UNIVERSITY OF GEORGIA

PRE-DISASTER HAZARD MITIGATION PLAN

2018 Update

Emergency Preparedness
UNIVERSITY OF GEORGIA

University of Georgia
Pre-Disaster Hazard Mitigation Plan
2018 Update

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Preface

Mitigation Vision for the Future

Emergency Managers succeed and fail by how well they follow the following fundamental principles of emergency management, mitigation, preparedness, response and recovery. Purposefully, our emergency management forefathers put the word mitigation first as a "means" to prevent or minimize the effects of disasters.

Mitigation is commonly defined as sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects. Hazard mitigation focuses attention and resources on community policies and actions that will produce successive benefits over time. A mitigation plan states the aspirations and specific courses of action that a community intends to follow to reduce vulnerability and exposure to future hazard events. These plans are formulated through a systematic process centered on the participation of citizens, businesses, public officials, and other community stakeholders.

Mitigation forms, or should form, the very foundation of every emergency management agency. For the prevention of disasters in communities, emergency management agencies that adopt mitigation practices in an effort to reduce, minimize, or eliminate hazards in their community have found, the vision for the future of emergency management. The Federal Disaster Mitigation Act of 2000 has set the benchmark and outlines the criteria for communities with the vision to implement hazard mitigation practices in their communities.

The University of Georgia realizes the benefits achieved by the development and implementation of mitigation plans and strategies in our community. University of Georgia's officials, public safety departments, planners, and many others have proven that by working together towards the development and implementation of this plan, have the vision to implement mitigation practices therefore reducing the loss of life and property in their community.

The areas covered by this plan include:

University of Georgia main campus in Athens, GA

Table of Contents

Chapter One - Introduction

Summary of Updates for Chapter One

The following table provides a description of each section of this chapter, and a summary of the changes that have been made to the University of Georgia Pre-Disaster Hazard Mitigation Plan 2013 Version.

Chapter 1 Section	Update
Introduction	• Identification of Mitigation Goals
Scope	• New Section – Not in 2012 Mitigation Plan
Purpose	• Updated from 2012 Mitigation plan
Consistency with Federal Guidelines	• New Section – Not in 2012 Mitigation Plan
Plan Review	• New Section – Not in 2012 Mitigation Plan
Hazard Mitigation Plan Update Committee	• Updated committee list to match the 2017-2018 planning participants
Multi-Jurisdictional Considerations	• Updated with requirement descriptions
Incorporation of Existing Plans, Studies, and Resources	• New Section – Not in 2012 Mitigation Plan

Introduction

The University of Georgia Hazard Mitigation Plan Update is the first phase of a multi-hazard mitigation strategy for the entire community. This Plan encourages cooperation among various organizations and crosses political sub-divisions. As written, this Plan fulfills the requirements of the Federal Disaster Mitigation Act of 2000. The Federal Disaster Mitigation Act of 2000 provides federal assistance to state and local emergency management agencies and other disaster response organizations in an effort to reduce damage from disasters. The Act is administered by the Georgia Emergency Management Agency (GEMA) and the Federal Emergency Management Agency (FEMA).

It is important that State and local government, public-private partnerships, and community citizens can see the results of these mitigation efforts; therefore, the goals and strategies need to be achievable. The University of Georgia Pre-Disaster Hazard Mitigation Plan Update Committee identified the following goals during plan development:

GOAL 1 Protect the public health and safety

GOAL 2 Reduce and eliminate (to the extent possible) community exposure to natural and manmade hazard events

GOAL 3 Reduce loss and damage to private property and public infrastructure resulting from natural or manmade hazards

GOAL 4 Maintain continuity of public and private sector operations during and after hazard events

GOAL 5 Respond promptly, appropriately, and efficiently in the event of natural or manmade hazards

Scope

The scope of the University of Georgia Pre-Disaster Hazard Mitigation Plan Update encompasses all areas of the University of Georgia. The Plan identifies all natural and technological hazards that could threaten life and property at the University of Georgia. The scope of this Plan includes both short and long-term mitigation strategies with implementation and possible sources of project funding.

The Hazard Mitigation Plan Update is organized to incorporate the requirements of Interim Final Rule 44 CFR 201.4.

Chapter One includes an overview of the Hazard Mitigation Plan Update, the overall goals of the plan, and details of the planning process as required by Interim Final Rule 44 CFR 201.4(c)(1).

Chapter Two of the Plan details the University of Georgia profile, including the demographics and history of the University of Georgia.

Chapter Three identifies the risk assessment process, past natural hazard events with associated losses, and current natural hazard risks. Potential losses are also analyzed as required by Interim Final Rule 44 CFFR 201.4(c) (2). Additionally, Chapter Three identifies and analyzes potential technological hazards faced by the University of Georgia.

Chapter Four identifies the University of Georgia's hazard mitigation goals and objectives, mitigation strategies and actions, and sources of potential funding for mitigation projects as required by Interim Final Rule 44 CFR 201.4(c)(3).

Chapter Five identifies the plan maintenance and implementation strategies. The process for evaluation of the hazard mitigation plan implementation progress is also detailed as required by Interim Final Rule 44 CFR 201.4(c) (4) and (5).

Purpose

The Disaster Mitigation Act of 2000 was signed into law on October 10, 2000 and allowed for states and local governments to develop comprehensive and enhanced mitigation plans. These plans are intended to help reduce disaster losses and, if one occurs, streamline the recovery process. The plan's functional purpose is to reduce disruption of services, property damage, and loss of lives from hazardous events.

The Disaster Resistant University (DRU) project is a planning initiative where universities develop a hazard mitigation plan like cities, counties, and states with a mission to promote campus disaster planning, mitigation, response, and recovery. In the last decade, disasters have affected university and college campuses with disturbing frequency, sometimes causing death and injury, but always imposing monetary losses and disruption of the institution's teaching, research, and public service. Damage to buildings and infrastructure and interruption to the institutional mission can result in significant losses that can be measured by faculty and student departures, decreases in research funding, and increases in insurance premiums. These losses could have been substantially reduced or eliminated through comprehensive pre-disaster planning and mitigation actions. Hazard mitigation is accepted as good practice and many government jurisdictions now require it. Higher education institutions have an interest on many levels to become more disaster-resistant. Administrators, faculty, and staff are realizing that improving their campus' resistance to disaster will not only protect their own lives and those of their students, it will also safeguard the campus' instruction, research, and public service.

The University of Georgia (UGA) is strongly committed to protecting its population of more than 47,000 faculty, staff, students, and visitors on a daily basis. With more than 465 buildings on the main campus nestled in the center of Athens, Georgia (see Appendix A) and 40 buildings on the UGA Health Sciences Campus (HSC), formally the Navy Supply Corps School (see Appendix G), UGA continually strives to maintain strong ties within the Athens-Clarke County community. Furthermore, UGA is susceptible and vulnerable to many potential natural and technological hazards, which requires the need to mitigate these potential losses before they occur. This plan, which is included in the 2018-2023 Athens-Clarke County Hazard Mitigation Plan Update (Athens-Clarke County HMPU) as Appendix I, follows the objectives and mirrors the mission of the Athens-Clarke County HMPU in that:

> "To make the faculty, staff, students, and visitors at the University of Georgia less vulnerable to the effects of natural hazards through the effective study of hazard mitigation, hazard risk assessments, wise floodplain management, and a coordinated approach to mitigation policy through state, regional, and local planning activities."

Preparation of the University of Georgia Pre-Disaster Hazard Mitigation Plan (UGA PDM Plan) is uniquely consistent with the UGA Office of Emergency Preparedness' mission:

> "To provide a comprehensive security and emergency management program for the University of Georgia in order to save lives, protect property, promote continuity of operations, and reduce the overall effects of large-scale disasters."

The two mission statements listed above, collectively, provide a basis for preparing a UGA PDM Plan. The completed UGA PDM Plan will aid the UGA Office of Emergency Preparedness in accomplishing its mission on behalf of the University of Georgia community as well as assist the Athens-Clarke County Government and emergency officials in their efforts to promote a community-wide "all hazards" emergency planning concept.

Documents included in the following appendices provide additional reference information related to the threats addressed in the UGA PDM Plan.

- Appendix A University of Georgia Main Campus Map
- Appendix B University of Georgia Inventory of Assets
- Appendix C University of Georgia Tornado Siren Map
- Appendix D Photos of the Trail Creek Flood
- Appendix E University of Georgia Campus Housing Map
- Appendix F UGA Presidential Proclamation
- Appendix G UGA Health Sciences Campus Map

Plan Review

Requirement §201.6(c) (1)

The contracted planner, Lux Mitigation and Planning, had the primary responsibility for collecting updated information and presenting data to the committee. The approved 2013 PDM Plan was provided to each member of the Pre-Disaster Hazard Mitigation Plan Update Committee. Each chapter was reviewed with updated hazard, risk and vulnerability data; updated critical infrastructure information; and revised mitigation strategies based upon whether the strategy was completed, needed to be modified, is an ongoing strategy, or no longer applies. Additional participants were kept informed with emails to provide additional feedback on the 2013 University of Georgia PDM Plan.

In addition to the development of the 2018 University of Georgia Pre-Disaster Hazard Mitigation Plan Update, the Office of Emergency Preparedness was a full participant in the Athens-Clarke County Hazard Mitigation Plan Update for 2018-2023. Below is a full list of meetings held for both the Athens-Clarke County and University of Georgia Hazard Mitigation plan updates:

Thursday, August 17, 2017	Athens-Clarke County Kick-Off Meeting
Tuesday, August 29, 2017	Hazard Identification and Prioritization; Risk Assessment Analysis
Wednesday, September 20, 2017	Analysis of Hazard Profile Research; Review and Edit of Current Hazard Mitigation Strategies
Tuesday, October 3, 2017	Identification of New Hazard Mitigation Strategies
Tuesday, October 17, 2017	Update of Critical Facilities; Presentation of Athens-Clarke County Hazard Mitigation Plan Rough Draft
Tuesday, November 14, 2017	Review and Edit of Athens-Clarke County Hazard Mitigation Plan Final Draft
Friday, January 26, 2018	University of Georgia Pre-Disaster Hazard Mitigation Plan Update Meeting

Each section of the University of Georgia's 2013 Hazard Mitigation Plan has been revised in some manner. Therefore, a summary of those changes will be listed in the first section of each chapter. Major plan changes include the following:

- Addition of Wildfire to Natural Hazards
- Addition of Tropical Cyclone to Natural Hazards
- Separation of Tornado into a new section (Previously part of severe storms)
- Addition of Earthquakes to Natural Hazards
- Addition of Dam Failure to Technological Hazards
- Addition of Transportation Incident to Technological Hazards
- Addition of Terrorism to Technological Hazards
- Addition of Biological/Radiological Incident to Technological Hazards
- Addition of Emergent Infectious Diseases to Technological Hazards
- Addition of Conflagration to Technological Hazards
- Addition of new and revised mitigation strategies

Hazard Mitigation Plan Update Committee

Requirement §201.6(b) (2)

The following members, representing various jurisdictions, consolidated government departments, and community organizations and businesses, participated in the update of the University of Georgia's 2013 Pre-Disaster Mitigation Plan.

Athens-Clarke County Hazard Mitigation Plan Update Committee

Noelle Broadnax
Emergency Operations Coordinator
University of Georgia Office of Emergency Preparedness

Beth Burgess
Director
Athens-Clarke County Office of Emergency Management

Pete Golden
Emergency Operations Coordinator
University of Georgia Office of Emergency Preparedness

Steve Harris
Director
University of Georgia Office of Emergency Preparedness

John Newton
Emergency Operations Manager
University of Georgia Office of Emergency Preparedness

The University of Georgia convened the Hazard Mitigation Plan Update Committee comprised of representatives from various participating departments and external partners from Athens-Clarke County. The Committee worked with Lux Mitigation and Planning and provided input throughout the process. Efforts were made to involve departments and organizations, which might have a role in the implementation of the mitigation actions or policies. These efforts included invitations to attend meetings, e-mail updates, and opportunities for input and comment on all deliverables.

In addition to the University of Georgia Pre-Disaster Hazard Mitigation Plan Update Committee, the Athens-Clarke County Emergency Management Agency will be provided with a copy of the completed University of Georgia Pre-Disaster Hazard Mitigation Plan 2018.

Multi-Jurisdictional Considerations

Within Athens-Clarke County, the University of Georgia governmentally functions as a separate jurisdiction. UGA operates and controls most of its own infrastructure in regards to utilities, bus transportation, and other public services. UGA does rely on Athens-Clarke County water and sewer services as well as fire services for campus. UGA submitted this document as an appendix to the 2018-2023 Athens-Clarke County PDM Plan (2018-2023 Athens-Clarke County PDM Plan Appendix I) as well as for the Disaster-Resistant University (DRU) project coordinated through the University System of Georgia. All UGA facilities identified within Clarke County (utilizing the GEMA Mitigation Information System data) are listed with Athens-Clarke County critical facilities and those within the City of Winterville. UGA facilities are displayed on the GEMA Mitigation System Online Tool in red.

The University and Athens-Clarke County, in general, share the same vulnerability to identified hazards; there are no special jurisdictional considerations or variations between the two. The exceptions are floods, dam failure, and hazardous materials that are detailed in Chapter 3. While it is impossible to predict the location of many potential hazards, like thunderstorms, there are presumably inherent differences between the two jurisdictions where hazard events will occur. Geography, topography, and physical development are important differences in the two jurisdictions.

Incorporation of Existing Plans, Studies, and Resources

Requirement §201.6(b) (3)
State Requirement Element F3

Existing Plans

2013 University of Georgia Pre-Disaster Hazard Mitigation Plan
2014 State of Georgia Hazard Mitigation Plan
2018-2023 Athens-Clarke County Hazard Mitigation Plan

Studies

2017 Athens-Clarke County HAZUS Report
2009 Athens-Clarke County Flood Insurance Study
Radeloff, V. C., R. B. Hammer, S. I Stewart, J. S. Fried, S. S. Holcomb, and J. F. McKeefry. 2005. The Wildland Urban Interface in the United States. Ecological Applications 15:799-805.

Resources

2014 City of Boston Natural Hazard Mitigation Plan Update
2010 Camden County Joint Hazard Mitigation Plan Update
2010 Northern Virginia Hazard Mitigation Plan Update
National Climactic Data Center
National Weather Service
University of Georgia Website – www.uga.edu
GMIS Database
City University of New York
Colorado State University
United States Geological Survey
FEMA Flood Insurance Rate Maps
National Flood Insurance Program
United States Coast Guard National Response Center Data
Georgia Department of Transportation
Georgia Safe Dams Program

Existing Planning Mechanism	Reviewed?	Incorporation Into Mitigation Plan
2013 University of Georgia Pre-Disaster Mitigation Plan	Yes	Baseline for the 2018 Plan; updated mitigation strategies; updated hazards; updated University of Georgia information
2014 State of Georgia Hazard Mitigation Plan	Yes	Hazard descriptions; potential hazards; mapping mechanisms; potential mitigation strategies that could be adopted on a local level
Athens-Clarke County 2018-2023 Hazard Mitigation Plan Update	Yes	Baseline for the 2018 Plan; updated hazards; updated format
2009 Athens-Clarke County Flood Insurance Study	Yes	Identify potential flood prone areas; prioritization of flood-related mitigation strategies
Athens-Clarke County Flood Mitigation Assistance Plan	No	No such plan exists

Application of Existing Plans and Studies

Chapter Two - University of Georgia Profile

Summary of Updates for Chapter Two

The following table provides a description of each section of this chapter, and a summary of the changes that have been made to the University of Georgia Pre-Disaster Mitigation Plan 2013 Version.

Chapter 2 Section	Updates
Past Hazards	• New Section – Not in 2013 Mitigation Plan. This information involved a review of the hazards listed in the previous plan. • Information was updated for the last 50 years and reflects impacts to Athens-Clarke County
History	• New Section – Not in 2013 Mitigation Plan • Information was included in Section 1.8 – Institutional Data
Past Events	• New Section – Not in 2012 Mitigation Plan. Some of these events were listed in the hazard profiles in the previous plan.
Enrollment and Population Information	• Updated data from Section 1.8 – Institutional Data
Transportation	• New Section – Not in 2013 Mitigation Plan • Information was included in Section 1.8 – Institutional Data
Climate	• New Section – Not in 2013 Mitigation Plan

Past Hazards

Athens-Clarke County and the University of Georgia has faced many hazards in its long history. Severe Thunderstorms have been, perhaps, the most prevalent of these hazards. In the last 50 years, Athens-Clarke County has been subjected to 115 documented Severe Thunderstorm events. Most of these events had direct or indirect impacts to the University of Georgia. These events include torrential rainfall, hail, thunderstorm-force winds, and lightning.

Tornadoes, which can sometimes spawn from severe thunderstorms, have also occurred in Athens-Clarke County, although with much less frequency. There have been 5 documented tornadoes in the

last fifty years in Athens-Clarke County. The May 1973 F3 Tornado struck the Navy Supply School – now home to the University of Georgia's Health Sciences Campus.

Because of heavy rainfall either within or upstream from Athens-Clarke County, flooding has occurred in the past as well. Documentation of 10 flooding events exist within the National Climactic Data Center of the National Weather Service for Athens-Clarke County.

Winter storms and heavy snowfall have affected Athens-Clarke County and the University of Georgia infrequently in the last 50 years. These events are not a yearly occurrence and typically do not have the pre-planning in place when compared to Northern and Western states who see this type of weather phenomena regularly. The NCDC record 26 documented winter storm or heavy snow events for Athens-Clarke County with 8 of those having occurred in the last 5 years.

Athens-Clarke County and the University of Georgia has been plagued by other less severe or less frequent hazards in the past. These hazards include, but are not limited to, the following: drought, excessive heat, tropical cyclones, earthquakes, and wildfires.

History

When the University of Georgia was incorporated by an act of the General Assembly on January 27, 1785, Georgia became the first state to charter a state-supported university. In 1784 the General Assembly had set aside 40,000 acres of land to endow a college or seminary of learning.

At the first meeting of the board of trustees, held in Augusta on February 13, 1786, Abraham Baldwin was selected president of the university. A native of Connecticut and a graduate of Yale University, Baldwin -- who had come to Georgia in 1784 -- drafted the charter adopted by the General Assembly.

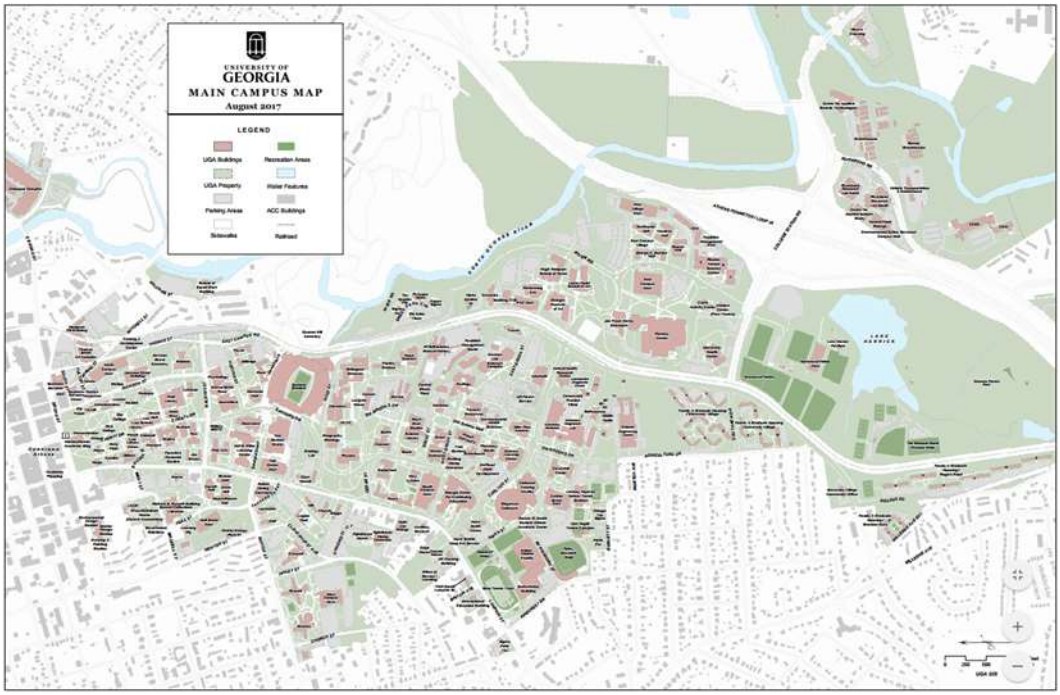
The university was actually established in 1801 when a committee of the board of trustees selected a land site. John Milledge, later a governor of the state, purchased and gave to the board of trustees the chosen tract of 633 acres on the banks of the Oconee River in northeast Georgia.

Josiah Meigs was named president of the university and work was begun on the first building, originally called Franklin College in honor of Benjamin Franklin and now known as Old College. The university graduated its first class in 1804. The curriculum of traditional classical studies was broadened in 1843 to include courses in law, and again in 1872 when the university received federal funds for instruction in agriculture and mechanical arts.

Seventeen colleges and schools, with auxiliary divisions, carry on the university's programs of teaching, research, and service. These colleges and schools and the dates of their establishment as separate administrative units are: Franklin College of Arts and Sciences, 1801; College of Agricultural and Environmental Sciences, 1859; School of Law, 1859; College of Pharmacy, 1903; D. B. Daniel B. Warnell School of Forestry and Natural Resources, 1906; College of Education, 1908; Graduate School, 1910; C. Herman and Mary Virginia Terry College of Business, 1912; Henry W. Grady College of Journalism and Mass Communication, 1915; College of Family and Consumer Sciences, 1933; College of Veterinary Medicine, 1946; School of Social Work, 1964; College of Environment and Design, 1969; School of Public and International Affairs, 2001; the College of Public Health, 2005, the Odum School of Ecology, 2007 and the College of Engineering, 2012. The Division of General Extension, now the Georgia Center for Continuing Education Conference Center & Hotel, was incorporated into the university in 1947.

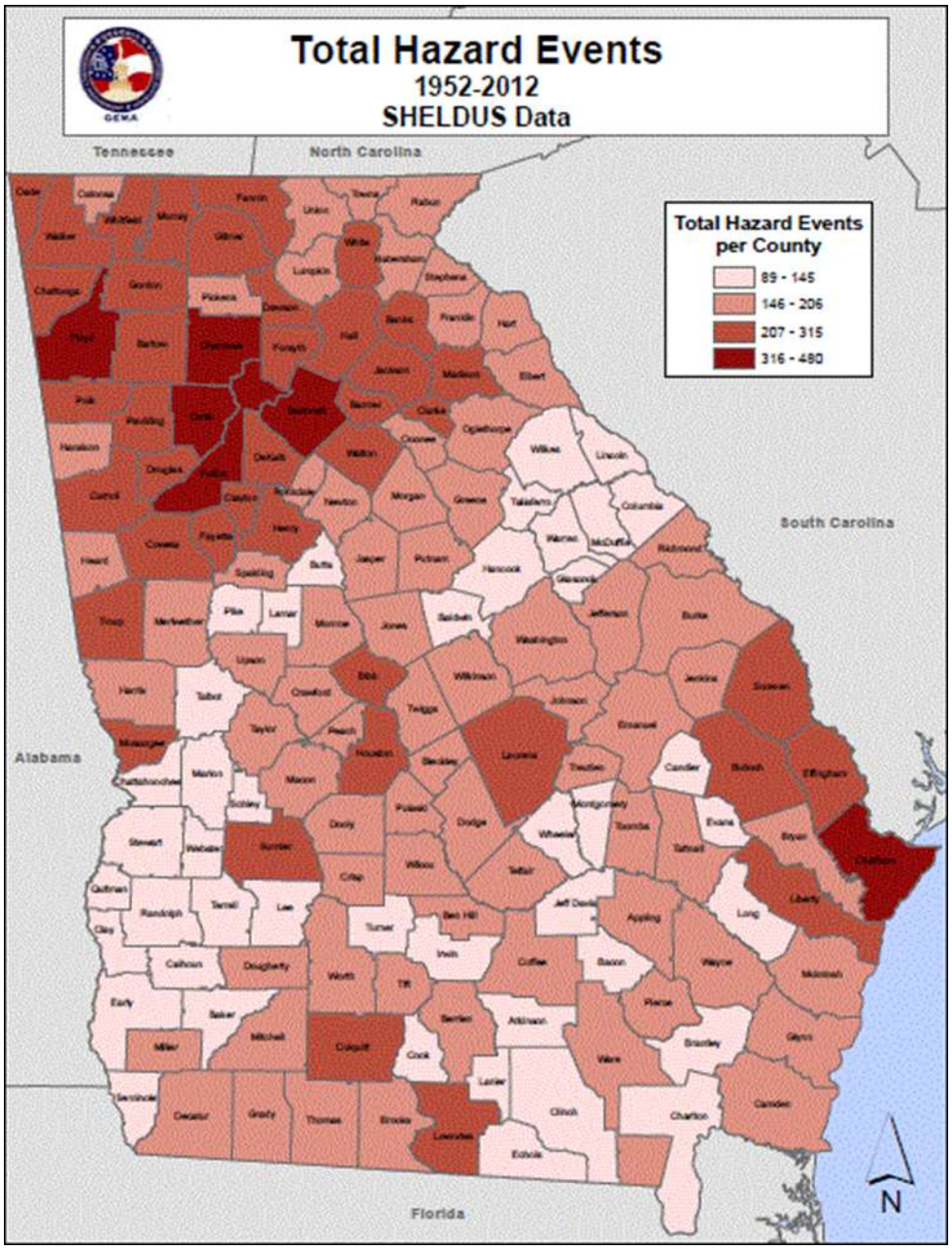
In 1931 the General Assembly of Georgia placed all state-supported institutions of higher education, including UGA, under the jurisdiction of a single board. This organization, known as the University System of Georgia, is governed by the board of regents. The board of regents' executive officer, the

chancellor, exercises a general supervisory control over all institutions of the University System, with each institution having its own executive officers and faculty.



Past Events

- 2017, Hurricane Irma (Athens-Clarke County Federal Declaration)
- 2016, Flash Flood Event
- 2014, Ice Storm (Athens-Clarke County Federal Declaration)
- 2009, Winter Storm
- 2009, Thunderstorm Wind Event
- 2007, Thunderstorm Wind Event
- 2005, Winter Storm
- 2004, Tropical Storm Ivan (Wind)
- 2004, Tropical Storm Frances (Wind)
- 2000, Ice Storm (Athens-Clarke County Federal Declaration)
- 1997, Thunderstorm Wind Event
- 1994, Thunderstorm Wind Event
- 1986, Tornado (F1)
- 1977, Drought (Athens-Clarke County Federal Declaration)
- 1976, Tornado (F2)
- 1973, Tornado (F3) (Athens-Clarke County Federal Declaration)
- 1973, Tornado (F2) (Athens-Clarke County Federal Declaration)



SOURCE: 2014 STATE OF GEORGIA HAZARD MITIGATION STRATEGY (MOST UP-TO-DATE VERSION)

Enrollment and Population Information

	2017 Fall Semester
Undergraduate Population	28,848
Graduate/Professional Population	8,758
Total Student Population	37,606
Faculty	3,060
Administrative/Other Professional staff	4,475
Technical/Clerical/Crafts/ Maintenance Staff	3,130
Total Faculty and Staff	10,665
Total Population	48,271
Annual Budget (FY 2018)	$1.64 Billion
Person Below Poverty Line	----
Homeowners	----

UGA's main campus in Athens consists of approximately 458 major buildings located on over 700 acres. Total UGA acreage in Georgia exceeds 40,000 acres in 35 Georgia counties.

The University of Georgia is the largest employer in Clarke County with a total regular workforce of approximately 10,000 employees (faculty, staff, and administrators). Additionally, approximately 5,000 individuals are employed in temporary or student worker positions throughout the year.

Collegiate sports include nine men's varsity sports and 12 women's varsity sports. Georgia teams have won 38 national championships. UGA competes in the NCAA Division 1, Southeastern Conference. The largest of UGA's sports venue is Sanford Stadium, the fifth largest on-campus stadium in the country with a seating capacity of nearly 93,000 and the 14th largest in the world.

Transportation

Athens-Clarke County's transportation system consists primarily of state highways and county maintained roads. U.S. Highways 29, 78, 129, and 441, as well as State highways 8, 10, 15, and 72 are major transportation routes that carry the majority of passenger and commercial traffic in and out of Athens-Clarke County.

Freight rail services owned and operated by CSX, Norfolk Southern Railroad and Athens Line LLC cross through Athens-Clarke County.

The University of Georgia owns and operates the UGA Campus Transit system, which includes 11 bus routes throughout Athens.

The Athens-Ben Epps Airport (AHN) services Athens-Clarke County and the University of Georgia with 2 runways – one 4,000 feet and one just over 6,000 feet.

Climate

The University of Georgia, like much of Georgia, enjoys a temperate climate. As a result, the University of Georgia has four well-defined seasons: warm to hot summers; brisk fall temperatures; relatively brief, cool winters; and a warm spring season. The University of Georgia's proximity to the Atlantic Ocean can affect the overall climate and create milder winters and warmer, wetter summers than other parts of the State of Georgia.

AVERARE MONTHLY TEMPERATURES IN GEORGIA (FAHRENHEIT)

Month	State of Georgia Temperature	University of Georgia Temperature
January	46	45
February	49	47
March	56	54
April	63	61
May	70	69
June	77	77
July	80	78
August	79	79
September	74	73
October	64	62
November	56	52
December	48	46

Chapter Three - Hazard Profiles

Summary of Updates for Chapter Three

The following table provides a description of each section of this chapter, and a summary of the changes that have been made to the University of Georgia Pre-Disaster Mitigation Plan 2013.

Chapter 3 Section	Updates
Risk Assessment	• Expanded the explanation of the Risk Assessment • Added an explanation of each part of the Hazard Information
Natural Hazard Thunderstorms	• Updated hazard description to match Georgia State Hazard Mitigation Plan information • Consolidated Thunderstorms/High Winds, Hail and Lightning into a single hazard section • Updated and consolidated hazard profile with new data • Content revised
Natural Hazard Winter Storms	• Updated hazard description to match Georgia State Hazard Mitigation Plan information • Updated and consolidated hazard profile with new data • Content revised
Natural Hazard Flooding	• Updated hazard description to match Georgia State Hazard Mitigation Plan information • Updated and consolidated hazard profile with new data • Land Use and Development trends updated to include municipal NFIP information • Content revised
Natural Hazard Tornado	• Updated hazard description to match Georgia State Hazard Mitigation Plan information • Updated and consolidated hazard profile with new data • Content revised
Natural Hazard Drought	• Updated hazard description • Updated and consolidated hazard profile data • Content revised
Natural Hazard Wildfire	• New Section – Not in 2013 Plan
Natural Hazard Earthquake	• New Section – Not in 2013 Plan
Natural Hazard Tropical Cyclone	• New Section – Not in 2013 Plan
Technological Hazard Hazardous Materials	• Updated hazard description • Updated and consolidated hazard profile data • Content revised

Technological Hazard Dam Failure	• Updated hazard description • Updated and consolidated hazard profile data • Content revised
Technological Hazard Transportation	• New Section – Not in 2013 Plan
Technological Hazard Terrorism	• New Section – Not in 2013 Plan
Technological Hazard Emergent Infectious Disease	• New Section – Not In 2013 Plan
Technological Hazard Biological / Radiological Release	• New Section – Not in 2013 Plan
Technological Hazard Conflagration	• New Section – Not in 2013 Plan

Risk Assessment

Requirement §201.6(c) (2) (i and ii)
Requirement §201.6(d) (3)

The Athens-Clarke County and University of Georgia Hazard Mitigation Planning Committees conducted a comprehensive Threat and Hazard Identification and Risk Assessment (THIRA) for the University of Georgia. This assessment developed the hazard basis for this plan. The assessment includes the following components for each hazard:

1. Hazard Identification: The Athens-Clarke County and University of Georgia Hazard Mitigation Planning Committees identified eight natural hazards and seven technological hazards for this Hazard Mitigation Plan. This is an increase of eight hazard from the previous iteration of the plan. Each hazard was identified by the use of statistical data and records from a variety of sources. The list of hazards is based upon frequency, severity of impact, probability, potential losses, and vulnerability.
2. Hazard Description: Each hazard was described in detail. Many hazard descriptions came from the Georgia Hazard Mitigation Plan since many of the hazards that could impact the state could also potentially impact the University of Georgia.
3. Profile of Hazards: Each hazard was profiled as to how it could potentially impact the University of Georgia.
4. Assets Exposed to the Hazard: The plan considers critical facilities and infrastructure as part of the vulnerability assessment. This assessment determines the vulnerability of the municipalities and attempts to identify the populations most vulnerable to each hazard, although many have potential countywide impacts.
5. Estimated Potential Losses: Using critical facility and past history data, an estimation of potential losses due to a particular hazard event were determined.
6. Land Use and Development Trends: Land use trends were considered when determining the potential future impacts of each hazard. This is of particular importance in regards to flooding and dam failure events.
7. Multi-Jurisdictional Concerns: Each jurisdiction was considered when determining the potential hazard impact.

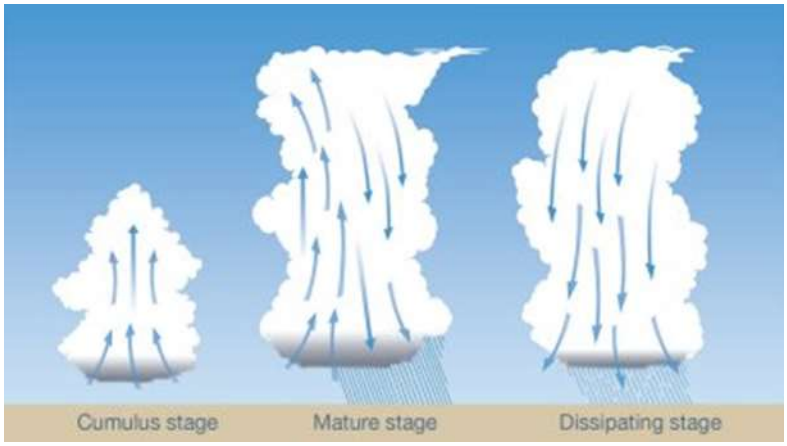
Natural Hazard: Thunderstorms

Hazard Description

This section provides general and historical information about thunderstorms, including high wind, lightning, and hail. Other elements of thunderstorms, such as tornadoes and flooding, are addressed in their own sections.

Thunderstorms are formed when moist air near the earth's surface is forced upward through some catalyst (convection or frontal system). As the moist air rises, the air condenses to form clouds. Because condensation is a warming process, the cloud continues to expand upward. When the initial updraft is halted by the upper troposphere, both the anvil shape and a downdraft form. This system of up-drafting and down-drafting air columns is termed a "cell."

As the process of updrafts and downdrafts feeds the cell, the interior particulates of the cloud collide and combine to form rain and hail, which falls when the formations are heavy enough to push through the updraft. The collision of water and ice particles within the cloud creates a large electrical field that must discharge to reduce charge separation. This discharge is the lightning that occurs from cloud to ground or cloud to cloud in the thunderstorm cell. In the final stage of development, the updraft weakens as the downdraft-driven precipitation continues until the cell dies.



Each thunderstorm cell has the ability to extend several miles across its base and to reach 40,000 feet in altitude. Thunderstorm cells may compound and move abreast to form a squall line of cells, extending farther than any individual cell's potential.

In terms of temporal characteristics, thunderstorms exhibit no true seasonality in that occurrences happen throughout the year. Convectively, driven systems dominate the summer while frontal driven systems dominate during the other seasons. The rate of onset is rapid in that a single cell endures only 20 minutes. However, various cells in different stages of development may form a thunderstorm that lasts up to a few hours as it moves across the surface.

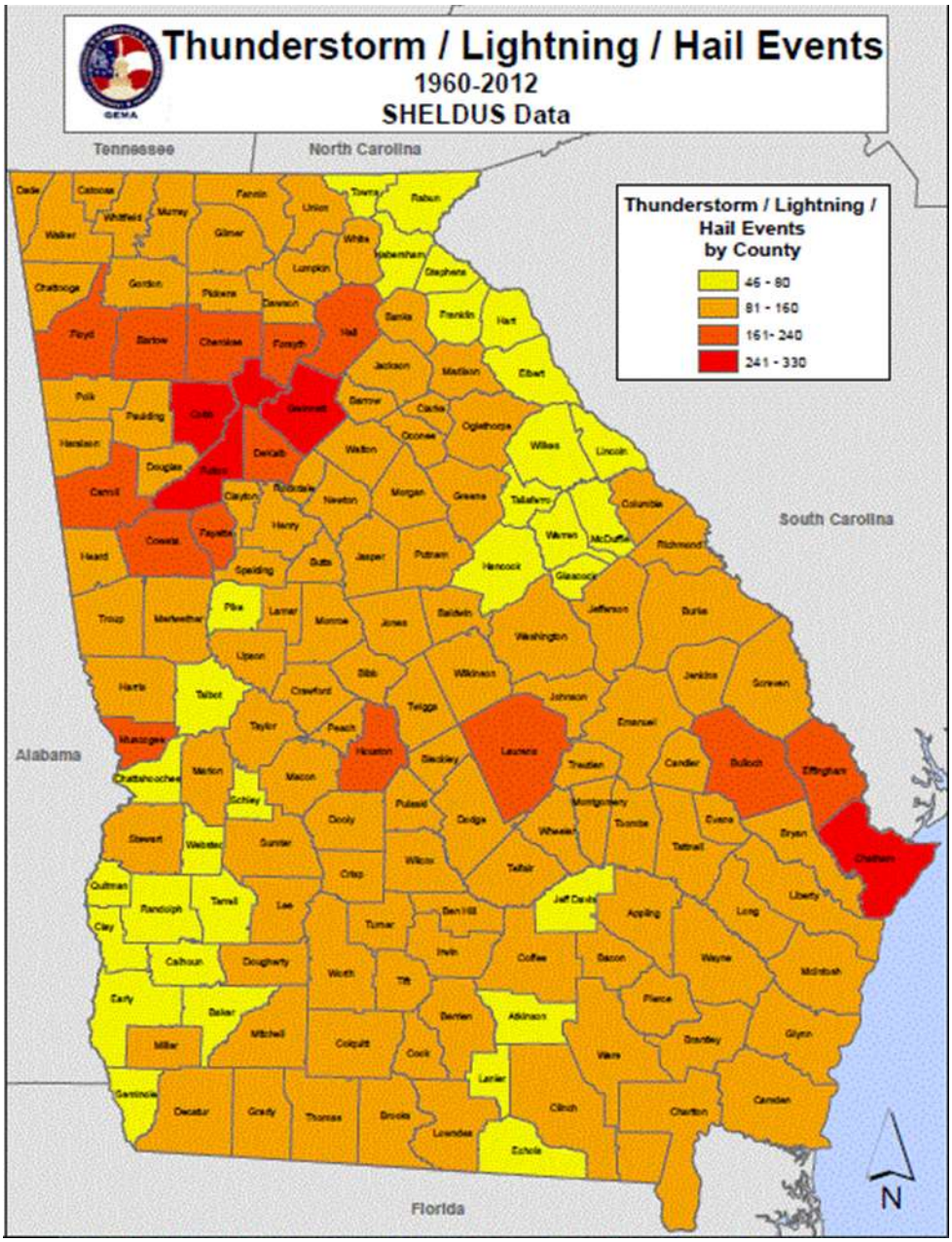
In terms of magnitude, the National Weather Service defines thunderstorms in terms of severity as a severe thunderstorm that produces winds greater than 57 mph and/or hail of at least 1 inch in diameter and/or a tornado. The National Weather Service chose these measures of severity as parameters more capable of producing considerable damage. Therefore, these are measures of magnitude that may project intensity.

Lightning
Lightning occurs when the difference between the positive and negative charges of the upper layers of the cloud and the earth's surface becomes great enough to overcome the resistance of the insulating air. The current flows along the forced conductive path to the surface (in cloud to ground lightning) and reaches up to 100 million volts of electrical potential. In Georgia, lightning strikes peak in July, with June and August being second highest in occurrence.

Hail
Hail is a form of precipitation that forms during the updraft and downdraft-driven turbulence within the cloud. The hailstones are formed by layers of accumulated ice (with more layers creating larger hailstones) that can range from the size of a pea to the size of a grapefruit. Hailstones span a variety of shapes but usually take a spherical form. Hailstorms mostly endanger cars, but have been known to damage aircraft and structures.

Hailstone size	Measurement		Updraft Speed	
	in.	cm.	mph	km/h
bb	< 1/4	< 0.64	< 24	< 39
pea	1/4	0.64	24	39
marble	1/2	1.3	35	56
dime	7/10	1.8	38	61
penny	3/4	1.9	40	64
nickel	7/8	2.2	46	74
quarter	1	2.5	49	79
half dollar	1 1/4	3.2	54	87
walnut	1 1/2	3.8	60	97
golf ball	1 3/4	4.4	64	103
hen egg	2	5.1	69	111
tennis ball	2 1/2	6.4	77	124
baseball	2 3/4	7.0	81	130
tea cup	3	7.6	84	135
grapefruit	4	10.1	98	158
softball	4 1/2	11.4	103	166

Severe thunderstorms, including high winds, hail and lightning, are a serious threat to the University of Georgia. Severe thunderstorms are the most frequently occurring natural hazard in Georgia. Many of these storms include high winds, lightning, and hail. Hail up to 2.75 inches was recorded in Athens-Clarke County on several occasions, most recently in 1999. While there have been dozens of documented thunderstorm events affecting Athens-Clarke County over the last 50 years, it is likely that the official number is a low estimate due to poor record keeping in decades past.



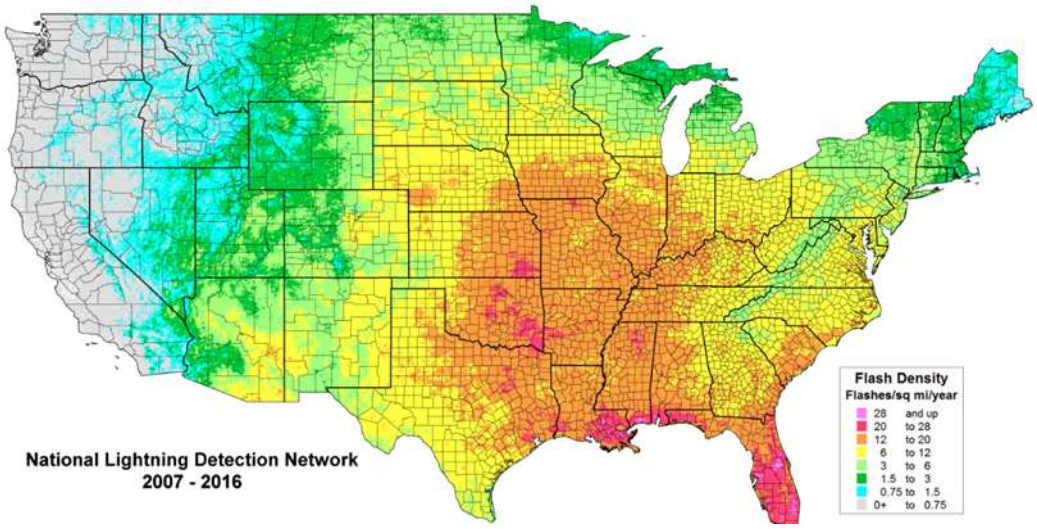
SOURCE: 2014 STATE OF GEORGIA HAZARD MITIGATION STRATEGY (MOST UP-TO-DATE VERSION)

Most of the available information relating to severe thunderstorm events in Athens-Clarke County fails to describe damage estimates in any detail. With each thunderstorm event, there are likely unreported costs related to infrastructure costs, public safety response costs, utility repair costs, and personal home and business repair costs. Thunderstorms have occurred during all parts of the day and night and in every month in Athens-Clarke County.

During the last 50 years, 115 thunderstorm events were recorded in Athens-Clarke County, with 83 of those occurring in the last 25 years. This number includes 25 hail events and only 4 lightning reports. According to these records, Athens-Clarke County and the University of Georgia has a 0.9% chance daily of a thunderstorm event based upon data from the last 25 years. Over the last 10 years, Athens-

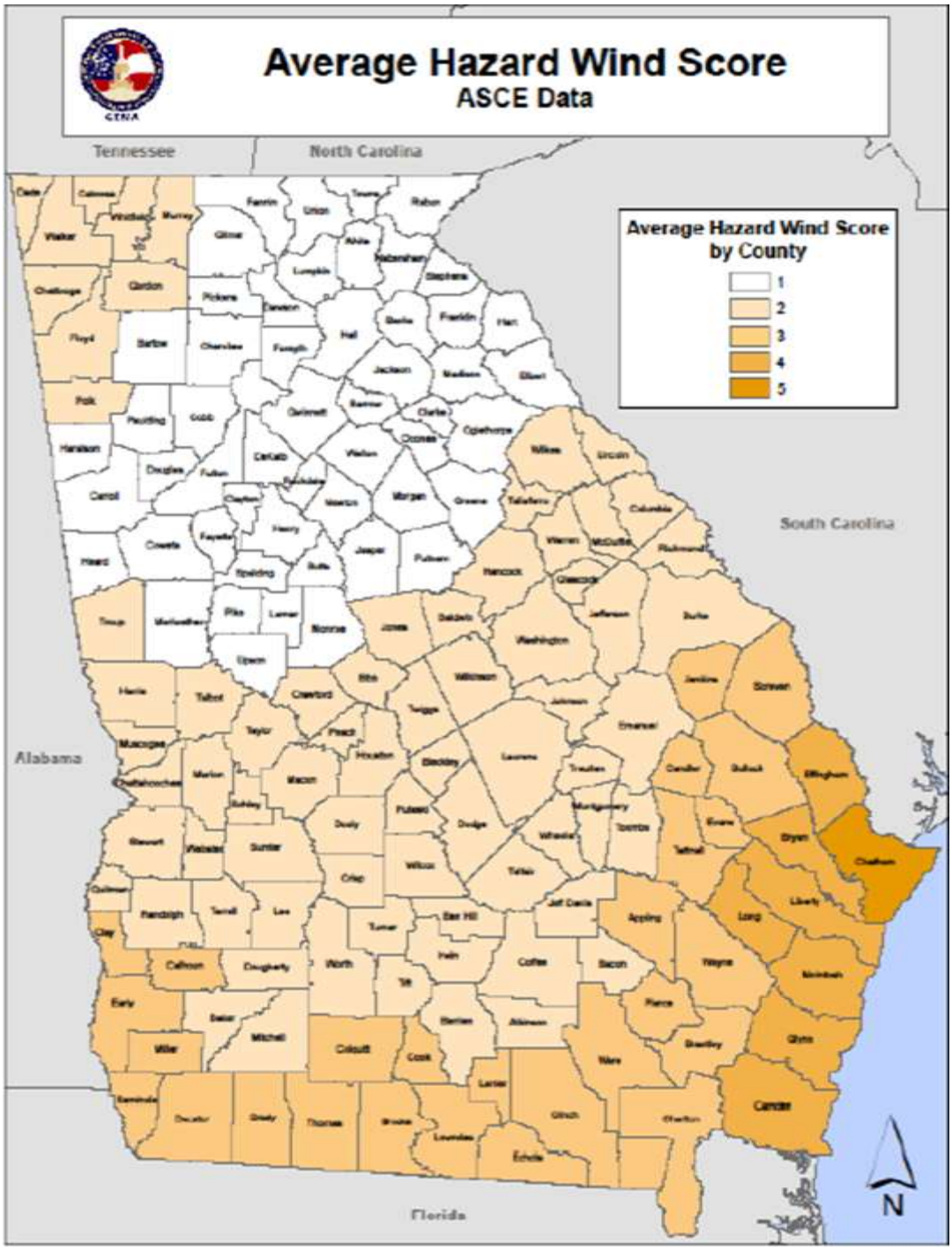
Clarke County has averaged 3.4 thunderstorm events per year (34 events). This includes 0.6 hail events per year over the last 16 years. Due to improved record keeping protocols, the University of Georgia Pre-Disaster Hazard Mitigation Plan Update Committee believes the data from the last ten years provides a more accurate representation of the thunderstorm threat to the county. The University of Georgia Pre-Disaster Hazard Mitigation Plan Update Committee has also determined that the lightning threat is severely under-reported, as shown in the NCDC data numbers located at the end of this section.

As indicated by the below graphics, Athens-Clarke County averages between 6 and 12 flashes of cloud to ground lightning per square mile per year. That equals a 1.6% to 3.3% chance of a cloud-to-ground lightning strike on any given day. This shows a much higher indication of lightning occurrences than has been reported to the National Weather Service and the National Climatic Data Center. It is the determination of the University of Georgia Pre-Disaster Hazard Mitigation Plan update Committee that this data shows a more accurate representation of the scope of the threat that lightning poses to the University of Georgia.

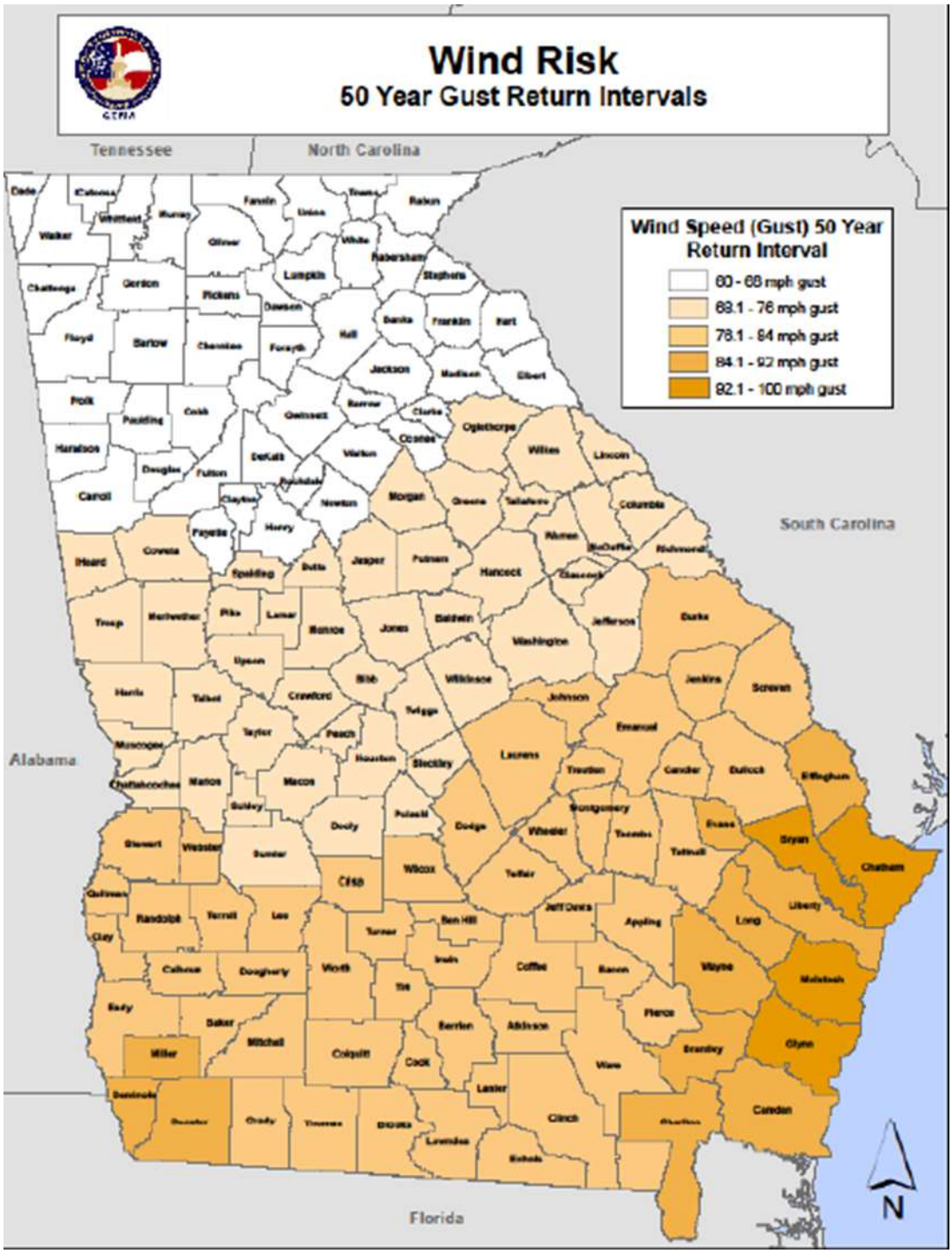


Severe thunderstorm winds, which are defined as winds of at least 58 mph in conjunction with a convective event, have occurred with many thunderstorms that have effected Athens-Clarke County and the University of Georgia. These winds can exceed 100 mph and cause damage comparable to weak tornadoes. Below are two maps that identify the wind risk and the hazard wind score for the State of Georgia, including Athens-Clarke County and the University of Georgia. The Hazard Wind Score maps uses the following scale:

Hazard Score	Wind Speeds
1	<90 mph gust
2	91 – 100 mph gust
3	101 – 110 mph gust
4	111 – 120 mph gust
5	>120 mph gust



SOURCE: 2014 STATE OF GEORGIA HAZARD MITIGATION STRATEGY (MOST UP-TO-DATE VERSION)



SOURCE: 2014 STATE OF GEORGIA HAZARD MITIGATION STRATEGY (MOST UP-TO-DATE VERSION)

Assets Exposed to the Hazard

In evaluating assets that are susceptible to severe thunderstorms, the Athens-Clarke County and University of Georgia Hazard Mitigation Planning Committees determined that all public and private property is at threat by severe thunderstorms, including the University of Georgia. This is due to the lack of spatially prejudice of severe thunderstorm events.

Estimated Potential Losses

Estimates of damage for the past events in Athens-Clarke County from the last 50 years are over $880,000, or $17,725 annually. When only the last 25 years on considered, those estimates double to $35,450 annually. These numbers are thought to be a gross underestimation of actual past damages.

Hazard Summary

Thunderstorm events pose one of the greatest threats of property damage, injuries, and loss of life at the University of Georgia. Thunderstorm events are the most frequently occurring weather event that threatens the University of Georgia. As a result, the Athens-Clarke County and University of Georgia Hazard Mitigation Planning Committees recommend that the mitigation measures identified in this plan for thunderstorms should be aggressively pursued due to the frequency of this hazard and the ability for this hazard to affect any part of Athens-Clarke County, including the University of Georgia.

Thunderstorm Data Table

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	Prd
Totals:								0	2	893.25K
CLARKE CO.	CLARKE CO.	GA	5/25/1968	19:23	CST	Thunderstorm Wind	56 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	8/2/1968	16:30	CST	Thunderstorm Wind	52 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	7/8/1969	16:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	5/12/1971	15:23	CST	Hail	0.75 in.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	3/21/1974	4:30	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	3/21/1974	4:34	CST	Thunderstorm Wind	52 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	7/17/1980	20:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	8/19/1980	15:25	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	5/31/1981	16:30	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	7/5/1983	14:18	CST	Thunderstorm Wind	51 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	3/28/1984	14:50	CST	Hail	1.00 in.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	3/28/1984	14:50	CST	Thunderstorm Wind	56 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	5/2/1984	17:50	CST	Hail	1.00 in.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	5/2/1984	17:50	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	5/2/1984	18:30	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	11/10/1984	18:15	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	4/5/1985	20:10	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	4/5/1985	20:30	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	6/9/1986	16:40	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	7/21/1986	16:26	CST	Thunderstorm Wind	68 kts.	0	0	0.00K

CLARKE CO.	CLARKE CO.	GA	5/4/1987	15:00	CST	Hail	0.75 in.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	5/4/1987	15:15	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	6/25/1988	17:50	CST	Thunderstorm Wind	0 kts.	0	2	0.00K
CLARKE CO.	CLARKE CO.	GA	4/4/1989	15:15	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	5/5/1989	15:15	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	11/15/1989	22:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	2/10/1990	5:45	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	2/10/1990	6:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	3/16/1990	18:35	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	3/16/1990	19:05	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	4/10/1990	17:27	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	4/28/1990	13:45	CST	Hail	0.75 in.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	5/20/1990	14:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	6/9/1990	18:10	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	10/12/1990	3:30	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	3/1/1991	17:45	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	3/1/1991	18:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	4/27/1991	18:20	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	4/29/1991	15:30	CST	Hail	1.00 in.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	6/1/1991	14:32	CST	Thunderstorm Wind	50 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	8/6/1991	18:45	CST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	3/19/1992	12:42	CST	Hail	0.75 in.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	6/26/1992	13:15	PST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	7/1/1992	14:15	PST	Thunderstorm Wind	0 kts.	0	0	0.00K
CLARKE CO.	CLARKE CO.	GA	7/5/1992	16:45	PST	Thunderstorm Wind	0 kts.	0	0	0.00K
Athens	CLARKE CO.	GA	2/21/1993	22:30	EST	Thunderstorm Wind	0 kts.	0	0	5.00K
Athens	CLARKE CO.	GA	5/19/1993	7:50	EST	Hail	1.50 in.	0	0	0.00K
Athens	CLARKE CO.	GA	6/18/1994	19:00	EST	Thunderstorm Wind	0 kts.	0	0	50.00K
Athens	CLARKE CO.	GA	6/24/1994	14:00	EST	Thunderstorm Wind	0 kts.	0	0	5.00K
Winterville	CLARKE CO.	GA	1/19/1995	17:23	EST	Thunderstorm Wind	0 kts.	0	0	0.50K
Athens	CLARKE CO.	GA	6/30/1995	16:17	EST	Thunderstorm Wind	0 kts.	0	0	10.00K

ATHENS	CLARKE CO.	GA	5/6/1996	18:00	EST	Hail	0.75 in.	0	0	0.00K
ATHENS	CLARKE CO.	GA	2/21/1997	15:05	EST	Thunderstorm Wind		0	0	2.50K
ATHENS	CLARKE CO.	GA	3/5/1997	19:35	EST	Thunderstorm Wind		0	0	1.00K
ATHENS	CLARKE CO.	GA	4/22/1997	13:56	EST	Hail	1.75 in.	0	0	0.00K
ATHENS	CLARKE CO.	GA	4/22/1997	14:35	EST	Hail	0.75 in.	0	0	0.00K
ATHENS	CLARKE CO.	GA	4/22/1997	18:45	EST	Thunderstorm Wind		0	0	1.50K
ATHENS	CLARKE CO.	GA	4/28/1997	15:35	EST	Hail	0.75 in.	0	0	0.00K
ATHENS	CLARKE CO.	GA	8/17/1997	16:23	EST	Hail	1.00 in.	0	0	0.00K
ATHENS MUNI ARPT	CLARKE CO.	GA	8/17/1997	16:30	EST	Thunderstorm Wind		0	0	50.00K
ATHENS	CLARKE CO.	GA	4/3/1998	17:39	EST	Hail	1.00 in.	0	0	0.00K
ATHENS	CLARKE CO.	GA	4/8/1998	22:11	EST	Hail	0.75 in.	0	0	0.00K
ATHENS	CLARKE CO.	GA	5/7/1998	10:00	EST	Hail	1.75 in.	0	0	5.00K
ATHENS	CLARKE CO.	GA	5/7/1998	10:15	EST	Hail	0.88 in.	0	0	0.00K
ATHENS	CLARKE CO.	GA	5/7/1998	18:15	EST	Hail	1.75 in.	0	0	2.00K
ATHENS	CLARKE CO.	GA	5/7/1998	18:32	EST	Hail	1.75 in.	0	0	2.00K
COUNTYWIDE	CLARKE CO.	GA	6/16/1998	1:10	EST	Thunderstorm Wind		0	0	10.00K
ATHENS	CLARKE CO.	GA	6/16/1998	17:15	EST	Thunderstorm Wind		0	0	0.50K
ATHENS	CLARKE CO.	GA	6/19/1998	11:50	EST	Hail	0.75 in.	0	0	0.00K
ATHENS	CLARKE CO.	GA	6/19/1998	11:59	EST	Thunderstorm Wind		0	0	20.00K
ATHENS	CLARKE CO.	GA	6/24/1998	21:48	EST	Hail	0.75 in.	0	0	0.00K
ATHENS	CLARKE CO.	GA	7/19/1998	21:15	EST	Thunderstorm Wind		0	0	1.00K
ATHENS	CLARKE CO.	GA	7/20/1998	15:30	EST	Thunderstorm Wind		0	0	5.00K
ATHENS	CLARKE CO.	GA	7/20/1998	15:30	EST	Hail	0.88 in.	0	0	0.00K
ATHENS	CLARKE CO.	GA	5/13/1999	16:05	EST	Hail	0.75 in.	0	0	0.00K
ATHENS	CLARKE CO.	GA	6/4/1999	16:22	EST	Hail	1.75 in.	0	0	0.00K
ATHENS	CLARKE CO.	GA	6/4/1999	16:40	EST	Hail	2.75 in.	0	0	5.00K
ATHENS	CLARKE CO.	GA	6/30/1999	16:00	EST	Thunderstorm Wind		0	0	1.00K
ATHENS	CLARKE CO.	GA	8/20/1999	18:25	EST	Hail	1.00 in.	0	0	0.00K
ATHENS	CLARKE CO.	GA	8/20/1999	18:30	EST	Hail	1.75 in.	0	0	0.00K
ATHENS	CLARKE CO.	GA	8/20/1999	18:30	EST	Lightning		0	0	10.00K
ATHENS	CLARKE CO.	GA	7/23/2000	15:05	EST	Thunderstorm Wind		0	0	0.50K
ATHENS	CLARKE CO.	GA	12/16/2000	21:30	EST	Thunderstorm Wind		0	0	5.00K
COUNTYWIDE	CLARKE CO.	GA	2/16/2001	19:20	EST	Thunderstorm Wind		0	0	5.00K

WINTERVILLE	CLARKE CO.	GA	6/14/2001	13:25	EST	Thunderstorm Wind	50 kts. E	0	0	2.00K
ATHENS	CLARKE CO.	GA	5/13/2002	15:35	EST	Thunderstorm Wind		0	0	0.50K
WHITEHALL	CLARKE CO.	GA	7/2/2002	20:00	EST	Thunderstorm Wind		0	0	10.00K
ATHENS	CLARKE CO.	GA	2/22/2003	8:00	EST	Thunderstorm Wind	35 kts. EG	0	0	0.25K
ATHENS	CLARKE CO.	GA	5/2/2003	18:45	EST	Thunderstorm Wind	50 kts. EG	0	0	5.00K
OCONEE HGTS	CLARKE CO.	GA	5/6/2003	13:20	EST	Thunderstorm Wind	50 kts. EG	0	0	0.00K
WINTERVILLE	CLARKE CO.	GA	5/6/2003	13:40	EST	Thunderstorm Wind	50 kts. EG	0	0	0.00K
ATHENS	CLARKE CO.	GA	7/1/2003	20:20	EST	Thunderstorm Wind	50 kts. EG	0	0	0.00K
ATHENS	CLARKE CO.	GA	6/23/2004	18:55	EST	Thunderstorm Wind	50 kts. EG	0	0	5.00K
COUNTYWIDE	CLARKE CO.	GA	8/5/2004	14:10	EST	Thunderstorm Wind	50 kts. EG	0	0	25.00K
ATHENS	CLARKE CO.	GA	11/24/2004	11:33	EST	Thunderstorm Wind	52 kts. EG	0	0	5.00K
ATHENS	CLARKE CO.	GA	2/21/2005	19:30	EST	Hail	1.00 in.	0	0	0.00K
ATHENS	CLARKE CO.	GA	4/7/2005	19:00	EST	Lightning		0	0	1.00K
ATHENS	CLARKE CO.	GA	4/13/2005	15:05	EST	Hail	0.88 in.	0	0	0.00K
ATHENS	CLARKE CO.	GA	6/30/2005	20:30	EST	Thunderstorm Wind	31 kts. EG	0	0	0.25K
ATHENS	CLARKE CO.	GA	7/21/2005	17:05	EST	Thunderstorm Wind	50 kts. EG	0	0	25.00K
ATHENS	CLARKE CO.	GA	7/22/2006	18:10	EST	Thunderstorm Wind	50 kts. EG	0	0	1.50K
ATHENS	CLARKE CO.	GA	8/5/2006	17:28	EST	Thunderstorm Wind	50 kts. EG	0	0	25.00K
ATHENS	CLARKE CO.	GA	8/20/2006	15:30	EST	Thunderstorm Wind	38 kts. MG	0	0	3.00K
ATHENS	CLARKE CO.	GA	1/5/2007	12:38	EST-5	Thunderstorm Wind	50 kts. EG	0	0	3.00K
WINTERVILLE	CLARKE CO.	GA	8/17/2007	14:55	EST-5	Hail	0.75 in.	0	0	0.00K
ATHENS	CLARKE CO.	GA	8/24/2007	15:59	EST-5	Thunderstorm Wind	52 kts. EG	0	0	1.00K
WHITEHALL	CLARKE CO.	GA	7/21/2008	19:08	EST-5	Hail	0.88 in.	0	0	0.00K
ATHENS	CLARKE CO.	GA	4/14/2009	8:45	EST-5	Thunderstorm Wind	35 kts. EG	0	0	0.50K
ATHENS	CLARKE CO.	GA	4/14/2009	8:48	EST-5	Hail	0.75 in.	0	0	0.00K
ATHENS	CLARKE CO.	GA	5/3/2009	18:55	EST-5	Thunderstorm Wind	35 kts. EG	0	0	0.75K
WHITEHALL	CLARKE CO.	GA	6/17/2009	23:18	EST-5	Thunderstorm Wind	35 kts. EG	0	0	1.00K
ATHENS	CLARKE CO.	GA	12/9/2009	4:36	EST-5	Thunderstorm Wind	39 kts. EG	0	0	11.00K
ATHENS	CLARKE CO.	GA	6/15/2010	19:24	EST-5	Thunderstorm Wind	50 kts. EG	0	0	1.50K
ATHENS	CLARKE CO.	GA	6/25/2010	17:18	EST-5	Thunderstorm Wind	39 kts. EG	0	0	1.00K
ATHENS	CLARKE CO.	GA	6/29/2010	15:00	EST-5	Thunderstorm Wind	50 kts. EG	0	0	3.00K

WINTERVILLE	CLARKE CO.	GA	8/13/2010	15:00	EST-5	Lightning		0	0	200.00K
WINTERVILLE	CLARKE CO.	GA	8/13/2010	15:00	EST-5	Thunderstorm Wind	50 kts. EG	0	0	7.00K
ATHENS	CLARKE CO.	GA	8/13/2010	15:00	EST-5	Lightning		0	0	0.50K
BARRETTS MILL	CLARKE CO.	GA	8/13/2010	15:02	EST-5	Lightning		0	0	0.50K
OCONEE HGTS	CLARKE CO.	GA	8/13/2010	15:22	EST-5	Lightning		0	0	20.00K
BARRETTS MILL	CLARKE CO.	GA	8/13/2010	15:23	EST-5	Lightning		0	0	1.00K
ATHENS	CLARKE CO.	GA	5/26/2011	18:15	EST-5	Thunderstorm Wind	37 kts. EG	0	0	1.00K
ATHENS	CLARKE CO.	GA	6/18/2011	17:50	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K
WHITEHALL	CLARKE CO.	GA	6/18/2011	17:51	EST-5	Lightning		0	0	100.00K
ATHENS	CLARKE CO.	GA	6/24/2011	17:33	EST-5	Hail	0.75 in.	0	0	0.00K
WHITEHALL	CLARKE CO.	GA	6/26/2011	18:35	EST-5	Hail	1.00 in.	0	0	0.00K
GREEN ACRES	CLARKE CO.	GA	3/16/2012	19:45	EST-5	Hail	0.75 in.	0	0	0.00K
OCONEE HGTS	CLARKE CO.	GA	6/13/2013	18:50	EST-5	Thunderstorm Wind	60 kts. EG	0	0	8.00K
ATHENS	CLARKE CO.	GA	7/9/2013	21:45	EST-5	Thunderstorm Wind	55 kts. EG	0	0	50.00K
PRINCETON	CLARKE CO.	GA	7/10/2013	17:00	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.25K
OCONEE HGTS	CLARKE CO.	GA	5/25/2014	17:25	EST-5	Thunderstorm Wind	50 kts. EG	0	0	2.00K
OCONEE HGTS	CLARKE CO.	GA	5/30/2014	17:00	EST-5	Thunderstorm Wind	50 kts. EG	0	0	3.00K
ATHENS	CLARKE CO.	GA	10/9/2014	18:35	EST-5	Hail	1.00 in.	0	0	0.00K
WHITEHALL	CLARKE CO.	GA	4/20/2015	16:00	EST-5	Thunderstorm Wind	45 kts. EG	0	0	0.25K
ATHENS	CLARKE CO.	GA	5/26/2015	17:05	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K
BARRETTS MILL	CLARKE CO.	GA	7/2/2015	15:08	EST-5	Thunderstorm Wind	50 kts. EG	0	0	8.00K
OCONEE HGTS	CLARKE CO.	GA	7/14/2015	19:30	EST-5	Thunderstorm Wind	50 kts. EG	0	0	6.00K
WINTERVILLE	CLARKE CO.	GA	8/6/2015	14:49	EST-5	Thunderstorm Wind	45 kts. EG	0	0	1.00K
GREEN ACRES	CLARKE CO.	GA	8/10/2015	14:49	EST-5	Thunderstorm Wind	55 kts. EG	0	0	50.00K
ATHENS	CLARKE CO.	GA	6/30/2016	17:15	EST-5	Thunderstorm Wind	50 kts. EG	0	0	8.00K
ATHENS	CLARKE CO.	GA	7/6/2016	12:57	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K
WHITEHALL	CLARKE CO.	GA	7/19/2016	18:25	EST-5	Thunderstorm Wind	45 kts. EG	0	0	1.00K
ATHENS	CLARKE CO.	GA	8/17/2016	18:30	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K
OCONEE HGTS	CLARKE CO.	GA	8/17/2016	21:00	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K
WINTERVILLE	CLARKE CO.	GA	3/21/2017	18:20	EST-5	Hail	1.00 in.	0	0	0.00K
WHITEHALL	CLARKE CO.	GA	3/21/2017	18:25	EST-5	Hail	1.00 in.	0	0	0.00K

BARRETTS MILL	CLARKE CO.	GA	3/21/2017	18:55	EST-5	Thunderstorm Wind	65 kts. EG	0	0	50.00K
WHITEHALL	CLARKE CO.	GA	3/21/2017	19:01	EST-5	Hail	1.00 in.	0	0	0.00K
OCONEE HGTS	CLARKE CO.	GA	7/1/2017	17:35	EST-5	Thunderstorm Wind	50 kts. EG	0	0	7.00K
Totals:								0	2	893.25K

Natural Hazard: Winter Storms

Hazard Description

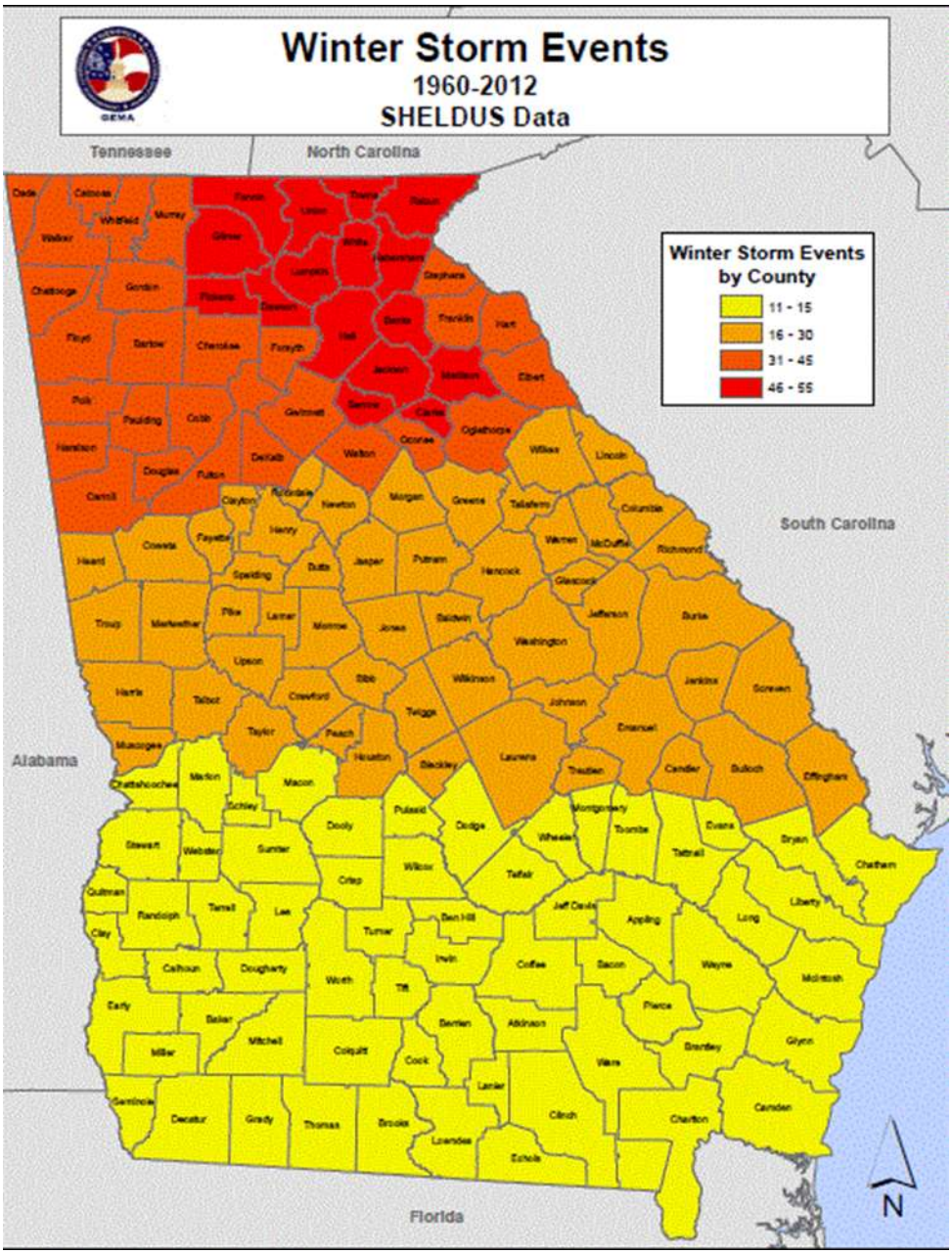
Severe winter storms bring the threat of ice and snow. There are many types of frozen precipitation that could create a severe winter weather event. Freezing rain consists of super cooled falling liquid precipitation freezing on contact with the surface when temperatures are below freezing. This results in an ice glazing on exposed surfaces including buildings, roads, and power lines. Sleet is easily discernable from freezing rain in that the precipitation freezes before hitting the surface. Often this sleet bounces when hitting a surface and does not adhere to the surface. However, sleet can compound into sufficient depths to pose some threat to motorists and pedestrians.

A heavy accumulation of ice, which is often accompanied by high winds, has the ability to devastate infrastructure and vegetation. Destructiveness in the southern states is often amplified due to the lack of preparedness and response measures. Also, the infrastructure was not designed to withstand certain severe weather conditions such as weight build-up from snow and ice. Often, sidewalks and streets become extremely dangerous to pedestrians and motorists. Primary industries such as farming and fishing suffer losses through winter seasons that produce extreme temperatures and precipitation.

Severe winter weather exhibits seasonal qualities in that most occur within the months of January to March, with the highest probability of occurrence in February. The rate of onset and duration varies from storm to storm, depending on the weather system driving the storm. Severe winter weather rarely frequents the State of Georgia. However, the impacts of the storms substantiate severe winter weather's inclusion in the risk assessment.

Hazard Profile

While winter storms are not as frequent of an occurrence in Athens-Clarke County as they are in areas in the Northern US, they still have the potential to wreak havoc on the community when they do occur. Winter storms in Athens-Clarke County typically cause drastic damage to infrastructure, such as roads, power lines, and bridges. In addition to these same damages occurring on campus at the University of Georgia, the damages suffered by Athens-Clarke County would also directly impact the University of Georgia. The large number of trees at the University of Georgia can also become a hazard when the tree limbs become weighed down with snow and ice and begin to break and fall to the ground, potentially damaging property, blocking roadways, or injuring people and animals.

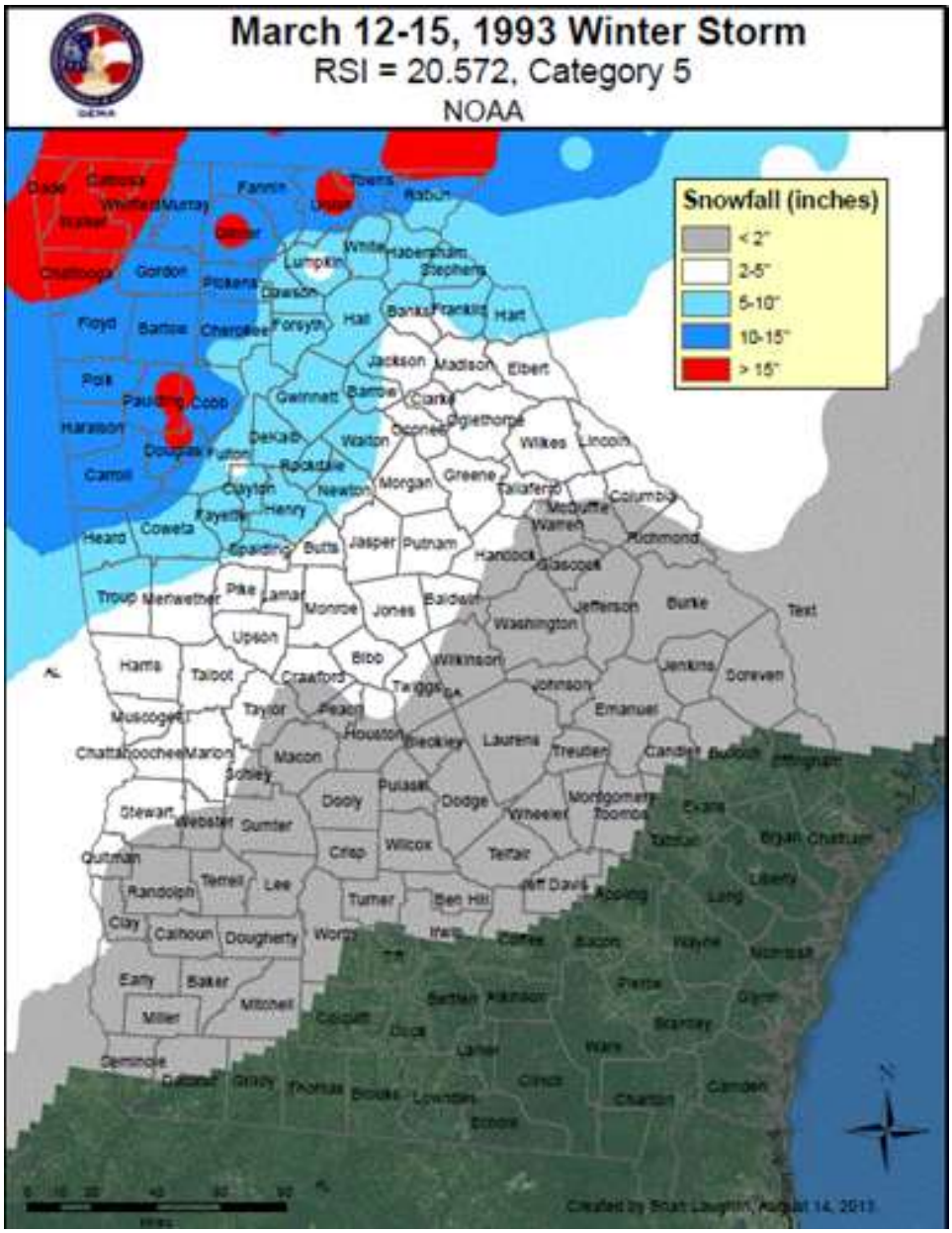


SOURCE: 2014 STATE OF GEORGIA HAZARD MITIGATION STRATEGY (MOST UP-TO-DATE VERSION)

During the past twenty years, documentation exists for 26 winter storm events in Athens-Clarke County. No cumulative data can be located prior to this timeframe. On average, a winter storm has occurred in Athens-Clarke County on a nearly annual basis. Athens-Clarke County averages 1.3 winter storm event per year. Due to improved record keeping techniques, the HMPC believes that looking at the record for the last 20-year period provides a more accurate representation of the threat of winter storms for the University of Georgia.

Individual events of Winter Weather can be drastically different depending on many factors, including the duration of the event, the type of precipitation involved, and the depth of the precipitation. Winter Storm events can be a light dusting of snow, ¼ inch of ice, or over a foot of snow. Other factors, such as wind, can influence the strength of these events, as happened with wind-blown snow during the March

1993 Winter Storm event. During this event, up to 5 inches of snow was reported at the University of Georgia.



SOURCE: 2014 STATE OF GEORGIA HAZARD MITIGATION STRATEGY

Assets Exposed to the Hazard

Since winter storms are indiscriminate with regard to location, the Athens-Clarke County and University of Georgia HMPCs determined that all property, including the University of Georgia, is susceptible to impacts from winter storms.

Estimated Potential Losses

Total estimated losses for winter storm events of the last 50 years indicate a total of over $1.2 million in losses. Extrapolated over 50 years, this averages out to $24,660 per year. However, nearly all of the documented winter storms with loss information have occurred over the last 20 years. As such, the

average loss per year for the last 20 years is $61,650 per year. It is estimated that these numbers are a gross underestimation of the impact of past winter storms and caution is expressed when using these figures to make loss determinations for winter storms.

Hazard Summary

Winter storms, which can include freezing rain, sleet, or snow, typically afford communities some advance warning, which is different from many other severe weather phenomena. The National Weather Service issues winter storm watches, advisories, and warnings as much as a day before the storm's impacts begin. Unfortunately, communities in the Southern United States are not equipped to handle winter storms due to their relative infrequent nature. Oftentimes, communities can face severe impact from these storms. The University of Georgia Hazard Mitigation Planning Committee recognizes the potential threats winter storms could have on the community and have identified specific mitigation actions as a result.

Winter Storm Data Table

Location	County/ Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD
Totals:								0	0	1.233M
CLARKE (ZONE)	CLARKE (ZONE)	GA	12/18/1996	18:00	EST	Heavy Snow		0	0	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	2/23/1999	11:00	EST	Winter Weather		0	0	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	1/22/2000	13:00	EST	Ice Storm		0	0	980.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	1/28/2000	19:00	EST	Ice Storm		0	0	32.79K
CLARKE (ZONE)	CLARKE (ZONE)	GA	12/13/2000	14:30	EST	Winter Storm		0	0	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	12/19/2000	0:00	EST	Winter Storm		0	0	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	1/2/2002	6:00	EST	Heavy Snow		0	0	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	12/4/2002	14:00	EST	Ice Storm		0	0	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	1/25/2004	5:00	EST	Ice Storm		0	0	15.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	2/26/2004	0:00	EST	Winter Storm		0	0	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	1/28/2005	20:00	EST	Winter Storm		0	0	150.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	12/15/2005	0:00	EST	Ice Storm		0	0	5.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	2/1/2007	4:00	EST-5	Winter Weather		0	0	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	3/1/2009	13:00	EST-5	Heavy Snow		0	0	50.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	3/2/2010	7:00	EST-5	Winter Weather		0	0	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	12/25/2010	17:00	EST-5	Heavy Snow		0	0	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	1/9/2011	23:00	EST-5	Heavy Snow		0	0	0.00K

CLARKE (ZONE)	CLARKE (ZONE)	GA	2/9/2011	23:00	EST-5	Heavy Snow		0	0	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	1/25/2013	7:00	EST-5	Winter Weather		0	0	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	1/28/2014	12:00	EST-5	Winter Storm		0	0	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	2/11/2014	7:00	EST-5	Winter Storm		0	0	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	2/16/2015	15:00	EST-5	Ice Storm		0	0	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	2/20/2015	19:00	EST-5	Winter Weather		0	0	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	1/22/2016	16:00	EST-5	Winter Weather		0	0	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	2/9/2016	2:00	EST-5	Winter Weather		0	0	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	1/7/2017	1:00	EST-5	Winter Weather		0	0	0.00K
Totals:								0	0	1.233M

Natural Hazard: Flooding

Requirement §201.6(c) (2) (ii)
Requirement §201.6(c) (3) (ii)

Hazard Description

Flooding is a temporary overflow of water on normally dry lands adjacent to the source of water, such as a river, stream, or lake. The causes of flooding include mass sources of precipitation, such as tropical cyclones, frontal systems, and isolated thunderstorms combined with other environmental variables, such as changes to the physical environment, topography, ground saturation, soil types, basin size, drainage patterns, and vegetative cover. Adverse impacts may include structural damages, temporary backwater effects in sewers and drainage systems, death of livestock, agricultural crop loss, loss of egress and access to critical facilities due to roads being washed-out or over-topped and unsanitary conditions by deposition of materials during recession of the floodwaters.

Floods are loosely classified as either coastal or riverine. Coastal flooding occurs when normally dry, low-lying land is flooded by sea water. Coastal flooding is usually associated with tropical cyclones in Georgia. Riverine flooding occurs from inland water bodies such as streams and rivers. Riverine flooding is often classified based on rate of onset. The first is slow to build, peak, and recede, often allowing sufficient time for evacuations. The other type of riverine flood is referred to as a "flash" flood, which rapidly peaks and recedes, thus giving insufficient time for evacuations. Flash floods are typically considered the most dangerous of these types.

On a broad scale, flooding can occur around any body of water or low-lying surface given enough precipitation or snowmelt. The spatial extent of the flooding event depends on the amount of water overflow, but can usually be mapped because of existing floodplains (areas already prone to flooding).

Flooding in Georgia is highly dependent on precipitation amounts and is highly variable. Certain seasons are more prone to flooding to a greater likelihood of excessive precipitation. Typically, the wet seasons are during the winter, early spring, and midsummer. Late spring and fall are usually drier seasons.

Hazard Profile

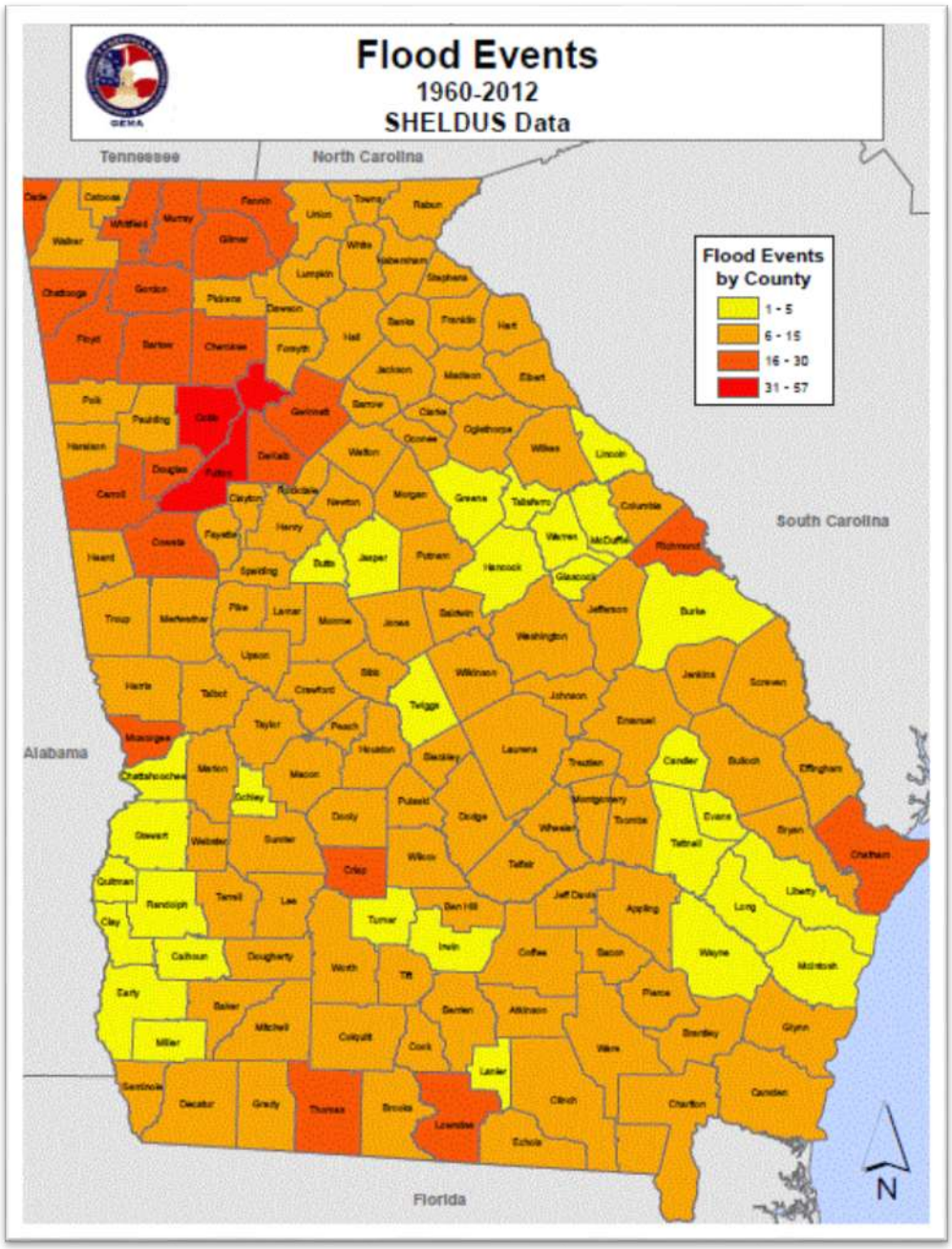
The Athens-Clarke County and University of Georgia Hazard Mitigation Planning Committees researched flooding information for the last fifty years. It was determined that flooding has caused significant damage on a relatively small number of occasions over the last 20 years. Two significant flash flooding event that affected the University of Georgia occurred in 2004 and 2005. In 2004, flooding occurred at Sanford Stadium, the Tennis Complex, and the Foley Field locker rooms resulting in nearly $200,000 in damages. In the 2005 event, flooding occurred at the Chicopee Building and caused approximately $40,000 in damages. While data was collected for the entire 50-year timeframe, little information was available regarding flood events over that period, possibly due to poor record keeping.

Flood events at the University of Georgia are typically associated with areas of special flood hazard as identified on Flood Rate Insurance Maps (FIRMs) published by the Federal Emergency Management Agency. Relatively little information is available regarding flooding damage estimates. However, with each flooding event, it is likely that significant costs arose related to road repair, infrastructure repair, and public safety response operations. Most of the flood damage in Athens-Clarke County's history appears to be related to roads and culverts washing out as a result of flood waters. Several University of Georgia facilities are located within the 100-year floodplain. These include the Chicopee Building, Tate Center, Lamar Dodd School of Art, Joe Frank Harris Commons, Ramsey Center, George D. Busbee Hall, and School of Social Work Building.

There are 10 documented flood events over the last 50 years. Based on the 50-year record, it can be inferred that such an event is likely to occur every 5 years in Athens-Clarke County. This relates to a 20% chance of a flood event occurring in a given year. Flooding is of a significant concern to Athens-Clarke County and the University of Georgia, but particularly to those areas along the Oconee River and its tributaries and distributaries.

Assets Exposed to the Hazard

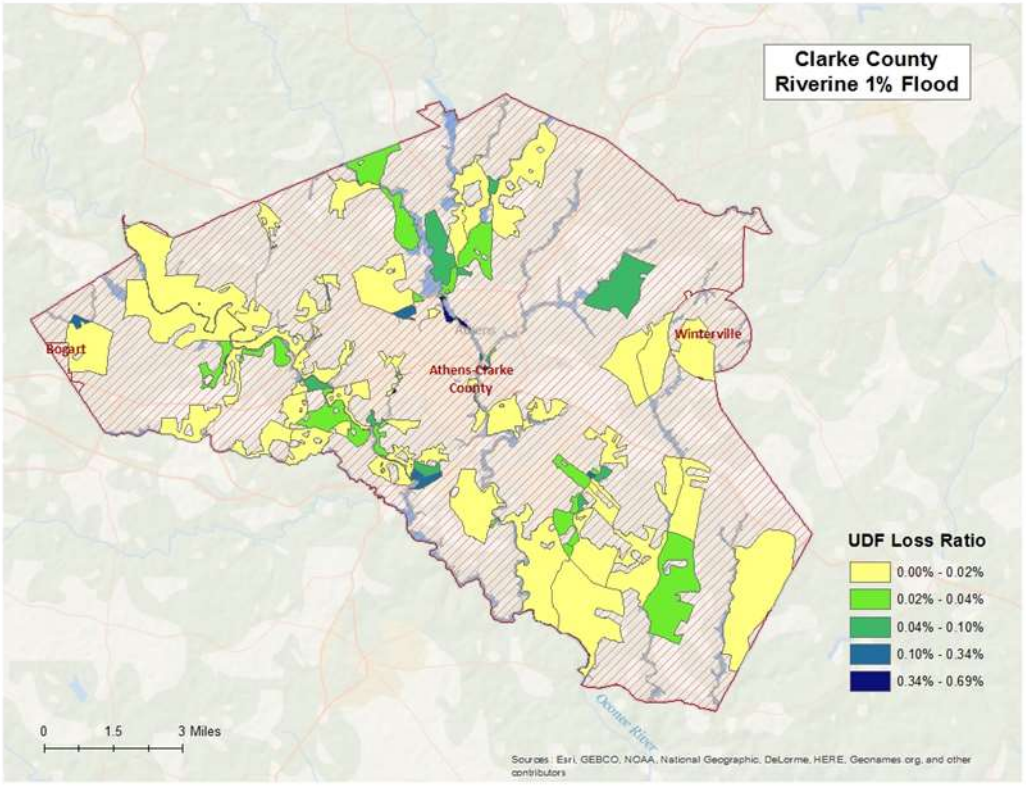
To evaluate the assets that would potentially be impacted by flooding, the Athens-Clarke County and University of Georgia Hazard Mitigation Planning Committees attempted to identify known structures within, or close to, the 100-year floodplain. These structures are the ones believed to be at the greatest risk from flooding.



SOURCE: 2014 STATE OF GEORGIA HAZARD MITIGATION STRATEGY (MOST UP-TO-DATE VERSION)

Estimated Potential Losses

Based upon the 2017 Athens-Clarke County HAZUS report, a flood equivalent to the 1% riverine flood levels could result in losses in excess of $37 million. However, it is possible that some areas may not experience total losses while others may be inundated with flood waters who are not designated in the 1% riverine flood areas. At the University of Georgia, damage to campus facilities would be significant, with the Joe Frank Harris Commons likely at the greatest risk from a 1% riverine flood.



SOURCE: 2017 ATHENS-CLARKE COUNTY HAZUS REPORT

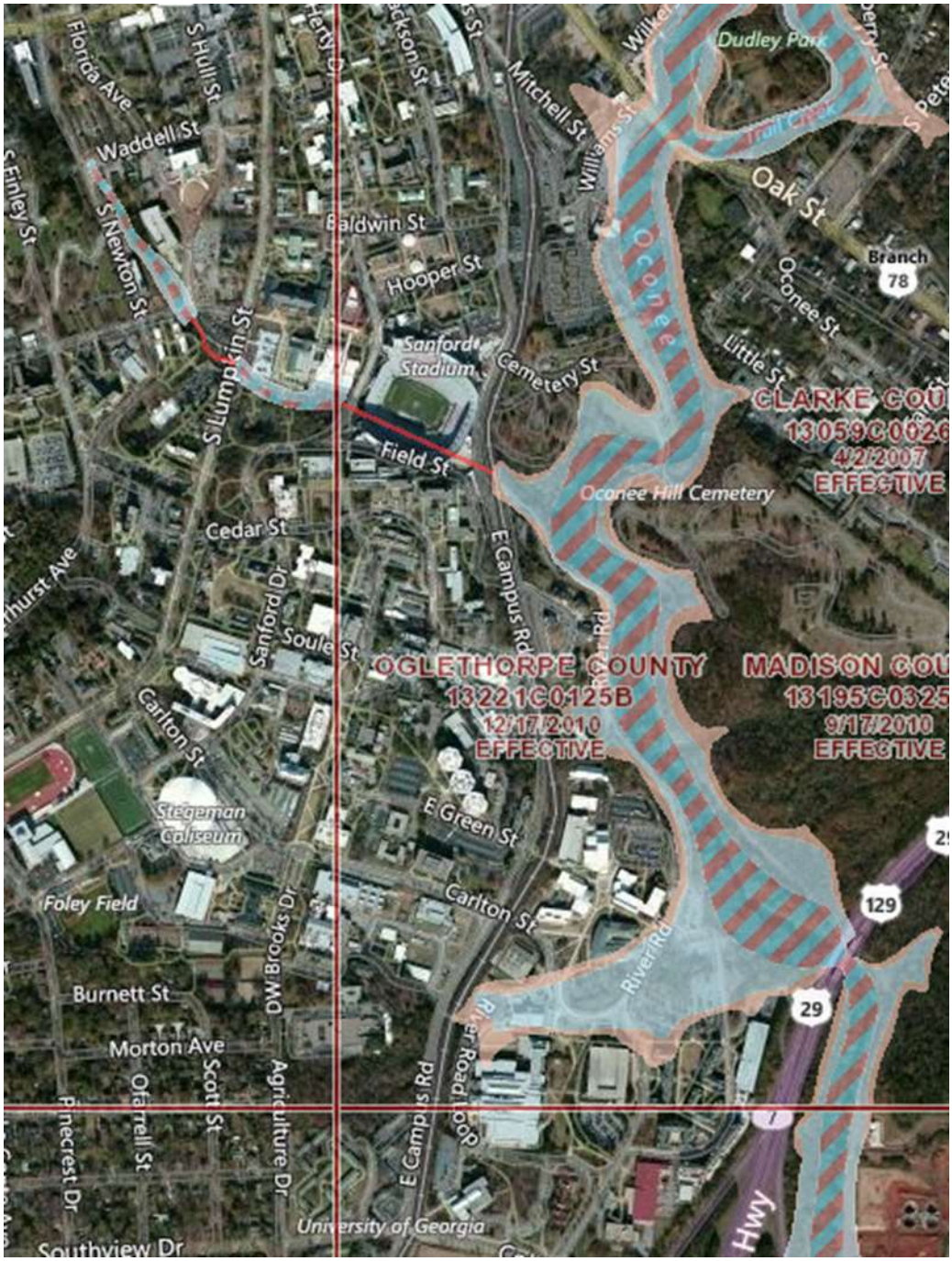
Hazard Summary

Flooding has the potential to inflict significant damage at the University of Georgia, particularly along the Oconee River and its tributaries and distributaries. Mitigation of flood damage requires the community to be aware of flood-prone areas, including roads, bridges, and University facilities. The Athens-Clarke County and University of Georgia Hazard Mitigation Planning Committees identified flooding as a hazard requiring mitigation measures and identified specific goals, objectives, and action items they deemed necessary to lessen the impact of flooding for their communities. These maps were updated since the previous plan.

Location	County/ Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD
Totals:								0	0	46.50K
ATHENS	CLARKE CO.	GA	8/9/1998	16:30	EST	Flood		0	0	5.00K
WINTERVILLE	CLARKE CO.	GA	6/14/2001	13:25	EST	Flood		0	0	0.00K
COUNTYWIDE	CLARKE CO.	GA	7/25/2001	6:00	EST	Flood		0	0	0.00K
ATHENS	CLARKE CO.	GA	9/14/2002	15:30	EST	Flood		0	0	0.00K
ATHENS	CLARKE CO.	GA	5/6/2003	14:04	EST	Flash Flood		0	0	0.00K
OCONEE HGTS	CLARKE CO.	GA	7/1/2005	16:30	EST	Flash Flood		0	0	0.50K
OCONEE HGTS	CLARKE CO.	GA	9/21/2009	20:00	EST-5	Flash Flood		0	0	5.00K
OCONEE HGTS	CLARKE CO.	GA	12/30/2015	17:00	EST-5	Flash Flood		0	0	3.00K
PRINCETON	CLARKE CO.	GA	8/4/2016	21:30	EST-5	Flash Flood		0	0	30.00K

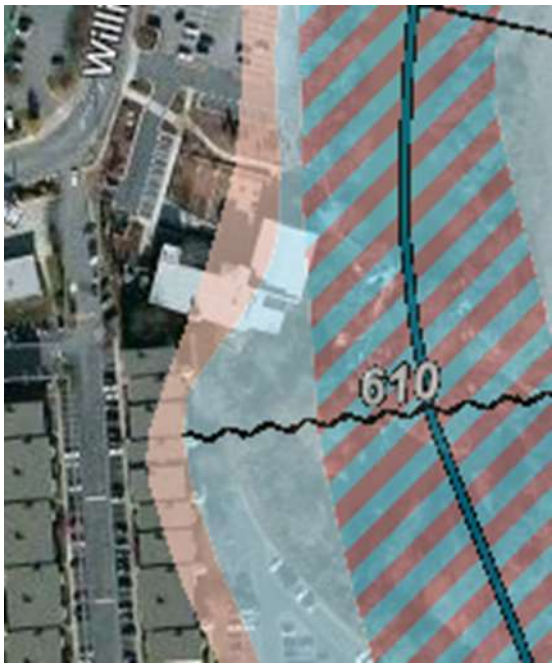
PRINCETON	CLARKE CO.	GA	8/17/2016	21:00	EST-5	Flash Flood		0	0	3.00K
Totals:								0	0	46.50K

University of Georgia Flood Map

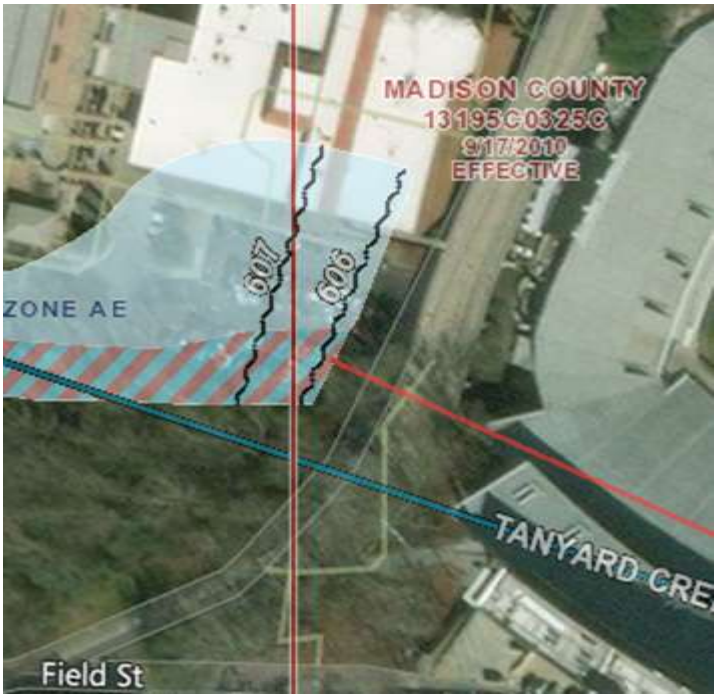


Chicopee Building

School of Social Work Building



Tate Center



Lamar Dodd School of Art

Joe Frank Harris Commons and the Ramsey Center

George D. Busbee Hall

SOURCE: GEORGIA FLOOD MAP PROGRAM (GEORGIA DNR/DFIRM)

Natural Hazard: Tornado

Hazard Description

A tornado is a violently rotating column of air (seen only when containing condensation, dust, or debris) that is in contact with the surface of the ground. Exceptionally large tornadoes may not exhibit the classic "funnel" shape, but may appear as a large, turbulent cloud near the ground or a large rain shaft. Destructive because of strong winds and windborne debris, tornadoes can topple buildings, roll mobile homes, uproot vegetation and launch objects hundreds of yards.

Most significant tornadoes (excluding some weak tornadoes and waterspouts) stem from the right rear quadrant of large thunderstorm systems where the circulation develops between 15,000 and 30,000 feet. As circulation develops, a funnel cloud, a rotating air column aloft, or tornado descends to the surface. These tornadoes are typically stronger and longer-lived. The weaker, shorter-lived tornadoes can develop along the leading edge of a singular thunderstorm. Although tornadoes can occur in most locations, most of the tornado activity in the United States in the Midwest and Southeast. Tornadoes can occur anywhere within the State of Georgia.

In terms of the continuum of area of impact for hazard events, tornadoes are fairly isolated. Typically ranging from a few hundred to one or two miles across, tornadoes affect far less area than larger meteorological events such as tropical cyclones, winter storms and severe weather events. An exact season does not exist for tornadoes. However, most occur between early spring to mid-summer (February-June). The rate of onset of tornado events is rapid. Typically, the appearance of the first signs of the tornado is the descending funnel cloud. This sign may be only minutes from the peak of the event, giving those in danger minimal sheltering time. However, meteorological warning systems attempt to afford those in danger more time to shelter. The frequency of specific tornado intensities is undetermined because no pattern seems to exist in occurrence. Finally, the duration of tornado events range from the few minutes of impact on a certain location to the actual tornado lasting up to a few hours.

Tornadoes are measured after the occurrence using the subjective intensity measures. The Enhanced Fujita Scale describes the damage and then gives estimates of magnitude of peak 3-second gusts in miles per hour.

The Enhanced Fujita Scale	
EF Rating	3 second gust (mph)
0	65-85
1	86-110
2	111-135
3	136-165
4	166-200
5	over 200

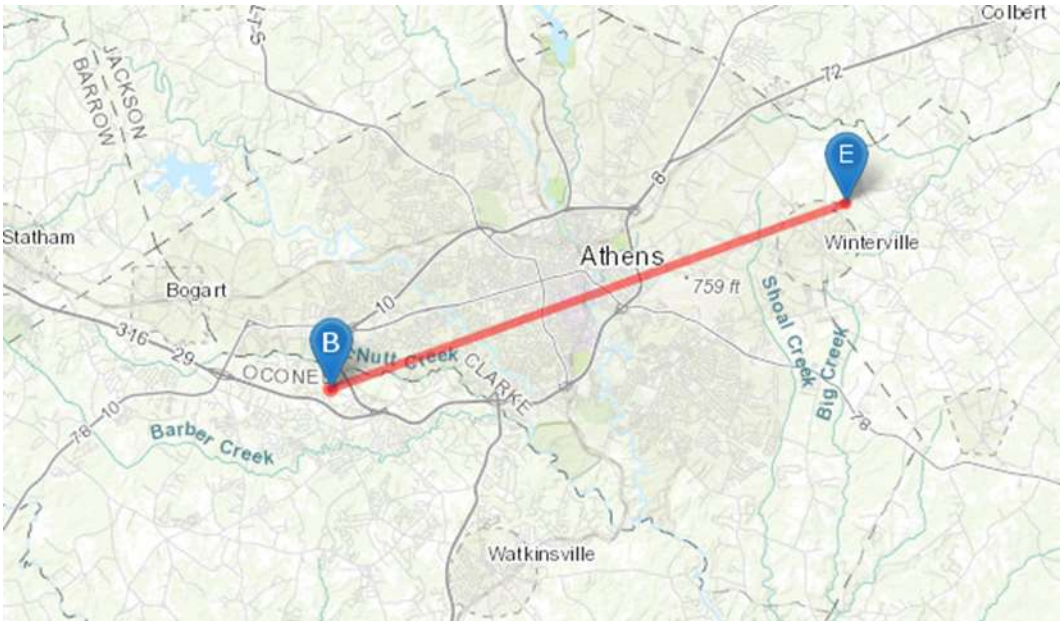
Hazard Profile

All areas of the University of Georgia are vulnerable to the threat of a tornado. Due to the indiscriminate and unpredictable nature of tornadoes, there is no reliable method to determine where or when a tornado will strike. There have been 5 documented tornadoes in the last 50 years in Athens-

Clarke County. It is likely that other tornadoes have occurred within this timeframe, but available records are limited in nature.

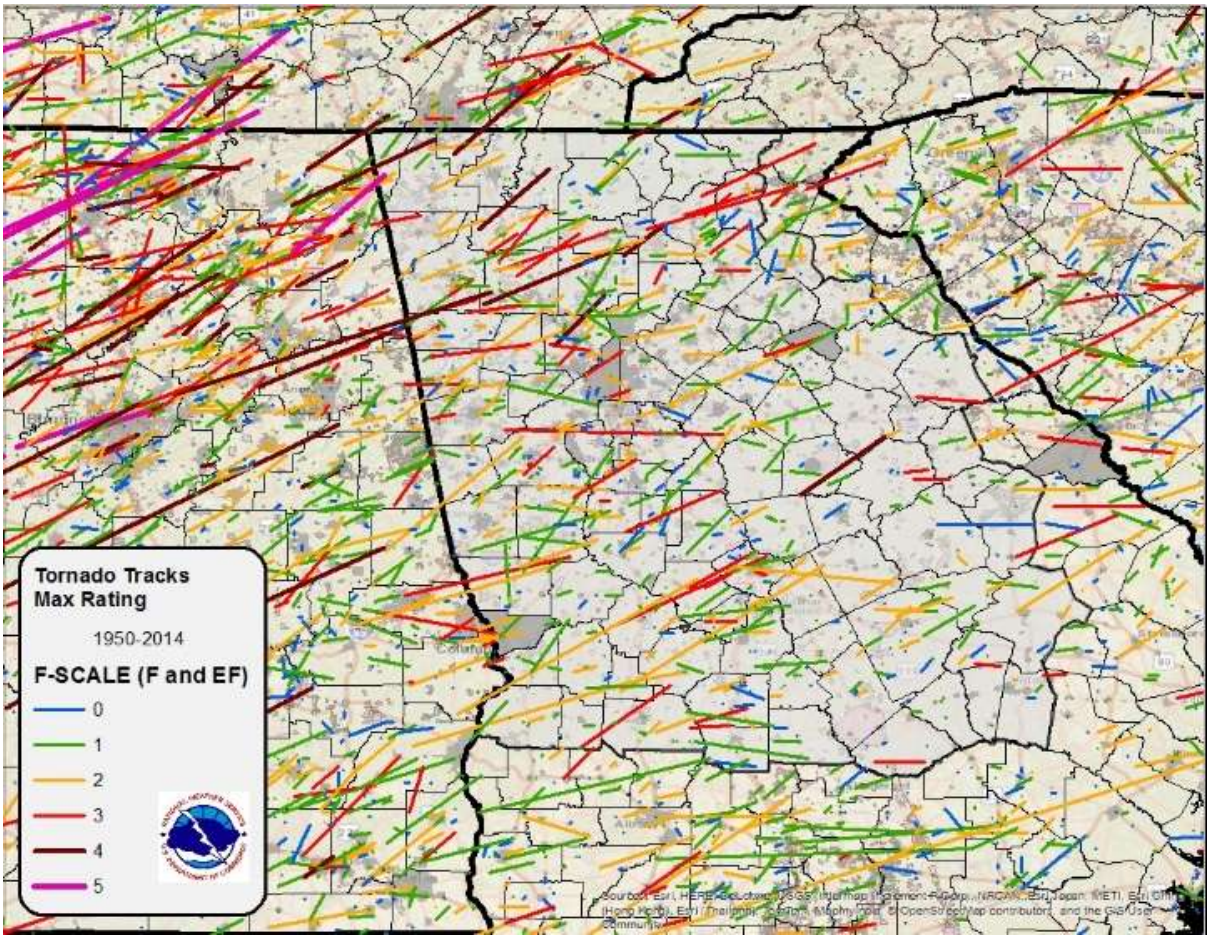
Based on the 50-year information available for Athens-Clarke County, a tornado occurs every 10 years. On an annual basis, Athens-Clarke County has a 10% chance of being impacted from a tornado event.

Individual tornado events can cause extreme damage to an area. This holds true for Athens-Clarke County, as well. The strongest documented tornado of the last 50 years to impact Athens-Clarke County was an F3 in 1973. The storm cut a 9.8 mile path across Athens-Clarke County, where it caused $25 million in damages and led to 65 injuries and one death. The costliest tornado ever to impact Athens-Clarke County also occurred in 1973. This storm was an F2 that stayed on the ground for 12.4 miles. The tornado led to 50 injuries and one death and caused over $250 million in damages. The tornado track for the March 1973 tornado indicate that the University of Georgia was directly impacted. However, no additional data has been discovered to corroborate this information. The May 1973 tornado, however, did directly impact the Navy Supply School – which is now home to the University of Georgia Health Science Campus.



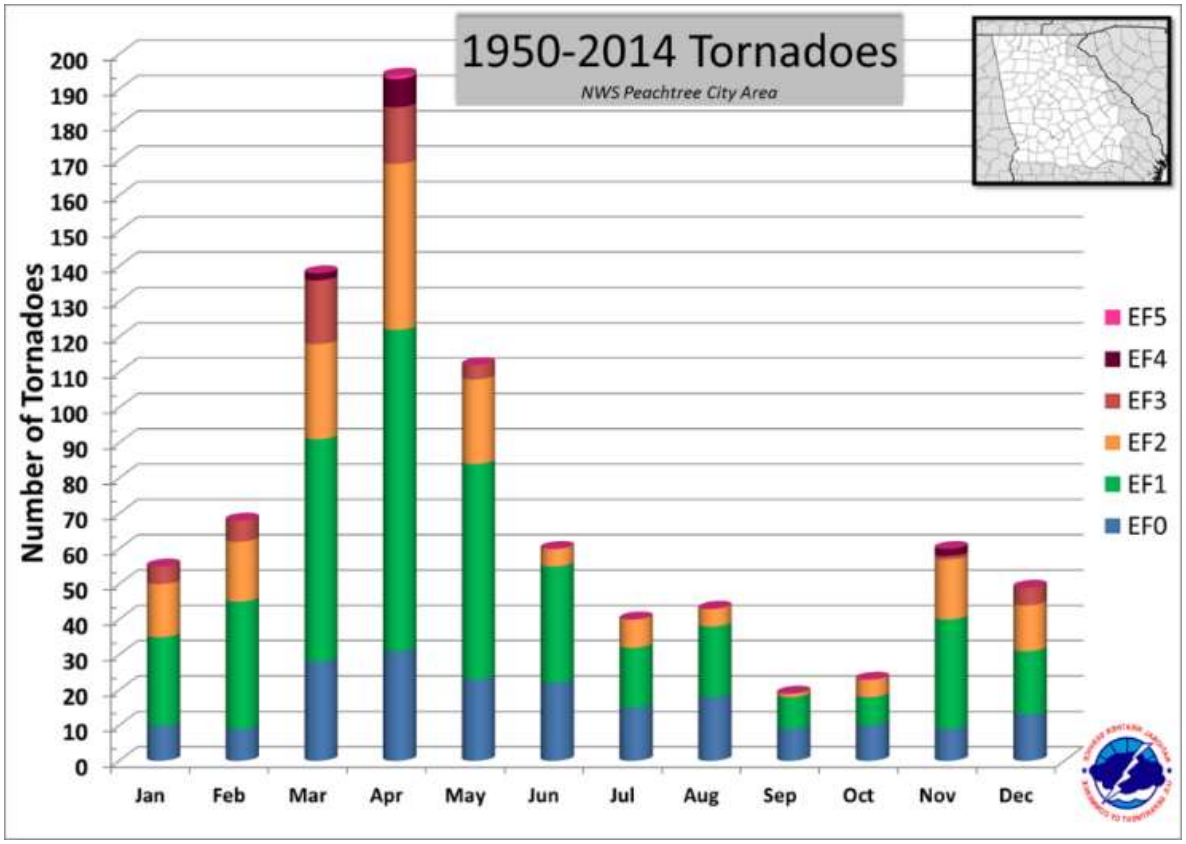
F2 TORNADO – MAY 1973 (SOURCE: NATIONAL CLIMACTIC DATA CENTER)

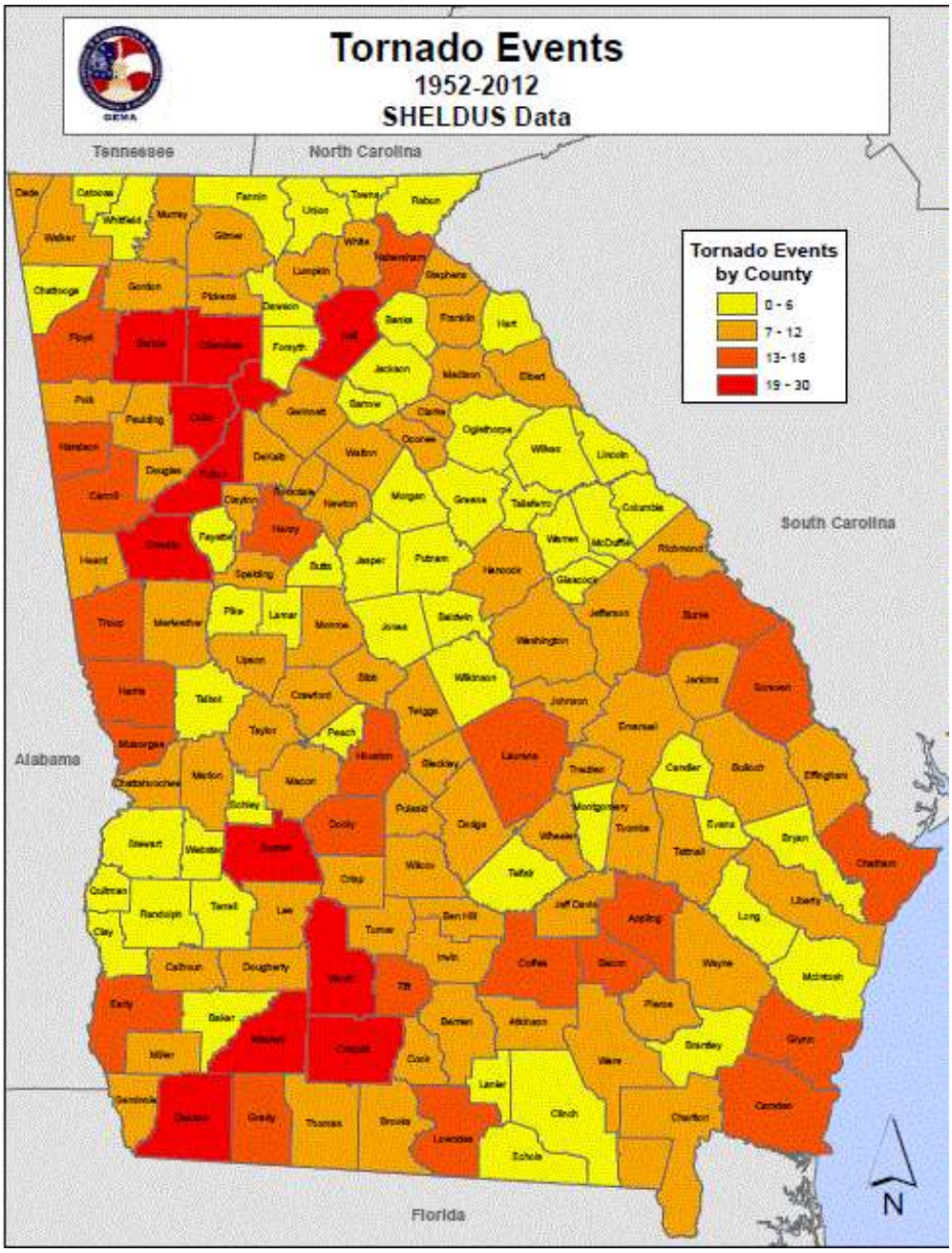
F2 TORNADO – MAY 1973 (SOURCE: NATIONAL CLIMACTIC DATA CENTER)



Estimated Potential Losses

Estimates of damage for the past events of the last 50 years are over $275 million, or $5.5 million annually. A direct impact to the University of Georgia campus could cause significant damage in excess of $500 million. Additionally, the economic impact to Athens-Clarke County and the surrounding areas would be significant.





SOURCE: 2014 STATE OF GEORGIA HAZARD MITIGATION STRATEGY (MOST UP-TO-DATE VERSION)

Hazard Summary

The University of Georgia remains at risk to potential damage from tornadoes, especially considering the average of one tornado every 10 years over the last 50 years. Due to the destructive power of tornadoes, it is essential that the mitigation measures identified in this plan regarding tornado activity receive full consideration.

Tornado Data Table

Location	County/ Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD
Totals:								2	115	275.280M
CLARKE CO.	CLARKE CO.	GA	3/31/1973	18:15	CST	Tornado	F2	1	50	250.000M
CLARKE CO.	CLARKE CO.	GA	5/28/1973	15:20	CST	Tornado	F3	1	65	25.000M
CLARKE CO.	CLARKE CO.	GA	5/28/1976	15:25	CST	Tornado	F0	0	0	2.50K
CLARKE CO.	CLARKE CO.	GA	5/28/1976	16:30	CST	Tornado	F2	0	0	25.00K
CLARKE CO.	CLARKE CO.	GA	4/8/1980	12:50	CST	Tornado	F0	0	0	2.50K
CLARKE CO.	CLARKE CO.	GA	4/8/1986	15:30	CST	Tornado	F1	0	0	250.00K
Totals:								2	115	275.280M

Natural Hazard: Drought

Hazard Description

Drought is a normal, recurrent feature of climate consisting of a deficiency of precipitation over an extended period (usually a season or more). This deficiency results in a water shortage for some social or environmental sector. Drought should be judged relative to some long-term average condition of balance between precipitation and evapotranspiration in a particular area that is considered "normal." Drought should not be viewed as only a natural hazard because the demand people place on water supply affects perceptions of drought conditions. From limited water supplies in urban areas to insufficient water for farmland, the impacts of drought are vast.

Droughts occur in virtually every climatic zone and on every continent. Because the impacts of drought conditions are largely dependent on the human activity in the area, the spatial extent of droughts can span a few counties to an entire country.

Temporal characteristics of droughts are drastically different from other hazards due to the possibility of extremely lengthy durations as well as a sluggish rate of onset. Drought conditions may endure for years or even decades. This factor implicates drought as having a high potential to cause devastation on a given area. The duration characteristic of droughts is so important that droughts are classified in terms of length of impact. Droughts lasting 1 to 3 months are considered short term, while droughts lasting 4 to 6 months are considered intermediate and droughts lasting longer than 6 months are long term. With the slow rate of onset, most populations have some inkling that drought conditions are increasingly present. However, barring drastic response measures, most only have to adapt to the changing environment.

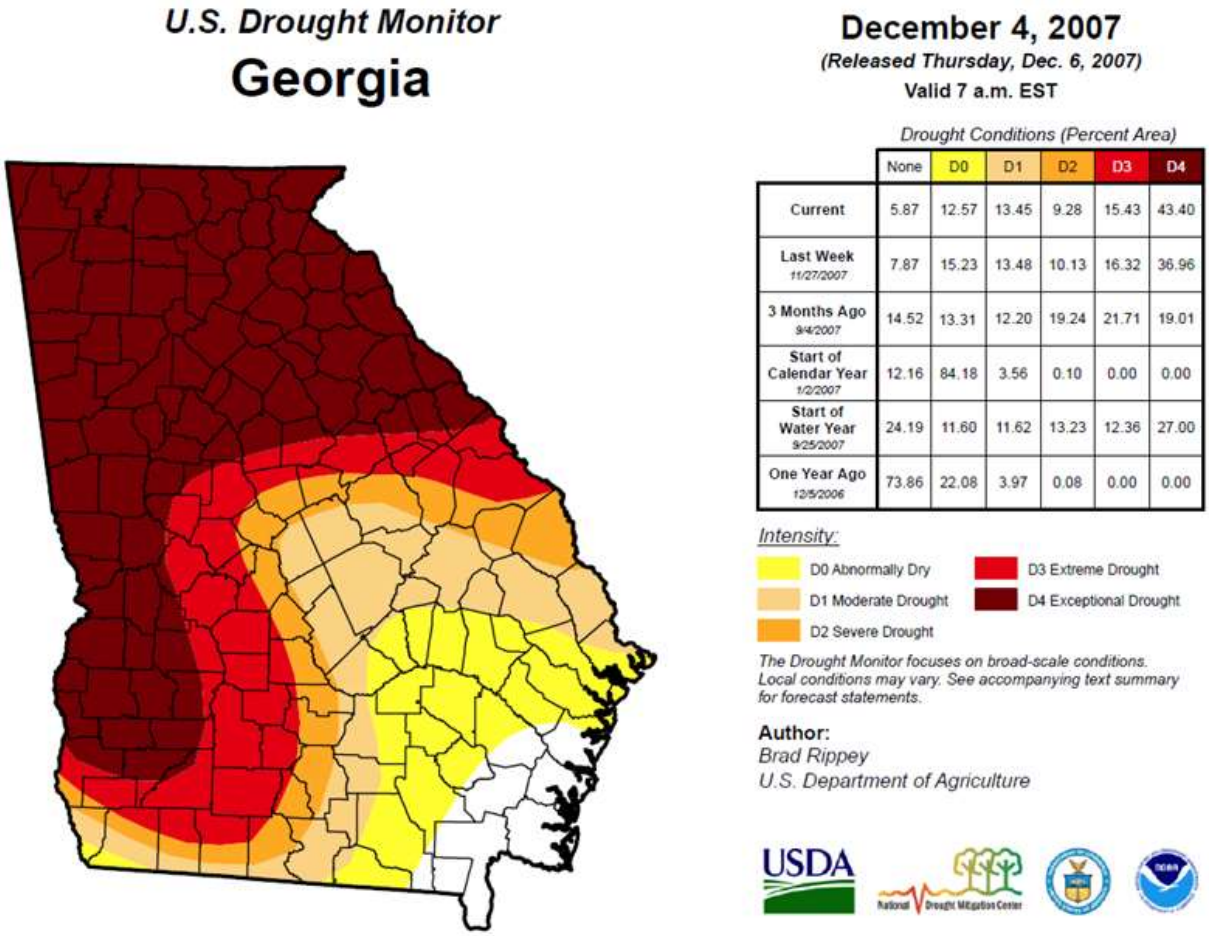
Seasonality has no general impact on droughts in terms of calendar seasons. However, "wet" and "dry" seasons obviously determine the severity of drought conditions. In other words, areas are less susceptible to drought conditions if the area is experiencing a wet season. The frequency of droughts in undetermined due to the fact that the hazard spans such a long period of time. However, climatologists track periods of high and low moisture content similarly to the tracking of cooling and warming periods.

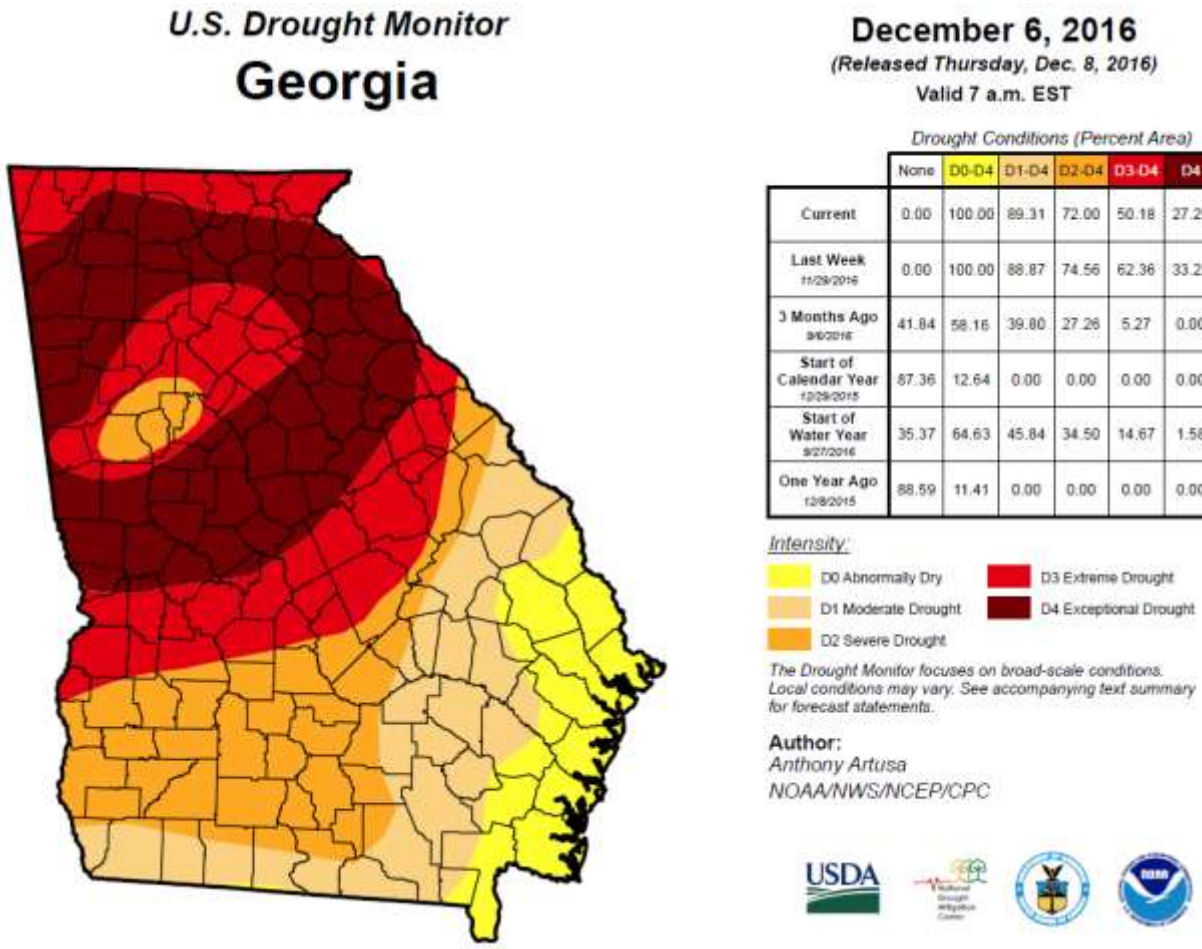
Hazard Profile

The Athens-Clarke County and University of Georgia Hazard Mitigation Planning Committees reviewed data for the last 50 years regarding drought conditions.

Due to poor record keeping and the unpredictable nature of drought conditions, reliability of historical data for the last 50 years is low. Athens-Clarke County and the University of Georgia has been impacted by 6 drought events in the last 20 years, according to data from the National Climatic Data Center. This amounts to a 30% chance of a drought for a given year over the last 20 years. Athens-Clarke County has documented $860,000 in losses due to drought over the last 50 years. This equates to an average loss of $17,200 annually.

There have been two recent examples of "exceptional" drought events affecting Athens-Clarke County and the University of Georgia. These events occurred in 2007 and 2016. Both of these events reached the D4 (Exceptional Drought) designation, according to data from the United States Drought Monitor. Below are maps of these two events.

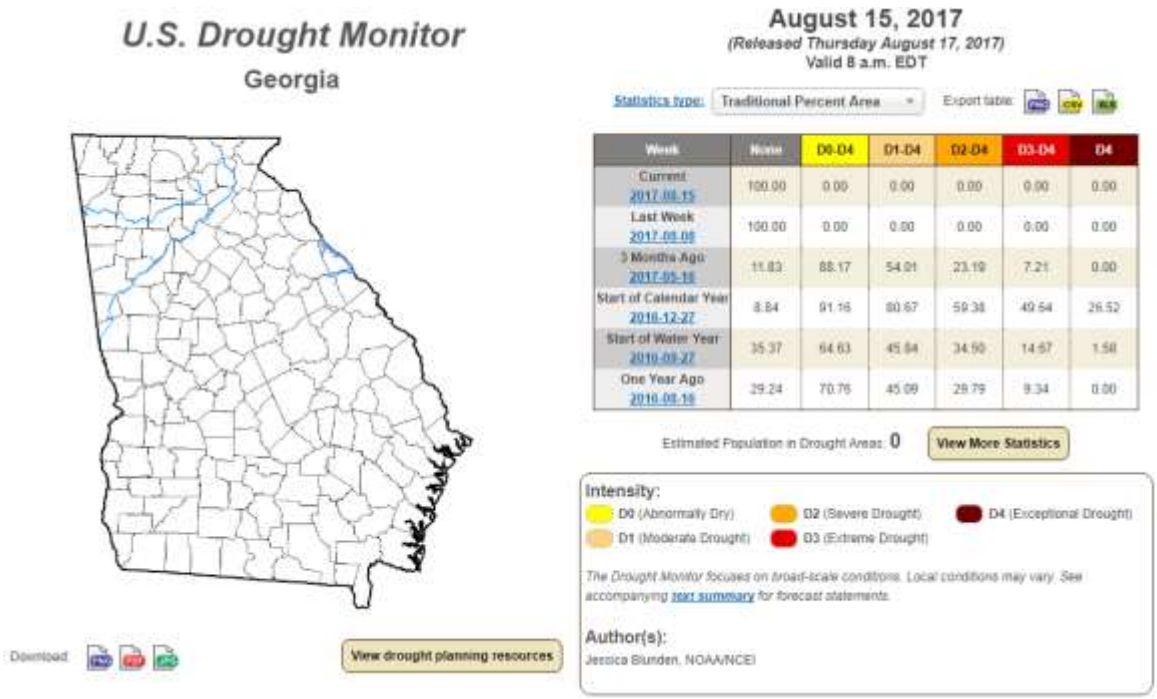




Events of this extent can cause water shortages for residential and corporate needs, as well as affecting the ability for firefighting operations to be properly effective. Drought conditions of this extent can have devastating effects on the local agricultural industries, which has occurred in previous D4 level droughts.

Estimated Potential Losses

No damage to structures or critical facilities is expected as a direct result of drought conditions. However, crop damage and subsequent losses can be expected to occur as a result of drought conditions. These damages are of particular concern to parts of the University of Georgia who are utilizing crops for research purposes. The degree of losses would depend on the duration of the drought, severity of the drought, temperatures during the drought, season in which the drought occurs, and the specific needs of the involved crops. Water system shortages and need for supply assistance for those systems could also lead to economic losses and other potential campus impacts.



SOURCE: UNITED STATES DROUGHT MONITOR (UNIVERSITY OF NEBRASKA-LINCOLN)

Hazard Summary

Drought conditions can cause significant direct and indirect impacts to the University of Georgia. Drought impacts include increased wildfire threat, decreased water supplies for residential and facility needs, stream-water quality, and water recreation facilities. The Athens-Clarke County and University of Georgia Hazard Mitigation Planning Committees recognize the potential threats drought conditions could have on the community and have identified specific mitigation actions as a result.

In addition, UGA's Strategic Plan indicates an increasing trend to develop University owned land located near the Athens campus (which has traditionally been utilized for agricultural purposes) into additional academic, research, and recreational facilities. As a result, less UGA-owned land will be utilized in Clarke County for agricultural purposes and more land will be purchased in other rural areas of the state for this primary purpose. On the whole, Clarke County is becoming less agricultural and more developed with most land previously used for agricultural purposes being utilized for commercial or residential use. Currently, UGA owns about 1,200 acres in Clarke County that is strictly utilized for beef cattle, poultry, swine, and agricultural research activities. Increased residential development trends will also expose increasing populations to disruption of water supplies caused by droughts. These effects are not expected to affect critical facilities. The GEMA Mitigation Information System data is not applicable to this hazard.

In October 2007, a 12-member advisory task force (comprised of UGA faculty, staff and students) was charged with developing recommendations for the UGA senior administration to consider in order to achieve more effective water conservation on campus. The charge to the Ad-Hoc Task Force on Water Resources was three-fold: (1) to develop practical recommendations to conserve significant amounts of water in the short term with the least possible impact on core missions; (2) to develop recommendations for sustained water conservation; and (3) to generate proposals for potentially increasing the University's water supply, both now and in the future.

Several initiatives and proposals that resulted from the UGA report include proposals for systemic changes in UGA's construction and maintenance practices to retain water and use it more efficiently; development of an emergency management plan to identify and prioritize critical campus functions to maintain in the event of a water supply crisis; and enhancement of a public awareness campaign to increase knowledge of the issue and effect changes in behavior by individual members of the campus community.

Drought Data Table

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	860.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	9/1/1997	0:00	EST	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	5/1/1999	0:00	EST	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	8/1/1999	0:00	EST	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	2/1/2000	0:00	EST	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	4/1/2000	0:00	EST	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	5/1/2000	0:00	EST	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	6/1/2000	0:00	EST	Drought		0	0	0.00K	860.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	7/1/2000	0:00	EST	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	10/1/2000	0:00	EST	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	10/1/2001	0:00	EST	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	11/1/2001	0:00	EST	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	12/1/2001	0:00	EST	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	4/1/2002	0:00	EST	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	8/1/2002	0:00	EST	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	1/1/2003	0:00	EST	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	3/1/2004	0:00	EST	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	5/1/2007	0:00	EST-5	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	9/1/2007	0:00	EST-5	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	10/1/2007	0:00	EST-5	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	11/1/2007	0:00	EST-5	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	12/1/2007	0:00	EST-5	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	9/1/2011	0:00	EST-5	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	6/1/2016	0:00	EST-5	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	7/1/2016	0:00	EST-5	Drought		0	0	0.00K	0.00K

CLARKE (ZONE)	CLARKE (ZONE)	GA	8/1/2016	0:00	EST-5	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	10/1/2016	0:00	EST-5	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	11/1/2016	0:00	EST-5	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	12/1/2016	0:00	EST-5	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	1/1/2017	0:00	EST-5	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	2/1/2017	0:00	EST-5	Drought		0	0	0.00K	0.00K
CLARKE (ZONE)	CLARKE (ZONE)	GA	3/1/2017	0:00	EST-5	Drought		0	0	0.00K	0.00K
Totals:								0	0	0.00K	860.00K

Natural Hazard: Wildfire

Hazard Description

A wildfire is an uncontained fire that spreads through the environment. Wildfires have the ability to consume large areas, including infrastructure, property, and resources. When massive fires, or conflagrations, develop near populated areas, evacuations could possibly ensue. Not only do the flames impact the environment, but the massive volumes of smoke spread by certain atmospheric conditions also impact the health of nearby populations.

Wildfires result from the interaction of three crucial elements: fuel, ignition (heat), and oxygen. Natural and manmade forces cause the three crucial elements to coincide in a manner that produces wildfire events. Typically, fuel consists of natural vegetation. However, as the urban and suburban footprint expands, wildfires may utilize other means of fuel, such as buildings. In terms of ignition or source of heat, the primary source is lightning. However, humans are more responsible for wildfires than lightning. Manmade sources vary from the unintentional, such as fireworks, campfires or machinery, to intentional arson. With these two elements provided, the wildfires may spread as long as oxygen is present.

Weather is the most variable factor affecting wildfire behavior. Strong winds propel wildfires quickly across most landscapes unless firebreaks are present. Shifting winds create erratic wildfires, which can complicate fire management efforts. Dry conditions provide faster-burning fuels, either making the area more vulnerable to wildfire or increasing the mobility of preexisting wildfires.

Wildfires are notorious for spawning secondary hazards, such as flash flooding and landslides, long after the original fire is extinguished. Both flash flooding and landslides result from fire consuming the natural vegetation that provides precipitation interception and infiltration as well as slope stability.

All of Georgia is prone to wildfire due to the presence of wildland fuels associated with wildfires. Land cover associated with wildland fuels includes coniferous, deciduous, and mixed forest; shrub land; grassland and herbaceous; transitional; and woody and emergency herbaceous wetlands. The spatial extent of wildfire events greatly depends on both the factors driving the fire as well as the efforts of fire management and containment operations.

In terms of seasonality, wildfires can occur during any season of the year. However, drier seasons, which vary within the State of Georgia, are more vulnerable to severe wildfires because of weather patterns and the abundant quick-burning fuels. In terms of rate of onset and duration, wildfires vary depending on the available fuels and weather patterns. Some wildfires can engulf an area in a matter of

minutes from the first signs whereas others may be slower burning and moving. The frequency of wildfires is not typically measured because of the high probability of human ignition being statistically unpredictable. Magnitude and intensity are typically only measured by size of the wildfire and locations of burning.

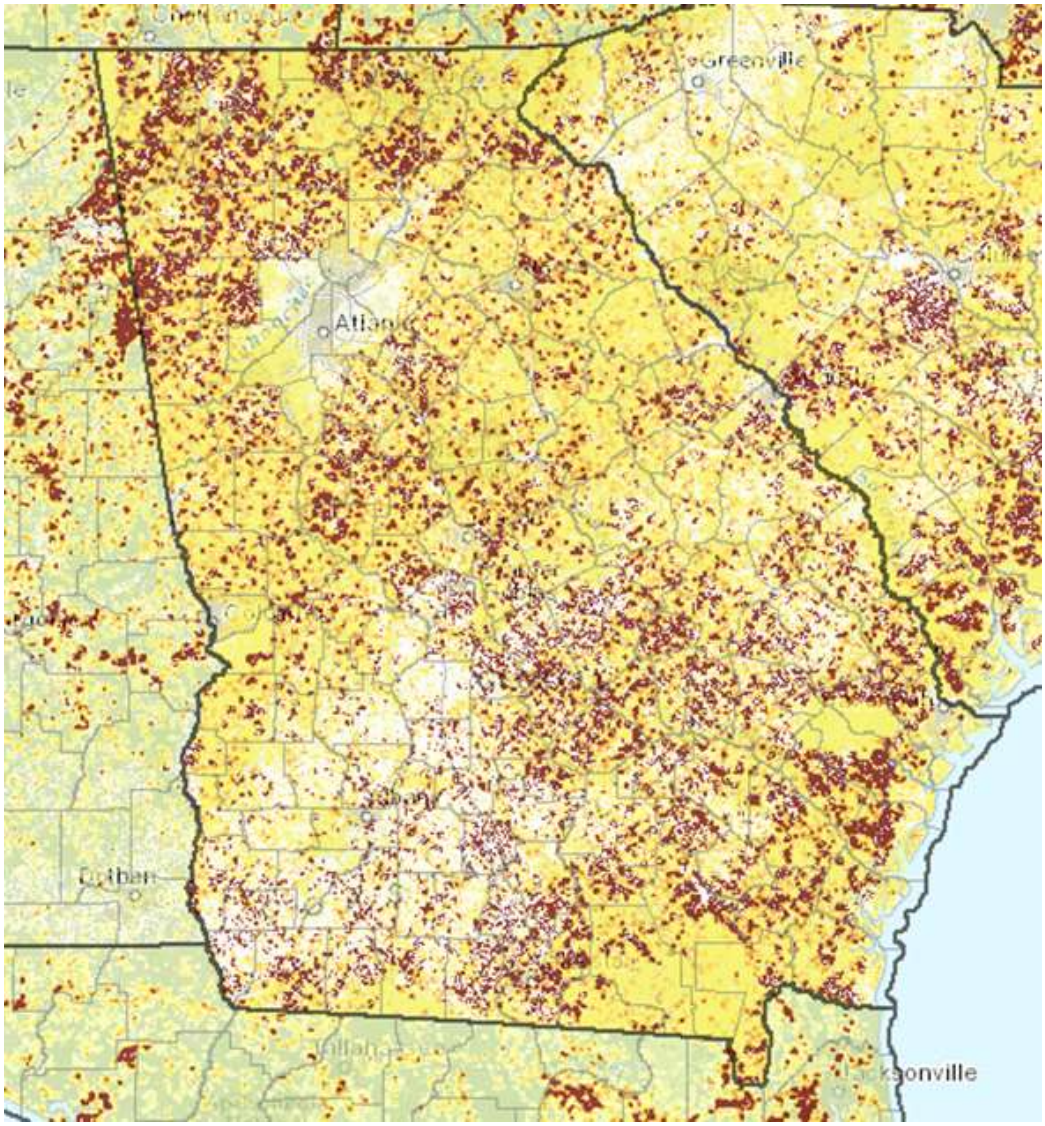
Three classes of fires include understory, crown, and ground fires. Naturally-induced wildfires burn at relatively low intensities, consuming grasses, woody shrubs, and dead trees. These understory fires often play an important role in plant reproduction and wildlife habitat renewal and self-extinguish due to low fuel loads or precipitation. Crown fires, which consist of fires consuming entire living trees, are low probability but high consequence events due to the creation of embers that can be spread by the wind. Crown fires typically match perceptions of wildfires. In areas with high concentrations of organic materials in the soil, ground fires may burn, sometimes persisting undetected for long periods until the surface is ignited.

Hazard Profile

Wildfires could pose a serious threat to the University of Georgia. This is a result of the high amount of wildland-urban interface (WUI) area in and around the University of Georgia, which is defined as areas where structures and other human development meets undeveloped wildland properties.

While the University of Georgia is at less direct risk from wildfires than the most of Athens-Clarke County, the University of Georgia would almost certainly be indirectly impacted by any large wildfire that occurs in Athens-Clarke County. The Eastern and Southern reaches of the University of Georgia Main Campus – particularly those areas along the Oconee River and south of College Station Road – are at the greatest risk for direct impacts from a wildfire event.

Georgia Wildfire Ignition Density



SOURCE: SOUTHERN GROUP OF STATE FORESTERS WILDFIRE RISK ASSESSMENT PORTAL

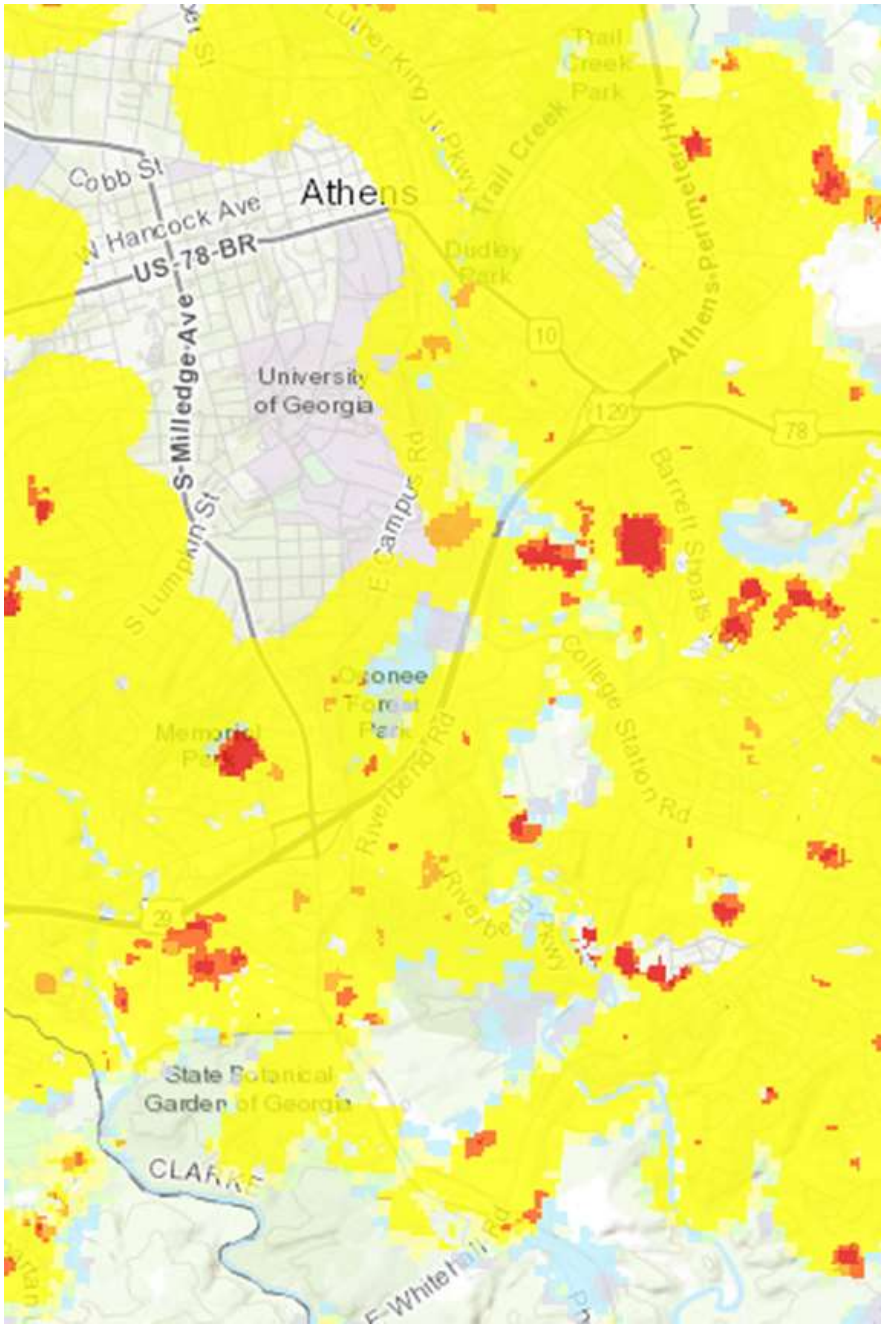
Estimated Potential Losses

Little information is available regarding damages, in terms of dollars, for wildfire losses at the University of Georgia.

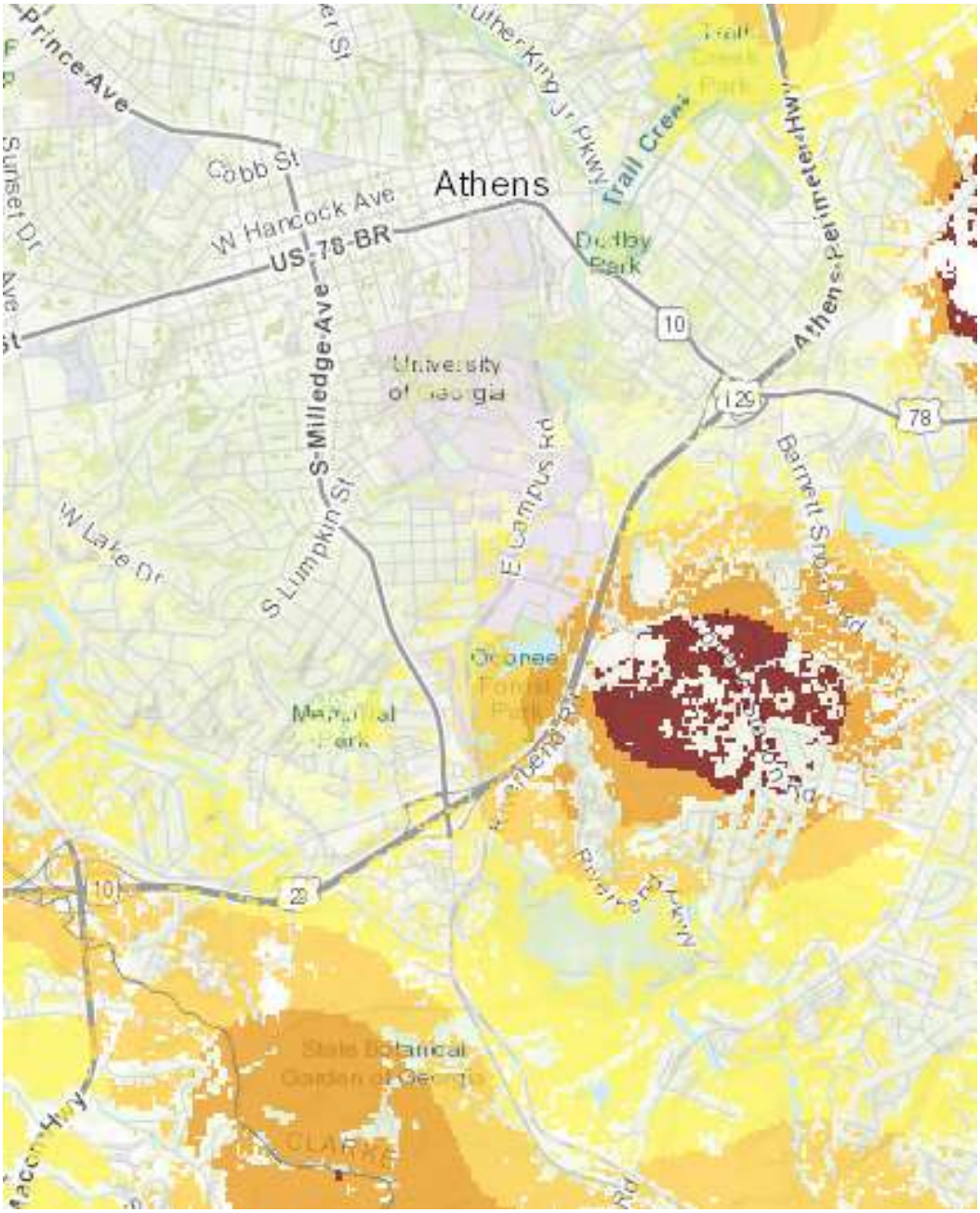
Hazard Summary

Wildfire is a significant threat to the University of Georgia due to the increased amount of Wildland-Urban Interface. The increasing amount of area where structures and other human development meets undeveloped, wildland property is where 98% of Athens-Clarke County's population lives – including the University of Georgia. The mitigation measures identified in this plan should be aggressively pursued based on the high frequency of this hazard and the ability for wildfires to inflict devastation anywhere in Athens-Clarke County, including the University of Georgia.

University of Georgia WUI Risk



University of Georgia Wildfire Ignition Density



ALL MAPS IN THIS SECTION ARE FROM THE SOUTHERN GROUP OF STATE FORESTERS WILDFIRE RISK ASSESSMENT PORTAL

Natural Hazard: Earthquakes

Hazard Description

Earthquakes are generally defined as the sudden motion or trembling of the Earth's surface caused by an abrupt release of slowly accumulated strain. This release typically manifests on the surface as ground shaking, surface faulting, tectonic uplifting and subsidence, or ground failures, and tsunamis. In the United States, earthquake activity east of the Rocky Mountains is relatively low compared to the Western states because it is away from active plate boundaries and the plate interior strain rates are known to be very low.

The physical property of earthquakes that causes the majority of damage within the United States is ground shaking. The vibrations from the seismic waves that propagate outward from the epicenter may cause failure in structures not adequately designed to withstand earthquakes. Because the seismic waves have different frequencies of vibration, the waves disseminate differently through sub-surface materials. For example, high frequency compression and shear waves arrive first, whereas lower frequency Rayleigh and love waves arrive later. Not only are the speeds varied between seismic waves, but also the types of movement. The surface vibration may be horizontal, vertical, or a combination of the two, which causes a wider array or structures to collapse.

Another manifestation of earthquakes is surface faulting. This phenomenon is defined as the offset or tearing of the earth's surface by a differential movement across a fault. Structures built across active faults tend to sustain damage regularly. There are no active faults within or near Georgia. Distinct inactive faults are known within the state north or the Columbus to Macon to Augusta fall line and running generally northeast-southwest.

The third earthquake phenomenon that causes damage is tectonic uplift and subsidence. Tectonic uplift can cause shallowing of the harbors and waterways while tectonic subsidence can cause permanent or intermittent inundation. Due to the association of tectonic uplift and subsidence with active faults, Georgia is not at risk to these phenomena.

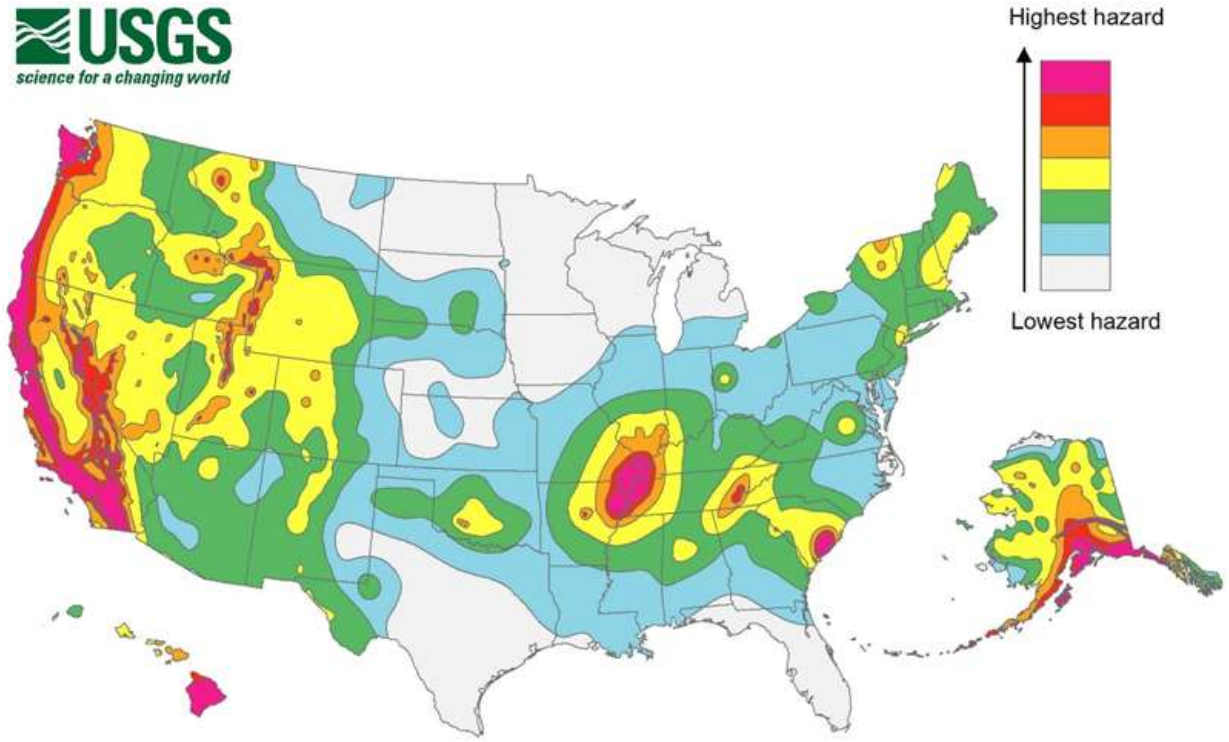
The fourth earthquake damage-causing phenomena are earthquake-induced ground failures, including liquefaction and landslides. During an earthquake, the areas that are rich in sand and silt have groundwater within 30 feet of the surface temporarily behave as viscous fluids during strong ground shaking. Structures built on these materials can settle, topple, or collapse as the ground "liquefies" beneath it. Landslides can also form when earthquake shaking or seismic activity dislodges rock and debris on steep slopes, triggering rock falls, avalanches, and slides.

Also, unstable or nearly unstable slopes consisting of clay soils may lose shear strength when disturbed by ground shaking and fail, resulting in a landslide. Georgia is at very low risk of seismic induced liquefaction or landslides.

The last of the earthquake-induced phenomena are tsunamis, which are large, gravity-driven waves triggered by the sudden displacement of a large volume of water. The waves produced travel in all directions from the origin at speeds of up to 600 miles per hour. In deep water, tsunamis normally have small wave heights.

However, as the waves reach shallower water near land, the wave speed diminishes and the amplitude drastically increases. Upon impact with a shoreline, the waves can inundate land rapidly, engulfing everything in its path. Successive wave crests follow, typically arriving minutes to hours later, frequently with later arrivals being more dominant. Frequently, the first tsunami waves are downward, causing dramatic exposure of the beach. Because of this, people are often killed trying to collect newly exposed seashells when the positive waves then arrive.

Although large tsunamis are rare in the eastern coast of the US, the possibility of such events occurring anywhere along the Atlantic and Gulf coast exists.



SOURCE: UNITED STATES GEOLOGICAL SURVEY (USGS)

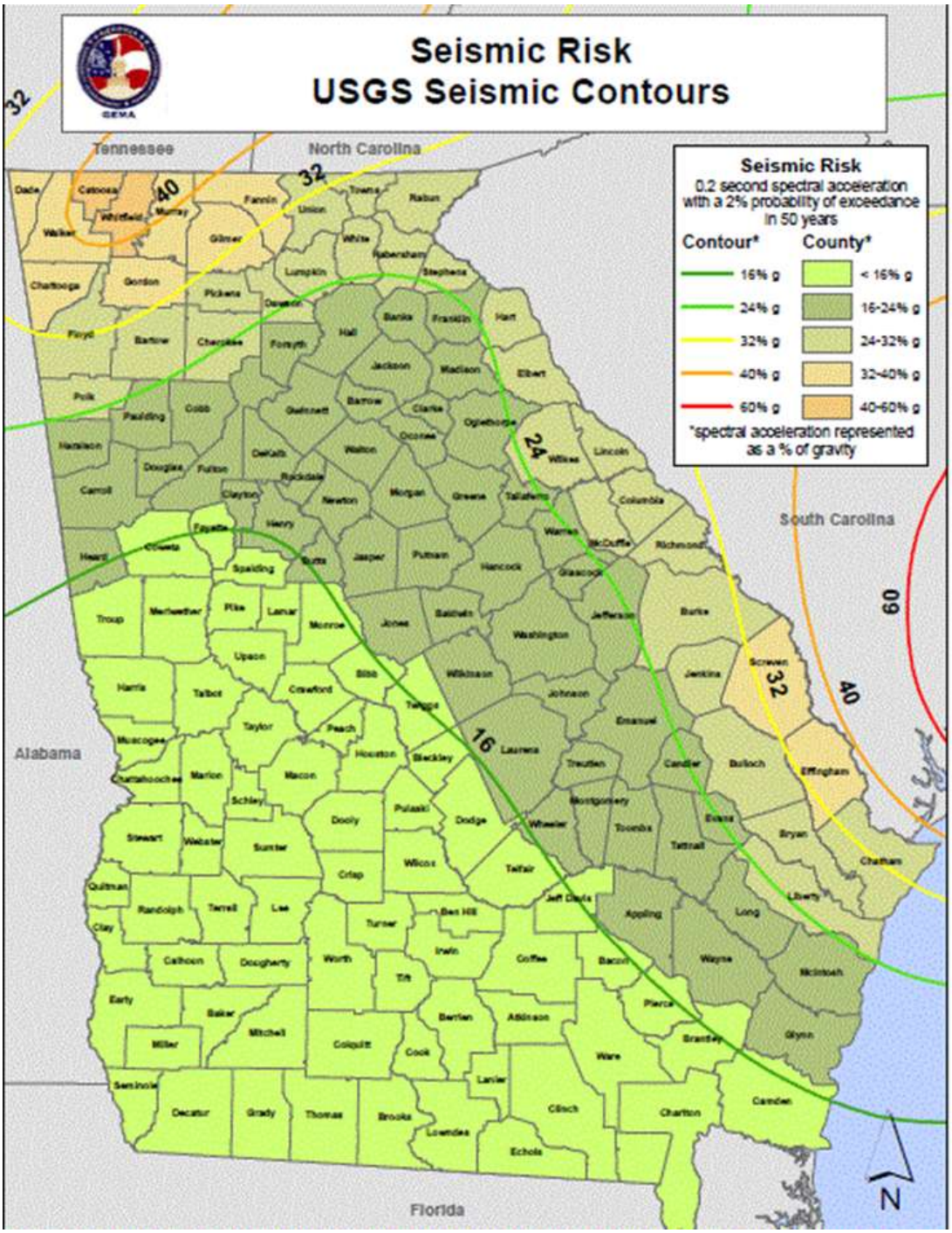
Hazard Profile

Athens-Clarke County is not one of the 37 Georgia counties with the highest earthquake risk, according to the Georgia Emergency Management Agency and Georgia Tech School of Earth and Atmospheric Sciences. In reviewing data of the last 50 years, no earthquakes have originated from within Athens-Clarke County. However, earthquakes with a magnitude of 3.0 or greater have occurred as close as Lake Secession, SC. The closest earthquake to the University of Georgia in the last 50 years occurred 6 km West-Northwest of Danielsville, GA in 2004 and measured 2.2 on the Richter Scale. Overall, 7 earthquakes have originated within 50 miles of the University of Georgia in the last 50 years. Historically, the 1886 Charleston, SC earthquake, estimated to be between 6.6 and 7.3 on the modern Richter Scale, likely caused impacts to the University of Georgia. Although no historical records exist exhibiting any damages, the University of Georgia was estimated to be in a level VI area of the Modified Mercalli Intensity scale for this event. This would indicate strong shaking felt by everyone inside and outside at the time of the event and characterized by broken windows, movement of heavy furniture, and slight to moderate damage for poorly built buildings. Even with this low number of occurrences, it was determined that if earthquakes occur within or close to the University of Georgia, significant damage could occur. Therefore, the Athens-Clarke County and University of Georgia Hazard Mitigation Planning Committee has determined the threat of earthquakes to be higher than the statistics would indicate.

Instrumental Intensity	Acceleration (%g)	Velocity (cm/s)	Perceived Shaking	Potential Damage
I	< 0.17	< 0.1	Not Felt	None
II-III	0.17 - 1.4	0.1 - 1.1	Weak	None
IV	1.4 - 3.9	1.1 - 3.4	Light	None
V	3.9 - 9.2	3.4 - 8.1	Moderate	Very light
VI	9.2 - 18	8.1 - 16	Strong	Light
VII	18 - 34	16 - 31	Very Strong	Moderate
VIII	34 - 65	31 - 60	Severe	Moderate to Heavy
IX	65 - 124	60 - 116	Violent	Heavy
X+	> 124	> 116	Extreme	Very Heavy

Estimated Potential Losses

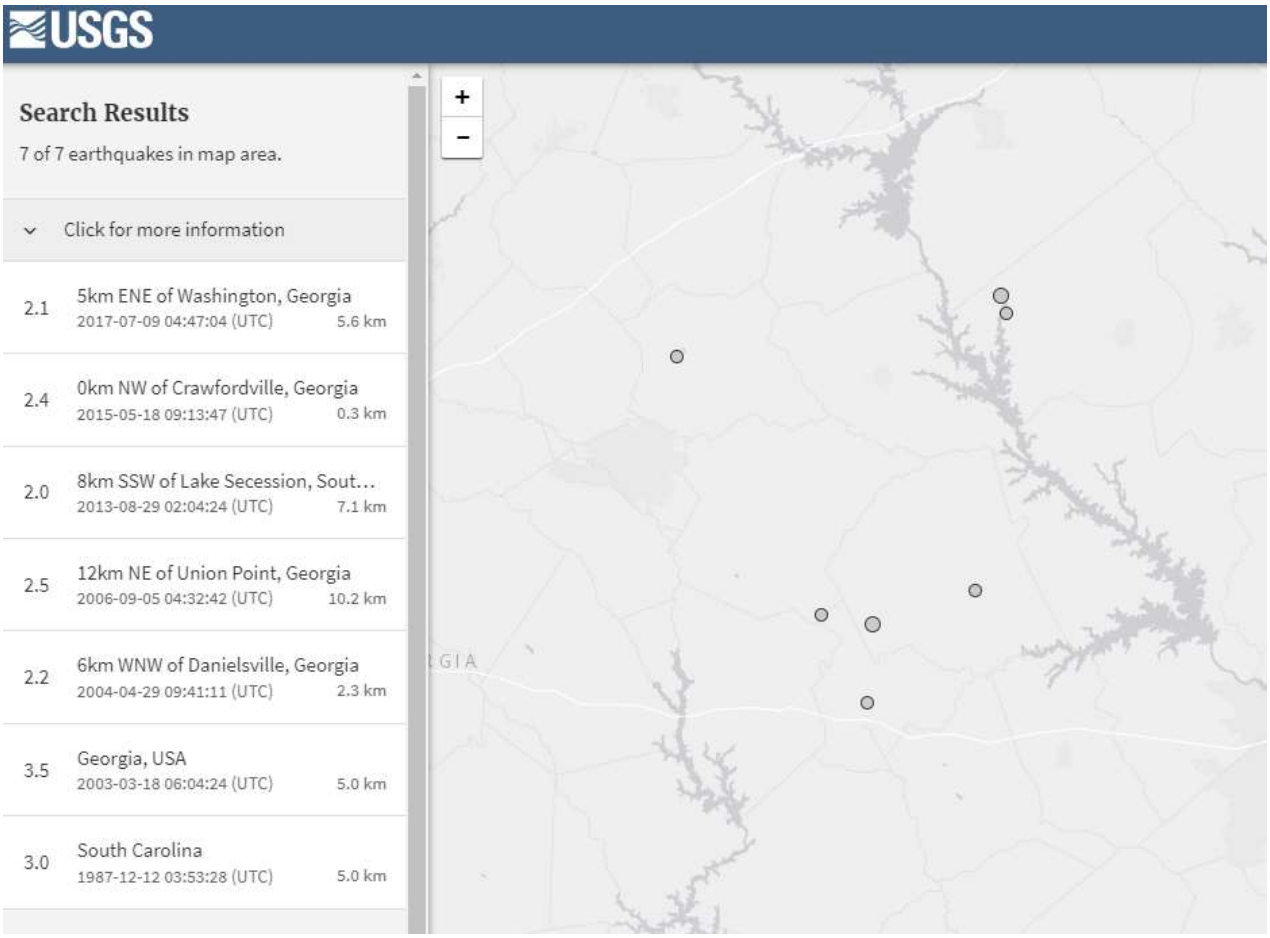
Little information is available regarding damages, in terms of dollars, for earthquake losses at the University of Georgia.



SOURCE: 2014 STATE OF GEORGIA HAZARD MITIGATION STRATEGY (MOST UP-TO-DATE VERSION)

Hazard Summary

Even with the infrequency of earthquake impacts at the University of Georgia, the potential losses and impacts associated with the event would severely damage the infrastructure and economic viability of the University. The mitigation measures identified in this plan should be pursued based on the high impact potential of this hazard and the ability for earthquakes to inflict widespread devastation anywhere in Athens-Clarke County, including the University of Georgia.



SOURCE: UNITED STATES GEOLOGICAL SURVEY (USGS) EARTHQUAKE HAZARDS PROGRAM

Natural Hazard: Tropical Cyclone

Hazard Description

The National Weather Service describes tropical cyclones systems in the Atlantic Basin, including the Gulf of Mexico and Caribbean Sea, into four types based on strength.

Tropical Disturbance: A discrete tropical weather system of apparently organized thunderstorms – generally 100 to 300 nautical miles in diameter – originating in the tropics or subtropics, and maintaining its identity for 24 hours or more.

Tropical Depression: An organized system of clouds and thunderstorms with a defined circulation and maximum sustained winds of 38 mph (33 knots) or less.

Tropical Storm: An organized system of strong thunderstorms with a defined circulation and maximum sustained winds of 39 mph to 73 mph (34-63 knots).

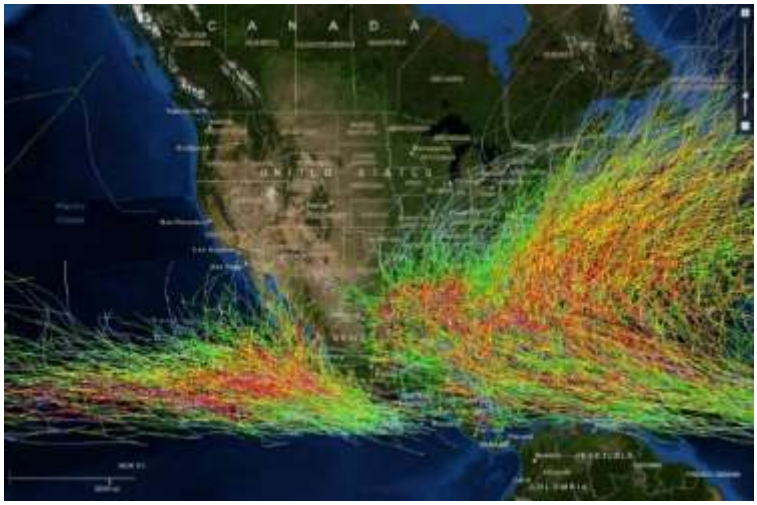
Hurricane: An intense tropical weather system with a well-defined circulation, producing maximum sustained winds of 74 mph (64 knots) or greater. Hurricane intensity is classified into five categories using the Saffir-Simpson Hurricane scale. Winds in a hurricane range from 74-95 mph for a Category 1 hurricane to greater than 156 mph for a Category 5 hurricane.

Saffir-Simpson Scale for Hurricane Classification				
Strength	Wind Speed (Kts)	Wind Speed (MPH)	Pressure (Millibars)	Pressure
Category 1	64- 82 kts	74- 95 mph	>980 mb	28.94 "Hg
Category 2	83- 95 kts	96-110 mph	965-979 mb	28.50-28.91 "Hg
Category 3	96-113 kts	111-130 mph	945-964 mb	27.91-28.47 "Hg
Category 4	114-135 kts	131-155 mph	920-944 mb	27.17-27.88 "Hg
Category 5	>135 kts	>155 mph	919 mb	27.16 "Hg
Tropical Cyclone Classification				
Tropical Depression	20-34kts			
Tropical Storm	35-63kts			
Hurricane	64+kts or 74+mph			

Tropical cyclones can cause catastrophic damage to coastlines and areas several hundred miles inland. Tropical cyclones can produce sustained high winds and spawn tornadoes and microbursts. Additionally, tropical cyclones can create storm surges along the coast and cause extensive damage from heavy rainfall. Floods and flying debris from the excessive winds are often the deadly and destructive results of these weather events.

Slow moving tropical cyclones traveling into mountainous regions tend to produce especially heavy rain. Excessive rain can trigger landslides or mudslides. Flash flooding can also occur due to intense rainfall.

Each of these hazards present unique characteristics and challenges; therefore, the following have been separated and analyzed as individual hazards: Tropical cyclones, Thunderstorms, Tornadoes, and Flooding. This section will focus on the direct effects of tropical cyclones.



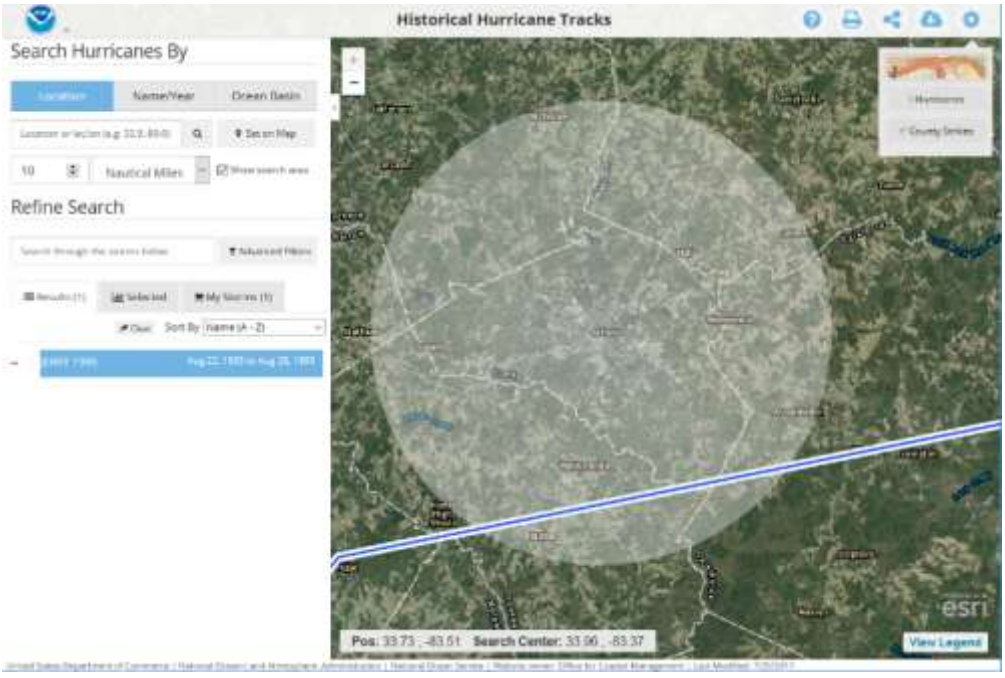
Hazard Profile

Tropical cyclones have directly impacted Athens-Clarke County and the University of Georgia on an infrequent basis over the last 50 years. However, the possibility of a hurricane or tropical storm retaining their wind strength as far inland as Athens-Clarke County is possible. There have been thirteen documented impacts from Tropical Cyclones in Athens-Clarke County. This equates to a 26% chance of a tropical cyclone impacting Athens-Clarke County in any given year. All of these impactful storms have occurred in the last 16 years, which equates to an 81% chance of a tropical cyclone impacting Athens-Clarke County in a given year.

One storm – Tropical Storm Jerry in 1995 – had a track that directly dissected Athens-Clarke County in the last 50 years. This storm was below Tropical Storm strength at the time it entered Athens-Clarke County. In 2017, Hurricane Irma dropped over 2.5 inches of rain in Athens with sustained winds near Tropical Storm levels (35 mph) and gusts above Tropical Storm levels (42 mph). The full impacts of Hurricane Irma are still being determined. Two other storms – Ivan and Frances in 2004 – also led to federal disaster declaration in Athens-Clarke County.

In addition to the Athens-Clarke County location, the University of Georgia has locations throughout 35 counties in Georgia. Several of these locations are in coastal areas that could see a direct, major impact from a tropical cyclone. Hurricane Matthew in 2016 severely impacted the Georgia coast, including several University of Georgia facilities. Damage totals were approximated at $1.3 million to University of Georgia facilities.

Even with the infrequent occurrences, the impacts that would result from hurricane or tropical storm forces on the citizens, infrastructure, and critical facilities of Athens-Clarke County could be potentially catastrophic in nature.



SOURCE: OFFICE OF COASTAL MANAGEMENT (NOAA)

Estimated Potential Losses

Little information is available regarding damages, in terms of dollars, is available for direct tropical cyclone losses in Athens-Clarke County. Most losses for these events have been labeled under other impacts, such as tornadoes and flooding.

Hazard Summary

Even with the relative infrequency of tropical cyclone impacts at the University of Georgia in the recent past, the potential losses and impacts associated with the event would severely damage the infrastructure of the University. The mitigation measures identified in this plan for tropical cyclones should be pursued based on the high impact potential of this hazard.

Location	County/Zone	St.	Date	Time	T.Z.	Type
CLARKE (ZONE)	CLARKE (ZONE)	GA	09/14/2002	11:00	EST	Tropical Storm
CLARKE (ZONE)	CLARKE (ZONE)	GA	07/01/2003	00:00	EST	Tropical Storm
CLARKE (ZONE)	CLARKE (ZONE)	GA	09/06/2004	12:00	EST	Tropical Storm
CLARKE (ZONE)	CLARKE (ZONE)	GA	09/16/2004	00:00	EST	Tropical Storm
CLARKE (ZONE)	CLARKE (ZONE)	GA	09/26/2004	00:00	EST	Tropical Storm
CLARKE (ZONE)	CLARKE (ZONE)	GA	06/12/2005	00:00	EST	Tropical Storm
CLARKE (ZONE)	CLARKE (ZONE)	GA	07/06/2005	15:00	EST	Tropical Storm
CLARKE (ZONE)	CLARKE (ZONE)	GA	07/10/2005	10:00	EST	Hurricane (typhoon)
CLARKE (ZONE)	CLARKE (ZONE)	GA	08/29/2005	11:00	EST	Hurricane (typhoon)
CLARKE (ZONE)	CLARKE (ZONE)	GA	10/05/2005	04:00	EST	Tropical Storm
CLARKE (ZONE)	CLARKE (ZONE)	GA	08/21/2008	12:00	EST-5	Tropical Storm
CLARKE (ZONE)	CLARKE (ZONE)	GA	11/10/2009	05:00	EST-5	Tropical Storm
CLARKE (ZONE)	CLARKE (ZONE)	GA	09/04/2011	11:00	EST-5	Tropical Storm
CLARKE (ZONE)	CLARKE (ZONE)	GA	09/11/2017	13:00	EST-5	Tropical Storm

Technological Hazard: Hazardous Materials

Hazard Description

Hazardous materials, or hazmat, refers to any materials that may pose a real hazard to human health and/or the environment because of its quantity, concentration, and/or physical or chemical characteristics. Hazardous materials include explosives, flammables, combustibles, oxidizers, toxic materials, radioactive substances, and corrosives. Specific federal and state regulations exist regarding the transport and storage of hazardous materials.

A hazardous materials spill or release occurs when a hazardous material gets into the environment in an uncontrolled fashion. Response to a hazmat spill or release depends greatly on the type of material involved and the subsequent physical and chemical characteristics. Major sources of hazardous materials spills include transportation accidents on roadways and railways, pipeline breaches, and spills

into rivers and creeks. Jurisdictions with facilities that produce, process, or store hazardous materials are at risk, as are facilities that treat or dispose of hazardous materials.

Hazard Profile

Data from the United States Coast Guard National Response Center was reviewed regarding hazardous materials spill history in Athens-Clarke County. Data is available from 1982 to 2016 and all available data was reviewed. There were 126 NRC reported hazardous materials spills or releases in Athens-Clarke County over a 25 year period. Two of these 126 events were at the University of Georgia. In 2006, a student dropped a mercury thermometer that subsequently broke and spilled its contents. In 2015, a beaker exploded containing Sodium Azide, Ethyl Acetate, and Methanol. The student involved in the 2015 incident was subsequently transported to the hospital with injuries. It is anticipated that many more hazardous materials incidents have occurred over the last 25 years, but have not been reported or have not been of a reportable amount. According to the NRC data, Athens-Clarke County averages 5.04 hazardous materials incidents of a reportable amount in any given year. The reported incidents led to 4 fatalities and 51 injuries.

The UGA Hazard Mitigation Planning Committee reviewed information concerning hazardous materials on the UGA campus with special attention given to areas of prior hazard events. Hazardous materials events or accidents typically can occur where these materials or substances are produced, transported, or stored. Facilities that provide transport for hazardous materials, like roads, railways, and pipelines, also represent probable locations for a hazardous materials spill. Based on these assumptions, the University of Georgia has two types of vulnerabilities relative to hazardous materials.

One potential vulnerability is a hazardous materials spill from an outside source on a roadway, pipeline, or railway adjacent to campus properties. The UGA campus has a spur rail line of the Hartwell Railroad that cuts through the eastern edge of campus. In addition, the eastern part of campus that has recently experienced massive growth (student recreation facility, large dormitories, museum, etc.) is adjacent to the major bypass (GA 10 Loop) circumventing the downtown Athens business district.

The second vulnerability is a hazardous materials spill that could potentially occur on the UGA campus that UGA personnel accidentally (or others intentionally) initiate in a laboratory or when hazardous materials are being transported or stored in the UGA Hazardous Materials Treatment Facility (HMTF). The University of Georgia has over 1,800 labs and maintains the HMTF off the main campus where hazardous materials of sizeable quantities are stored until they are picked up to be destroyed at an off-site location by commercial contractors. These chemicals and other toxic substances used in campus research laboratories are closely monitored by various internal UGA departments (Laboratory Safety, Radiation Safety, and Biosafety Office) as well as external agencies (Center for Disease Control, Georgia Department of Agriculture, etc.). Collectively, these units monitor and regulate use, storage, and disposal of these hazardous materials. Athens-Clarke County Fire and Emergency Services is the primary responding agency for hazardous materials response in Athens-Clarke County. Additionally, the UGA Environmental Safety Division has staff that can provide technical assistance (building chemical inventories, floor plans and emergency lab contacts) to the fire department during spills.

Numerous occurrences of small spills in labs around campus have been recorded over the past ten years and all were cleaned up in a prescribed manner utilizing universal safety precautions with assistance from the now defunct, UGA Hazardous Assessment Response Team. UGA HART (Ex. Health Sciences Building in 2005-Formalin spill in lab). One spill was significant in nature and required advanced clean up procedures from outside 32 contractors (Ex. Wilson Pharmacy Building in 2003-Isoamyl Nitrite spill ignited a fire). Examples of hazardous materials on campus include flammable materials, corrosives, hazardous waste, radioactive materials, biological agents, and toxins. Additional hazardous materials

incidents could occur anywhere on campus where bulk fuel storage facilities are maintained. These areas have been identified by the UGA PDM Planning Committee and safety procedures are in place and practiced at these sites. When and if a hazardous material event occurs, it can potentially pose a threat to faculty, staff, students, visitors, and the community in terms of health and safety. It can also damage public or private property on the campus.

Estimated Potential Losses

Estimation of potential losses is difficult with regard to hazardous materials due to the vast array of potential types of hazardous materials that could be involved in the incident and unknown costs regarding environmental damages. A hazardous materials release, whether in transport or at a fixed facility, would incur significant costs regarding emergency response, potential road closures, evacuations, watershed protection measures, expended man-hours, and cleanup materials, equipment, and personnel.

Hazard Summary

As previously noted, the University of Georgia campus has several buildings and sites that contain hazardous materials, but due to the small quantities of these materials on campus, the UGA Hazard Mitigation Planning Committee does not believe they present a significant potential to cause serious hazardous materials spills. The greatest probability for these sites to incur a spill is believed to be when materials are being transported. Spills can occur at points of operation but greater potential damage, both to property and people, exist as these materials move through the campus. As the Hazard Mitigation Planning Committee identified roads, bridges, and rail lines where hazardous materials travel, mitigation actions were identified to reduce potential losses resulting from hazardous materials spills.

Technological Hazard: Dam Failure

Hazard Description

Georgia law defines a dam as any artificial barrier, which impounds or diverts water, is 25 feet or more in height from the natural bed of a stream, or has an impounding capacity at maximum water storage evaluation of 100 acre-feet or more. Dams are generally constructed to provide a ready supply of water for drinking, irrigation, recreation, and other purposes. Dams can be constructed from earth, rock, masonry, concrete or any combination of these materials.

Dam failure is a term used to describe a significant breach of a dam and the subsequent loss of contained water. Dam failure can cause significant damages downstream to structures, roads, utilities, and crops. Dam failure can also put human and animal lives at risk. National statistics indicate that one-third of all dam failures in the United States are caused by overtopping due to inadequate spillway design, debris blocking spillways, or settlement of the dam crest. Another third of all US dam failures are the result of foundation defects, including settlement and slope instability.

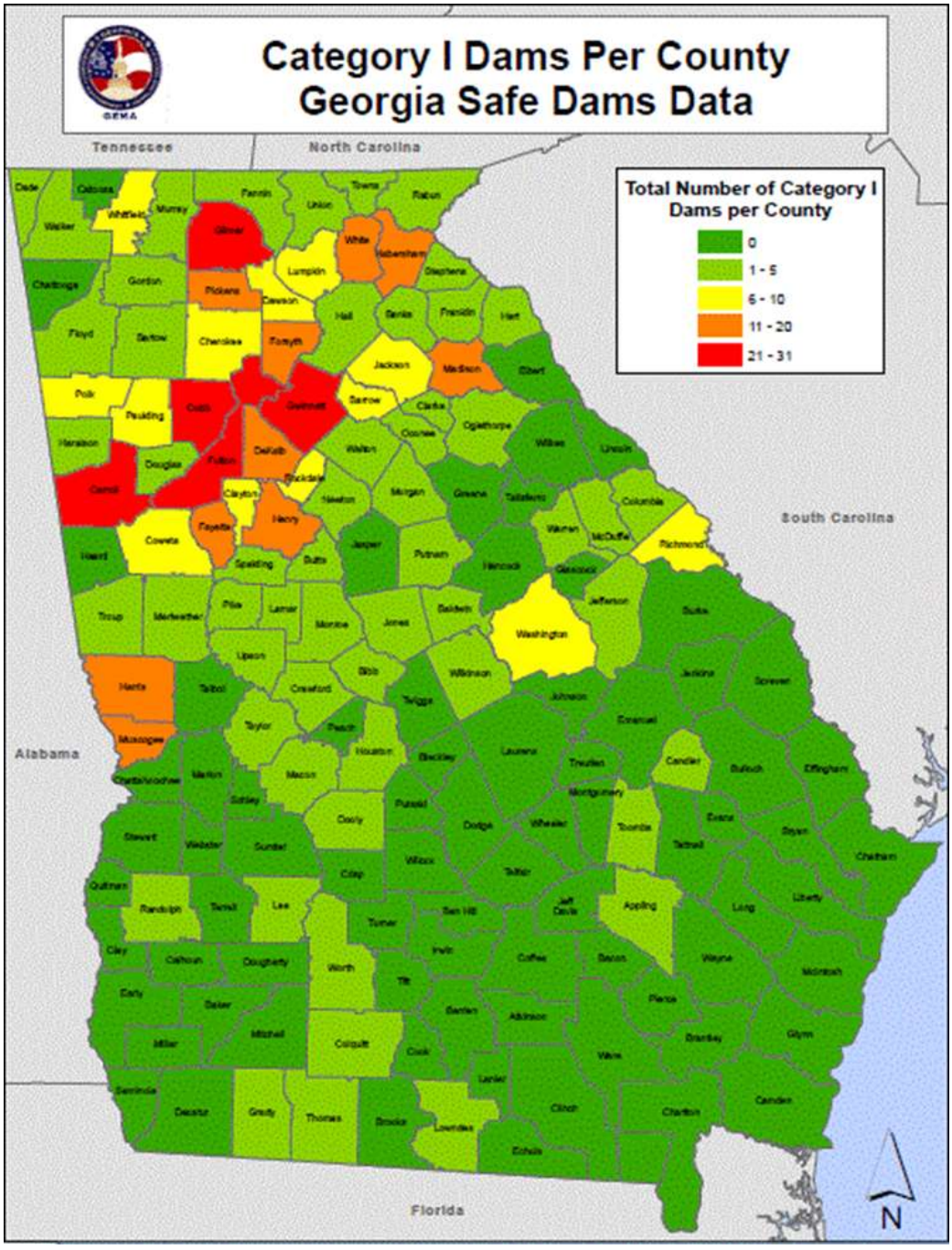
Hazard Profile

There are 0 category I dams and 2 category II dams at the University of Georgia. Category I dams are those that would pose a possible threat to human life if a failure were to occur. All category I dams must be inspected annually according to Georgia's Safe Dams Act. Failure of any of the Category I or Category II dams could have tremendous have direct and indirect impacts on the University of Georgia.

The threat of a dam failure at or near the University of Georgia could potentially lead to downstream flooding. This downstream flooding would have many of the same hazards as a flood event, but with the onset of such an event being much quicker than in a typical flood event.

Assets Exposed to Hazard

To evaluate the assets that would potentially be impacted by a dam failure, the Athens-Clarke County and University of Georgia Hazard Mitigation Planning Committees attempted to identify known structures within, or close to, the 100-year floodplain, as well as areas downstream from



SOURCE: 2014 STATE OF GEORGIA HAZARD MITIGATION STRATEGY (MOST UP-TO-DATE VERSION)

Hazard Summary

Dam failure poses a threat to the University of Georgia and its infrastructure, faculty, students, and staff. A dam failure could prove catastrophic for areas downstream of the dam. As a result, mitigation efforts for dam failure should be focused in this potentially affected area.

Beef Cattle Farm Irrigation Pond (Category II Dam)

Lake Allen M. Herrick Dam (Category II)

University of Georgia Golf Course Dam

Technological Hazard: Transportation Incident

Hazard Description

There are many secondary hazards that could be associated with transportation incidents. Injuries or deaths can occur as a result of the impact of a transportation accident, by a hazardous materials release as a result of a transportation incident, or by other related transportations hazards. Transportation can occur via roadways, highways, interstates, railways, air or navigable waterways. Each transportation type poses their own unique hazard issues and consequences.

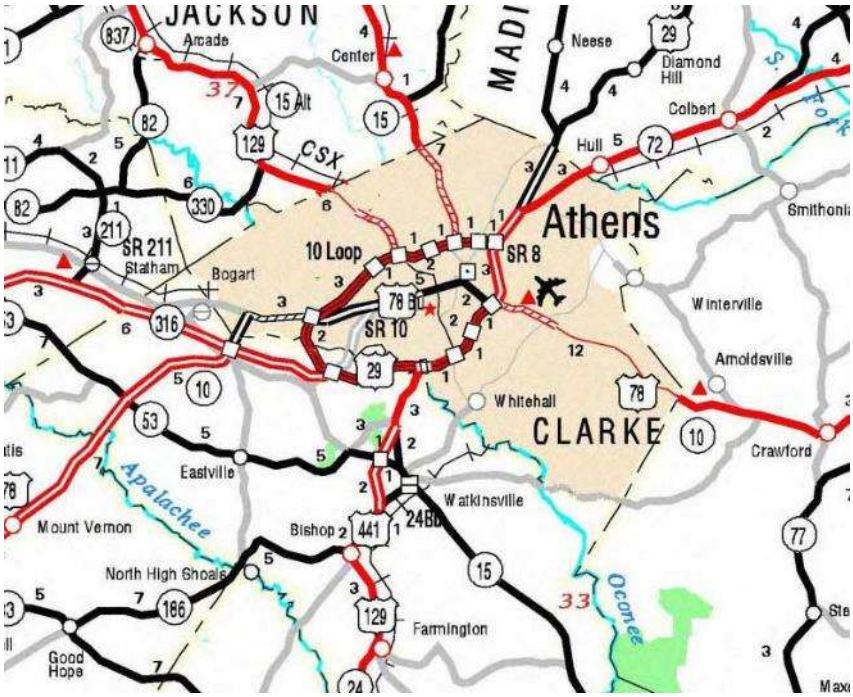
Roadway hazards are most likely to be caused by a motor vehicle accident involving one or more cars, trucks, vans, or transport vehicles. These incidents can have injuries as a result of the impact of the MVA or a hazardous materials release into the local environment, including waterways. Railway incidents pose many of the same dangers as motor vehicle accidents. However, the threat of a hazardous materials release is greatly increased when railway transportation incidents are considered.

Air accidents can include commercial airplanes, private airplanes, hot air balloons, helicopters, or other forms of air travel. Each of these incidents can cause a significant threat to human life as well as posing a hazardous material threat due to the cargo being transported or the fuel being used. Navigable waterway incidents can create formidable incidents for response organizations. Because of the waterway, technical expertise is needed to carry out rescue operations, especially in swift-moving waterways. Also, any incident in a waterway is likely to have environmental impacts.

Hazard Profile

Transportation incidents are of a significant concern to the University of Georgia. Passing through Athens-Clarke County are US Highways 29, 78, 129, and 441, and Georgia Highways 8, 10, 15, and 72. Many of these highways traverse Athens-Clarke County in close proximity to the University of Georgia. Any incident on these roadways would likely have direct and indirect impacts on the University of Georgia community.

In addition to the threat of a transportation incident independent of the University, UGA also operates multiple UGA Transit bus routes throughout Athens-Clarke County. An incident involving one of these buses, particularly if injuries and/or deaths were to occur, would also have direct and indirect impacts on the University.



Estimated Potential Losses

Estimated potential losses cannot be anticipated with this event due to the vast number of differing scenarios regarding transportation incidents.

Hazard Summary

The Athens-Clarke County and University of Georgia Hazard Mitigation Planning Committees have determined that transportation incidents pose a high risk to their jurisdictions due to the unpredictable nature and likelihood of the incident. As a result, mitigation strategies and actions have been developed with transportation incidents in mind.

Technological Hazard: Terrorism

Hazard Description

The Federal Bureau of Investigation (FBI) defines terrorism as violent acts or acts dangerous to human life that violate federal or state law, appear to be intended to intimidate or coerce a civilian population, affect the conduct of a government by mass destruction, assassination or kidnapping, and is calculated to influence or affect the conduct of a government by intimidation or retaliate against government conduct. Terrorism is usually referenced as being premeditated and politically motivated.

Terrorist acts are, by their very nature, designed and carried out with the intention of inflicting mass casualties and extensive property damage. When an act of terrorism is carried out in a jurisdiction, it will likely be necessary to implement multiple aspects of the emergency management system and summon additional resources from local, state, and federal partners.

Terrorism is generally divided into two types: domestic terrorism and international terrorism. Domestic terrorism is defined as terroristic acts focused on facilities and populations without foreign direction. International terrorism involves activities that are foreign-based and/or sponsored by organizations outside of the United States.

Terrorists often use threats to create fear among the public, to convince citizens that government is powerless to prevent terrorism and to get immediate publicity for their causes. Weapons of Mass Destruction (WMDs), including incendiary, explosive, chemical, biological, radiological and nuclear agents, have the capability to cause death or serious bodily injury to a significant number of people, thus posing the threat of a catastrophic incident. Terrorism can also include arson, agro-terrorism, armed attack, intentional hazardous materials release, and attacks on infrastructure and electronic information systems.

Hazard Profile

Terrorism targets have historically been facilities that make a large economic or social impact on the targeted government or jurisdiction. In this context, the University of Georgia could potentially be viewed as a prime target for potential terrorist activities. Terrorism includes a multitude of potential approaches.

While active shooter situations are not always classified as terrorism, for this plan, the Athens-Clarke County and University of Georgia Hazard Mitigation Planning Committees have chosen to classify them as such. Active shooter situations can occur in any location, including businesses, colleges and universities, schools, government buildings, and public spaces. Colleges and Universities, such as the University of Georgia, are seen as particularly vulnerable to these types of situations due to the high publicity of recent active shooter events. While active shooter events and other acts of terrorism occur worldwide, they have a relatively low probability for the University of Georgia but would have devastating impacts if they were to occur. To help mitigate some of these impacts, the University of Georgia has exercised active shooter responses on multiple occasions in the past to better prepare for any such event for both the law enforcement response and the response of the civilian population.

Additionally, the University of Georgia also take civil disturbances and cyber-attacks into consideration when discussing terrorism as a hazard. While these threats could be considered separately, they have been incorporated into the concerns of this section due to the numerous crossover impacts associated with active shooter and other traditional terrorist activities.

Estimated Potential Losses

Losses due to terrorism are difficult to estimate due to the unpredictable nature of terrorism. The type of terrorist act carried out, location of the act, and the impact of the act would all affect the potential losses.

Hazard Summary

Terrorism, while a low-probability hazard, would have an exceedingly high impact on the University of Georgia. These impacts would be immediate and long-lasting and could be potentially economically crippling. Because of these considerations, the University of Georgia Hazard Mitigation Planning Committee has developed mitigation actions with terrorism as defined in this section in mind.

Technological Hazard: Emergent Infectious Diseases

Hazard Description

Microorganisms, such as bacteria, viruses, parasites, fungi, or prions, surround us within the environment. They can even be found within our own bodies. Most microorganisms are completely harmless and many are actually beneficial. However, some of these organisms are pathogenic, meaning they cause or have the ability to cause disease. Infectious diseases are caused by these pathogenic organisms and are communicable – meaning they can be spread from person to person either directly

or indirectly. Direct transmission of the disease occurs through actual physical contact with an infected person or their bodily fluids. Indirect transmission of a disease occurs when an infected person contaminates a surface by sneezing, coughing, etc., and a non-infected person comes into contact with that infected surface. Another means of indirect transmission includes vectors, such as mosquitos, flies, mites, ticks, fleas, rodents, or dogs, which may carry the pathogenic microorganism and transmit it to people via a bite. Infectious diseases can also impact animal populations, particularly livestock and other farm animals. Even though these diseases may not directly affect humans, the economic impact of these diseases can be just as harmful, if not more so, to the community.

Infectious diseases can occur as primary events or they may occur as a cascading result of another disaster, such as a tornado, flood, or winter weather. Infectious diseases can vary greatly in severity and magnitude. According to the World Health Organization, infectious diseases account for three of the ten leading causes of death worldwide – HIV/AIDS, lower respiratory infections, and diarrheal disease. These three events, combined with tuberculosis and malaria, account for 20% of deaths globally.

In Western countries, the impact of infectious diseases has diminished greatly over the last 75 years due to improved sanitation, personal hygiene, vaccinations, and the use of antibiotics. In the United States, only one infectious diseases – seasonal influenza and pneumonia – ranks in the top ten leading causes of death. Annually, there are 1,500 deaths in the United States from seasonal influenza and another 52,000 from pneumonia. Children and older adults are the greatest at risk for both of these.

Emergent infectious diseases are those that are appearing in a population for the first time. Re-emergent infectious diseases are those that may have previously existed in a population, but levels had dropped to the point where it was no longer considered a public health problem until levels once again began increasing.

During the last 25 years, emergent and re-emergent infectious diseases have been on the rise. The below table outlines some of the contributing factors to this rise:

Contributing Factors to Increasing Occurrence of Emergent Diseases
Agent-Related Factors
• Evolution of pathogenic infectious agents • Development of resistance to drugs • Resistance of disease carriers to pesticides
Host-Related Factors
• Human demographic changes (humans inhabiting new areas) • Human behavior (sexual practices and drug use) • Human susceptibility to infection
Environment-Related Factors
• Economic development and land use patterns • International travel and commerce • Deterioration of surveillance systems

Due to a lack of ready-made vaccines for these diseases and a lack of immunity in the population, emergent and re-emergent infectious diseases are much more likely to escalate to pandemic levels rapidly.

CDC-Identified Emergent and Re-emergent Infectious Diseases	
Drug-resistant Infections	Mad Cow/Variant Creutzfeldt-Jakob Diseases
Campylobacteriosis	Chagas Disease
Cholera	Cryptococcosis

Cryptosporidiosis (Crypto)	Cyclosporiasis
Cysticercosis	Dengue Fever
Diphtheria	Ebola Hemorrhagic Fever
Group B Streptococcal Infection	Hantavirus Pulmonary Syndrome
Hepatitis C	Hendra Virus Infection
Histoplasmosis	HIV/AIDS
Influenza	Lassa Fever
Legionnaire's' Disease and Pontiac Fever	Leptospirosis
Listeriosis	Lyme Disease
Malaria	Marbug Hemorrhagic Fever
Measles	Meningitis
Monkey pox	MRSA
Nipha Virus Infection	Norovirus Infection
Pertussis	Plague
Polio	Rabies
Rift Valley Fever	Rotavirus Infection
Salmonellosis	SARS
Shigellosis	Smallpox
Sleeping Sickness (Trypanosomiasis)	Tuberculosis
Tularemia	Valley Fever (Coccidioidomycosis)
VISA/VRSA	Staphylococcus Aureus
West Nile Virus Infection	Yellow Fever

Hazard Profile

Emergent Infectious diseases are of significant concern to the University of Georgia, particularly those that would have an impact on the human population or animal population of the University of Georgia. The lack of current vaccines and preparatory activities for these diseases has created a situation where the potential impact to the University of Georgia of a pandemic or epidemic could be catastrophic. The most recent pandemic scare in the Central Georgia area was the 2009-2010 H1N1 Swine Flu. There were 1286 cases of H1N1 in Georgia in 2009-2010 and 33 deaths. The majority of registered cases occurred with people between the ages of 5 and 29. This equates to a mortality rate of just over 2.5% - which is slightly lower than the 3% rate of the 1918-1919 Spanish Flu Pandemic.

Over the last 25 years, emergent infectious disease outbreaks have occurred in other parts of the country. These include:

- 1993 Cryptosporidium Outbreak (Milwaukee, Wisconsin – 403,000 people ill and 100 deaths)
- 2010 Whooping Cough Outbreak (California – 9,500 people ill and 10 infant deaths)
- 2014 Measles (Nationwide – 334 cases from January to May, 2014 – most in 20 years)
- 2015 H5N2 Avian Flu Outbreak (Midwest – over 25 million chickens and turkeys destroyed as a precautionary measure at 83 locations)

Estimated Potential Losses

Losses due to emergent infectious diseases are difficult to estimate due to the unpredictable nature of the hazard. The type of emergent infectious disease, location of the outbreak, and the impact of the outbreak would all affect the potential losses.

Hazard Summary

An emergent infectious disease would have devastating effects on the University of Georgia. These impacts would be immediate and long-lasting and could be potentially economically crippling.

Due to the large, concentrated, and transient population at the University of Georgia, Emergent Infectious Diseases are of particular concern. Outbreaks of communicable diseases have occurred at multiple colleges and universities across the nation in the last few years. Outbreaks of bacterial meningitis have occurred at

Ohio University (2008), Princeton University (2013), the University of California, Santa Barbara (2013), and the University of Oregon (2015) in recent years.

In addition to the faculty, student, and staff populations, the University of Georgia is also concerned about such outbreaks in the animal population. The University of Georgia maintains a large animal population for farm and veterinary research purposes on its main campus and throughout the State of Georgia.

Because of these considerations, the University of Georgia Hazard Mitigation Planning Committee has developed mitigation actions with emergent infectious diseases in mind.

Technological Hazard: Biological and Radiological Release

Hazard Description

An accidental biological or radiological release could unknowingly release Microorganisms, such as bacteria, viruses, parasites, fungi, or prions, or dangerous radiological material into the local environment. Vulnerability for this type of incident is greater in areas where biological and/or radiological material is stored in relatively large quantities.

A radiological incident is an hazardous event that involves the release of potentially dangerous radioactive materials that could affect human life, property, and the environment. Typically, a radiological release is in the form of a plume, or cloud, and could negatively impact the health and safety of persons and property downwind from the release site.

Accidental radiological release can occur anywhere radioactive materials are transported, used, or stored. Industries that transport and store radioactive materials are closely regulated by multiple state and federal agencies, including the Department of Energy, Environmental Protection Agency, and Environmental Protection Division of the Department of Natural Resources.

Hazard Profile

The University of Georgia is uniquely vulnerable to an accidental biological or radiological release due to the United States Environmental Protection Agency and Georgia Environmental Protection Division all having office locations within close proximity to the University. Research at the University of Georgia and US Environmental Protection Agency may involve such materials that could pose a risk to the population if they were accidentally released into the surrounding environment.

Estimated Potential Losses

Losses due to an accidental release of biological or radiological material are difficult to estimate due to the unpredictable nature of the hazard. The type of material, location of the release, and the impact would all affect the potential losses.

Hazard Summary

An accidental biological or radiological release could have devastating effects on Athens-Clarke County and the University of Georgia. These impacts would be immediate and long-lasting and could be potentially economically crippling.

Technological Hazard: Conflagration

Hazard Description

Conflagration is a large, destructive fire that directly and indirectly threatens human and animal life, health, property, and/or the environment. Devastating fires have occurred throughout history in major cities across the United States. These fires have increased in destructive power in direct relation to increased urbanization and population density in urban areas.

Uncontrolled fires in urban areas can be impacted by many factors, including local climatology, density, age of buildings in the area, and availability of firefighting resources. In many urban areas, buildings are not only close together, but may actually be conjoined and interconnected structures. This building practice, particularly in the absences of firewall structures between buildings.

Hazard Profile

Athens-Clarke County and the University of Georgia are uniquely vulnerable to conflagration due to the age of many buildings in downtown Athens and on North Campus. There are buildings in Athens and on campus that date back to the late 18th and early 19th century. These buildings were erected well before NFPA and other building regulations were implemented and, therefore, are at a greater risk were a large fire to break out in the area. Additionally, many of the jurisdictions surrounding Athens-Clarke County are more rural than Athens-Clarke County and may not be as well equipped to assist firefighting operations in the urban areas of Athens-Clarke County, such as the University of Georgia, as other metropolitan and urban fire departments would be.

While many other areas of Athens-Clarke County are at a high risk of Wildfire, Conflagration is a more direct threat to the University of Georgia, particularly on North Campus due to its proximity to Downtown Athens and the age of many North Campus buildings.

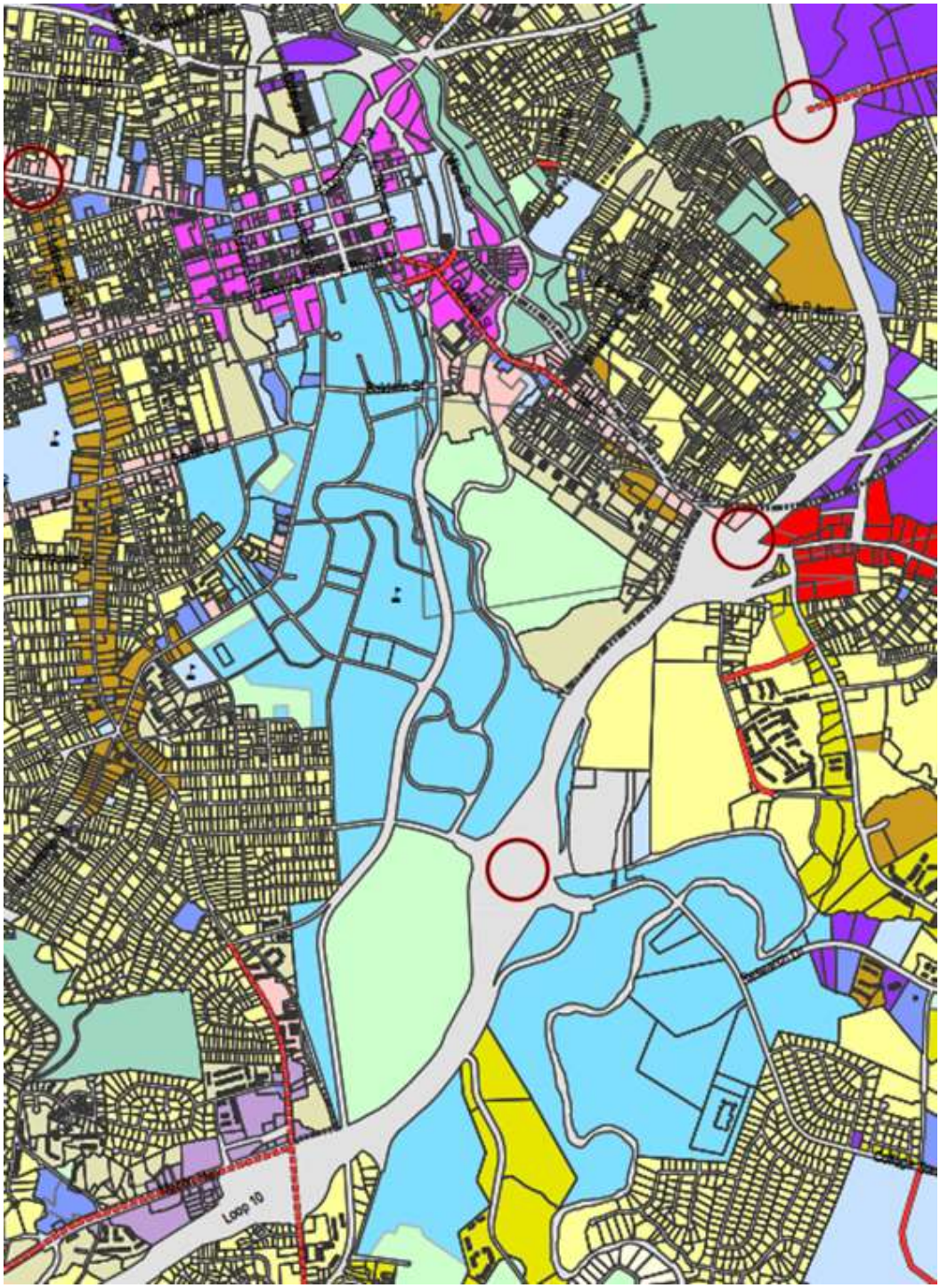
Estimated Potential Losses

Losses due to conflagration are difficult to estimate due to the unpredictable nature of the hazard.

Hazard Summary

Conflagration could have devastating effects on Athens-Clarke County and the University of Georgia. These impacts could be immediate and long-lasting and could be potentially economically crippling to both Athens-Clarke County and the University.

Athens-Clarke County Future Development Map



Note: The University of Georgia is in blue on the above map. The pink, purple, and red colors indicate areas of business development. These areas – particularly those to the north of the University of Georgia campus – combined with the dense residential population to the west of the University of Georgia campus (indicated by the very small lot sizes) highlight the threat conflagration poses to the University.

Chapter Four - Hazard Mitigation Strategies

Summary of Updates to Chapter Four

The following table provides a description of each section of this chapter, and a summary of the changes that have been made to the Athens-Clarke County Hazard Mitigation Plan 2012.

Chapter 4 Section	• Updates
Goals and Objectives	• Updated goals to match the needs of Athens-Clarke County and its municipalities
Identification and Analysis of Mitigation Techniques	• The beginning of this section includes new information regarding rating the mitigation strategies based upon the EMAP Standard Hazard Mitigation Section • The Mitigation Strategies have been updated, reorganized by objective, and new strategies have been added • A chart of completed Mitigation Strategies has been added
Multi-Jurisdictional Considerations	• Revised • Multi-Jurisdictional considerations listed for each identified hazard

Goals and Objectives

Requirement §201.6(c) (3)
Requirement §201.6(c) (3) (i)

It is important that State and local government, public-private partnerships, and the average citizen can see the results of these mitigation efforts, therefore, the goals and strategies need to be achievable. The mitigation goals and objectives form the basis for the development of specific mitigation actions. County and municipal officials should consider the listed goals before making community policies, public investment programs, economic development programs, or community development decisions for their communities. The goals of Athens-Clarke County have changed slightly in the last five years (since 2012) due to specific threat events, such as the snow and ice storms of 2014 and Hurricane Irma in 2017. The 2014 Ice Storms, in particular, led to changes at the State and local levels regarding the importance of winter weather preparedness, both for the general public and the response ability of local jurisdictions, including Athens-Clarke County. Because of the recentness of the impacts of these hazards and the devastation that occurred, these types of events have taken a greater priority, particularly in the increased priority of mitigation strategies directly related to these events and the development of new mitigation strategies related to these hazards.

Each jurisdiction covered by the Athens-Clarke County Hazard Mitigation plan update – Athens-Clarke County and the City of Winterville – has limited ability to fully implement the mitigation actions described in this plan. These jurisdictions are severely hampered by their small population and tax base when attempting to raise sufficient revenue to pursue many of these actions. All jurisdictions lack the needed financial strength and staffing to implement all of the actions described in this plan. Many of the actions will be pursued through grant programs and by partnering with public and private

organizations who can supplement the needed resources to accomplish the goals outlined in this plan. For actions where grant funding or partnerships are not available, Athens-Clarke County or municipality revenue streams may be supplemented through Special Purpose Local Option Sales Tax (SPLOST) funds, which are voted on by the electorate.

Since the adoption of the 2012 Athens-Clarke County Hazard Mitigation Plan, Athens-Clarke County has implemented many mitigation strategies to protect their community. Holland youth sports installed lightning rods, a tornado siren was added to the University of Georgia's East Campus Deck, and a community safe room assessment was completed. Additionally, Athens-Clarke County put a mass notification system in place, created a GIS Department, Conducted educational programs on water conservation, and created a generator life cycle replacement plan. Finally, Athens-Clarke County started a Local Emergency Planning Committee (LEPC) since the adoption of the 2012 plan.

GOAL 1	Maximize the use of all resources by promoting intergovernmental coordination and partnerships in the public and private sectors
GOAL 2	Harden communities against the impacts of disasters through the development of new mitigation strategies and strict enforcement of current regulations that have proven effective
GOAL 3	Reduce and, where possible, eliminate repetitive damage, loss of life and property from disasters
GOAL 4	Bring greater awareness throughout the community about potential hazards and the need for community preparedness

These objectives state a more specific outcome that Athens-Clarke County strives to accomplish over the next five years. Action steps are the specific steps necessary to achieve these objectives. Objectives are not listed in order of importance.

OBJECTIVE1	Reduce damage to property and loss of life from flooding
OBJECTIVE 2	Minimize the damage to property and loss of life resulting from high wind events
OBJECTIVE 3	Provide advanced severe weather warning
OBJECTIVE 4	Provide educational awareness to citizens regarding the dangers of natural hazards
OBJECTIVE 5	Implement initiatives for water conservation and wildfire protection
OBJECTIVE 6	Increase the ability of Athens-Clarke County, its municipalities, and its citizens to respond to natural and manmade hazards
OBJECTIVE 7	Maintain continuity of critical operations during and after hazard events
OBJECTIVE 8	Minimize damage to property and loss of life resulting from winter storm events
OBJECTIVE 9	Implement additional protective measures and capabilities in response to manmade incidents

Identification and Analysis of Mitigation Techniques

Requirement §201.6(c) (3) (iv)
Requirement §201.6(c) (3) (iii)

In updating the University of Georgia's mitigation strategy, a wide range of activities were considered in order to help achieve the mitigation goals and objectives. This includes the following activities as highlighted by the Emergency Management Accreditation Program (EMAP):

1) The use of applicable building construction standards;
2) Hazard avoidance through appropriate land-use practices;
3) Relocation, retrofitting, or removal of structures at risk;
4) Removal or elimination of the hazard;
5) Reduction or limitation of the amount or size of the hazard;
6) Segregation of the hazard from that which is to be protected;
7) Modification of the basic characteristics of the hazard;
8) Control of the rate of release of the hazard;
9) Provision of protective systems or equipment for both cyber and physical risks;
10) Establishment of hazard warning and communication procedures; and
11) Redundancy or duplication of essential personnel, critical systems, equipment, and information materials.

Part of the prioritization includes a general assessment according to the STAPLEE criteria, which stands for Social, Technical, Administrative, Political, Legal, Economic and Environmental. This process led to three designated priorities: High, Medium, and Low. Most items that require grant funding must undergo a full Benefit Cost Analysis to determine the action's actual cost effectiveness prior to funding. This process will be completed as part of the grant opportunity application process. All estimations listed in the plan are just that – estimations. Actual costs associated with the project will be determined prior to implementation and will subjected to a full Benefit-Cost Analysis to ensure the most appropriate use of local tax monies.

Strategy Priority	Priority Description	Strategies within this priority
LOW	Low priority strategies are those strategies that will have less direct impact on mitigating the University of Georgia's hazards, are in the early stages of strategy development, or score poorly on a preliminary cost-benefit analysis	
MEDIUM	Medium priority strategies are those strategies that will have a direct impact on mitigation the University of Georgia's hazards, but will not have as large of an anticipated impact as High Priority strategies or may be focused on hazards that are not as potentially impactful or prevalent for the University of Georgia. These strategies may be in the earlier stages of development or score mediocre on a preliminary cost-benefit analysis	
HIGH	High priority strategies are those strategies that would have a direct, large impact on mitigation the University of Georgia's hazards. These strategies are oftentimes well-established needs of the University of Georgia and have score high on a preliminary cost-benefit analysis	

The lead department listed in the Mitigation Strategy charts will be responsible for the jurisdictional administration and implementation of the mitigation strategy prioritization. Prioritization was

determined based on many factors. These include the likelihood of the event, the potential impact of the event, the current readiness posture of the University of Georgia for the event, the all-hazard impact of the mitigation strategy, and a cost-benefit analysis for the action. For example, mitigation actions addressing high-likelihood, high-impact events with low cost would rate higher than low-likelihood, high-impact events with high cost.

Many of the mitigation strategies identified in this and previous plans have had little to no progress towards completion. This is due to a lack of funding associated with the project, grant opportunities to complete the project, and personnel to dedicate to the project and/or project management.

All mitigation strategies considered by the University of Georgia Hazard Mitigation Plan Update Committee can be classified under one of the following six (6) broad categories of mitigation techniques:

Prevention

Requirement §201.6(c) (3) (ii)

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 in this updated plan are listed in the following table:

Natural Hazards	Mitigation Strategies
Drought	1. Continue to encourage cooperation and proactive planning among campus and Athens-Clarke County planning partners 2. Continue to promote and involve the volunteer efforts of the Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) in campus community preparedness 3. Encourage campus community participation in drills and exercises 4. Continue to engage campus departments in utilizing the UGA Business Continuity Plan Generator System 5. Implement the UGA water conservation program "Every Drop Counts" when warranted
Earthquake	1. Continue to encourage cooperation and proactive planning among campus and Athens-Clarke County planning partners 2. Continue to promote and involve the volunteer efforts of the Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) in campus community preparedness 3. Encourage campus community participation in drills and exercises, particularly the annual east coast Great Shakeout event 4. Continue to engage campus departments in utilizing the UGA Business Continuity Plan Generator System

Flood	1. Continue to encourage cooperation and proactive planning among campus and Athens-Clarke County planning partners 2. Continue to promote and involve the volunteer efforts of the Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) in campus community preparedness 3. Encourage campus community participation in drills and exercises 4. Continue to engage campus departments in utilizing the UGA Business Continuity Plan Generator System
Thunderstorms	1. Continue to encourage cooperation and proactive planning among campus and Athens-Clarke County planning partners 2. Continue to promote and involve the volunteer efforts of the Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) in campus community preparedness 3. Encourage campus community participation in drills and exercises 4. Continue to engage campus departments in utilizing the UGA Business Continuity Plan Generator System
Tornadoes	1. Continue to encourage cooperation and proactive planning among campus and Athens-Clarke County planning partners 2. Continue to promote and involve the volunteer efforts of the Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) in campus community preparedness 3. Encourage campus community participation in drills and exercises 4. Continue to engage campus departments in utilizing the UGA Business Continuity Plan Generator System
Tropical Cyclone	1. Continue to encourage cooperation and proactive planning among campus and Athens-Clarke County planning partners 2. Continue to work with personnel associated with the UGA coastal properties, extended campuses and other UGA properties located around the state 3. Continue to promote and involve the volunteer efforts of the Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) in campus community preparedness 4. Encourage campus community participation in drills and exercises 5. Continue to engage campus departments in utilizing the UGA Business Continuity Plan Generator System
Wildfire	1. Continue to encourage cooperation and proactive planning among campus and Athens-Clarke County planning partners 2. Continue to promote and involve the volunteer efforts of the Campus Community Emergency Response Team (UGA CERT) and the UGA

	Medical Reserve Corps (UGA MRC) in campus community preparedness 3. Encourage campus community participation in drills and exercises 4. Continue to engage campus departments in utilizing the UGA Business Continuity Plan Generator System
Winter Storms	1. Continue to encourage cooperation and proactive planning among campus and Athens-Clarke County planning partners 2. Continue to promote and involve the volunteer efforts of the Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) in campus community preparedness 3. Encourage campus community participation in drills and exercises 4. Continue to engage campus departments in utilizing the UGA Business Continuity Plan Generator System
Technological Hazards	**Mitigation Strategies**
Biological/Radiological Release	1. Continue to encourage cooperation and proactive planning among campus and Athens-Clarke County planning partners 2. Continue to promote and involve the volunteer efforts of the Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) in campus community preparedness 3. Encourage campus community participation in drills and exercises 4. Continue to engage campus departments in utilizing the UGA Business Continuity Plan Generator System
Conflagration	1. Continue to encourage cooperation and proactive planning among campus and Athens-Clarke County planning partners 2. Continue to promote and involve the volunteer efforts of the Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) in campus community preparedness 3. Encourage campus community participation in drills and exercises 4. Continue to engage campus departments in utilizing the UGA Business Continuity Plan Generator System
Dam Failure	1. Continue to encourage cooperation and proactive planning among campus and Athens-Clarke County planning partners 2. Continue to promote and involve the volunteer efforts of the Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) in campus community preparedness 3. Encourage campus community participation in drills and exercises 4. Continue to engage campus departments in utilizing the UGA Business Continuity Plan Generator System

Emergent Infectious Disease	1. Regularly update the UGA Infectious Disease Response Plan 2. Continue to encourage cooperation and proactive planning among campus and Athens-Clarke County planning partners 3. Continue to promote and involve the volunteer efforts of the Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) in campus community preparedness 4. Encourage campus community participation in drills and exercises 5. Continue to engage campus departments in utilizing the UGA Business Continuity Plan Generator System
Hazardous Materials	1. Regularly coordinate with the UGA Environmental Safety Division and the UGA Research and Integrity Office on hazardous materials safety and response issues 2. Continue to encourage cooperation and proactive planning among campus and Athens-Clarke County planning partners 3. Continue to promote and involve the volunteer efforts of the Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) in campus community preparedness 4. Encourage campus community participation in drills and exercises 5. Continue to engage campus departments in utilizing the UGA Business Continuity Plan Generator System
Terrorism	1. Continue to coordinate with the UGA Police and other campus public safety partners on the evolving terrorism threats 2. Continue to encourage cooperation and proactive planning among campus and Athens-Clarke County planning partners 3. Continue to promote and involve the volunteer efforts of the Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) in campus community preparedness 4. Encourage campus community participation in drills and exercises 5. Continue to engage campus departments in utilizing the UGA Business Continuity Plan Generator System
Transportation	1. Continue to encourage cooperation and proactive planning among campus and Athens-Clarke County planning partners 2. Continue to promote and involve the volunteer efforts of the Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) in campus community preparedness 3. Encourage campus community participation in drills and exercises 4. Continue to engage campus departments in utilizing the UGA Business Continuity Plan Generator System

Property Protection

Property protection measures involve the modification of existing buildings and structures to help them better withstand the forces of a hazard, or involve the removal of the structures from hazardous locations. Examples of property protection in this updated plan are listed in the following table:

Natural Hazards	Mitigation Strategies
Drought	
Earthquake	1. Implement a non-structural mitigation comprehensive plan on campus 2. Install transfer switches and make buildings generator ready (all University dining facilities) 3. Install emergency generators to power life safety, food preservation and for some food preparation in all the University dining facilities 4. Install a transfer switch or an emergency generator in the Wheeler Hall Gym that has been identified as a small, short-term shelter facility
Flood	1. Review the Athens-Clarke County flood property protection measures for areas on campus that are likely to be impacted by severe flooding 2. Coordinate with Athens-Clarke County on collaborative projects pertaining property protection mitigation measures
Thunderstorms	1. Install transfer switches and make buildings generator ready (all University dining facilities) 2. Install emergency generators to power life safety, food preservation and for some food preparation in all the University dining facilities 3. Install a transfer switch or an emergency generator in the Wheeler Hall Gym that has been identified as a small, short-term shelter facility
Tornadoes	1. Install transfer switches and make buildings generator ready (all University dining facilities) 2. Install emergency generators to power life safety, food preservation and for some food preparation in all the University dining facilities 3. Install a transfer switch or an emergency generator in the Wheeler Hall Gym that has been identified as a small, short-term shelter facility
Tropical Cyclone	1. Install transfer switches and make buildings generator ready (all University dining facilities) 2. Install emergency generators to power life safety, food preservation and for some food preparation in all the University dining facilities 3. Install a transfer switch or an emergency generator in the Wheeler Hall Gym that has been identified as a small, short-term shelter facility

Wildfire	1. Install transfer switches and make buildings generator ready (all University dining facilities) 2. Install emergency generators to power life safety, food preservation and for some food preparation in all the University dining facilities 3. Install a transfer switch or an emergency generator in the Wheeler Hall Gym that has been identified as a small, short-term shelter facility
Winter Storms	1. Install transfer switches and make buildings generator ready (all University dining facilities) 2. Install emergency generators to power life safety, food preservation and for some food preparation in all the University dining facilities 3. Install a transfer switch or an emergency generator in the Wheeler Hall Gym that has been identified as a small, short-term shelter facility
Technological Hazards	**Mitigation Strategies**
Biological/Radiological Release	1. Install transfer switches and make buildings generator ready (all University dining facilities) 2. Install emergency generators to power life safety, food preservation and for some food preparation in all the University dining facilities 3. Install a transfer switch or an emergency generator in the Wheeler Hall Gym that has been identified as a small, short-term shelter facility
Conflagration	1. Install transfer switches and make buildings generator ready (all University dining facilities) 2. Install emergency generators to power life safety, food preservation and for some food preparation in all the University dining facilities 3. Install a transfer switch or an emergency generator in the Wheeler Hall Gym that has been identified as a small, short-term shelter facility
Dam Failure	1. Install transfer switches and make buildings generator ready (all University dining facilities) 2. Install emergency generators to power life safety, food preservation and for some food preparation in all the University dining facilities 3. Install a transfer switch or install an emergency generator in the Wheeler Hall Gym that has been identified as a small, short-term shelter facility
Emergent Infectious Disease	1. Install transfer switches and make buildings generator ready (all University dining facilities) 2. Install emergency generators to power life safety, food preservation and for some food preparation in all the University dining facilities

	3. Install a transfer switch or an emergency generator in the Wheeler Hall Gym that has been identified as a small, short-term shelter facility
Hazardous Materials	1. Install transfer switches and make buildings generator ready (all University dining facilities) 2. Install emergency generators to power life safety, food preservation and for some food preparation in all the University dining facilities 3. Install a transfer switch or an emergency generator in the Wheeler Hall Gym that has been identified as a small, short-term shelter facility
Terrorism	1. Install transfer switches and make buildings generator ready (all University dining facilities) 2. Install emergency generators to power life safety, food preservation and for some food preparation in all the University dining facilities 3. Install a transfer switch or an emergency generator in the Wheeler Hall Gym that has been identified as a small, short-term shelter facility
Transportation	1. Install transfer switches and make buildings generator ready (all University dining facilities) 2. Install emergency generators to power life safety, food preservation and for some food preparation in all the University dining facilities 3. Install a transfer switch or an emergency generator in the Wheeler Hall Gym that has been identified as a small, short-term shelter facility

Natural Resource Protection

Natural resource protection activities reduce the impact of natural hazards by preserving or restoring natural areas (ex: floodplains, wetlands, steep slopes, sand dunes) and their protective functions. Parks, recreation, or conservation agencies and organizations often implement these protective measures. Examples of natural resource protection in this updated plan are listed in the following table:

Natural Hazards	Mitigation Strategies
Drought	1. Utilize vegetation that is drought resistant but provides good ground stabilization 2. Continue the practice of utilizing an arborist on campus to prune and remove trees that may be hazards, as needed
Earthquake	1. Create plans to reduce the potential for loss of power, damage to facilities and dangers for the University community as a result of downed trees 2. Continue the practice of utilizing an arborist on campus to prune and remove trees that may be hazards, as needed
Flood	1. Continue to participate in the Georgia Safe Dams program

	2. Coordinate with Athens-Clarke County on collaborative Natural Resource Protection projects
Thunderstorms	1. Create plans to reduce the potential for loss of power, damage to facilities and dangers for the University community as a result of downed trees 2. Continue the practice of utilizing an arborist on campus to prune and remove trees that may be hazards, as needed
Tornadoes	1. Create plans to reduce the potential for loss of power, damage to facilities and dangers for the University community as a result of downed trees 2. Continue the practice of utilizing an arborist on campus to prune and remove trees that may be hazards, as needed
Tropical Cyclone	1. Create plans to reduce the potential for loss of power, damage to facilities and dangers for the University community as a result of downed trees 2. Continue the practice of utilizing an arborist on campus to prune and remove trees that may be hazards, as needed
Wildfire	1. Implement controlled burn programs to remove vegetation that could cause fire hazards
Winter Storms	1. Create plans to reduce the potential for loss of power, damage to facilities and dangers for the University community as a result of downed trees 2. Continue the practice of utilizing an arborist on campus to prune and remove trees that may be hazards, as needed
Technological Hazards	Mitigation Strategies
Biological/Radiological Release	Not applicable to hazard
Conflagration	1. Implement controlled burn programs to remove vegetation that could cause fire hazards
Dam Failure	1. Create plans to reduce the potential for loss of power, damage to facilities and dangers for the University community as a result of downed trees
Emergent Infectious Disease	Not applicable to hazard
Hazardous Materials	Not applicable to hazard
Terrorism	Not applicable to hazard
Transportation	Not applicable to hazard

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 of structural projects in this updated plan are listed in the following table:

Natural Hazards	Mitigation Strategies
Drought	1. Develop a campus drought emergency plan with criteria or triggers for drought-related actions 2. Develop a drought communication plan and early warning system to facilitate timely information to campus stakeholders 3. Continue to coordinate with UGA Facilities Management Division and appropriate Athens-Clarke County departments to evaluate areas and facilities where mitigation projects may be beneficial 4. Incorporate more drought tolerant plantings on campus
Earthquake	1. Incorporate more educational information on structural and non-structural mitigation techniques for the campus community 2. Establish a survey procedure and guidance to inventory structural and non-structural hazards in and around campus buildings
Flood	1. Develop a floodplain management plan 2. Complete a storm water drainage study for known problem areas 3. Continue to coordinate with Athens-Clarke County Emergency Management regarding their safe dams program 4. Continue to the practice of routinely cleaning and repairing storm water drains
Thunderstorms	1. Continue to utilize lightning detection devices for athletic events and other special events 2. Install lightning protection devices on critical facilities
Tornadoes	1. Work to complete the project at the Health Sciences Campus to place all electrical lines underground 2. Continue the practice of tree pruning around buildings and power lines
Tropical Cyclone	1. Work to complete the project at the Health Sciences Campus to place all electrical lines underground 2. Continue the practice of tree pruning around buildings and power lines
Wildfire	1. Continue the practice of tree pruning near buildings and power lines

Winter Storms	1. Continue to update plans for and maintaining campus road and debris clearing techniques 2. Work to complete the project at the Health Sciences Campus to place all electrical lines underground 3. Continue practice of tree pruning near buildings and power lines
Technological Hazards	**Mitigation Strategies**
Biological/Radiological Release	1. Continue to coordinate with UGA Biosafey, UGA Radiation Safety and Athens-Clarke officials regarding building safeguards and emergency responses
Conflagration	1. Continue the practice of tree pruning near buildings and power lines
Dam Failure	1. Develop a floodplain management plan 2. Continue to coordinate with Athens-Clarke County regarding participation in the Georgia Safe Dams Program
Emergent Infectious Disease	Not applicable to hazard
Hazardous Materials	1. Continue to coordinate with UGA Environmental Safety Division and appropriate Athens-Clarke County officials regarding UGA's chemical storage facility pods
Terrorism	1. Coordinate with UGA Police and UGA Facilities Management Division to install bollards and barricades in high pedestrian trafficked areas on campus as warranted
Transportation	1. Coordinate with UGA Police and UGA Facilities Management Division to install bollards and barricades in high pedestrian trafficked areas on campus as warranted

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 of emergency services in this updated plan are listed in the following table:

Natural Hazards	Mitigation Strategies
Drought	1. Continue to exercise and refine response plans for public safety, facilities, animal resources, IT, Housing, Dining Services and other responsible campus partners 2. Formalize and train a campus damage assessment team

Earthquake	1. Continue to exercise and refine response plans for public safety, facilities, animal resources, IT, Housing, Dining Services and other responsible campus partners 2. Formalize and train a campus damage assessment team
Flood	1. Continue to exercise and refine response plans for public safety, facilities, animal resources, IT, Housing, Dining Services and other responsible campus partners 2. Formalize and train a campus damage assessment team
Thunderstorms	1. Continue to exercise and refine response plans for public safety, facilities, animal resources, IT, Housing, Dining Services and other responsible campus partners 2. Formalize and train a campus damage assessment team
Tornadoes	1. Continue to exercise and refine response plans for public safety, facilities, animal resources, IT, Housing, Dining Services and other responsible campus partners 2. Formalize and train a campus damage assessment team
Tropical Cyclone	1. Continue to exercise and refine response plans for public safety, facilities, animal resources, IT, Housing, Dining Services and other responsible campus partners 2. Formalize and train a campus damage assessment team
Wildfire	1. Continue to exercise and refine response plans for public safety, facilities, animal resources, IT, Housing, Dining Services and other responsible campus partners 2. Formalize and train a campus damage assessment team 3. Coordinate with Athens-Clarke Fire and Emergency Services to purchase an ATV with fire-fighting and patient transport capabilities for the nearby Greenway trails and special events
Winter Storms	1. Continue to exercise and refine response plans for public safety, facilities, animal resources, IT, Housing, Dining Services and other responsible campus partners 2. Formalize and train a campus damage assessment team.
Technological Hazards	**Mitigation Strategies**
Biological/Radiological Release	1. Continue to exercise and refine response plans for public safety, facilities, animal resources, IT, Housing, Dining Services and other responsible campus partners 2. Formalize and train a campus damage assessment team
Conflagration	1. Continue to exercise and refine response plans for public safety, facilities, animal resources, IT, Housing, Dining Services and other responsible campus partners 2. Formalize and train a campus damage assessment team

	3. Coordinate with Athens-Clarke Fire and Emergency Services to purchase an ATV with fire-fighting and patient transport capabilities for the nearby Greenway trails and special events
Dam Failure	1. Continue to exercise and refine response plans for public safety, facilities, animal resources, IT, Housing, Dining Services and other responsible campus partners 2. Formalize and train a campus damage assessment team
Emergent Infectious Disease	1. Continue to exercise and refine response plans for public safety, facilities, animal resources, IT, Housing, Dining Services and other responsible campus partners
Hazardous Materials	1. Continue to exercise and refine response plans for public safety, facilities, animal resources, IT, Housing, Dining Services and other responsible campus partners
Terrorism	1. Continue to exercise and refine response plans for public safety, facilities, animal resources, IT, Housing, Dining Services and other responsible campus partners
Transportation	1. Continue to exercise and refine response plans for public safety, facilities, animal resources, IT, Housing, Dining Services and other responsible campus partners 2. Coordinate with Athens-Clarke Fire and Emergency Services to purchase an ATV with fire-fighting and patient transport capabilities for the nearby Greenway trails and special events

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 that they can use to protect themselves and their property. Examples of public education and awareness strategies in this updated plan are listed in the following table:

Natural Hazards	Mitigation Strategies
Drought	1. Continue and enhance new student orientation programs that highlight all-hazards emergency preparedness 2. Continue to host and enhance the membership of the UGA Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) training programs 3. Research and pursue potential enhancements to the UGAAlert emergency mass notification system in currently place on the UGA campus 4. 4Encourage the use of other redundant emergency notification methods in addition to the UGAAlert system (weather apps, weather radios, social media, etc.) 5. Implement a guest notification opt in feature for the UGAAlert emergency mass notification system for sporting and other special events on campus that allows for fans and spectators not affiliated with

	UGA to receive emergency alerts via the UGAAlert system for a specified time period 6. Continue to actively engage the University community to download and use the UGA mobile safety app for access to emergency plans, resources and other safety information 7. Implement the UGA mobile safety app in collaboration with UGA Athletics at all UGA sports venues to better assist fans in knowing venue specific emergency plans 8. Create an all-hazards brief instructional video for the University community to highlight best practices in responding to common building level emergencies 9. Purchase an emergency kit for each new student residing in UGA Housing each year (5,500 students)
Earthquake	1. Continue and enhance new student orientation programs that highlight all-hazards emergency preparedness 2. Continue to host and enhance the membership of the UGA Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) training programs 3. Research and pursue potential enhancements to the UGAAlert emergency mass notification system in currently place on the UGA campus 4. Encourage the use of other redundant emergency notification methods in addition to the UGAAlert system (weather apps, weather radios, social media, etc.) 5. Implement a guest notification opt in feature for the UGAAlert emergency mass notification system for sporting and other special events on campus that allows for fans and spectators not affiliated with UGA to receive emergency alerts via the UGAAlert system for a specified time period 6. Continue to actively engage the University community to download and use the UGA mobile safety app for access to emergency plans, resources and other safety information 7. Implement the UGA mobile safety app in collaboration with UGA Athletics at all UGA sports venues to better assist fans in knowing venue specific emergency plans 8. Create an all-hazards brief instructional video for the University community to highlight best practices in responding to common building level emergencies 9. Purchase an emergency kit for each new student residing in UGA Housing each year (5,500 students)
Flood	1. Continue and enhance new student orientation programs that highlight all-hazards emergency preparedness

	2. Continue to host and enhance the membership of the UGA Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) training programs 3. Research and pursue potential enhancements to the UGAAlert emergency mass notification system in currently place on the UGA campus 4. Encourage the use of other redundant emergency notification methods in addition to the UGAAlert system (weather apps, weather radios, social media, etc.) 5. Implement a guest notification opt in feature for the UGAAlert emergency mass notification system for sporting and other special events on campus that allows for fans and spectators not affiliated with UGA to receive emergency alerts via the UGAAlert system for a specified time period 6. Continue to actively engage the University community to download and use the UGA mobile safety app for access to emergency plans, resources and other safety information 7. Implement the UGA mobile safety app in collaboration with UGA Athletics at all UGA sports venues to better assist fans in knowing venue specific emergency plans 8. Create an all-hazards brief instructional video for the University community to highlight best practices in responding to common building level emergencies 9. Purchase an emergency kit for each new student residing in UGA Housing each year (5,500 students)
Thunderstorms	1. Continue and enhance new student orientation programs that highlight all-hazards emergency preparedness 2. Continue to host and enhance the membership of the UGA Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) training programs 3. Research and pursue potential enhancements to the UGAAlert emergency mass notification system in currently place on the UGA campus 4. Encourage the use of other redundant emergency notification methods in addition to the UGAAlert system (weather apps, weather radios, social media, etc.) 5. Implement a guest notification opt in feature for the UGAAlert emergency mass notification system for sporting and other special events on campus that allows for fans and spectators not affiliated with UGA to receive emergency alerts via the UGAAlert system for a specified time period 6. Continue to actively engage the University community to download and use the UGA mobile safety app for access to emergency plans, resources and other safety information

	7. Implement the UGA mobile safety app in collaboration with UGA Athletics at all UGA sports venues to better assist fans in knowing venue specific emergency plans 8. Create an all-hazards brief instructional video for the University community to highlight best practices in responding to common building level emergencies 9. Purchase an emergency kit for each new student residing in UGA Housing each year (5,500 students)
Tornadoes	1. Continue new student orientation programs that highlight all-hazards emergency preparedness 2. Continue to host and enhance the membership of the UGA Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) training programs 3. 3Research and pursue potential enhancements to the UGAAlert emergency mass notification system in currently place on the UGA campus 4. Encourage the use of other redundant emergency notification methods in addition to the UGAAlert system (weather apps, weather radios, social media, etc.) 5. Implement a guest notification opt in feature for the UGAAlert emergency mass notification system for sporting and other special events on campus that allows for fans and spectators not affiliated with UGA to receive emergency alerts via the UGAAlert system for a specified time period 6. Continue to actively engage the University community to download and use the UGA mobile safety app for access to emergency plans, resources and other safety information 7. Implement the UGA mobile safety app in collaboration with UGA Athletics at all UGA sports venues to better assist fans in knowing venue specific emergency plans 8. Create an all-hazards brief instructional video for the University community to highlight best practices in responding to common building level emergencies 9. Purchase an emergency kit for each new student residing in UGA Housing each year (5,500 students)
Tropical Cyclone	1. Continue and enhance new student orientation programs that highlight all-hazards emergency preparedness 2. Continue to host and enhance the membership of the UGA Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) training programs 3. Research and pursue potential enhancements to the UGAAlert emergency mass notification system in currently place on the UGA campus

	4. Encourage the use of other redundant emergency notification methods in addition to the UGAAlert system (weather apps, weather radios, social media, etc.) 5. Implement a guest notification opt in feature for the UGAAlert emergency mass notification system for sporting and other special events on campus that allows for fans and spectators not affiliated with UGA to receive emergency alerts via the UGAAlert system for a specified time period 6. Continue to actively engage the University community to download and use the UGA mobile safety app for access to emergency plans, resources and other safety information 7. Implement the UGA mobile safety app in collaboration with UGA Athletics at all UGA sports venues to better assist fans in knowing venue specific emergency plans 8. Create an all-hazards brief instructional video for the University community to highlight best practices in responding to common building level emergencies 9. Purchase an emergency kit for each new student residing in UGA Housing each year (5,500 students)
Wildfire	1. Continue and enhance new student orientation programs that highlight all-hazards emergency preparedness 2. Continue to host and enhance the membership of the UGA Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) training programs 3. Research and pursue potential enhancements to the UGAAlert emergency mass notification system in currently place on the UGA campus 4. Encourage the use of other redundant emergency notification methods in addition to the UGAAlert system (weather apps, weather radios, social media, etc.) 5. Implement a guest notification opt in feature for the UGAAlert emergency mass notification system for sporting and other special events on campus that allows for fans and spectators not affiliated with UGA to receive emergency alerts via the UGAAlert system for a specified time period 6. Continue to actively engage the University community to download and use the UGA mobile safety app for access to emergency plans, resources and other safety information 7. Implement the UGA mobile safety app in collaboration with UGA Athletics at all UGA sports venues to better assist fans in knowing venue specific emergency plans 8. Create an all-hazards brief instructional video for the University community to highlight best practices in responding to common building level emergencies

	9. Purchase an emergency kit for each new student residing in UGA Housing each year (5,500 students)
Winter Storms	1. Continue and enhance new student orientation programs that highlight all-hazards emergency preparedness 2. Continue to host and enhance the membership of the UGA Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) training programs 3. Research and pursue potential enhancements to the UGAAlert emergency mass notification system in currently place on the UGA campus 4. Encourage the use of other redundant emergency notification methods in addition to the UGAAlert system (weather apps, weather radios, social media, etc.) 5. Implement a guest notification opt in feature for the UGAAlert emergency mass notification system for sporting and other special events on campus that allows for fans and spectators not affiliated with UGA to receive emergency alerts via the UGAAlert system for a specified time period 6. Continue to actively engage the University community to download and use the UGA mobile safety app for access to emergency plans, resources and other safety information 7. Implement the UGA mobile safety app in collaboration with UGA Athletics at all UGA sports venues to better assist fans in knowing venue specific emergency plans 8. Create an all-hazards brief instructional video for the University community to highlight best practices in responding to common building level emergencies 9. Purchase an emergency kit for each new student residing in UGA Housing each year (5,500 students)
Technological Hazards	**Mitigation Strategies**
Biological/Radiological Release	1. Continue and enhance new student orientation programs that highlight all-hazards emergency preparedness 2. Continue to host and enhance the membership of the UGA Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) training programs 3. Research and pursue potential enhancements to the UGAAlert emergency mass notification system in currently place on the UGA campus 4. Encourage the use of other redundant emergency notification methods in addition to the UGAAlert system (weather apps, weather radios, social media, etc.) 5. Implement a guest notification opt in feature for the UGAAlert emergency mass notification system for sporting and other special events on campus that allows for fans and spectators not affiliated with

	UGA to receive emergency alerts via the UGAAlert system for a specified time period 6. Continue to actively engage the University community to download and use the UGA mobile safety app for access to emergency plans, resources and other safety information 7. Implement the UGA mobile safety app in collaboration with UGA Athletics at all UGA sports venues to better assist fans in knowing venue specific emergency plans 8. Create an all-hazards brief instructional video for the University community to highlight best practices in responding to common building level emergencies 9. Purchase an emergency kit for each new student residing in UGA Housing each year (5,500 students)
Conflagration	1. Continue and enhance new student orientation programs that highlight all-hazards emergency preparedness 2. Continue to host and enhance the membership of the UGA Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) training programs 3. Research and pursue potential enhancements to the UGAAlert emergency mass notification system in currently place on the UGA campus 4. Encourage the use of other redundant emergency notification methods in addition to the UGAAlert system (weather apps, weather radios, social media, etc.) 5. Implement a guest notification opt in feature for the UGAAlert emergency mass notification system for sporting and other special events on campus that allows for fans and spectators not affiliated with UGA to receive emergency alerts via the UGAAlert system for a specified time period 6. Continue to actively engage the University community to download and use the UGA mobile safety app for access to emergency plans, resources and other safety information 7. Implement the UGA mobile safety app in collaboration with UGA Athletics at all UGA sports venues to better assist fans in knowing venue specific emergency plans 8. Create an all-hazards brief instructional video for the University community to highlight best practices in responding to common building level emergencies 9. Purchase an emergency kit for each new student residing in UGA Housing each year (5,500 students)
Dam Failure	1. Continue and enhance new student orientation programs that highlight all-hazards emergency preparedness

	2. Continue to host and enhance the membership of the UGA Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) training programs 3. Research and pursue potential enhancements to the UGAAlert emergency mass notification system in currently place on the UGA campus 4. Encourage the use of other redundant emergency notification methods in addition to the UGAAlert system (weather apps, weather radios, social media, etc.) 5. Implement a guest notification opt in feature for the UGAAlert emergency mass notification system for sporting and other special events on campus that allows for fans and spectators not affiliated with UGA to receive emergency alerts via the UGAAlert system for a specified time period 6. Continue to actively engage the University community to download and use the UGA mobile safety app for access to emergency plans, resources and other safety information 7. Implement the UGA mobile safety app in collaboration with UGA Athletics at all UGA sports venues to better assist fans in knowing venue specific emergency plans 8. Create an all-hazards brief instructional video for the University community to highlight best practices in responding to common building level emergencies 9. Purchase an emergency kit for each new student residing in UGA Housing each year (5,500 students)
Emergent Infectious Disease	1. Continue and enhance new student orientation programs that highlight all-hazards emergency preparedness 2. Continue to host and enhance the membership of the UGA Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) training programs 3. Research and pursue potential enhancements to the UGAAlert emergency mass notification system in currently place on the UGA campus 4. Encourage the use of other redundant emergency notification methods in addition to the UGAAlert system (weather apps, weather radios, social media, etc.) 5. Implement a guest notification opt in feature for the UGAAlert emergency mass notification system for sporting and other special events on campus that allows for fans and spectators not affiliated with UGA to receive emergency alerts via the UGAAlert system for a specified time period 6. Continue to actively engage the University community to download and use the UGA mobile safety app for access to emergency plans, resources and other safety information

	7. Implement the UGA mobile safety app in collaboration with UGA Athletics at all UGA sports venues to better assist fans in knowing venue specific emergency plans 8. Create an all-hazards brief instructional video for the University community to highlight best practices in responding to common building level emergencies 9. Purchase an emergency kit for each new student residing in UGA Housing each year (5,500 students)
Hazardous Materials	1. Continue and enhance new student orientation programs that highlight all-hazards emergency preparedness 2. Continue to host and enhance the membership of the UGA Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) training programs 3. Research and pursue potential enhancements to the UGAAlert emergency mass notification system in currently place on the UGA campus 4. Encourage the use of other redundant emergency notification methods in addition to the UGAAlert system (weather apps, weather radios, social media, etc.) 5. Implement a guest notification opt in feature for the UGAAlert emergency mass notification system for sporting and other special events on campus that allows for fans and spectators not affiliated with UGA to receive emergency alerts via the UGAAlert system for a specified time period 6. Continue to actively engage the University community to download and use the UGA mobile safety app for access to emergency plans, resources and other safety information 7. Implement the UGA mobile safety app in collaboration with UGA Athletics at all UGA sports venues to better assist fans in knowing venue specific emergency plans 8. Create an all-hazards brief instructional video for the University community to highlight best practices in responding to common building level emergencies 9. Purchase an emergency kit for each new student residing in UGA Housing each year (5,500 students)
Terrorism	1. Continue and enhance new student orientation programs that highlight all-hazards emergency preparedness 2. Continue to host and enhance the membership of the UGA Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) training programs 3. Research and pursue potential enhancements to the UGAAlert emergency mass notification system in currently place on the UGA campus

	4. Encourage the use of other redundant emergency notification methods in addition to the UGAAlert system (weather apps, weather radios, social media, etc.) 5. Implement a guest notification opt in feature for the UGAAlert emergency mass notification system for sporting and other special events on campus that allows for fans and spectators not affiliated with UGA to receive emergency alerts via the UGAAlert system for a specified time period 6. Continue to actively engage the University community to download and use the UGA mobile safety app for access to emergency plans, resources and other safety information 7. Implement the UGA mobile safety app in collaboration with UGA Athletics at all UGA sports venues to better assist fans in knowing venue specific emergency plans 8. Create an all-hazards brief instructional video for the University community to highlight best practices in responding to common building level emergencies 9. Purchase an emergency kit for each new student residing in UGA Housing each year (5,500 students)
Transportation	1. Continue and enhance new student orientation programs that highlight all-hazards emergency preparedness 2. Continue to host and enhance the membership of the UGA Campus Community Emergency Response Team (UGA CERT) and the UGA Medical Reserve Corps (UGA MRC) training programs 3. Research and pursue potential enhancements to the UGAAlert emergency mass notification system in currently place on the UGA campus 4. Encourage the use of other redundant emergency notification methods in addition to the UGAAlert system (weather apps, weather radios, social media, etc.) 5. Implement a guest notification opt in feature for the UGAAlert emergency mass notification system for sporting and other special events on campus that allows for fans and spectators not affiliated with UGA to receive emergency alerts via the UGAAlert system for a specified time period 6. Continue to actively engage the University community to download and use the UGA mobile safety app for access to emergency plans, resources and other safety information 7. Implement the UGA mobile safety app in collaboration with UGA Athletics at all UGA sports venues to better assist fans in knowing venue specific emergency plans 8. Create an all-hazards brief instructional video for the University community to highlight best practices in responding to common building level emergencies

	9. Purchase an emergency kit for each new student residing in UGA Housing each year (5,500 students)

Overall

Mitigation Technique Percentage	
Prevention	25%
Property Protection	10%
Natural Resource Protection	5%
Structural Projects	10%
Emergency Services	15%
Public Education and Awareness	35%

The following Mitigation Charts meet:

Requirement §201.6(c) (3) (ii)
Requirement §201.6(d) (3)