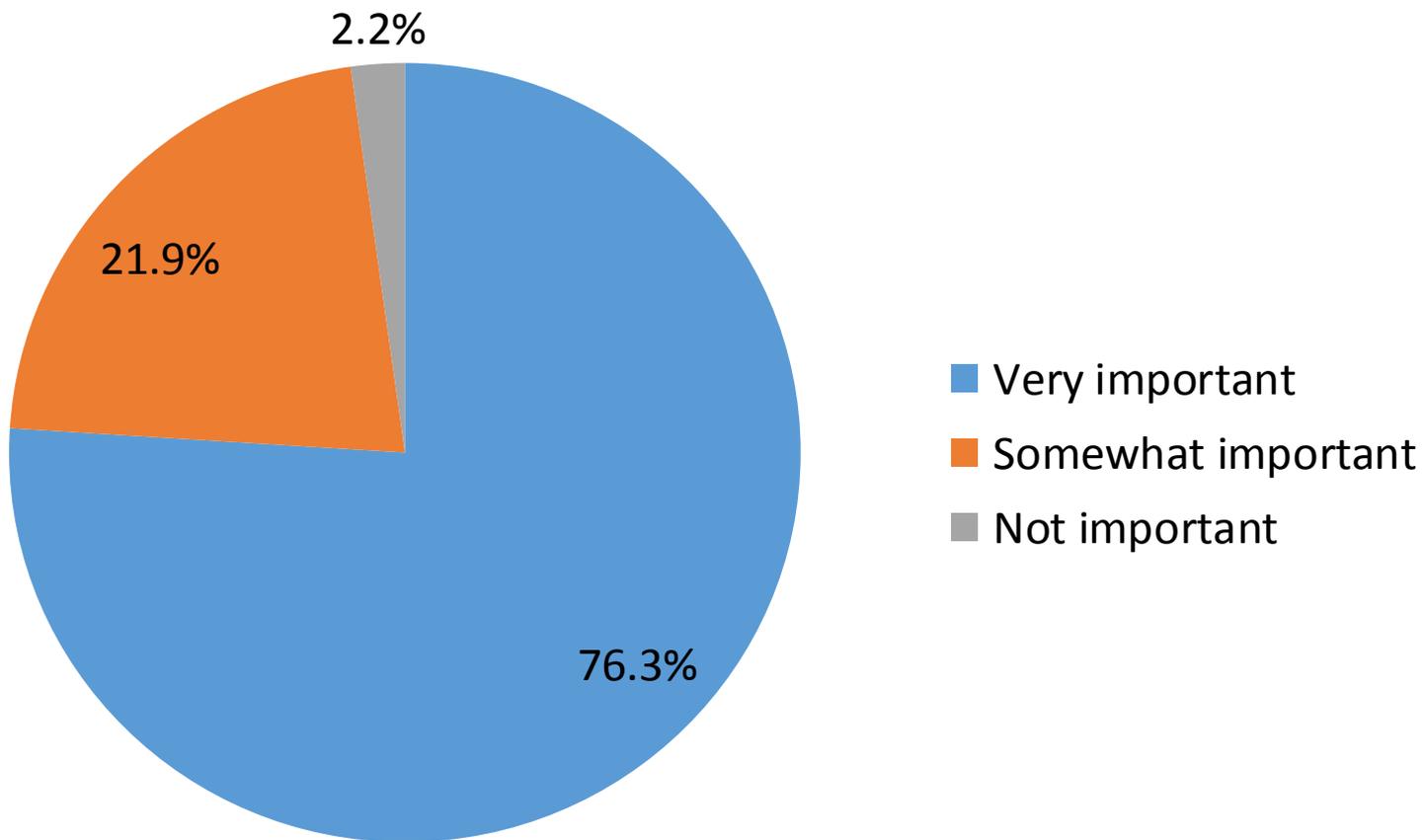
15. Mitigation Actions: Structural Projects



15. Mitigation Actions: Emergency Services



15. Mitigation Actions: Public Education & Awareness



15. Mitigation Actions – Summary

- Highest importance
 - Emergency Services
 - Public Education & Awareness
- Moderate importance
 - Prevention
 - Natural Resource Protection
- Lowest importance
 - Structural Projects
 - Property Protection

Randolph County Hazard Mitigation Plan

Public Participation Survey Results



August 2015 Storm Event in Randolph County
Photo Source: WNCT

 **Randolph County Hazard Mitigation Plan Draft**

To 'Zach Smith'; Alton.Hanes@DavidsonCountyNC.gov; janet.scott@chathamnc.org; Brooks, Scot (sbrooks@moorecountync.gov); 'corey.roberts@montgomerycountync.com'

Cc 'jared.byrd@randolphcountync.gov'

All,

One of FEMA's requests regarding the development of Hazard Mitigation Plans is that communities that develop a plan give an explicit opportunity to neighboring communities to provide comments/feedback during the drafting stage of the plan. As such, we are interested in any comments/feedback you would like to provide on the Randolph County Multi-Jurisdictional Hazard Mitigation Plan Draft, which can be downloaded at the link below.

<https://atkins.box.com/s/qi40yer9zfrh483v695bp6vqqbuupqt2>

Any comments we receive will be much appreciated and will be brought up for discussion with the members of the Randolph County Hazard Mitigation Planning Team. If you have any questions or concerns, please feel free to direct them to myself or Jared Byrd with Randolph County (cc'd on this email).

Thanks very much for your time!

Ryan Wiedenman, AICP, CFM
Sr. Planner, Land Planning

ATKINS

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