APPENDIX C

OTHER PLANNING DOCUMENTS

Hancock County Emergency Management Agency

Emergency Operations Plan

Plan Approved:
27-JUL-16

Revised:
27-JUL-16

RECORD OF REVISIONS

Date	Author	Section	Detail
07-27-2016 11:24:44	Leanza	Plan Approved	
07-27-2016 11:23:52	Hancock	Local Resolution	
07-27-2016 11:23:45	Hancock	Local Resolution	
07-27-2016 11:23:34	Hancock	Local Resolution	
07-27-2016 10:46:06	Hancock	ESF 13	
07-27-2016 10:44:02	Hancock	ESF 13	
07-27-2016 10:42:18	Hancock	ESF 9	
02-09-2016 12:20:20	Hancock	Agencies	
10-26-2015 10:06:37	Hancock	Agencies	
10-26-2015 09:57:40	Hancock	Agencies	
11-10-2014 10:55:45	Hancock	ESF 13	
11-10-2014 10:53:41	Hancock	ESF 9	
11-10-2014 10:46:04	Hancock	Agencies	
11-10-2014 10:43:38	Hancock	Agencies	
11-10-2014 10:26:38	Hancock	Agencies	
11-10-2014 10:21:36	Hancock	Agencies	
11-10-2014 10:18:50	Hancock	Agencies	
11-10-2014 10:09:36	Hancock	Agencies	
11-06-2014 03:11:24	Hancock	Agencies	
11-06-2014 03:10:02	Hancock	Agencies	
11-06-2014 03:08:44	Hancock	Agencies	
09-23-2014 01:39:52	Hancock	ESF 4	
02-06-2012 05:11:15	Hancock	Agencies	
02-06-2012 05:09:10	Hancock	Agencies	
02-06-2012 05:03:01	Hancock	Agencies	
01-11-2012 10:27:53	Hancock	ESF 6	
08-24-2011 04:14:54	Hancock	Incident Annexes	
08-24-2011 04:14:51	Hancock	Incident Annexes	
08-24-2011 04:14:23	Hancock	Incident Annexes	
08-24-2011 04:14:19	Hancock	Incident Annexes	
01-06-2011 11:31:20	Glowe	Plan Approved	

11-02-2010 06:16:23	Hancock	ESF 6	
10-22-2010 12:31:12	Hancock	Agencies	
10-22-2010 12:30:45	Hancock	ESF 11	
10-22-2010 12:23:38	Hancock	ESF 15	
10-22-2010 12:21:19	Hancock	ESF 14	
10-22-2010 12:21:16	Hancock	ESF 14	
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10-22-2010 12:06:20	Hancock	ESF 12	
10-22-2010 12:06:07	Hancock	ESF 12	
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10-22-2010 10:55:49	Hancock	ESF 10	
10-22-2010 10:55:46	Hancock	ESF 10	
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Hancock County
EMERGENCY OPERATIONS PLAN

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PREFACE

This Emergency Operations Plan (EOP) describes the management and coordination of resources and personnel during periods of major emergency. This comprehensive local emergency operations plan is developed to ensure mitigation and preparedness, appropriate response and timely recovery from natural and man made hazards which may affect residents of Hancock County.

This plan supersedes the Emergency Operations Plan dated from old eLEOP. It incorporates guidance from the Georgia Emergency Management Agency (GEMA) as well as lessons learned from disasters and emergencies that have threatened Hancock County. The Plan will be updated at the latest, every four years. The plan:

- Defines emergency response in compliance with the State-mandated Emergency Operations Plan process.
- Establishes emergency response policies that provide Departments and Agencies with guidance for the coordination and direction of municipal plans and procedures.
- Provides a basis for unified training and response exercises.

The plan consists of the following components:

- The Basic Plan describes the structure and processes comprising a county approach to incident management designed to integrate the efforts of municipal governments, the private sector, and non-governmental organizations. The Basic Plan includes the: purpose, situation, assumptions, concept of operations, organization, assignment of responsibilities, administration, logistics, planning and operational activities.
- Appendices provide other relevant supporting information, including terms, definitions, and authorities.
- Emergency Support Function Annexes detail the missions, policies, structures, and responsibilities of County agencies for coordinating resource and programmatic support to municipalities during Incidents of Critical Significance.
- Support Annexes prescribe guidance and describe functional processes and administrative requirements necessary to ensure efficient and effective implementation of incident management objectives.
- Incident Annexes address contingency or hazard situations requiring specialized application of the EOP. The Incident Annexes describe the missions, policies, responsibilities, and coordination processes that govern the interaction of public and private entities engaged in incident management and emergency response operations across a spectrum of potential hazards. Due to security precautions and changing nature of their operational procedures, these Annexes, their supporting plans, and operational supplements are published separately.

The following is a summary of the 15 Emergency Support Functions:

1. *Transportation*: Support and assist municipal, county, private sector, and voluntary organizations requiring transportation for an actual or potential Incident of Critical Significance.

2. *Communications*: Ensures the provision of communications support to municipal, county, and private-sector response efforts during an Incident of Critical Significance.

3. *Public Works and Engineering*: Coordinates and organizes the capabilities and resources of the municipal and county governments to facilitate the delivery of services, technical assistance, engineering expertise, construction management, and other support to prevent, prepare for, respond to, and/or recover from an Incident of Critical Significance.

4. *Firefighting*: Enable the detection and suppression of wild-land, rural, and urban fires resulting from, or occurring coincidentally with an Incident of Critical Significance.

5. *Emergency Management Services*: Responsible for supporting overall activities of the County Government for County incident management.

6. *Mass Care, Housing and Human Services*: Supports County-wide, municipal, and non-governmental organization efforts to address non-medical mass care, housing, and human services needs of individuals and/or families impacted by Incidents of Critical Significance.

7. *Resource Support*: Supports volunteer services, County agencies, and municipal governments tracking, providing, and/or requiring resource support before, during, and/or after Incidents of Critical Significance.

8. *Public Health and Medical Services*: Provide the mechanism for coordinated County assistance to supplement municipal resources in response to public health and medical care needs (to include veterinary and/or animal health issues when appropriate) for potential or actual Incidents of Critical Significance and/or during a developing potential health and medical situation.

9. *Search and Rescue*: Rapidly deploy components of the National US Response System to provide specialized life-saving assistance to municipal authorities during an Incident of Critical Significance.

10. *Hazardous Materials*: Coordinate County support in response to an actual or potential discharge and/or uncontrolled release of oil or hazardous materials during Incidents of Critical Significance.

11. *Agriculture and Natural Resources*: supports County and authorities and other agency efforts to address: Provision of nutrition assistance; control and eradication of an outbreak of a highly contagious or economically devastating animal/zoonotic

disease; assurance of food safety and food security and; protection of natural and cultural resources and historic properties.

12. *Energy*: Restore damaged energy systems and components during a potential of actual Incident of Critical Significance.

13. *Public Safety and Security Services*: Integrates County public safety and security capabilities and resources to support the full range of incident management activities associated with potential or actual Incidents of Critical Significance.

14. *Long Term Recovery and Mitigation*: Provides a framework for County Government support to municipal governments, nongovernmental organizations, and the private sector designed to enable community recovery from the long-term consequences of an Incident of Critical Significance.

15. *External Affairs*: Ensures that sufficient County assets are deployed to the field during a potential or actual Incident of Critical Significance to provide accurate, coordinated, and timely information to affected audiences, including governments, media, the private sector, and the populace.

BASIC PLAN

I. INTRODUCTION

Summary

This plan establishes a framework for emergency management planning and response to: prevent emergency situations; reduce vulnerability during disasters; establish capabilities to protect residents from effects of crisis; respond effectively and efficiently to actual emergencies; and provide for rapid recovery from any emergency or disaster affecting the local jurisdiction and Hancock County.

This Emergency Operations Plan (EOP) is predicated on the National Incident Management System (NIMS) which integrates the capabilities and resources of various municipal jurisdictions, incident management and emergency response disciplines, nongovernmental organizations (NGOs), and the private sector into a cohesive, coordinated, and seamless framework for incident management. The EOP, using the NIMS, is an all-hazards plan that provides the structure and mechanisms for policy and operational coordination for incident management. Consistent with the model provided in the NIMS, the EOP can be partially or fully implemented in the context of a threat, anticipation of a significant event, or the response to a significant event. Selective implementation through the activation of one or more of the systems components allows maximum flexibility in meeting the unique operational and information-sharing requirements of the situation at hand and enabling effective interaction between various entities. The EOP, as the core operational plan for incident management, establishes county-level coordinating structures, processes, and protocols that will be incorporated into certain existing interagency incident- or hazard-specific plans (such as the Hurricane Plan) that is designed to implement specific statutory authorities and responsibilities of various departments and agencies in particular contingency.

Purpose

The purpose of the EOP is to establish a comprehensive, countywide, all-hazards approach to incident management across a spectrum of activities including prevention, preparedness, response, and recovery. The EOP incorporates best practices and procedures from various incident management disciplines - homeland security, emergency management, law enforcement, firefighting, hazardous materials response, public works, public health, emergency medical services, and responder and recovery worker health and safety - and integrates them into a unified coordinating structure. The EOP provides the framework for interaction with municipal governments; the private sector; and NGOs in the context of incident prevention, preparedness, response, and recovery activities. It describes capabilities and resources and establishes responsibilities, operational processes, and protocols to help protect from natural and manmade hazards; save lives; protect public health, safety, property, and the environment; and reduce adverse psychological consequences and disruptions. Finally, the EOP serves as the foundation for the development of detailed supplemental plans and procedures to effectively and efficiently implement incident management activities and assistance in the context of specific types of incidents.

The EOP, using the NIMS, establishes mechanisms to:

Georgia Emergency Operation Plan

2017

Approval and Implementation

The Georgia Emergency Management and Homeland Security Agency maintains the Georgia Emergency Operations Plan and presents the plan to the Governor for adoption once every four years, at a minimum.

The Georgia Emergency Operations Plan was developed by the Georgia Emergency Management and Homeland Security Agency, in coordination with other state agencies, non-governmental organizations and private sector partners and is aligned with the National Incident Management System as well as the National Response Framework and the National Disaster Recovery Framework. In addition, Georgia Emergency Management and Homeland Security Agency modified the Georgia Emergency Operations Plan, its appendices, Emergency Support Function Annexes and Support and Hazard Specific Annexes incorporate lessons learned from exercises, training, incidents and events.

This plan supersedes the Georgia Emergency Operation Plan dated January 2013.

11/13/17

Homer Bryson

Director

Georgia Emergency Management and

Homeland Security Agency

Date

Executive Summary

Georgia is vulnerable to a variety of hazards as identified in the State's Hazard Mitigation Strategy Plan. Thus the Georgia Emergency Operations Plan is written for the entire State Disaster Response Team, to include, but not limited to: all executives, state emergency management personnel, Private-Sector Partners, Non-Governmental Organization partners, local emergency managers, faith-based organizations and any other individuals or organizations expected to support disaster response efforts through emergency management functions.

This Plan is intended to clarify expectations for an effective response by state and local officials in support of responders in the field which can save lives, protect property, and more quickly restore essential services.

This document represents decades of planning and coordination between local, state, federal and non-governmental partners operating within or supporting the State of Georgia and is intended to ensure seamless integration of federal and state resources when necessary.

This Plan is consistent with the National Response Framework and supports the local emergency operations plans for all 159 counties within the State.

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Hazard Risk Analyses
Supplement to the Hancock County Joint Hazard Mitigation Plan

Carl Vinson
Institute of Government
UNIVERSITY OF GEORGIA

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Introduction

The Federal Disaster Mitigation Act of 2000 (DMA2K) requires state, local, and tribal governments to develop and maintain a mitigation plan to be eligible for certain federal disaster assistance and hazard mitigation funding programs.

Mitigation seeks to reduce a hazard's impacts, which may include loss of life, property damage, disruption to local and regional economies, and the expenditure of public and private funds for recovery. Sound mitigation must be based on a sound risk assessment that quantifies the potential losses of a disaster by assessing the vulnerability of buildings, infrastructure, and people.

In recognition of the importance of planning in mitigation activities, FEMA Hazus-MH, a powerful disaster risk assessment tool based on geographic information systems (GIS). This tool enables communities of all sizes to predict estimated losses from floods, hurricanes, earthquakes, and other related phenomena and to measure the impact of various mitigation practices that might help reduce those losses.

In 2018, the Georgia Department of Emergency Management partnered with the Carl Vinson Institute of Government at the University of Georgia to develop a detailed risk assessment focused on defining hurricane, riverine flood, and tornado risks in Hancock County, Georgia. This assessment identifies the characteristics and potential consequences of the disaster, how much of the community could be affected by the disaster, and the impact on community assets.

Risk Assessment Process Overview

Hazus-MH Version 2.2 SP1 was used to perform the analyses for Hancock County. The Hazus-MH application includes default data for every county in the US. This Hazus-MH data was derived from a variety of national sources and in some cases the data are also several years old. Whenever possible, using local provided data is preferred. Hancock County provided building inventory information from the county's property tax assessment system. This section describes the changes made to the default Hazus-MH inventory and the modeling parameters used for each scenario.

County Inventory Changes

The default Hazus-MH site-specific point inventory was updated using data compiled from the Georgia Emergency Management Agency (GEMA). The default Hazus-MH aggregate inventory (General Building Stock) was also updated prior to running the scenarios. Reported losses reflect the updated data sets.

General Building Stock Updates

General Building Stock (GBS) is an inventory category that consists of aggregated data (grouped by census geography — tract or block). Hazus-MH generates a combination of site-specific and aggregated loss estimates based on the given analysis and user input.

The GBS records for Hancock County were replaced with data derived from parcel and property assessment data obtained from Hancock County. The county provided property assessment data was current as of November 2018 and the parcel data current as of November 2018. Records without improvements were deleted. The parcel boundaries were converted to parcel points located in the centroids of each parcel boundary; then, each parcel point was linked to an assessor record based upon matching parcel numbers. The parcel assessor match-rate for Hancock County is 96.2%. The generated building inventory represents the approximate locations (within a parcel) of structures. The building inventory was aggregated by census block. Both the tract and block tables were updated. Table 1 shows the results of the changes to the GBS tables by occupancy class.

Table 1: GBS Building Exposure Updates by Occupancy Class*

General Occupancy	Default Hazus-MH Count	Updated Count	Default Hazus-MH Exposure	Updated Exposure
Agricultural	7	1	$1,895,000	$1,000
Commercial	111	194	$50,417,000	$20,092,000
Education	7	9	$9,188,000	$300,000
Government	10	9	$6,679,000	$1,087,000
Industrial	19	2	$5,650,000	$115,000
Religious	29	65	$21,876,000	$3,829,000
Residential	5,196	4,046	$620,037,000	$452,522,000
Total	5,379	4,326	$715,742,000	$477,946,000

*The exposure values represent the total number and replacement cost for all Hancock County Buildings

For Hancock County, the updated GBS was used to calculate hurricane wind losses. The flood losses and tornado losses were calculated from building inventory modeled in Hazus-MH as User-Defined Facility

(UDF)[1], or site-specific points. Figure 1 shows the distribution of buildings as points based on the county provided data.

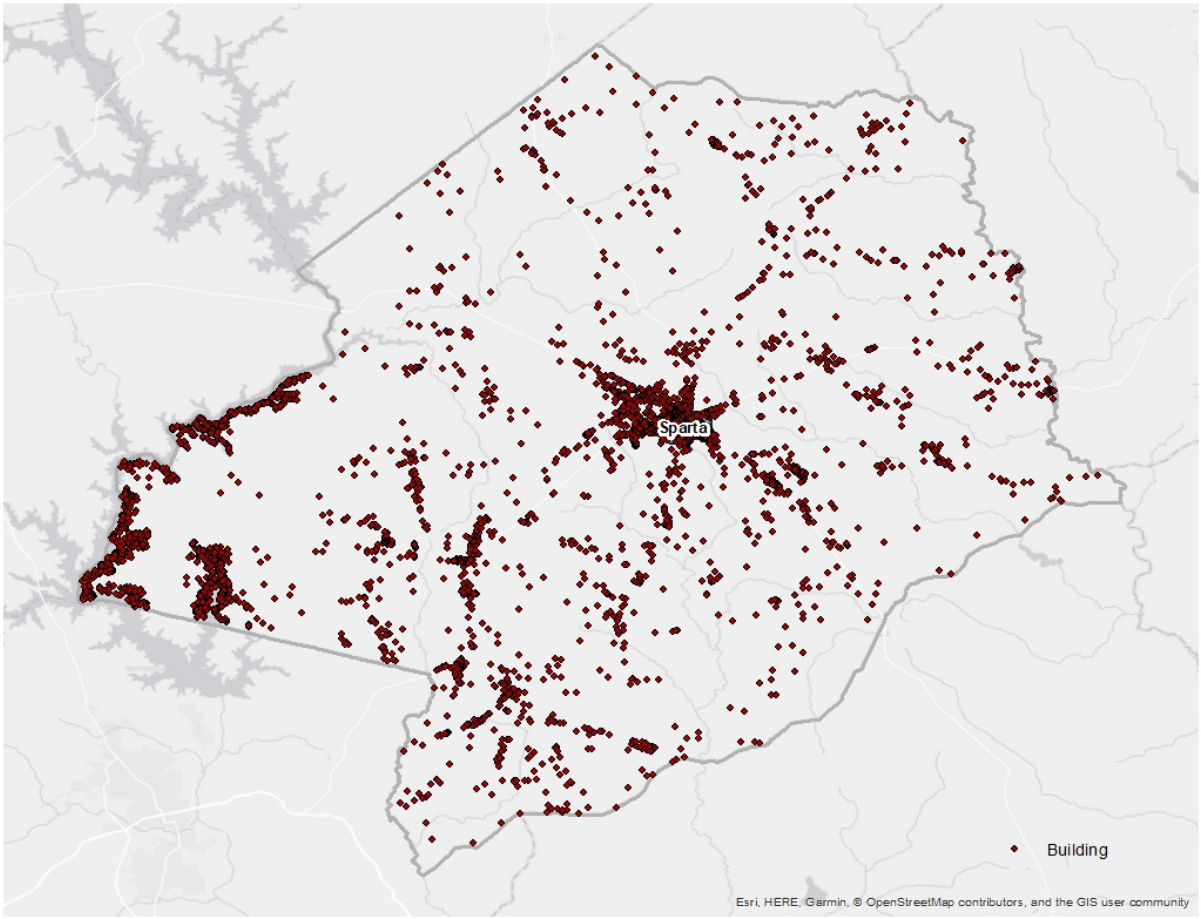


Figure 1: Hancock County Overview

Essential Facility Updates

The default Hazus-MH essential facility data was updated to reflect improved information available in the Georgia Mitigation Information System (GMIS) as of October 2018. For these risk analyses, only GMIS data for buildings that Hazus-MH classified as Essential Facilities was integrated into Hazus-MH because the application provides specialized reports for these five facilities. Essential Facility inventory was updated for the analysis conducted for this report. The following table summarizes the counts and exposures, where available, by Essential Facility classification of the updated data.

Essential facilities include:

- Care facilities
- EOCs
- Fire stations
- Police stations
- Schools

Table 2: Updated Essential Facilities

[1] The UDF inventory category in Hazus-MH allows the user to enter site-specific data in place of GBS data.

Classification	Updated Count	Updated Exposure
Sparta		
EOC	1	$880,000
Care	4	$2,109,000
Fire	2	$1,016,000
Police	1	$4,406,000
School	0	$0
Total	8	$8,411,000

Unincorporated Areas of Hancock County		
EOC	0	$0
Care	1	$550,000
Fire	3	$218,000
Police	0	$0
School	5	$4,400,000
Total	9	$5,168,000

Assumptions and Exceptions

Hazus-MH loss estimates may be impacted by certain assumptions and process variances made in this risk assessment.

- The Hancock County analysis used Hazus-MH Version 2.2 SP1, which was released by FEMA in May 2015.
- County provided parcel and property assessment data may not fully reflect all buildings in the county. For example, some counties do not report not-for-profit buildings such as government buildings, schools and churches in their property assessment data. This data was used to update the General Building Stock as well as the User Defined Facilities applied in this risk assessment.
- Georgia statute requires that the Assessor's Office assign a code to all of the buildings on a parcel based on the buildings primary use. If there is a residential or a commercial structure on a parcel and there are also agricultural buildings on the same parcel Hazus-MH looks at the residential and commercial "primary" structures first and then combines the value of all secondary structures on that parcel with the value of the primary structure. The values and building counts are still accurate but secondary structures are accounted for under the same classification as the primary structure. Because of this workflow, the only time that a parcel would show a value for an agricultural building is when there are no residential or commercial structures on the parcel thus making the agricultural building the primary structure. This is the reason that agricultural building counts and total values seem low or are nonexistent.
- GBS updates from assessor data will skew loss calculations. The following attributes were defaulted or calculated:

  Foundation Type was set from Occupancy Class

First Floor Height was set from Foundation Type
Content Cost was calculated from Replacement Cost

- It is assumed that the buildings are located at the centroid of the parcel.
- The essential facilities extracted from the GMIS were only used in the portion of the analysis designated as essential facility damage. They were not used in the update of the General Building Stock or the User Defined Facility inventory.

The hazard models included in this risk assessment included:

- Hurricane assessment which was comprised of a wind only damage assessment.
- Flood assessment based on the 1% annual chance event that includes riverine assessments.
- Tornado assessment based on GIS modeling.

Hurricane Risk Assessment

Hazard Definition

The National Hurricane Center describes a hurricane as a tropical cyclone in which the maximum sustained wind is, at minimum, 74 miles per hour (mph)[2]. The term hurricane is used for Northern Hemisphere tropical cyclones east of the International Dateline to the Greenwich Meridian. The term typhoon is used for Pacific tropical cyclones north of the Equator west of the International Dateline. Hurricanes in the Atlantic Ocean, Gulf of Mexico, and Caribbean form between June and November with the peak of hurricane season occurring in the middle of September. Hurricane intensities are measured using the Saffir-Simpson Hurricane Wind Scale (Table 3). This scale is a 1 to 5 categorization based on the hurricane's intensity at the indicated time.

Hurricanes bring a complex set of impacts. The winds from a hurricane produce a rise in the water level at landfall called storm surge. Storm surges produce coastal flooding effects that can be as damaging as the hurricane's winds. Hurricanes bring very intense inland riverine flooding. Hurricanes can also produce tornadoes that can add to the wind damages inland. In this risk assessment, only hurricane winds, and coastal storm surge are considered.

Table 3: Saffir-Simpson Hurricane Wind Scale

Category	Wind Speed (mph)	Damage
1	74 - 95	Very dangerous winds will produce some damage
2	96 - 110	Extremely dangerous winds will cause extensive damage
3	111 - 130	Devastating damage will occur
4	131 -155	Catastrophic damage will occur
5	> 155	Catastrophic damage will occur

The National Oceanic and Atmospheric Administration's National Hurricane Center created the HURDAT database, which contains all of the tracks of tropical systems since the mid-1800s. This database was used to document the number of tropical systems that have affected Hancock County by creating a 20-mile buffer around the county to include storms that didn't make direct landfall in Hancock County but impacted the county. Note that the storms listed contain the peak sustained winds, maximum pressure and maximum attained storm strength for the entire storm duration. Since 1852, Hancock County has had 19 tropical systems within 20 miles of its county borders (Table 4).

Table 4: Tropical Systems affecting Hancock County[3]

YEAR	DATE RANGE	NAME	MAX WIND(Knots)	MAX PRESSURE	MAX CAT
1852	August 19-30	UNNAMED	100	961	H2

[2] National Hurricane Center (2011). "Glossary of NHC Terms." National Oceanic and Atmospheric Administration. http://www.nhc.noaa.gov/aboutgloss.shtml#h. Retrieved 2012-23-02.

[3] Atlantic Oceanic and Meteorological Laboratory (2012). "Data Center." National Oceanic and Atmospheric Administration. http://www.aoml.noaa.gov/hrd/data_sub/re_anal.html. Retrieved 7-20-2015.

YEAR	DATE RANGE	NAME	MAX WIND(Knots)	MAX PRESSURE	MAX CAT
1886	June 17-24	UNNAMED	85	0	H1
1887	October 09-22	UNNAMED	75	0	H1
1889	September 12-26	UNNAMED	95	0	H1
1893	September 27 - October 05	UNNAMED	115	948	H3
1896	July 04-12	UNNAMED	85	0	H1
1901	September 21 - October 02	UNNAMED	45	0	TD
1928	August 03-13	UNNAMED	90	977	H1
1933	August 31 - September 07	UNNAMED	120	948	H3
1947	October 05-09	UNNAMED	50	0	TD
1949	August 23 - September 01	UNNAMED	115	1002	H3
1959	May 28 - June 02	ARLENE	55	1002	TD
1965	June 11-18	UNNAMED	45	0	TD
1972	June 14-23	AGNES	75	1001	H1
1990	October 09-13	MARCO	55	1007	TD
2000	September 15-25	HELENE	60	1012	TD
2001	June 05-19	ALLISON	50	1012	TD
2003	July 25-27	UNNAMED	30	1022	TD
2004	September 13-29	JEANNE	105	1010	H2

Category Definitions:

TS – Tropical storm

TD – Tropical depression

H1 – Category 1 (same format for H2, H3, and H4)

E – Extra-tropical cyclone

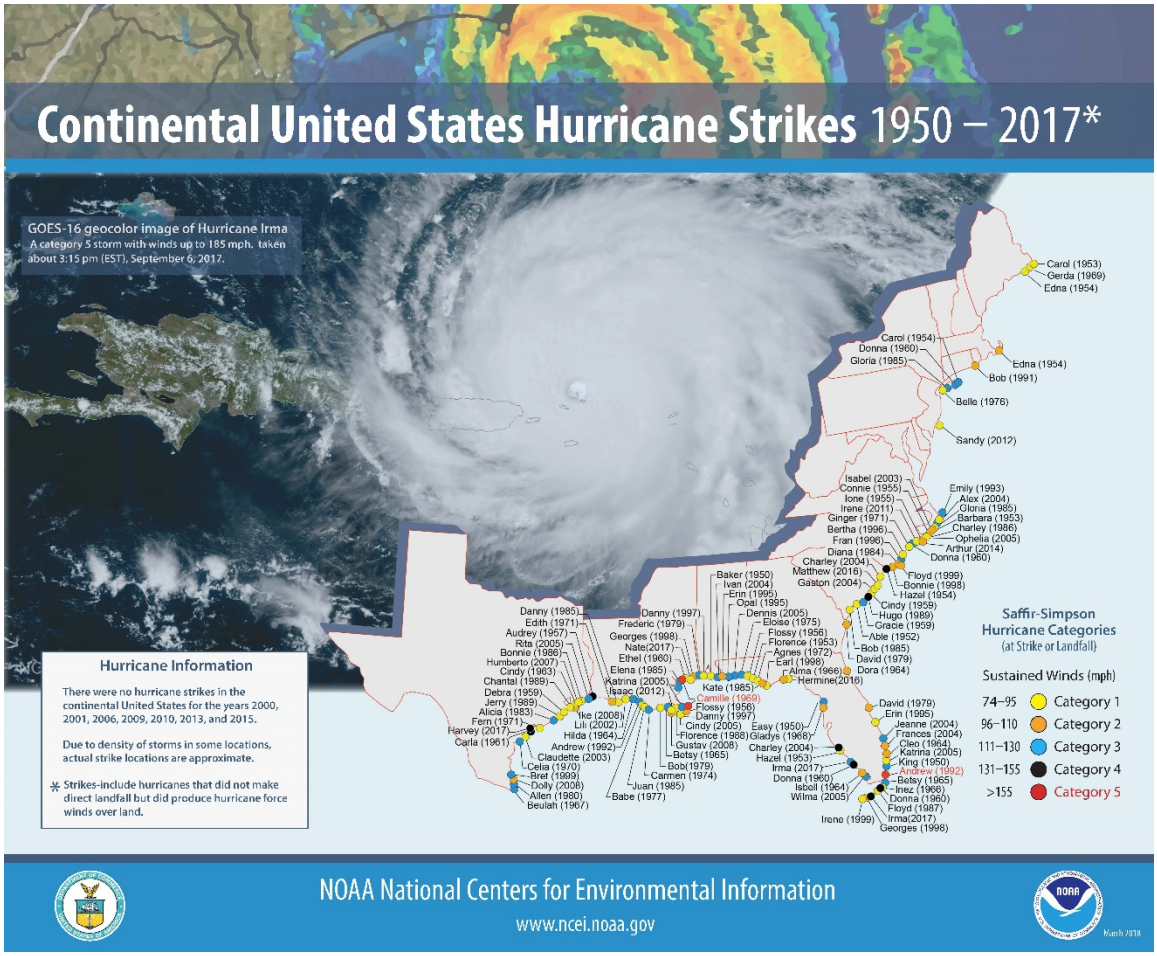


Figure 2: Continental United States Hurricane Strikes: 1950 to 2017[4]

Probabilistic Hurricane Scenario

The following probabilistic wind damage risk assessment modeled a Tropical Storm with maximum winds of 72 mph.

Wind Damage Assessment

Separate analyses were performed to determine wind and hurricane storm surge related flood losses. This section describes the wind-based losses to Hancock County. Wind losses were determined from probabilistic models run for the Tropical Storm which equates to the 1% chance storm event. Figure 3 shows wind speeds for the modeled Tropical Storm.

[4] Source: NOAA National Centers for Environmental Information

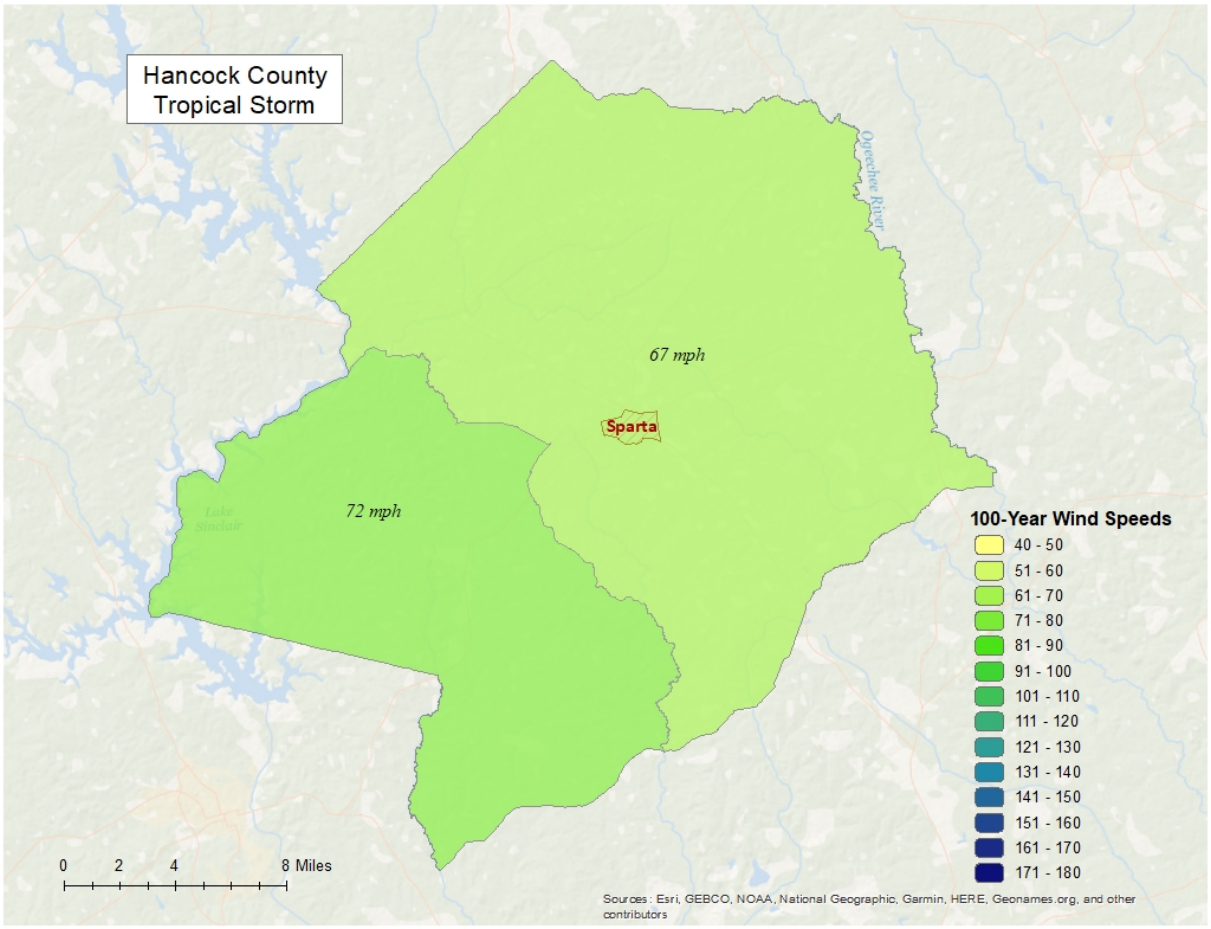


Figure 3: Wind Speeds by Storm Category

Wind-Related Building Damages

Buildings in Hancock County are vulnerable to storm events, and the cost to rebuild may have significant consequences to the community. The following table shows a summary of the results of wind-related building damage in Hancock County for the Tropical Storm (100 Year Event). The loss ratio expresses building losses as a percentage of total building replacement cost in the county. Figure 4 illustrates the building loss ratios of the modeled Tropical Storm.

Table 5: Hurricane Wind Building Damage

Classification	Number of Buildings Damaged	Total Building Damage	Total Economic Loss[5]	Loss Ratio
Tropical Storm	8	$549,010	$735,980	0.11%

[5] Includes property damage (infrastructure, contents, and inventory) as well as business interruption losses.

Note that wind damaged buildings are not reported by jurisdiction. This is due to the fact that census tract boundaries – upon which hurricane building losses are based – do not closely coincide with jurisdiction boundaries.

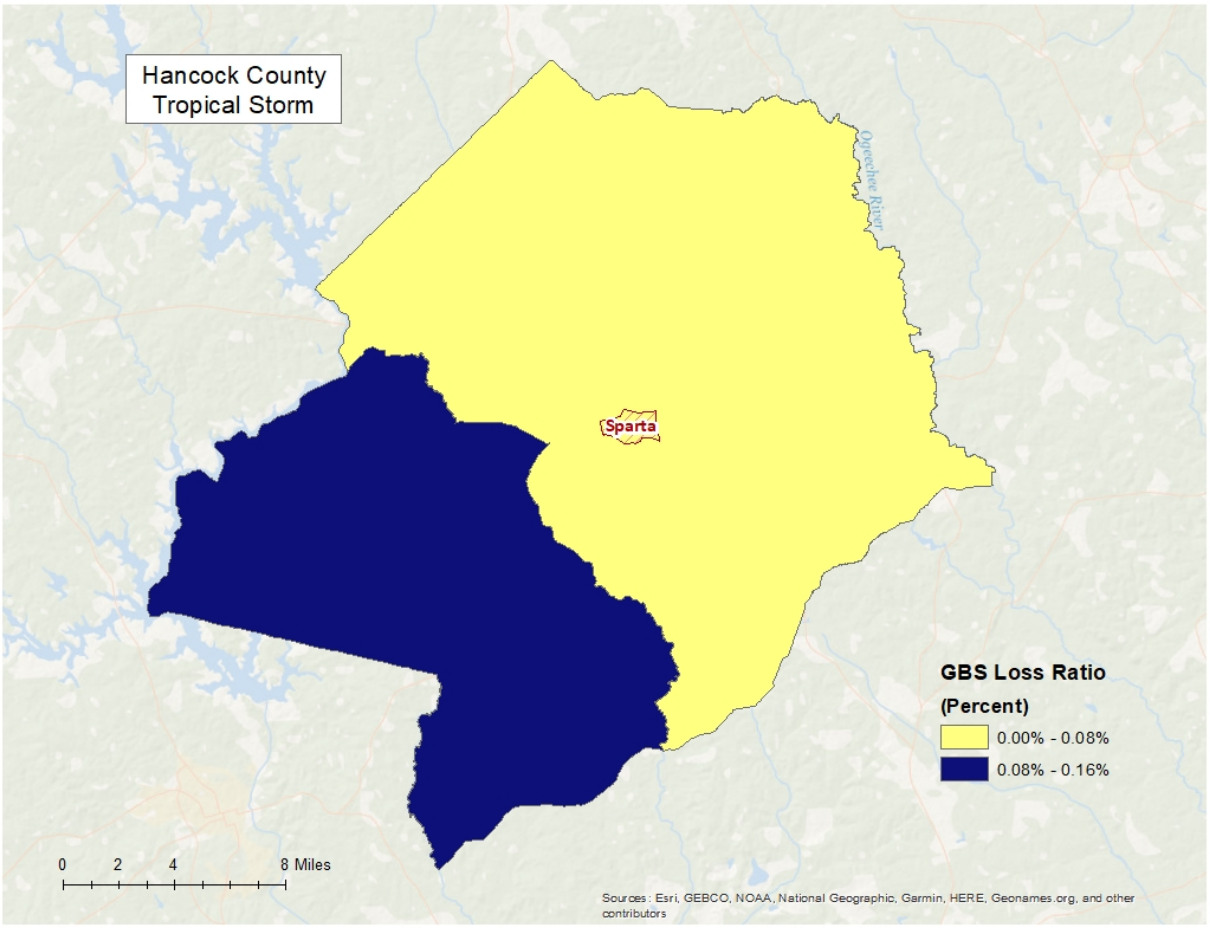


Figure 4: Hurricane Wind Building Loss Ratios

Essential Facility Losses

Essential facilities are also vulnerable to storm events, and the potential loss of functionality may have significant consequences to the community. Hazus-MH identified the essential facilities that may be moderately or severely damaged by winds. The results are compiled in Table 6.

There are 17 essential facilities in Hancock County.

Classification	Number
EOCs	1
Fire Stations	5
Care Facilities	5
Police Stations	1
Schools	5

Table 6: Wind-Damaged Essential Facility Losses

Classification	Facilities At Least Moderately Damaged > 50%	Facilities Completely Damaged > 50%	Facilities with Expected Loss of Use (< 1 day)
Tropical Storm	0	0	17

Shelter Requirements

Hazus-MH estimates the number of households evacuated from buildings with severe damage from high velocity winds as well as the number of people who will require short-term sheltering. Since the 1% chance storm event for Hancock County is a Tropical Storm, the resulting damage is not enough to displace Households or require temporary shelters as shown in the results listed in Table 7.

Table 7: Displaced Households and People

Classification	# of Displaced Households	# of People Needing Short-Term Shelter
Tropical Storm	0	0

Debris Generated from Hurricane Wind

Hazus-MH estimates the amount of debris that will be generated by high velocity hurricane winds and quantifies it into three broad categories to determine the material handling equipment needed:

- Reinforced Concrete and Steel Debris
- Brick and Wood and Other Building Debris
- Tree Debris

Different material handling equipment is required for each category of debris. The estimates of debris for this scenario are listed in Table 8. The amount of hurricane wind related tree debris that is estimated to require pick up at the public's expense is listed in the eligible tree debris column.

Table 8: Wind-Related Debris Weight (Tons)

Classification	Brick, Wood, and Other	Reinforced Concrete and Steel	Eligible Tree Debris	Other Tree Debris	Total
Tropical Storm	34	0	876	19,984	20,894

Figure 5 shows the distribution of all wind related debris resulting from a Tropical Storm. Each dot represents 20 tons of debris within the census tract in which it is located. The dots are randomly distributed within each census tract and therefore do not represent the specific location of debris sites.

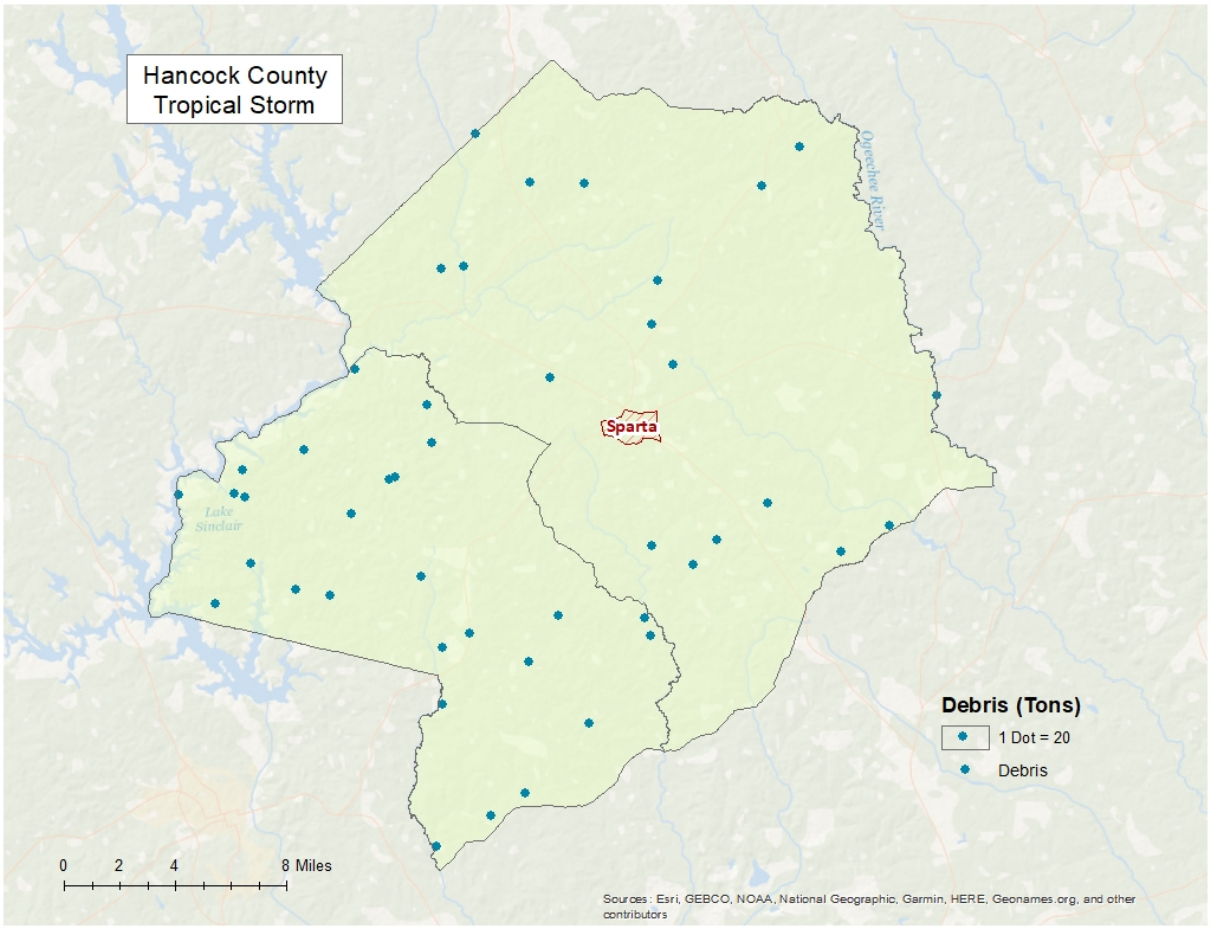


Figure 5: Wind-Related Debris Weight (Tons)

Flood Risk Assessment

Hazard Definition

Flooding is a significant natural hazard throughout the United States. The type, magnitude, and severity of flooding are functions of the amount and distribution of precipitation over a given area, the rate at which precipitation infiltrates the ground, the geometry and hydrology of the catchment, and flow dynamics and conditions in and along the river channel. Floods can be classified as one of three types: upstream floods, downstream floods, or coastal floods.

Upstream floods, also called flash floods, occur in the upper parts of drainage basins and are generally characterized by periods of intense rainfall over a short duration. These floods arise with very little warning and often result in locally intense damage, and sometimes loss of life, due to the high energy of the flowing water. Flood waters can snap trees, topple buildings, and easily move large boulders or other structures. Six inches of rushing water can upend a person; another 18 inches might carry off a car. Generally, upstream floods cause damage over relatively localized areas, but they can be quite severe in the local areas in which they occur. Urban flooding is a type of upstream flood. Urban flooding involves the overflow of storm drain systems and can be the result of inadequate drainage combined with heavy rainfall or rapid snowmelt. Upstream or flash floods can occur at any time of the year in Georgia, but they are most common in the spring and summer months.

Downstream floods, also called riverine floods, refer to floods on large rivers at locations with large upstream catchments. Downstream floods are typically associated with precipitation events that are of relatively long duration and occur over large areas. Flooding on small tributary streams may be limited, but the contribution of increased runoff may result in a large flood downstream. The lag time between precipitation and time of the flood peak is much longer for downstream floods than for upstream floods, generally providing ample warning for people to move to safe locations and, to some extent, secure some property against damage.

Coastal floods occurring on the Atlantic and Gulf coasts may be related to hurricanes or other combined offshore, nearshore, and shoreline processes. The effects of these complex interrelationships vary significantly across coastal settings, leading to challenges in the determination of the base (1-percent-annual-chance) flood for hazard mapping purposes. Land area covered by floodwaters of the base flood is identified as a Special Flood Hazard Area (SFHA). The Hancock County flood risk assessment analyzed at risk structures in the SFHA.

> The SFHA is the area where the National Flood Insurance Program's (NFIP) floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies. The owner of a structure in a high-risk area must carry flood insurance, if the owner carries a mortgage from a federally regulated or insured lender or servicer.

The following probabilistic risk assessment involves an analysis of a 1% annual chance riverine flood event (100-Year Flood) and a 1% annual chance coastal flood.

Riverine 1% Flood Scenario

Riverine losses were determined from the 1% flood boundaries downloaded from the FEMA Flood Map Service Center in November 2018. The flood boundaries were overlaid with the USGS 10 meter DEM

using the Hazus-MH Enhanced Quick Look tool to generate riverine depth grids. The riverine flood depth grid was then imported into Hazus-MH to calculate the riverine flood loss estimates. Figure 6 illustrates the riverine inundation boundary associated with the 1% annual chance.

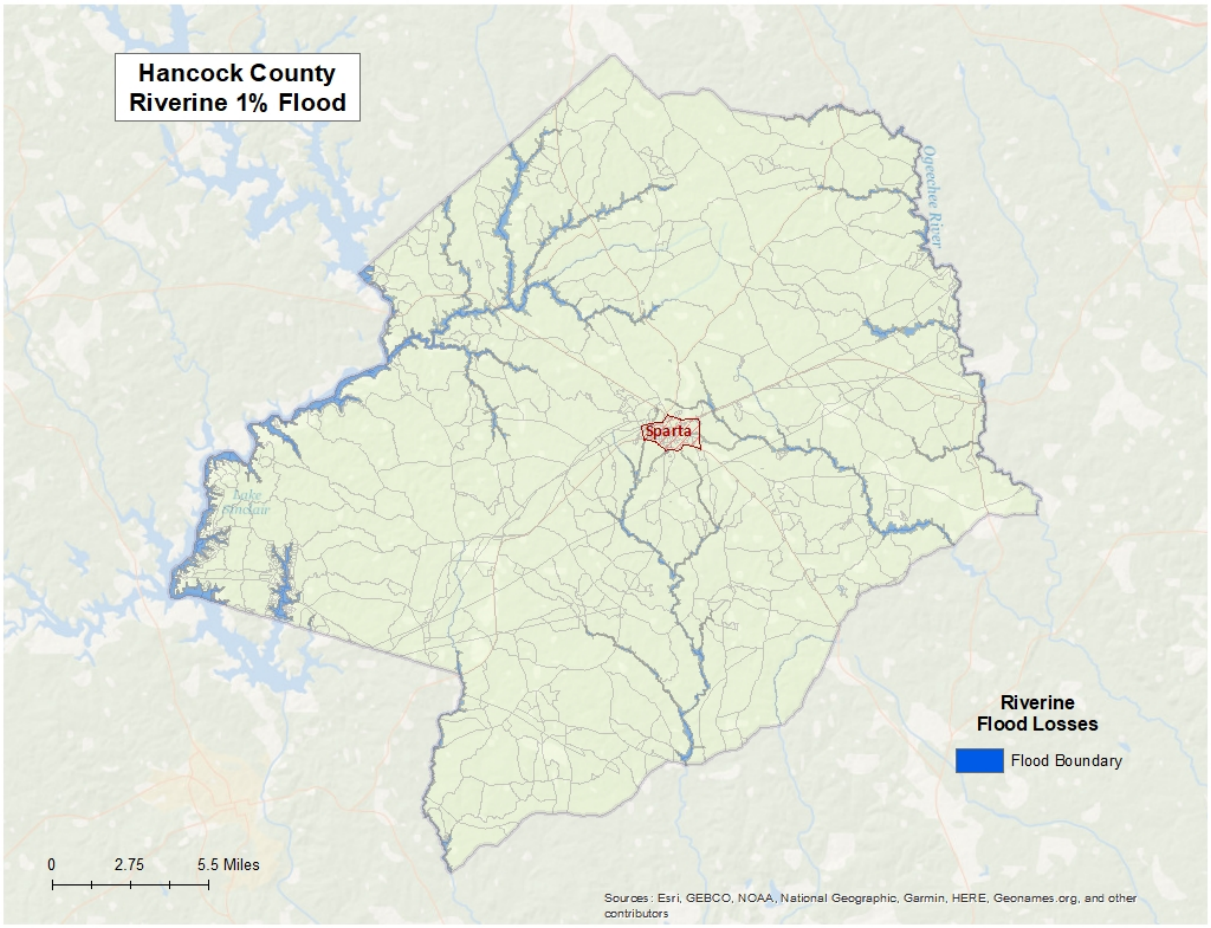


Figure 6: Riverine 1% Flood Inundation

Riverine 1% Flood Building Damages

Buildings in Hancock County are vulnerable to flooding from events equivalent to the 1% riverine flood. The economic and social impacts from a flood of this magnitude can be significant. Table 9 provides a summary of the potential flood-related building damage in Hancock County by jurisdiction that might be experienced from the 1% flood. Figure 7 maps the potential loss ratios of total building exposure to losses sustained to buildings from the 1% flood by 2010 census block and Figure 8 illustrates the relationship of building locations to the 1% flood inundation boundary.

Table 9: Hancock County Riverine 1% Building Losses

Occupancy	Total Buildings in the Jurisdiction	Total Buildings Damaged in the Jurisdiction	Total Building Exposure in the Jurisdiction	Total Losses to Buildings in the Jurisdiction	Loss Ratio of Exposed Buildings to Damaged Buildings in the Jurisdiction
Sparta					
Residential	488	3	$73,268,362	$148,048	0.20%
Unincorporated					
Residential	3,558	70	$379,259,404	$2,316,196	0.61%
Commercial	82	4	$10,358,040	$83,350	0.80%
County Total					
	4,128	**77**	**$462,885,806**	**$2,547,594**	

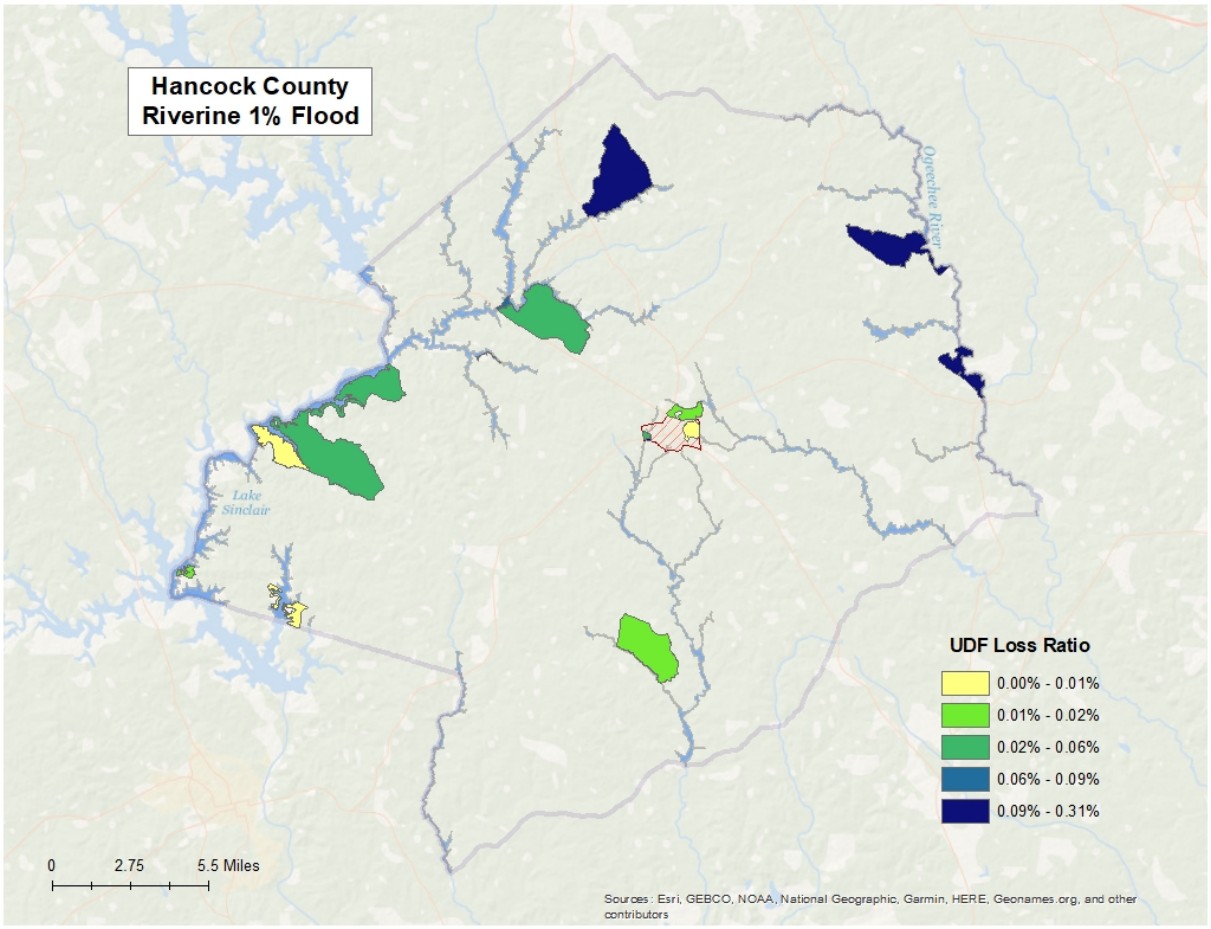


Figure 7: Hancock County Potential Loss Ratios of Total Building Exposure to Losses Sustained to Buildings from the 1% Riverine Flood by 2010 Census Block

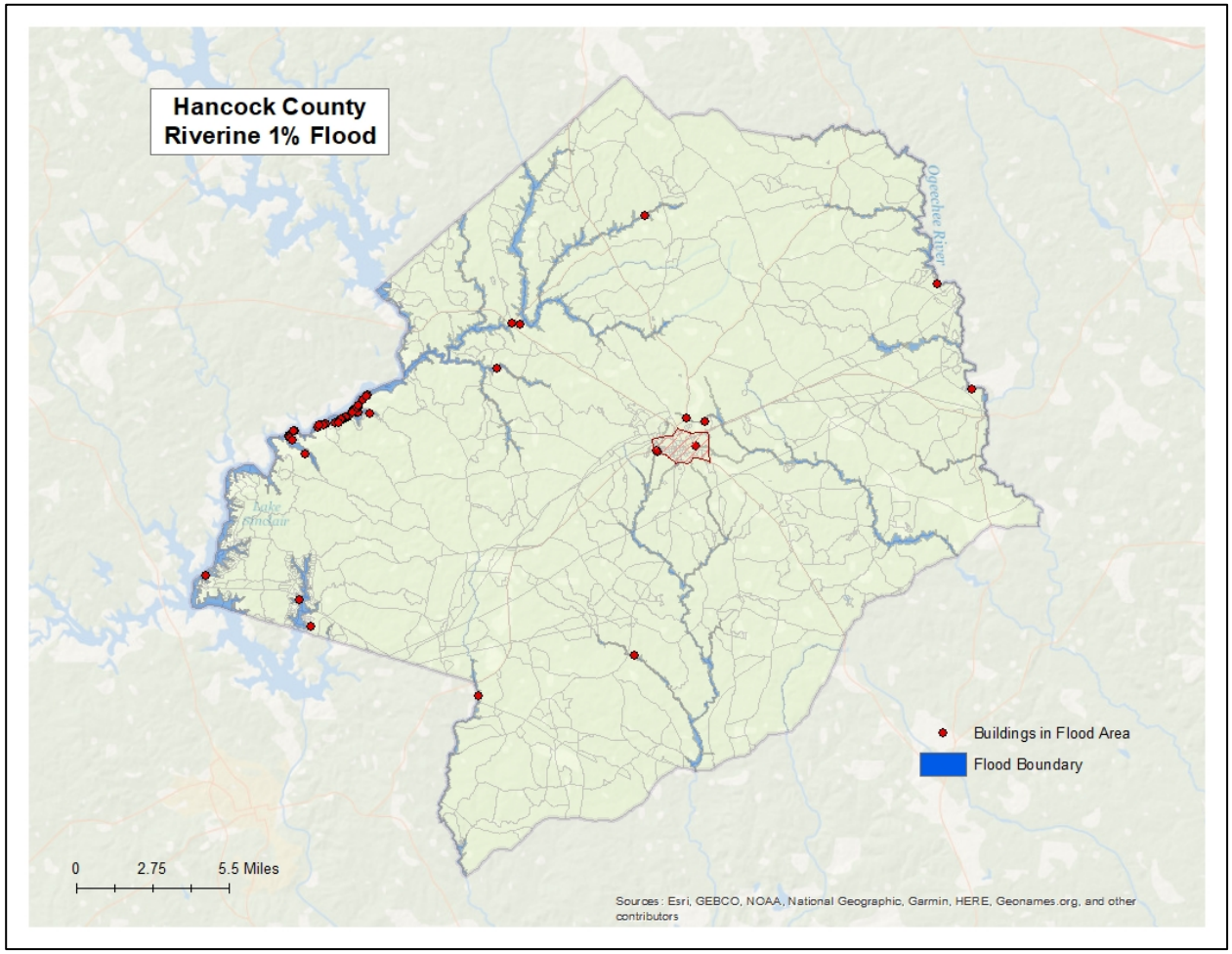


Figure 8: Hancock County Damaged Buildings in Riverine Floodplain (1% Flood)

Riverine 1% Flood Essential Facility Losses

An essential facility may encounter many of the same impacts as other buildings within the flood boundary. These impacts can include structural failure, extensive water damage to the facility and loss of facility functionality (e.g. a damaged police station will no longer be able to serve the community). The analysis identified one essential facility that were subject to damage in the Hancock County riverine 1% probability floodplain.

Table 10: Riverine 1% Flood Damaged Essential Facilities

Name	Category	City
Holiday Shores 5-1	Fire Station	Sparta

Riverine 1% Flood Shelter Requirements

Hazus-MH estimates that the number of households that are expected to be displaced from their homes due to riverine flooding and the associated potential evacuation. The model estimates 70 households might be displaced due to the flood. Displacement includes households evacuated within or very near to the inundated area. Displaced households represent 211 individuals, of which 8 may require short term publicly provided shelter. The results are mapped in Figure 9.

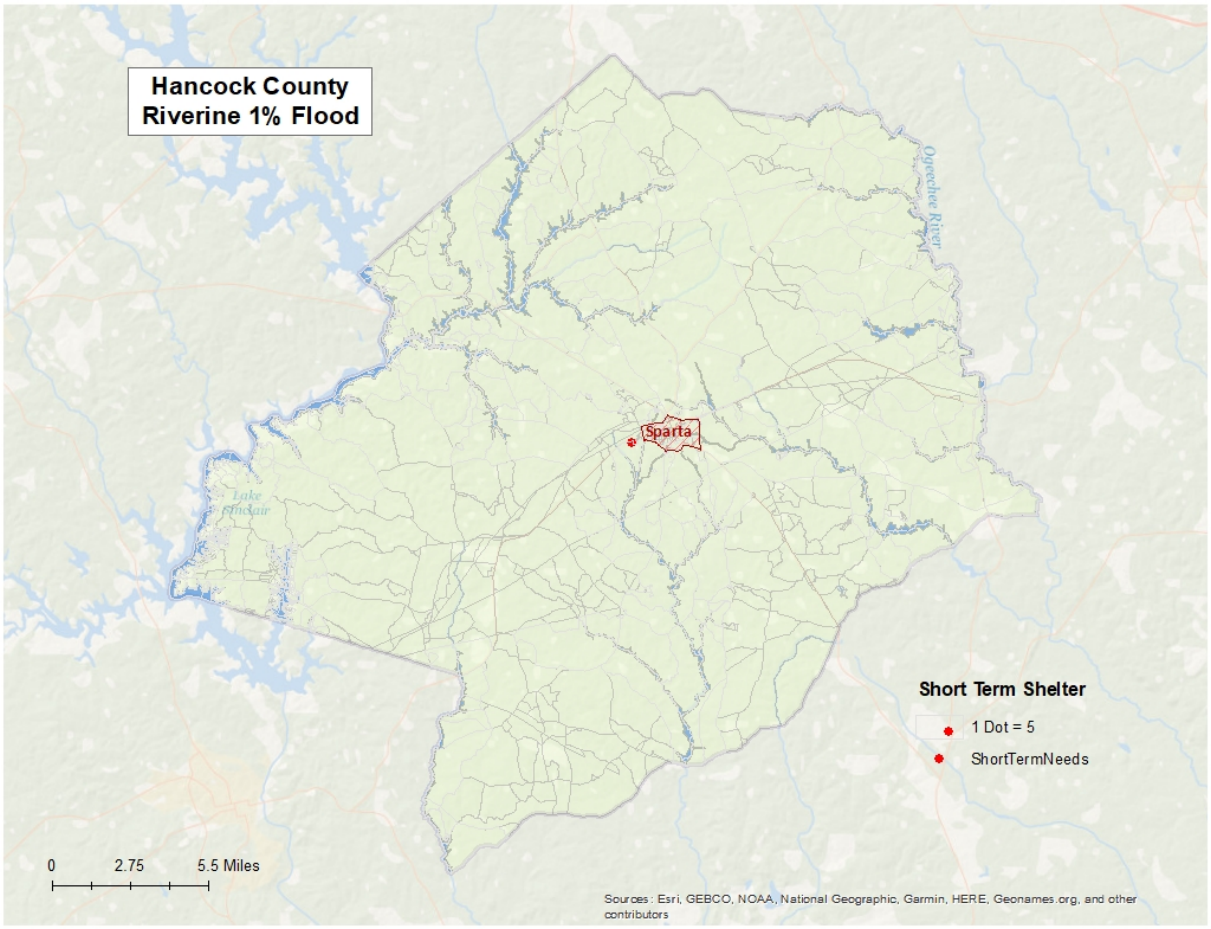


Figure 9: Riverine 1% Estimated Flood Shelter Requirements

Riverine 1% Flood Debris

Hazus-MH estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories:

- Finishes (dry wall, insulation, etc.)
- Structural (wood, brick, etc.)
- Foundations (concrete slab, concrete block, rebar, etc.)

Different types of material handling equipment will be required for each category. Debris definitions applied in Hazus-MH are unique to the Hazus-MH model and so do not necessarily conform to other definitions that may be employed in other models or guidelines.

The analysis estimates that an approximate total of 1,409 tons of debris might be generated: 1) Finishes- 532 tons; 2) Structural – 450 tons; and 3) Foundations- 427 tons. The results are mapped in Figure 10.

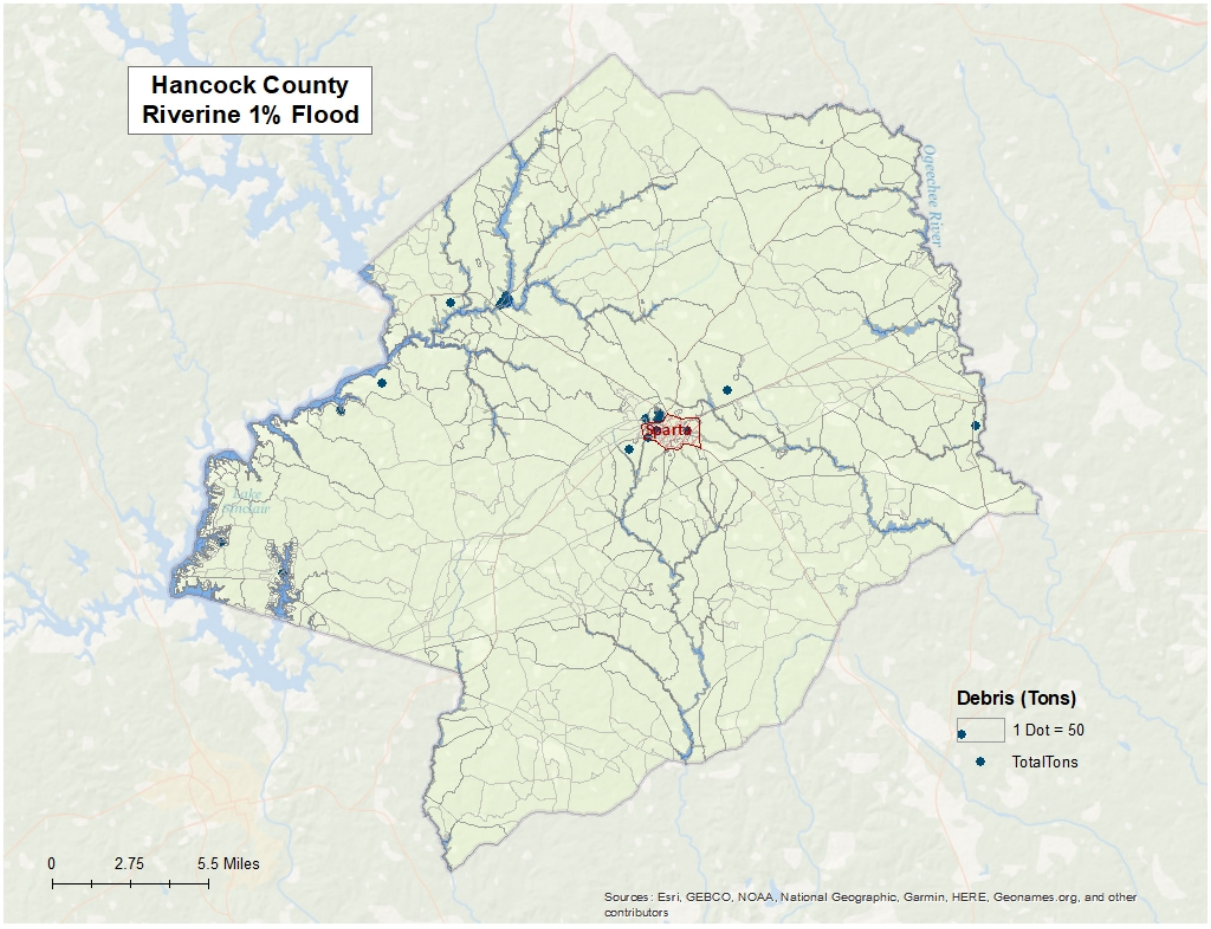


Figure 10: Riverine 1% Flood Debris Weight (Tons)

Tornado Risk Assessment

Hazard Definition

Tornadoes pose a great risk to the state of Georgia and its citizens. Tornadoes can occur at any time during the day or night. They can also happen during any month of the year. The unpredictability of tornadoes makes them one of Georgia's most dangerous hazards. Their extreme winds are violently destructive when they touch down in the region's developed and populated areas. Current estimates place the maximum velocity at about 300 miles per hour, but higher and lower values can occur. A wind velocity of 200 miles per hour will result in a wind pressure of 102.4 pounds per square foot of surface area—a load that exceeds the tolerance limits of most buildings. Considering these factors, it is easy to understand why tornadoes can be so devastating for the communities they hit.

Tornadoes are defined as violently-rotating columns of air extending from thunderstorms and cyclonic events. Funnel clouds are rotating columns of air not in contact with the ground; however, the violently-rotating column of air can reach the ground very quickly and become a tornado. If the funnel cloud picks up and blows debris, it has reached the ground and is a tornado.

Tornadoes are classified according to the Fujita tornado intensity scale. Originally introduced in 1971, the scale was modified in 2006 to better define the damage and estimated wind scale. The Enhanced Fujita Scale ranges from low intensity EF0 with effective wind speeds of 65 to 85 miles per hour, to EF5 tornadoes with effective wind speeds of over 200 miles per hour. The Enhanced Fujita intensity scale is included in Table 11.

Table 11: Enhanced Fujita Tornado Rating

Fujita Number	Estimated Wind Speed	Path Width	Path Length	Description of Destruction
EF0 *Gale*	65-85 mph	6-17 yards	0.3-0.9 miles	Light damage, some damage to chimneys, branches broken, sign boards damaged, shallow-rooted trees blown over.
EF1 Moderate	86-110 mph	18-55 yards	1.0-3.1 miles	Moderate damage, roof surfaces peeled off, mobile homes pushed off foundations, attached garages damaged.
EF2 Significant	111-135 mph	56-175 yards	3.2-9.9 miles	Considerable damage, entire roofs torn from frame houses, mobile homes demolished, boxcars pushed over, large trees snapped or uprooted.
EF3 Severe	136-165 mph	176-566 yards	10-31 miles	Severe damage, walls torn from well-constructed houses, trains overturned, most trees in forests uprooted, heavy cars thrown about.
EF4 Devastating	166-200 mph	0.3-0.9 miles	32-99 miles	Complete damage, well-constructed houses leveled, structures with weak foundations blown off for some distance, large missiles generated.
EF5 Incredible	> 200 mph	1.0-3.1 miles	100-315 miles	Foundations swept clean, automobiles become missiles and thrown for 100 yards or more, steel-reinforced concrete structures badly damaged.

Source: http://www.srh.noaa.gov

Hypothetical Tornado Scenario

For this report, an EF3 tornado was modeled to illustrate the potential impacts of tornadoes of this magnitude in the county. The analysis used a hypothetical path based upon an EF3 tornado event running along the predominant direction of historical tornados (southeast to northwest). The tornado path was placed to travel north of Sparta. The selected widths were modeled after a re-creation of the Fujita-Scale guidelines based on conceptual wind speeds, path widths, and path lengths. There is no guarantee that every tornado will fit exactly into one of these categories. Table 12 depicts tornado path widths and expected damage.

Table 12: Tornado Path Widths and Damage Curves

Fujita Scale	Path Width (feet)	Maximum Expected Damage
EF-5	2,400	100%
EF-4	1,800	100%
EF-3	1,200	80%
EF-2	600	50%
EF-1	300	10%
EF-0	300	0%

Within any given tornado path there are degrees of damage. The most intense damage occurs within the center of the damage path, with decreasing amounts of damage away from the center. After the hypothetical path is digitized on a map, the process is modeled in GIS by adding buffers (damage zones) around the tornado path. Figure 11 describes the zone analysis.

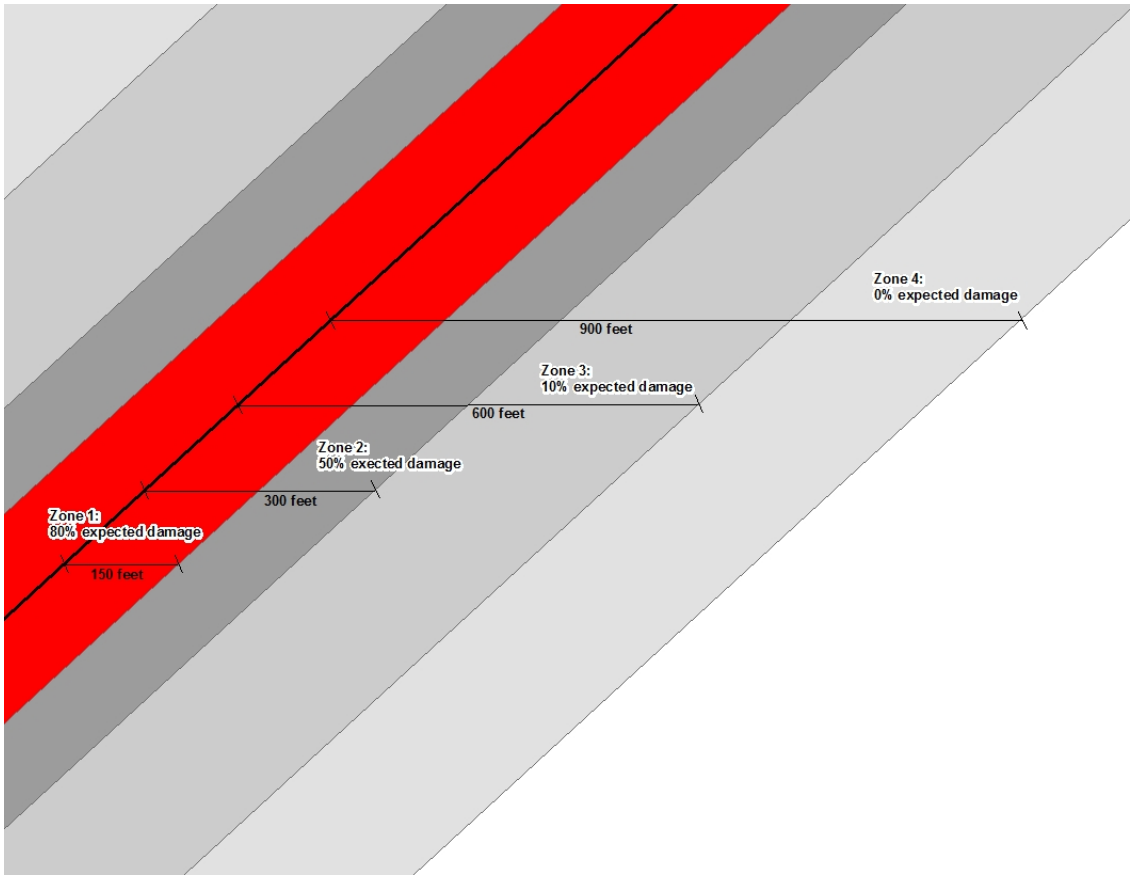


Figure 11: EF Scale Tornado Zones

An EF3 tornado has four damage zones, depicted in Table 13. Major damage is estimated within 150 feet of the tornado path. The outer buffer is 900 feet from the tornado path, within which buildings will not experience any damage. The selected hypothetical tornado path is depicted in Figure 12 and the damage curve buffer zones are shown in Figure 13.

Table 13: EF3 Tornado Zones and Damage Curves

Zone	Buffer (feet)	Damage Curve
1	0-150	80%
2	150-300	50%
3	300-600	10%
4	600-900	0%

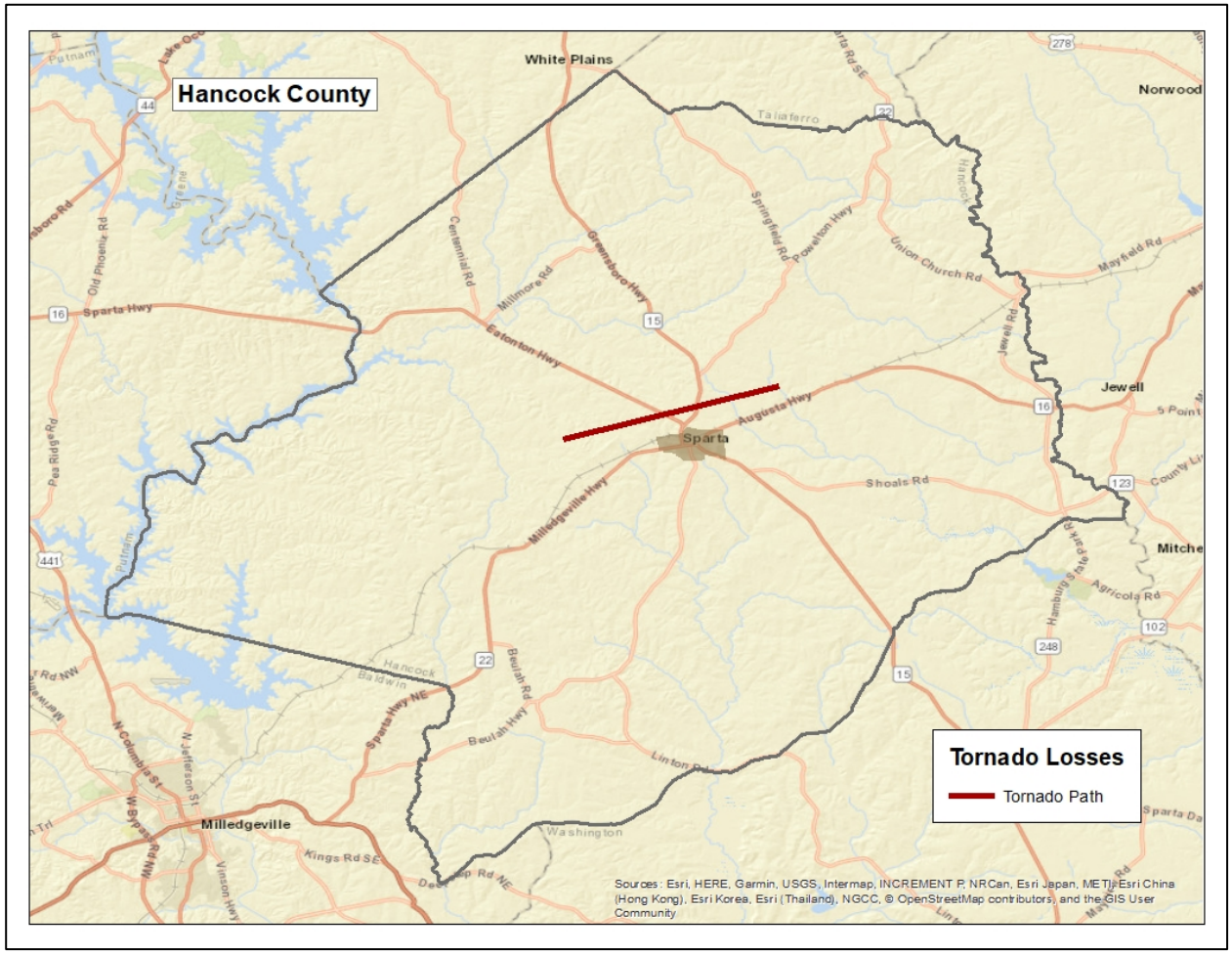


Figure 12: Hypothetical EF3 Tornado Path in Hancock County

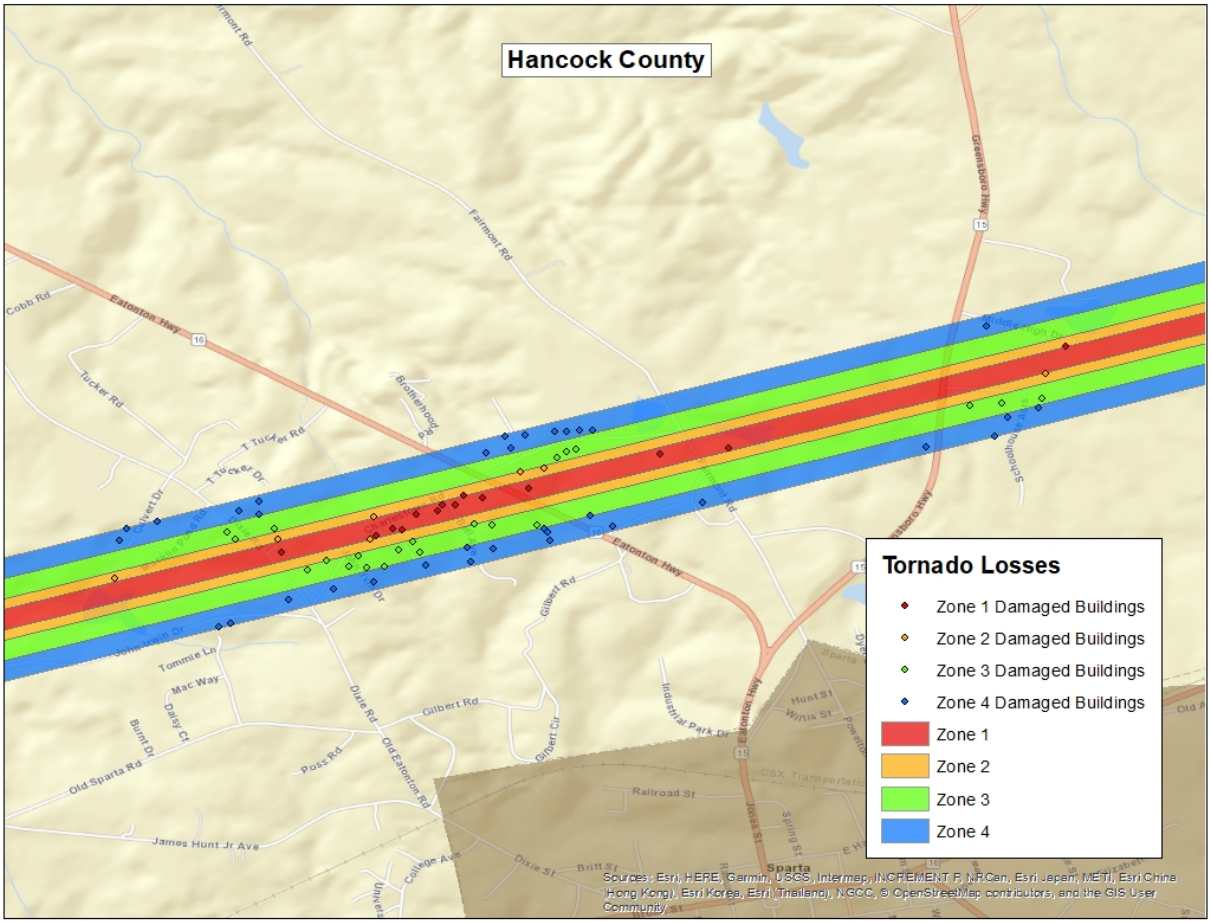


Figure 13: Modeled EF3 Tornado Damage Buffers in Hancock County

EF3 Tornado Building Damages

The analysis estimated that approximately 81 buildings could be damaged, with estimated building losses of $2 million. The building losses are an estimate of building replacement costs multiplied by the percentages of damage. The overlay was performed against parcels provided by Hancock County that were joined with Assessor records showing estimated property replacement costs. The Assessor records often do not distinguish parcels by occupancy class if the parcels are not taxable and thus the number of buildings and replacement costs may be underestimated. The results of the analysis are depicted in Table 14.

Table 14: Estimated Building Losses by Occupancy Type

Occupancy	Buildings Damaged	Building Losses
Residential	79	$2,076,730
Commercial	1	$0
Religious	1	$16,671
Total	81	$2,093,401

EF3 Tornado Essential Facility Damage

There was one essential facility located in the tornado path – one school. Table 15 outlines the specific facility and the amount of damage under the scenario.

Table 15: Estimated Essential Facilities Damaged

Facility	Amount of Damage
M.E. Lewis Elementary School	Minor Damage

According to the Georgia Department of Education, M.E. Lewis Elementary School's enrollment was approximately 390 students as of October 2018. Depending on the time of day, a tornado strike as depicted in this scenario could result in significant injury and loss of life. In addition, arrangements would have to be made for the continued education of the students in another location.

The location of the damaged Essential Facility is mapped in Figure 14.

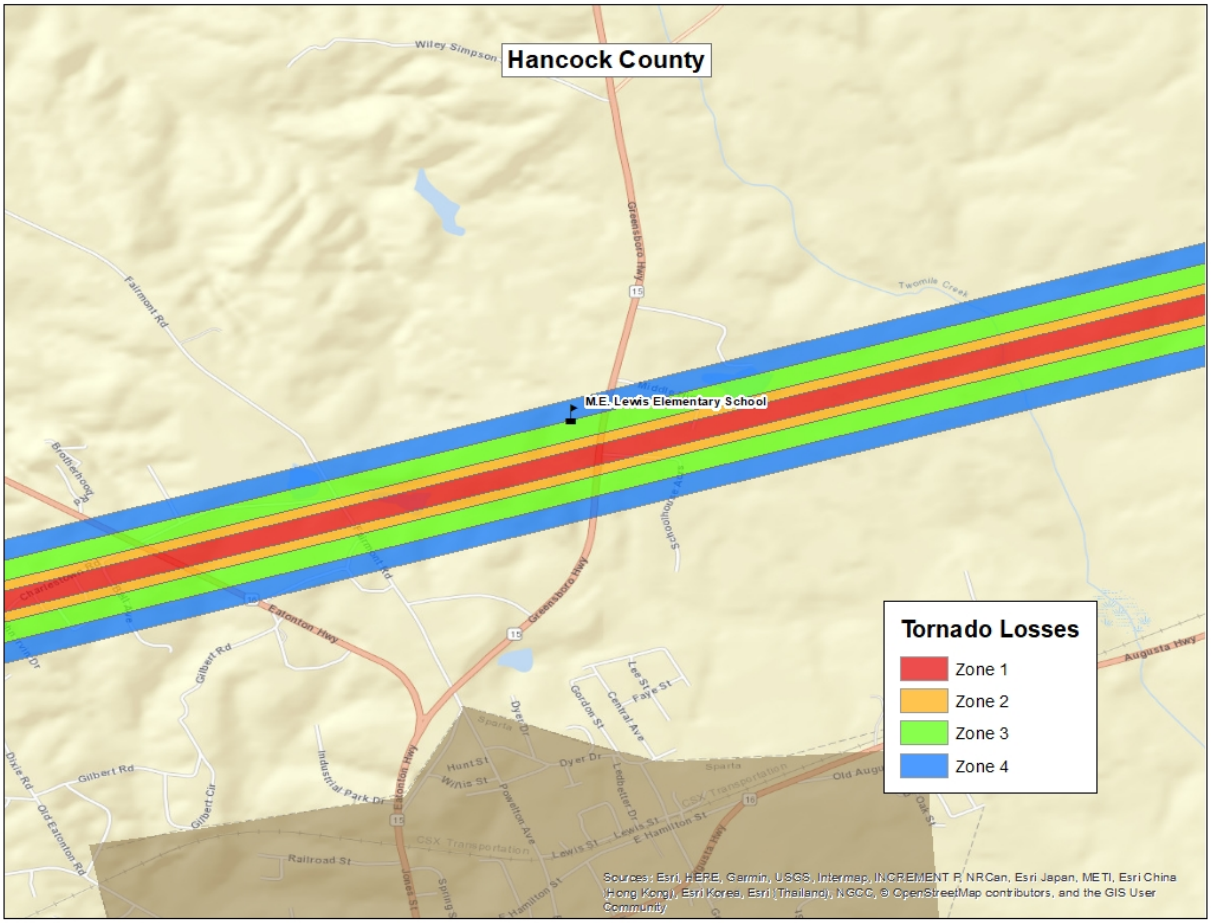


Figure 14: Modeled Essential Facility Damage in Hancock County

Exceptions Report

Hazus Version 2.2 SP1 was used to perform the loss estimates for Hancock County, Georgia. Changes made to the default Hazus-MH inventory and the modeling parameters used to setup the hazard scenarios are described within this document.

Reported losses reflect the updated data sets. Steps, algorithms and assumptions used during the data update process are documented in the project workflow named PDM_GA_Workflow.doc.

Statewide Inventory Changes

The default Hazus-MH Essential Facility inventory was updated for the entire state prior to running the hazard scenarios for Hancock County.

Updates to the Critical Facility data used in GMIS were provided by Hancock County in October 2018. These updates were applied by The Carl Vinson Institute of Government at the University of Georgia. Table 16 summarizes the difference between the original Hazus-MH default data and the updated data for Hancock County.

Table 16: Essential Facility Updates

Site Class	Feature Class	Default Replacement Cost	Default Count	Updated Replacement Cost	Updated Count
EF	Care	$2,503,000	5	$2,659,000	5
EF	EOC	$880,000	1	$880,000	1
EF	Fire	$1,184,000	4	$1,234,000	5
EF	Police	$4,406,000	1	$4,406,000	1
EF	School	$4,400,000	5	$4,400,000	5

County Inventory Changes

The GBS records for Hancock County were replaced with data derived from parcel and property assessment data obtained from Hancock County. The county provided property assessment data was current as of November 2018 and the parcel data current as of November 2018.

General Building Stock Updates

The parcel boundaries and assessor records were obtained from Hancock County. Records without improvements were deleted. The parcel boundaries were converted to parcel points located in the centroids of each parcel boundary. Each parcel point was linked to an assessor record based upon matching parcel numbers. The generated Building Inventory represents the approximate locations (within a parcel) of building exposure. The Building Inventory was aggregated by Census Block and

imported into Hazus-MH using the Hazus-MH Comprehensive Data Management System (CDMS). Both the 2010 Census Tract and Census Block tables were updated.

The match between parcel records and assessor records was based upon a common Parcel ID. For this type of project, unless the hit rate is better than 85%, the records are not used to update the default aggregate inventory in Hazus-MH. The Parcel-Assessor hit rate for Hancock County was 96.2%.

Adjustments were made to records when primary fields did not have a value. In these cases, default values were applied to the fields. Table 17 outlines the adjustments made to Hancock County records.

Table 17: Building Inventory Default Adjustment Rates

Type of Adjustment	Building Count	Percentage
Area Unknown	564	13%
Construction Unknown	592	14%
Condition Unknown	225	5%
Foundation Unknown	593	14%
Year Built Unknown	47	1%
Total Buildings	4,327	9%

Approximately 9% of the CAMA values were either missing (<Null> or '0'), did not match CAMA domains or were unusable ('Unknown', 'Other', 'Pending'). These were replaced with 'best available' values. Missing YearBuilt values were populated from average values per Census Block. Missing Condition, Construction and Foundation values were populated with the highest-frequency CAMA values per Occupancy Class. Missing Area values were populated with the average CAMA values per Occupancy Class.

The resulting Building Inventory was used to populate the Hazus-MH General Building Stock and User Defined Facility tables. The updated General Building Stock was used to calculate flood and tornado losses. Changes to the building counts and exposure that were modeled in Hancock County are sorted by General Occupancy in Table 1 at the beginning of this report. If replacements cost or building value were not present for a given record in the Assessor data, replacement costs were calculated from the Building Area (sqft) multiplied by the Hazus-MH RS Means ($/sqft) values for each Occupancy Class.

Differences between the default and updated data are due to various factors. The Assessor records often do not distinguish parcels by occupancy class when the parcels are not taxable; therefore, the total number of buildings and the building replacement costs for government, religious/non-profit, and education may be underestimated.

User Defined Facilities

Building Inventory was used to create Hazus-MH User Defined Facility (UDF) inventory for flood modeling. Hazus-MH flood loss estimates are based upon the UDF point data. Buildings within the flood boundary were imported into Hazus-MH as User Defined Facilities and modeled as points.

Table 18: User Defined Facility Exposure

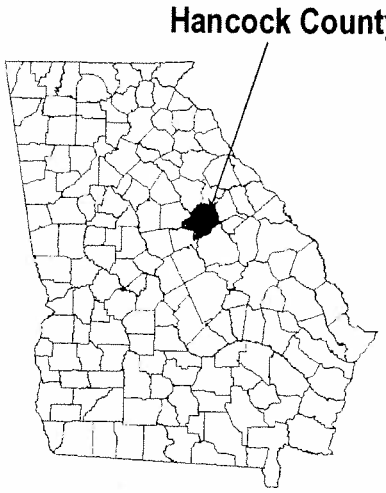
Class	Hazus-MH Feature	Counts	Exposure
BI	Building Exposure	4,326	$477,961,079
Riverine UDF	Structures Inside 1% Annual Chance Riverine Flood Area	83	$11,807,566

Assumptions

- Flood analysis was performed on Building Inventory. Building Inventory within the flood boundary was imported as User Defined Facilities. The point locations are parcel centroid accuracy.
- The analysis is restricted to the county boundary. Events that occur near the county boundary do not contain loss estimates from adjacent counties.
- The following attributes were defaulted or calculated:
  First Floor Height was set from Foundation Type
  Content Cost was calculated from Building Cost

FLOOD INSURANCE STUDY

HANCOCK COUNTY, GEORGIA
AND INCORPORATED AREAS



COMMUNITY NAME	COMMUNITY NUMBER
HANCOCK COUNTY (UNINCORPORATED AREAS)	130563
SPARTA, CITY OF	135275

EFFECTIVE:
SEPTEMBER 29, 2010

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
13141CV000A

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this FIS report at any time. In addition, FEMA may revise part of this FIS report by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult with community officials and check the Community Map Repository to obtain the most current FIS report components.

Initial Countywide FIS Effective Date: September 29, 2010

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FLOOD INSURANCE STUDY
HANCOCK COUNTY, GEORGIA AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This FIS revises and updates information on the existence and severity of flood hazards in the geographic area of Hancock County, including the City of Sparta and the unincorporated areas of Hancock County (referred to collectively herein as Hancock County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood-risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some States or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

The Digital Flood Insurance Rate Map (DFIRM) and FIS report for this countywide study have been produced in digital format. Flood hazard information was created to meet the Federal Emergency Management Agency (FEMA) DFIRM database specifications and Geographic Information System (GIS) format requirements. The flood hazard information was created and is provided in a digital format so that it can be incorporated into a local GIS and be accessed more easily by the community.

1.2 Authority and Acknowledgments

The sources of authority for this FIS are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

No previous FIS reports were prepared for the City of Sparta and the unincorporated areas of Hancock County.

The hydrologic and hydraulic analyses for this study were performed by Dewberry & Davis LLC, for FEMA, under Contract No. EMA-2008-CA-5870. This work was completed in June 2009.

Base map information shown on the Flood Insurance Rate Map (FIRM) was derived from digital orthoimagery produced at a scale of 1:20,000, from National Agriculture Imagery Program dated 2007. The projection used in the preparation

of this map is Georgia State Plane East FIPS Zone 1001 (feet), and the horizontal datum used is North American Datum 1983, GRS80 spheroid.

1.3 Coordination

An initial meeting is held with representatives from FEMA, the community, and the study contractor to explain the nature and purpose of a FIS, and to identify the streams to be studied or restudied. A final meeting is held with representatives from FEMA, the community, and the study contractor to review the results of the study.

The initial meeting for was held on July 9, 2008, and attended by representatives of FEMA, the Georgia Department of Natural Resources, and the study contractor.

The results of the study were reviewed at the final meeting held on January 4, 2010, and attended by representatives of Hancock County, City of Sparta and the Georgia Department of Natural Resources. All problems raised at that meeting have been addressed.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Hancock County, Georgia, including the incorporated communities listed in Section 1.1.

For this countywide FIS, the FIS report and FIRM were created in a countywide format, and the flooding information for the entire county, including both incorporated and unincorporated areas, is shown. The vertical datum is North American Vertical Datum of 1988 (NAVD 88). In addition, the Transverse Mercator projection, State Plane coordinates are referenced to the North American Datum of 1983.

All or portions of numerous flooding sources in the county were studied by approximate methods. Approximate analyses were used to study those areas having low development potential or minimal flood hazards. No detailed analyses were performed. The scope and methods of study were proposed to and agreed upon by FEMA and Hancock County.

No Letters of Map Change (LOMCs) were recorded for this countywide study.

2.2 Community Description

Hancock County, encompassing approximately 473 square miles, is located in eastern Georgia, approximately 108 miles southeast of the City of Atlanta. The county is bordered on the north by Greene and Taliaferro Counties; on the south by Baldwin and Washington Counties; on the east by Warren and Glascock

Counties; and on the west by Putnam County. Major transportation routes that serve Hancock County include State Highways 15, 16, 22, and 77.

According to the U.S. Census Bureau, in 2008 the population estimate for Hancock County was 9,440 (U.S. Census Bureau, 2009).

Hancock County's moderate climate consists of mild winters and warm summers. The average annual rainfall is 50 inches. The wettest month is March while the driest months are September and October (National Weather Service, 2009).

2.3 Principal Flood Problems

The low-lying areas of Hancock County adjacent to the major streams are subject to the periodic flooding that accompanies major storms.

2.4 Flood Protection Measures

No major structural flood protection measures exist or are planned for Hancock County.

3.0 ENGINEERING METHODS

For the flooding sources studied in the county, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 1-percent-annual-chance (100-year) flood in any 50-year period is approximately 40 percent (4 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied affecting the community.

Discharges for approximate study streams were developed using regression equations for rural areas in Georgia contained in the U.S. Geological Survey (USGS) report and available USGS gage record data (where applicable) (Stamey

and Hess, 1993). Drainage areas were developed from USGS 10-meter Digital Elevation Models (DEMs) (USGS, 2009).

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

For the streams studied by approximate methods, cross-section data was obtained from the USGS 10-meter DEMs (USGS, 2009). Hydraulically significant roads were modeled as bridges, with opening data approximated from available inventory data or approximated from the imagery. Top of road elevations were estimated from the best available topography. The approximate studied streams were modeled using HEC-RAS version 4.0 (Hydrologic Engineering Center, 2008).

Floodplains were delineated using the computer 1-percent-annual-chance water-surface elevations and the USGS 10-meter DEMs (USGS, 2009).

The hydraulic analyses for this study were based on unobstructed flow. The flood delineations are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

Qualifying bench marks within a given jurisdiction that are cataloged by the National Geodetic Survey (NGS) and entered into the National Spatial Reference System (NSRS) as First or Second Order Vertical and have a vertical stability classification of A, B, or C are shown and labeled on the FIRM with their 6-character NSRS Permanent Identifier.

Bench marks cataloged by the NGS and entered into the NSRS vary widely in vertical stability classification. NSRS vertical stability classifications are as follows:

- Stability A: Monuments of the most reliable nature, expected to hold position/elevation well (e.g., mounted in bedrock)
- Stability B: Monuments which generally hold their position/elevation well (e.g., concrete bridge abutment)
- Stability C: Monuments which may be affected by surface ground movements (e.g., concrete monument below frost line)
- Stability D: Mark of questionable or unknown vertical stability (e.g., concrete monument above frost line, or steel witness post)

In addition to NSRS bench marks, the FIRM may also show vertical control monuments established by a local jurisdiction; these monuments will be shown on the FIRM with the appropriate designations. Local monuments will only be

placed on the FIRM if the community has requested that they be included, and if the monuments meet the aforementioned NSRS inclusion criteria.

To obtain current elevation, description, and/or location information for bench marks shown on the FIRM for this jurisdiction, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their Web site at http://www.ngs.noaa.gov.

It is important to note that temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the Technical Support Data Notebook associated with this FIS and FIRM. Interested individuals may contact FEMA to access this data.

3.3 Vertical Datum

All FIS reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FIS reports and FIRMs was National Geodetic Vertical Datum of 1929 (NGVD 29). With the finalization of NAVD 88, many FIS reports and FIRMs are being prepared using NAVD 88 as the referenced vertical datum.

All models created for this FIS report are referenced to NAVD 88. Structure and ground elevations in the community must, therefore, be referenced to NAVD 88. It is important to note that adjacent communities may be referenced to NGVD 29.

For additional information regarding conversion between NGVD 29 and NAVD 88, visit the National Geodetic Survey website at http://www.ngs.noaa.gov, or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS provides 1-percent-annual-chance floodplain data, which may include a combination of the following: 10-, 2-, 1-, and 0.2-percent-annual-chance flood elevations; delineations of the 1- and 0.2-percent-annual-chance floodplains; and 1-percent-annual-chance floodway. This information is presented on the FIRM and in many components of the FIS, including Flood Profiles, Floodway Data tables, and Summary of Stillwater Elevation tables. Users should reference the data

presented in the FIS as well as additional information that may be available at the local community map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance flood is employed to indicate additional areas of flood risk in the community, although none were mapped for this study.

For the streams studied by approximate methods the boundaries were delineated using the USGS 10-meter DEMs (USGS, 2009).

For the streams studied by approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM (Exhibit 1).

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent-annual-chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

No floodways have been computed for Hancock County.

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFEs or base flood depths are shown within this zone.

Zone X

Zone X is the flood insurance risk zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by levees. No BFEs or base flood depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance risk zones as described in Section 5.0. Insurance agents use the zones in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1-percent-annual-chance floodplain.

The countywide FIRM presents flooding information for the entire geographic area of Hancock County. Historical data relating to the maps prepared for each community are presented in Table 1, "Community Map History".

7.0 OTHER STUDIES

Information pertaining to flood hazards for each jurisdiction within Hancock County has been compiled into this FIS. This should be considered authoritative for purposes of the NFIP.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting FEMA, Federal Insurance and Mitigation Division, Koger Center – Rutgers Building, 3003 Chamblee Tucker Road, Atlanta, Georgia 30341.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Hancock County (Unincorporated Areas)	September 29, 2010	None	September 29, 2010	
Sparta, City of	September 29, 2010	None	September 29, 2010	

TABLE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

HANCOCK COUNTY, GA AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

9.0 BIBLIOGRAPHY AND REFERENCES

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U.S. Census Bureau. (Accessed March 27, 2009). 2008 Population Estimate – http://www.census.gov/.

U.S. Geological Survey. (Downloaded March 2009). Seamless Data Distribution System – 10 meter Digital Elevation Model, http://seamless.usgs.gov/.

GEORGIA FORESTRY COMMISSION

Community Wildfire Protection Plan

An Action Plan for Wildfire Mitigation and Conservation of Natural Resources

Hancock County, Georgia

A Program of the Georgia Forestry Commission
with support from the U.S. Forest Service

MAY 2018

Prepared by;
William Lee, Chief Ranger, Hancock County
Will Fell CWPP Specialist (Initial Plan, 2011)
Beryl Budd, Wildfire Prevention Specialist (Revised 2018)
Georgia Forestry Commission
2200 Centennial Church Rd.
White Plains, Ga. 30678

The following report is a collaborative effort among various entities; the representatives listed below comprise the core decision-making team responsible for this report and mutually agree on the plan's contents:

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PLAN CONTENTS

Appended Documents:

Hancock County Southern Wildfire Risk Assessment Summary Report (SWRA)

Hancock County Wildfire Pre-suppression Plan

NFPA 1141 Standard for Fire Protection Infrastructure for Land Development in Suburban and Rural Areas.

Preface

The extreme weather conditions that are conducive to wildfire disasters (usually a combination of extended drought, low relative humidity and high winds) can occur in this area of Georgia as infrequently as every 10-15 years. This is not a regular event, but as the number of homes that have been built in or adjacent to forested or wildland areas increases, it can turn a wildfire under these weather conditions into a major disaster. Wildfires move fast and can quickly overwhelm the resources of even the best equipped fire department. Advance planning can save lives, homes and businesses.

This Community Wildfire Protection Plan (CWPP) includes a locally assessed evaluation of the wildland urban interface areas of the county, looking at the critical issues regarding access to these areas, risk to properties from general issues such as building characteristics and "fire wise" practices and response from local firefighting resources. It further incorporates a locally devised action plan to mitigate these risks and hazards though planning, education and other avenues that may become available to address the increasing threat of wildland fire. The CWPP does not obligate the county financially in any way, but instead lays a foundation for improved emergency response if and when grant funding is available to the county.

The Plan is provided at no cost to the county and can be very important for county applications for hazard mitigation grant funds through the National Fire Plan, FEMA mitigation grants and Homeland Security. Under the Healthy Forest Restoration Act (HFRA) of 2003, communities (counties) that seek grants from the federal government for hazardous fuels reduction work are required to prepare a Community Wildfire Protection Plan.

This plan will:

- Enhance public safety
- Raise public awareness of wildfire hazards and risks
- Educate homeowners on how to reduce home ignitability
- Build and improve collaboration at multiple levels

The public does not have to fall victim to this type of disaster. Homes (and communities) can be designed, built and maintained to withstand a wildfire even in the absence of fire equipment and firefighters on the scene. It takes planning and commitment at the local level before the wildfire disaster occurs and that is what the Community Wildfire Protection Plan is all about.

I. OBJECTIVES & COMMUNITY COLLABORATION

The mission of the following report is to set clear priorities for the implementation of wildfire mitigation in Hancock County. The plan includes prioritized recommendations for the appropriate types and methods of fuel reduction and structure ignitability reduction that will protect this community and its essential infrastructure. It also includes a plan for wildfire suppression. Specifically, the plan includes community-centered actions that will:

- Educate citizens on wildfire, its risks, and ways to protect lives and properties,
- Support fire rescue and suppression entities,
- Focus on collaborative decision-making and citizen participation,
- Develop and implement effective mitigation strategies, and
- Develop and implement effective community ordinances and codes.

The core team convened on March 9th, 2010 to assess risks and develop the Community Wildfire Protection Plan. The group is comprised of representatives from local government, local fire authorities, and the state agency responsible for forest management. Below are the groups included in the task force:

Hancock Sparta Fire Department
Hancock County EMA
Georgia Department of Corrections
Georgia Forestry Commission

It was decided to conduct a general assessment of the county using the hazard and wildfire risk assessment as a basis for discussion. The core team reconvened on Jan 20th, 2011 for the purpose of completing the following:

Risk Assessment	Assessed wildfire hazard risks and prioritized mitigation actions.
Fuels Reduction	Identified strategies for coordinating fuels treatment projects.
Structure Ignitability	Identified strategies for reducing the ignitability of structures within the Wildland interface.
Emergency Management	Forged relationships among local government and fire districts and developed/refined a pre-suppression plan.
Education and Outreach	Developed strategies for increasing citizen awareness and action and to conduct homeowner and community leader workshops.

II. COMMUNITY BACKGROUND AND WILDFIRE HISTORY

Background

Hancock County lies between the Oconee and Ogeechee rivers, in east central Georgia. It was founded December 17, 1793, and was named for John Hancock, signer of the Declaration of Independence. Sparta, established in 1795 and incorporated in 1805, is the county seat.

Hancock is steeped in history, from the early post-Revolutionary period and throughout the nineteenth century. The area attracted Revolutionary War (1775-83) veterans from Virginia, the Carolinas, and New England, who came to take advantage of the 1806 land lottery. These early settlers carved a refined community out of frontier forests. In 1825, on his American tour, the Marquis de Lafayette was hosted in Sparta by former Congressman William Terrell and others. By 1840 Hancock had given Georgia two governors, Nathaniel E. Harris and Charles McDonald, and had become well known for its strong educational institutions and religious affiliations.

In 1806 Georgia Methodists, as part of the South Carolina Conference of the Methodist Church, met in Sparta. Two prominent late-nineteenth-century Methodist bishops were Sparta residents: Bishop George Foster Pierce and his African American counterpart, Bishop Lucius Holsey. Presbyterians, Catholics, and Baptists also contributed to the early religious heritage of the county. Several male academies, at Powelton, Mount Zion, and Sparta, were nationally known; and the Sparta Female Model School attracted wealthy young girls from New England and the mid-Atlantic states. In 1862 Richard Malcolm Johnston's famous boys' school at Rockby set an example as a progressive institute of learning unique for nineteenth-century schools.

Cotton brought prosperity to the county by 1830. Better farming practices were introduced by innovative planters like David Dickson, who designed a plow and began the practice of using bat guano for fertilizer. Dickson, along with other progressive planters, founded the Hancock County Planters Club in 1837 to encourage improved agricultural achievements. It had a statewide influence on planters who witnessed the club's enthusiasm and successful yields, and it helped turn the tide of emigration to western lands after cotton farming had depleted the soil.

In January 1861, when the Georgia Secession Convention convened, the three Hancock County representatives, all staunch Unionists, voted against withdrawal. When Georgia seceded, however, they threw their fortunes in with the Confederacy, and the county supported four years of war by supplying soldiers and turning cotton fields to corn and grain fields to sustain an army. Two Confederate generals were born in Hancock County, and Linton Stephens, the half brother of Alexander Stephens, vice president of the Confederacy, lived in Sparta from 1852 to 1872. The town of Linton (near Sparta) was named for him in 1858.

War came to Hancock County in November 1864, when elements of General William T. Sherman's Union forces left Milledgeville on the infamous March to the Sea. Cavalry under Brigadier General Judson Kilpatrick raided the southern part of Hancock along the Ogeechee River, destroying farms and burning cotton. But the real devastation came in the war's aftermath. Most of the wealthy citizens left Sparta and Hancock County in the years following the war, and the area's prosperity declined considerably during Reconstruction. William J. Northen, who had moved to the county in the 1850s and established a farm there, was elected governor of Georgia in 1890.

Hancock never recovered its antebellum reputation as one of the richest counties in the state. The twentieth century saw a small return to farming, especially cotton, but by the 1940s that was gone, and timber replaced cotton as the county's main source of revenue. In 1921 writer Jean Toomer arrived in Sparta to work as the substitute principal at a black industrial school. Toomer's experiences in the community inspired his acclaimed novel *Cane*, which was published in 1923.

Hobbled by a legacy of political unrest and a weak economy, Hancock County's population consistently declined during much of the twentieth century. Once one of the richest counties in the state and now one of the poorest, Hancock ranks at the bottom of the state's counties in education and economic welfare. There have been efforts to capitalize on Hancock's rich history, including plans for heritage tourism with a museum and historical tours. Several National Register historic districts and sites are located around the county and in Sparta. In 2003 several roads in Hancock County became part of the Historic Piedmont Scenic Byway, a route that is intended to promote the historical and cultural features of the county.

According to the 2000 U.S. census, the population of Hancock County was 10,076 (77.8 percent black, 21.5 percent white, and 0.5 percent Hispanic), a 13 percent increase over 1990 figures. A satellite campus of Sandersville Technical College opened in Sparta in 2004.

Wildfire History

Hancock County located in just north of the fall line in central Georgia, once being the heart of the cotton plantation region has reverted back over the past decades to largely oak and pine forest. It is almost 87% forested. Despite the large blocks of woodlands covering much of the county, there are still homes and small communities scattered throughout. The risks and hazards from the wildland urban interface are fairly general and substantial throughout the county even on the edges of the incorporated cities.

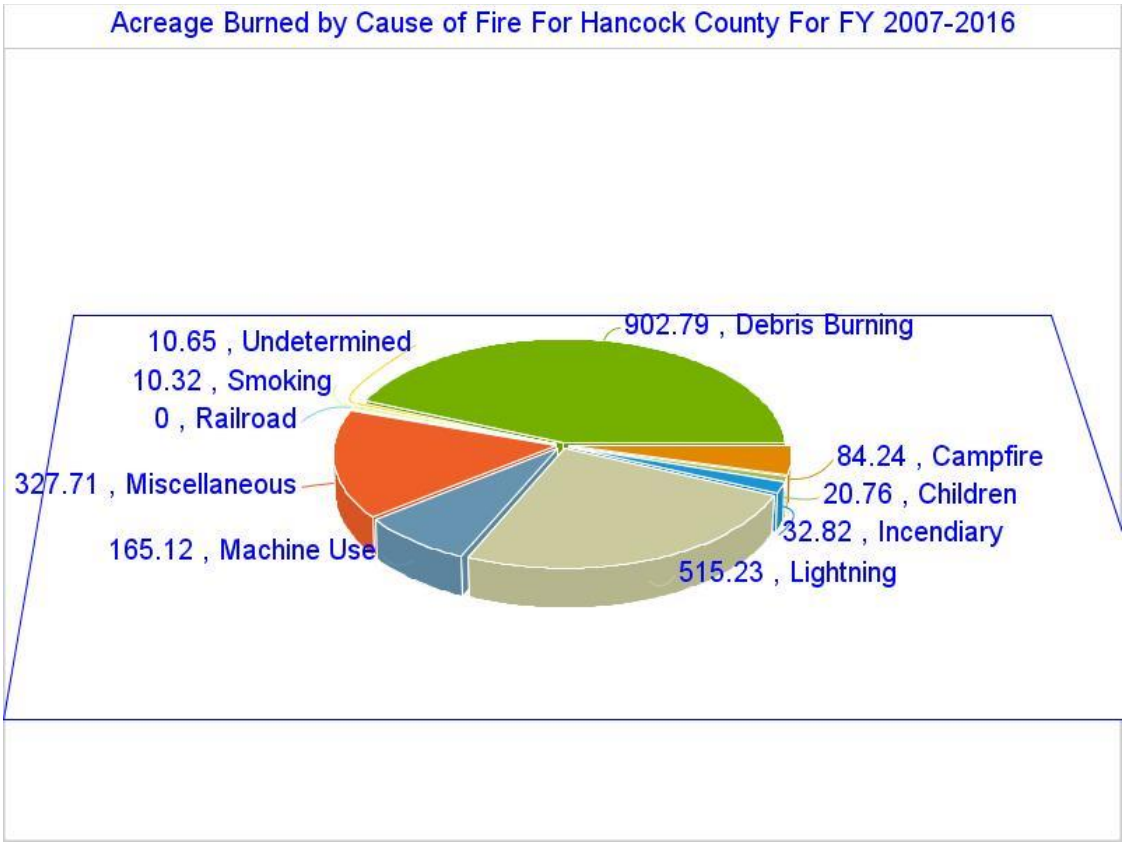
Hancock County is protected by a joint city county fire department with stations in the cities of Sparta and Devereaux. There are two additional rural stations in the southeastern portion of the county serving the communities along Lake Sinclair and a Department of Corrections station at the Hancock State Prison. The Georgia Forestry Commission maintains a county protection unit located near White Plains to respond to wildfires throughout the county. The city of Sparta is serviced by pressurized water systems with hydrants following Hwy 22 from the Baldwin county line north to the community of Culverton. There is also a water line and hydrants extending to the small community of Beulah.

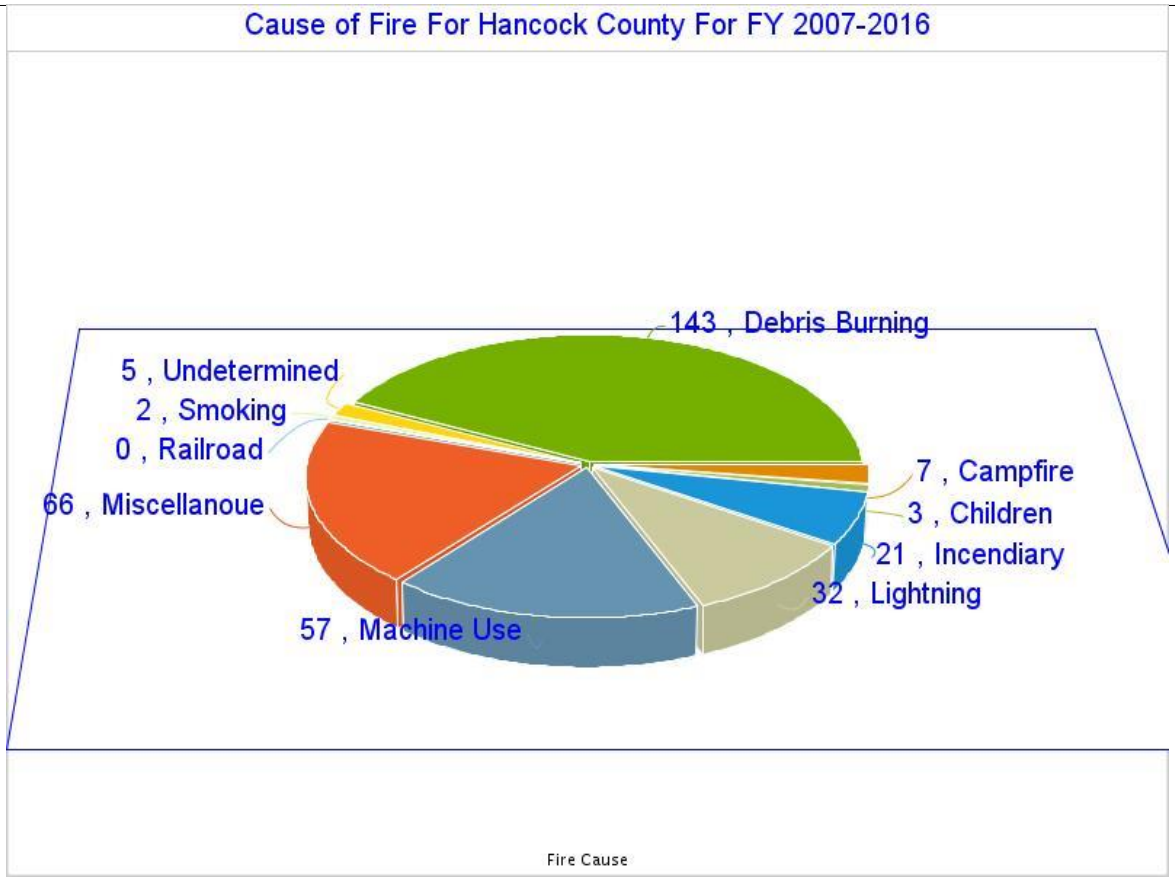
Over the past forty five years, Hancock County has averaged 51 reported wildland fires per year, burning an average of 283 acres per years. Using more recent figures over the past 10 years (2007 – 2016), the numbers have decreased to an average of 33 fires per year burning on average 207 acres annually. The occurrence of these fires during this later period shows a pronounced peak during the month of March but during the remainder of the year, the monthly average doesn’t vary much

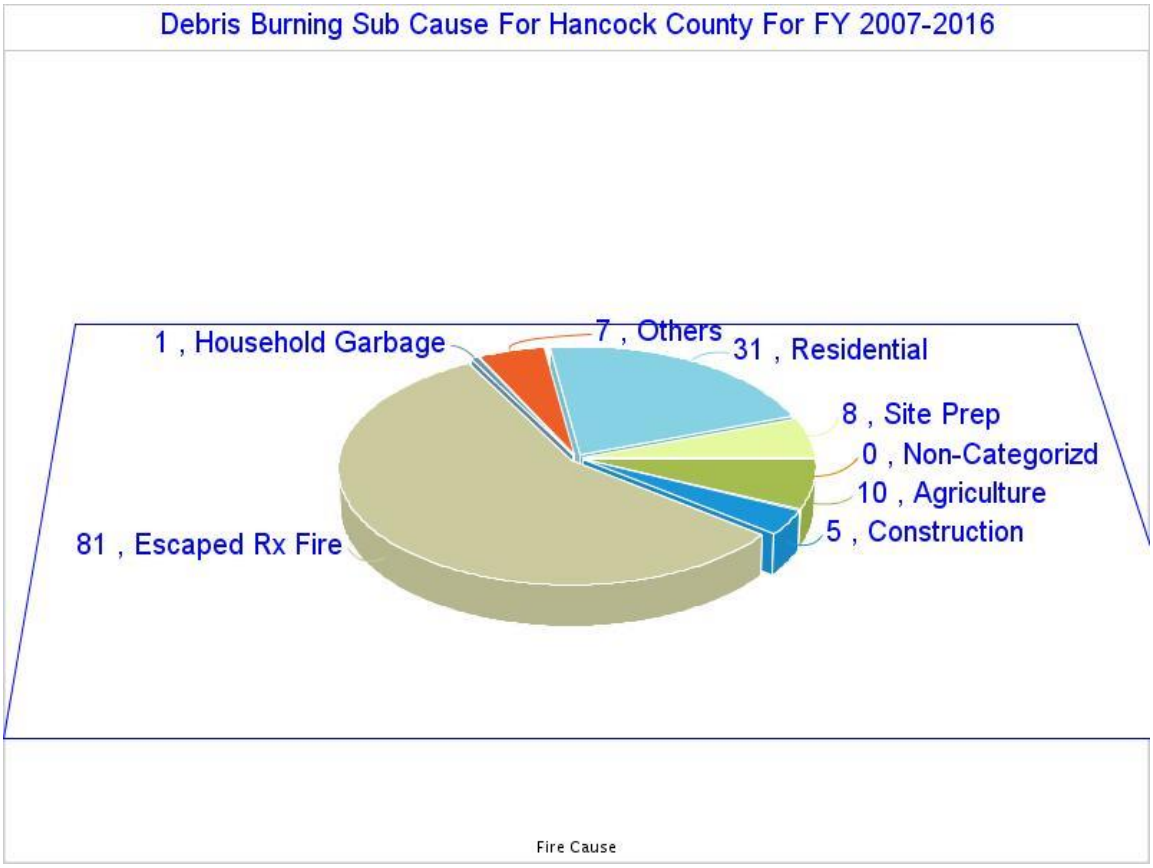
Over the past 10 years the leading cause of these fires, was Debris Burning causing 43% of the fires and 44% of the acres burned. The second leading cause of these fires was Machine Use.

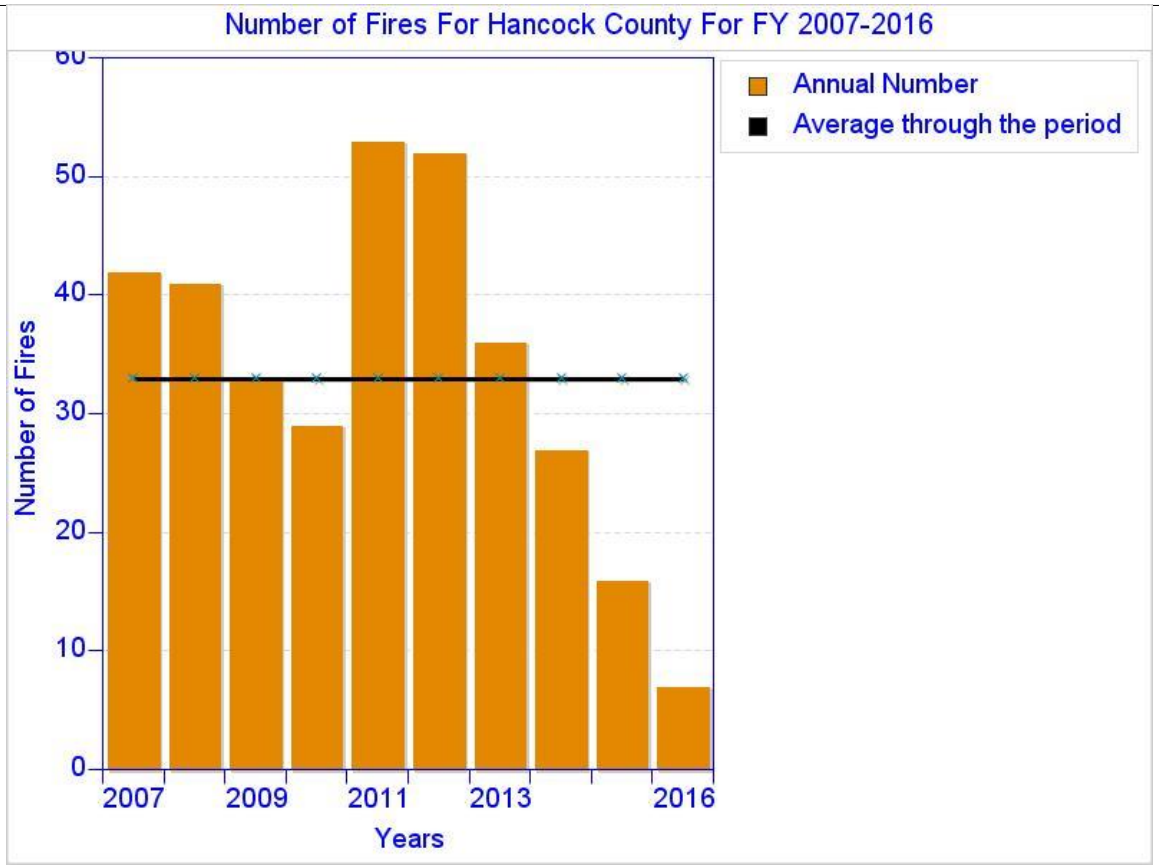
County = Hancock	Cause	Fires		Acres	Fires 5 Yr Avg	Acres 5 Yr Avg
Campfire	Campfire	1		14.50	1.00	12.54
Children	Children	1		0.10	0.20	0.02
Debris: Ag Fields, Pastures, Orchards, Etc	Debris: Ag Fields, Pastures, Orchards, Etc	2		20.55	1.00	7.53
Debris: Construction Land Clearing	Debris: Construction Land Clearing	2		17.73	0.40	3.55
Debris: Escaped Prescribed Burn	Debris: Escaped Prescribed Burn	4		11.10	4.80	36.63
Debris: Household Garbage	Debris: Household Garbage	2		2.75	0.60	3.03
Debris: Other	Debris: Other	1		1.00	0.40	0.22
Debris: Residential, Leafpiles, Yard, Etc	Debris: Residential, Leafpiles, Yard, Etc	5		27.62	3.40	24.43
Debris: Site Prep - Forestry Related	Debris: Site Prep - Forestry Related	4		5.55	1.20	1.46
Incendiary	Incendiary	0		0.00	0.60	0.67
Lightning	Lightning	1		10.10	1.20	12.18
Machine Use	Machine Use	8		47.15	3.00	12.93
Miscellaneous: Firearms/Ammunition	Miscellaneous: Firearms/Ammunition	1		8.80	0.40	5.34
Miscellaneous: Other	Miscellaneous: Other	0		0.00	0.40	1.39
Miscellaneous: Power lines/Electric fences	Miscellaneous: Power lines/Electric fences	5		5.30	4.20	34.10
Miscellaneous: Spontaneous Heating/Combustion	Miscellaneous: Spontaneous Heating/Combustion	0		0.00	0.20	0.10
Miscellaneous: Structure/Vehicle Fires	Miscellaneous: Structure/Vehicle Fires	0		0.00	0.20	0.29
Miscellaneous: Woodstove Ashes	Miscellaneous: Woodstove Ashes	2		1.10	0.60	0.92
Smoking	Smoking	1		2.00	0.40	2.44
Undetermined	Undetermined	4		4.51	1.80	3.03
Totals for County: Hancock Year: 2017		44		179.86	26.00	162.80

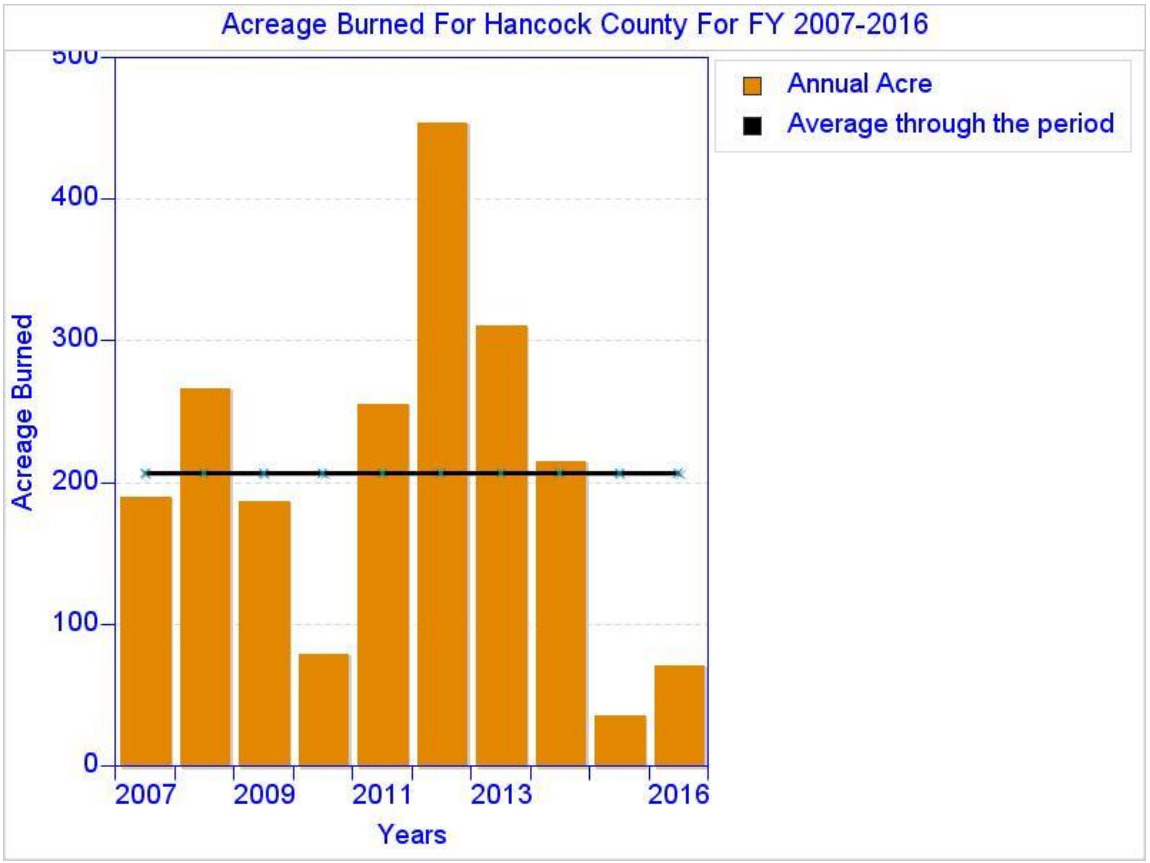
Acreage Burned /Number of Fires For State-wide For FY 2007-2016				
Year	**Acreage Burned**	**Number of Fires**	**Average size**	**Statewide Average Size**
2007	190.14	42	4.53	18.64
2008	267.37	41	6.52	4.56
2009	187.77	33	5.69	3.90
2010	79.78	29	2.75	3.93
2011	256.28	53	4.84	17.56
2012	454.14	52	8.73	5.08
2013	311.15	36	8.64	4.53
2014	215.65	27	7.99	5.02
2015	36.00	16	2.25	4.42
2016	71.36	7	10.19	6.29



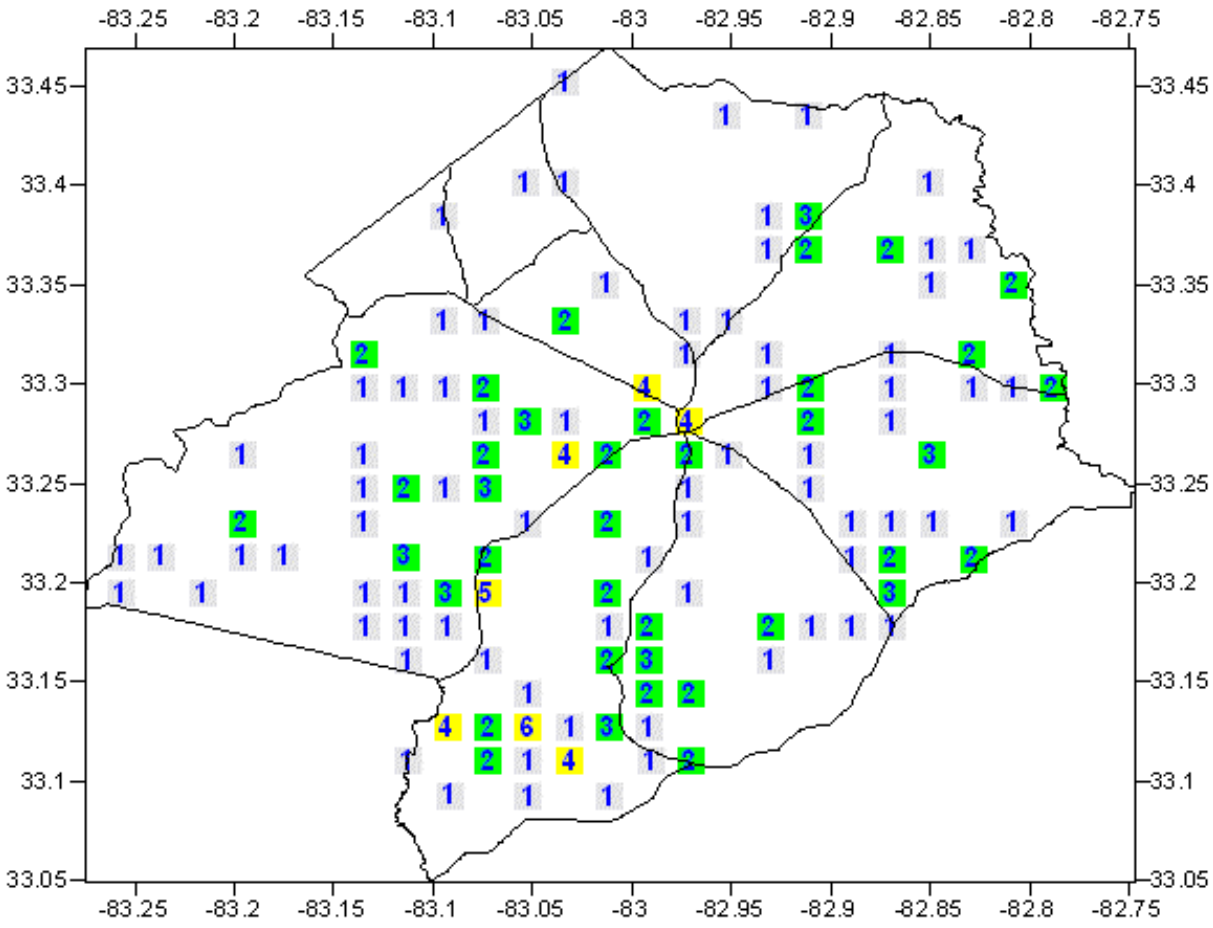

Cause of Fire For Hancock County For FY 2007-2016
143 , Debris Burning
5 , Undetermined
2 , Smoking
0 , Railroad
66 , Miscellanoue
7 , Campfire
3 , Children
21 , Incendiary
32 , Lightning
57 , Machine Use
Fire Cause


Debris Burning Sub Cause For Hancock County For FY 2007-2016
1 , Household Garbage
7 , Others
31 , Residential
8 , Site Prep
0 , Non-Categorizd
10 , Agriculture
5 , Construction
81 , Escaped Rx Fire
Fire Cause


Number of Fires For Hancock County For FY 2007-2016
Annual Number
Average through the period
Number of Fires
0
10
20
30
40
50
60
2007
2009
2011
2013
2016
Years


Acreage Burned For Hancock County For FY 2007-2016
Annual Acre
Average through the period
Acreage Burned
0
100
200
300
400
500
2007
2009
2011
2013
2016
Years

Fire Occurrence Map for Hancock County for Fiscal Year 2007-2011



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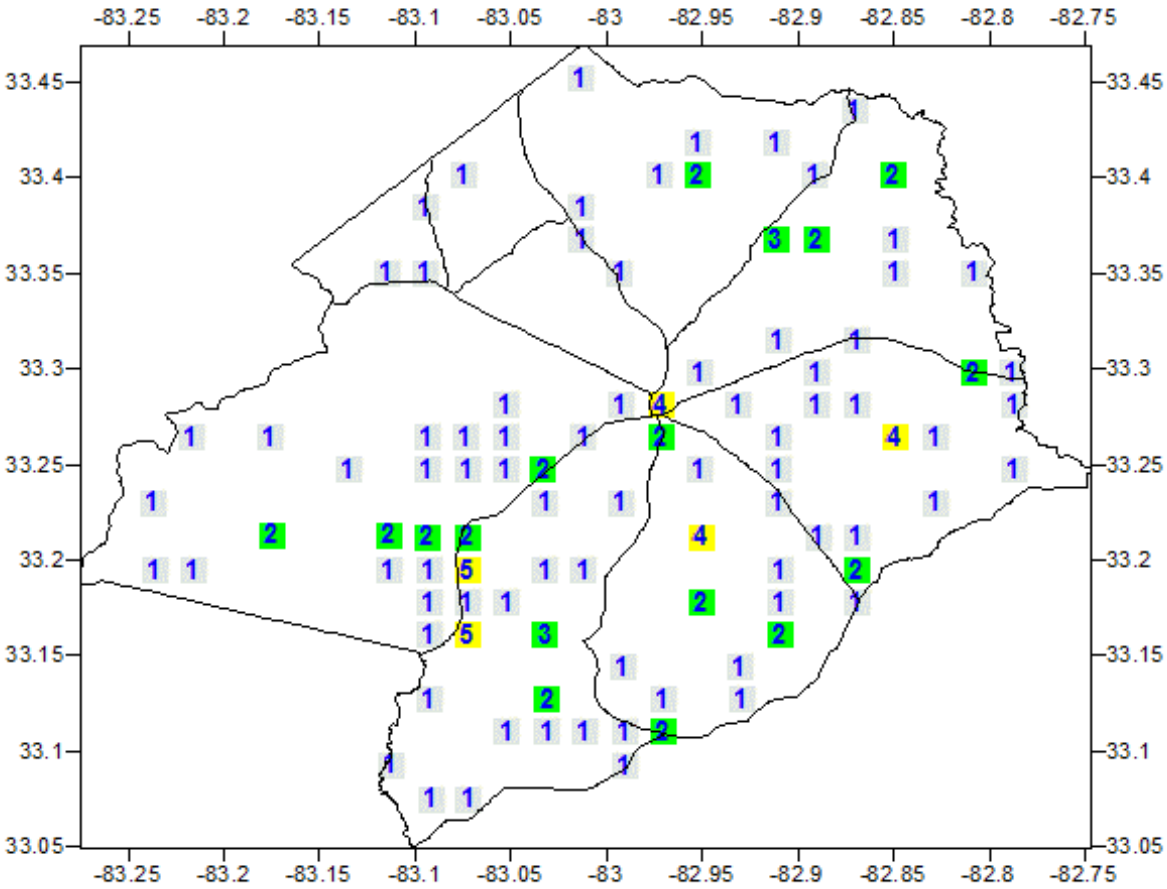
Fire Occurrence Map for Hancock County for Fiscal Year 2012-2016



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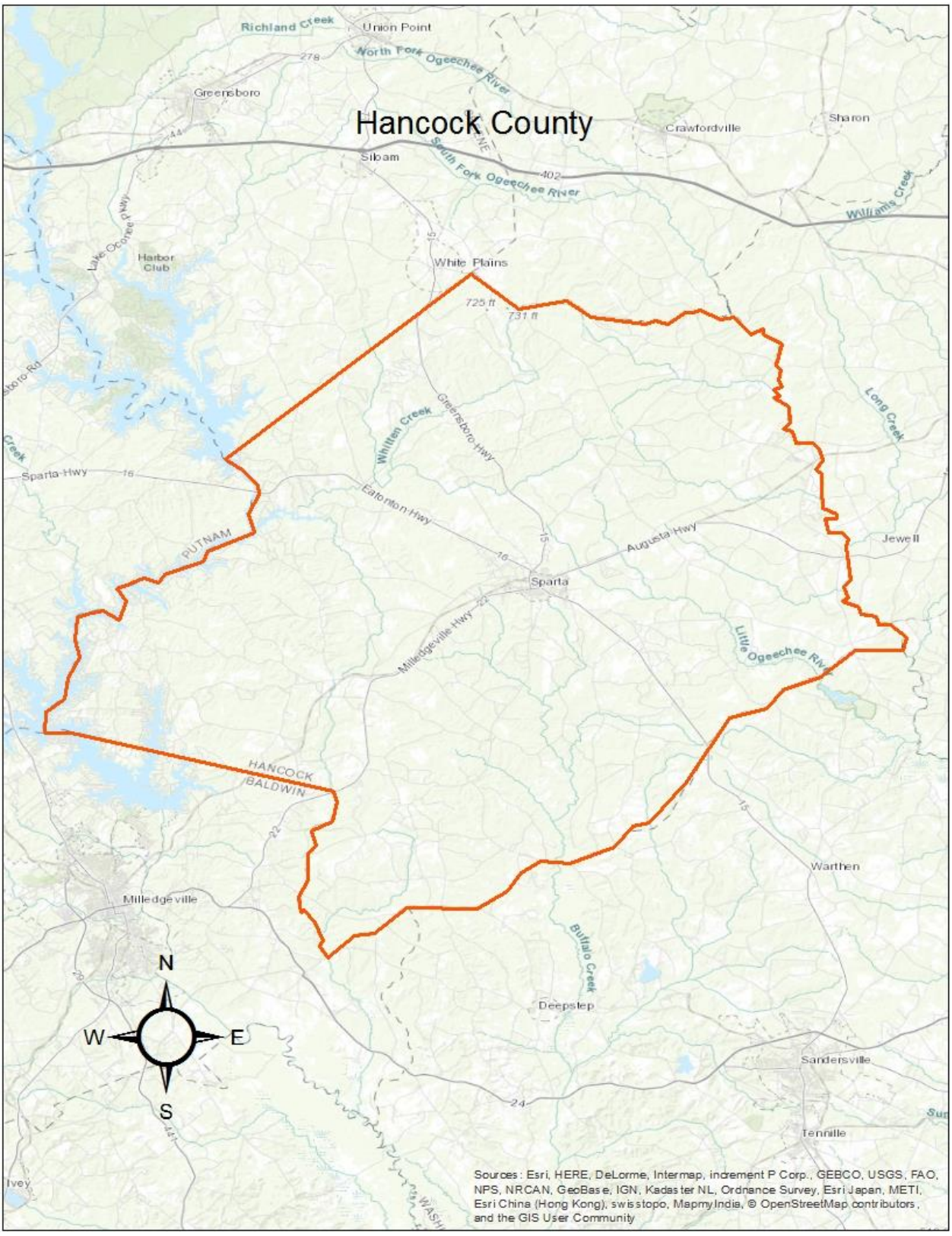
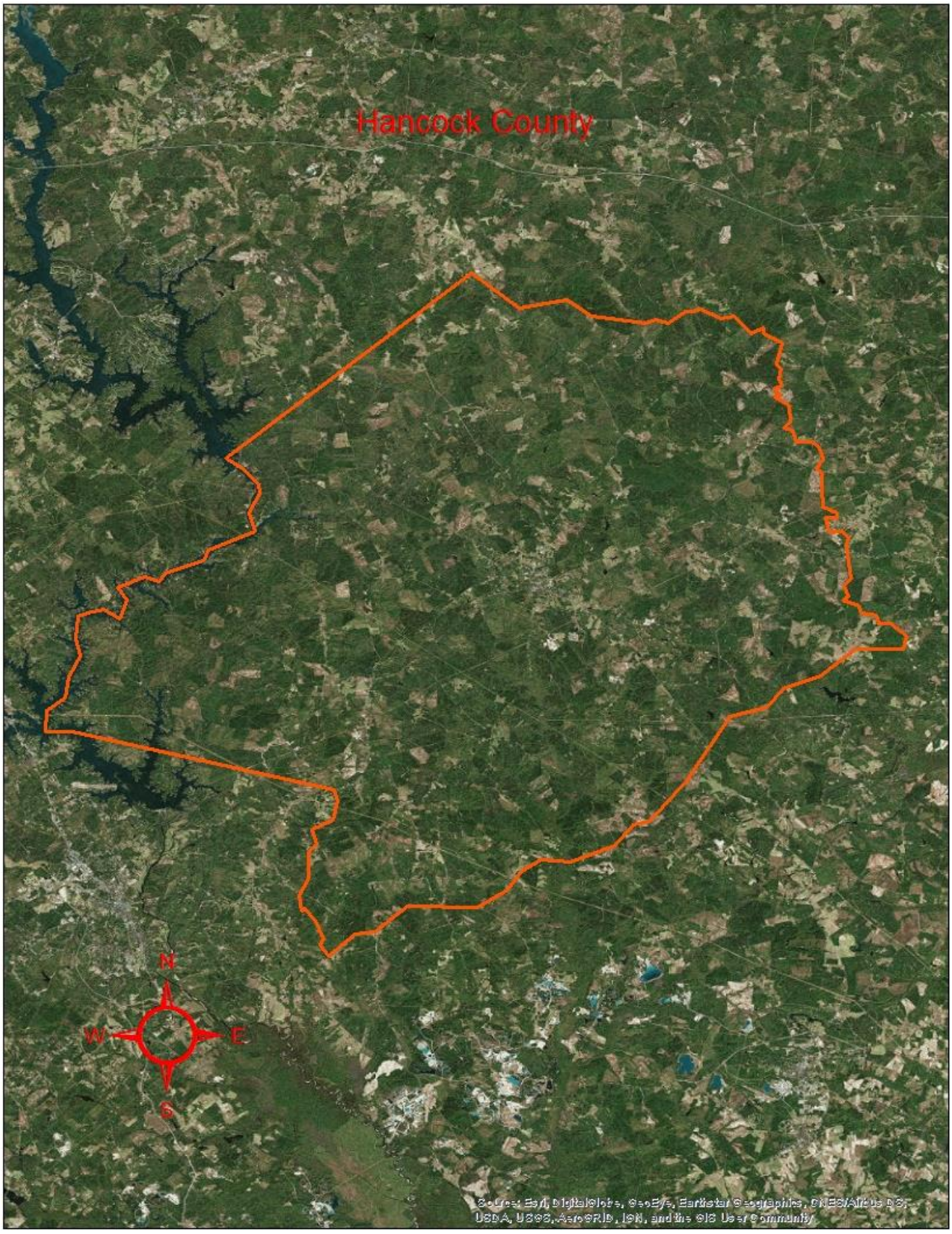
III. COUNTY BASE MAPS




Hancock County
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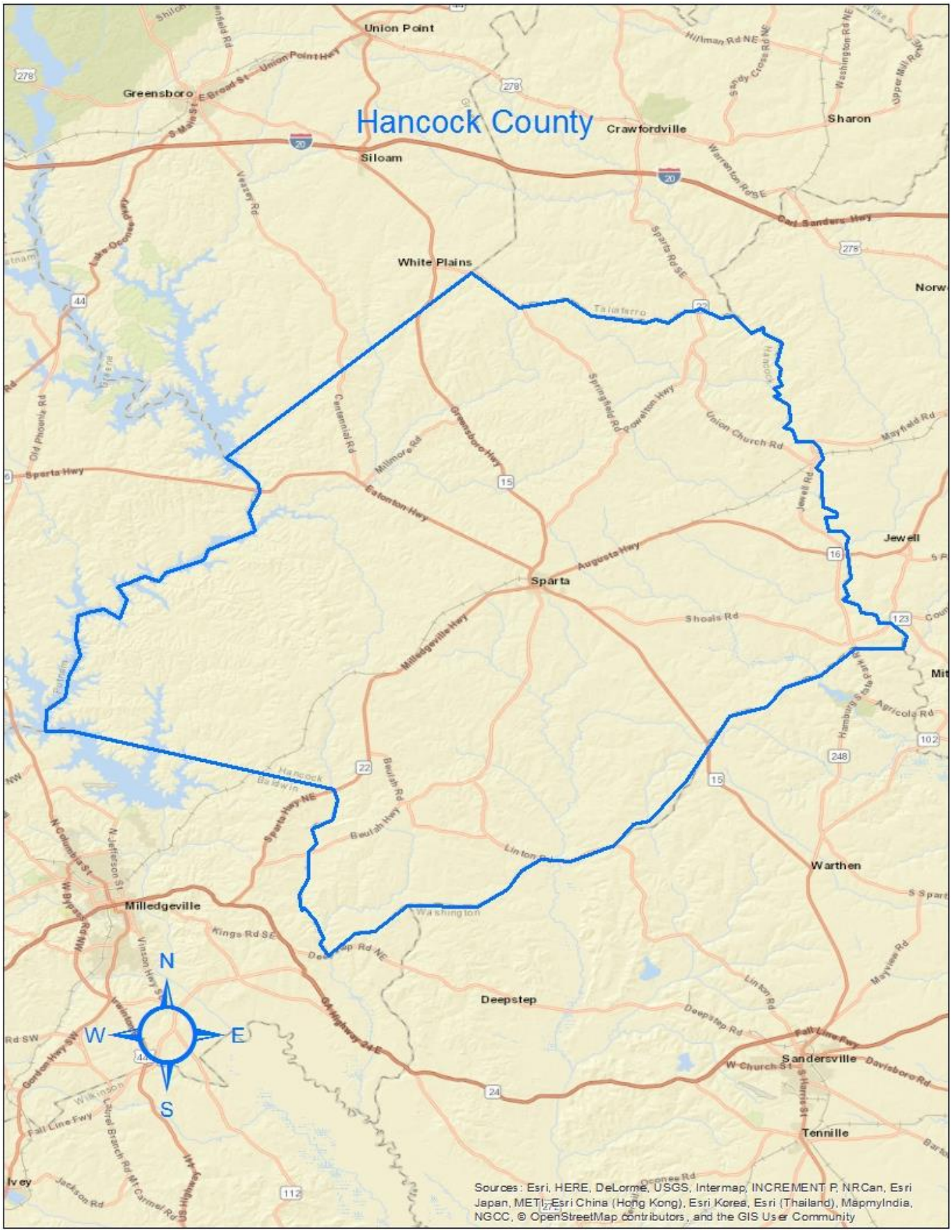
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community


Hancock County
Union Point
Greensboro
Siloam
Crawfordville
Sharon
White Plains
Sparta
Jewell
Warthen
Milledgeville
Deepstep
Sandersville
Tennille
Ivey
N
W
E
S
Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community

IV. COMMUNITY WILDFIRE RISK ASSESSMENT

The Wildland-Urban Interface

There are many definitions of the Wildland-Urban Interface (WUI), however from a fire management perspective it is commonly defined as an area where structures and other human development meet or intermingles with undeveloped wildland or vegetative fuels. As fire is dependent on a certain set of conditions, the National Wildfire Coordinating Group has defined the wildland-urban interface as a set of conditions that exists in or near areas of wildland fuels, regardless of ownership. This set of conditions includes type of vegetation, building construction, accessibility, lot size, topography and other factors such as weather and humidity. When these conditions are present in certain combinations, they make some communities more vulnerable to wildfire damage than others. This "set of conditions" method is perhaps the best way to define wildland-urban interface areas when planning for wildfire prevention, mitigation, and protection activities.

There are three major categories of wildland-urban interface. Depending on the set of conditions present, any of these areas may be at risk from wildfire. A wildfire risk assessment can determine the level of risk.

1. "Boundary" wildland-urban interface is characterized by areas of development where homes, especially new subdivisions, press against public and private wildlands, such as private or commercial forest land or public forests or parks. This is the classic type of wildland-urban interface, with a clearly defined boundary between the suburban fringe and the rural countryside.

2. "Intermix" wildland-urban interface areas are places where improved property and/or structures are scattered and interspersed in wildland areas. These may be isolated rural homes or an area that is just beginning to go through the transition from rural to urban land use.

3. "Island" wildland-urban interface, also called occluded interface, are areas of wildland within predominately urban or suburban areas. As cities or subdivisions grow, islands of undeveloped land may remain, creating remnant forests. Sometimes these remnants exist as parks, or as land that cannot be developed due to site limitations, such as wetlands.

Wildland Urban Interface Hazards

Firefighters in the wildland urban interface may encounter hazards other than the fire itself, such as hazardous materials, utility lines and poor access.

Hazardous Materials

- Common chemicals used around the home may be a direct hazard to firefighters from a flammability, explosion potential and/or vapors or off gassing. Such chemicals include paint, varnish and other flammable liquids, fertilizer, pesticides, cleansers, aerosol cans, fireworks, batteries and ammunition. In addition, some common household products such as plastics may give off very toxic fumes when they burn. Stay out of smoke form burning structures and any unknown sources such as trash piles.

Illicit Activities

- Marijuana plantations or drug production labs may be found in the wildland urban interface areas. Extremely hazardous materials such as propane tanks and flammable/toxic chemicals may be encountered.

Propane Tanks

- Both large (household size) and small (gas grill size) liquefied propane gas (LPG) tanks can present hazards to firefighters, including explosion. See the "LPG Tank Hazards" discussion for details

Utility Lines

- Utility Lines may be located above and below ground and may be cut or damaged by tools or equipment. Don't spray water on utility lines or boxes.

Septic Tanks and Fields

- Below ground structures may not be readily apparent and may not support the weight of engines or other equipment.

New Construction Materials

- Many new construction materials have comparatively low melting points and may "off- gas" extremely hazardous vapors. Plastic decking materials that resemble wood are becoming more common and may begin softening and losing structural strength at 180 degrees F, though they normally do not sustain combustion once direct flame is removed. However if they continue to burn they exhibit the characteristics of flammable liquids.

Pets and Livestock

- Pets and livestock may be left when residents evacuate and will likely be highly stressed making them more inclined to bite and kick. Firefighters should not put themselves at risk to rescue pets or livestock.

Evacuation Occurring

- Firefighters may be taking structural protect actions while evacuations of residents are occurring. Be very cautious of people driving erratically. Distraught residents mayrefuse to leave their property and firefighters may need to disengage from fighting fire to contact law enforcement officers for assistance. In most jurisdictions firefighters do not have the authority to force evacuations. Firefighters should not put themselves at risk trying to protect someone who will not evacuate!

Limited Access

- Narrow one-lane roads with no turn around room, inadequate or poorly maintained bridges and culverts are frequently found in wildland urban interface areas. Access should be sized up and an evacuation plan for all emergency personnel should be developed.

Wildland Urban Interface (WUI) is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels.

The Hancock County CWPP core committee using the Hazard and Wildfire Risk Assessment Form as a basis for discussion on the wildland urban interface issues in Hancock County.

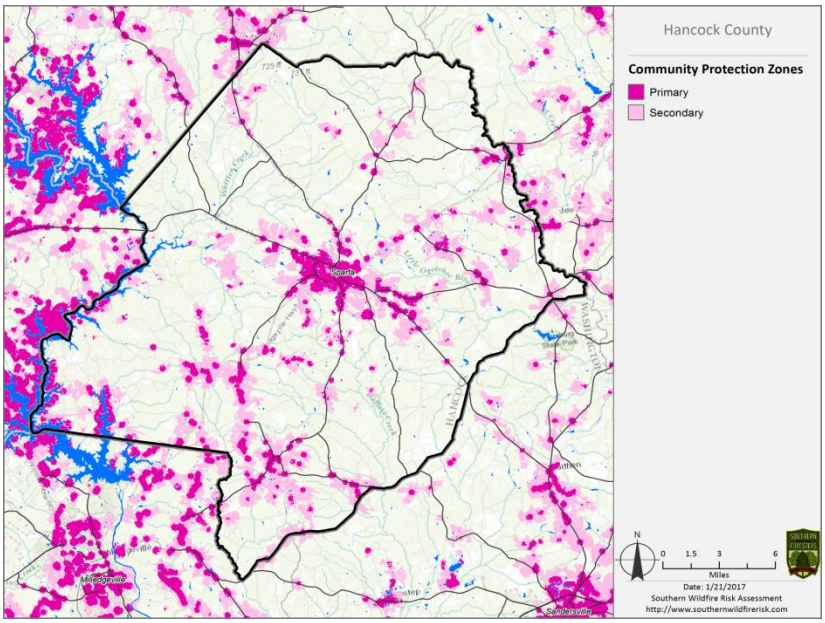
The instrument takes into consideration accessibility, vegetation (based on fuel models), roofing assembly, building construction, and availability of fire protection resources, placement of gas and electric utilities, and additional rating factors. The following factors contributed to the wildfire hazard scores for Hancock County:

- Unpaved roads and private driveways
- Narrow roads without drivable shoulders
- Inadequate driveway access
- Inadequate bridge capacity
- One way in and out on Lake subdivisions
- Minimal defensible space around structures
- Homes with wooden siding
- Unmarked septic tanks in yards
- Lack of pressurized or non-pressurized water systems available in areas of the county
- Inadequate water handling capacity
- Large, adjacent areas of forest or wildlands
- Heavy fuel buildup in adjacent wildlands
- Undeveloped lots comprising half the total lots in many rural communities.
- High occurrence of wildfires in the several locations

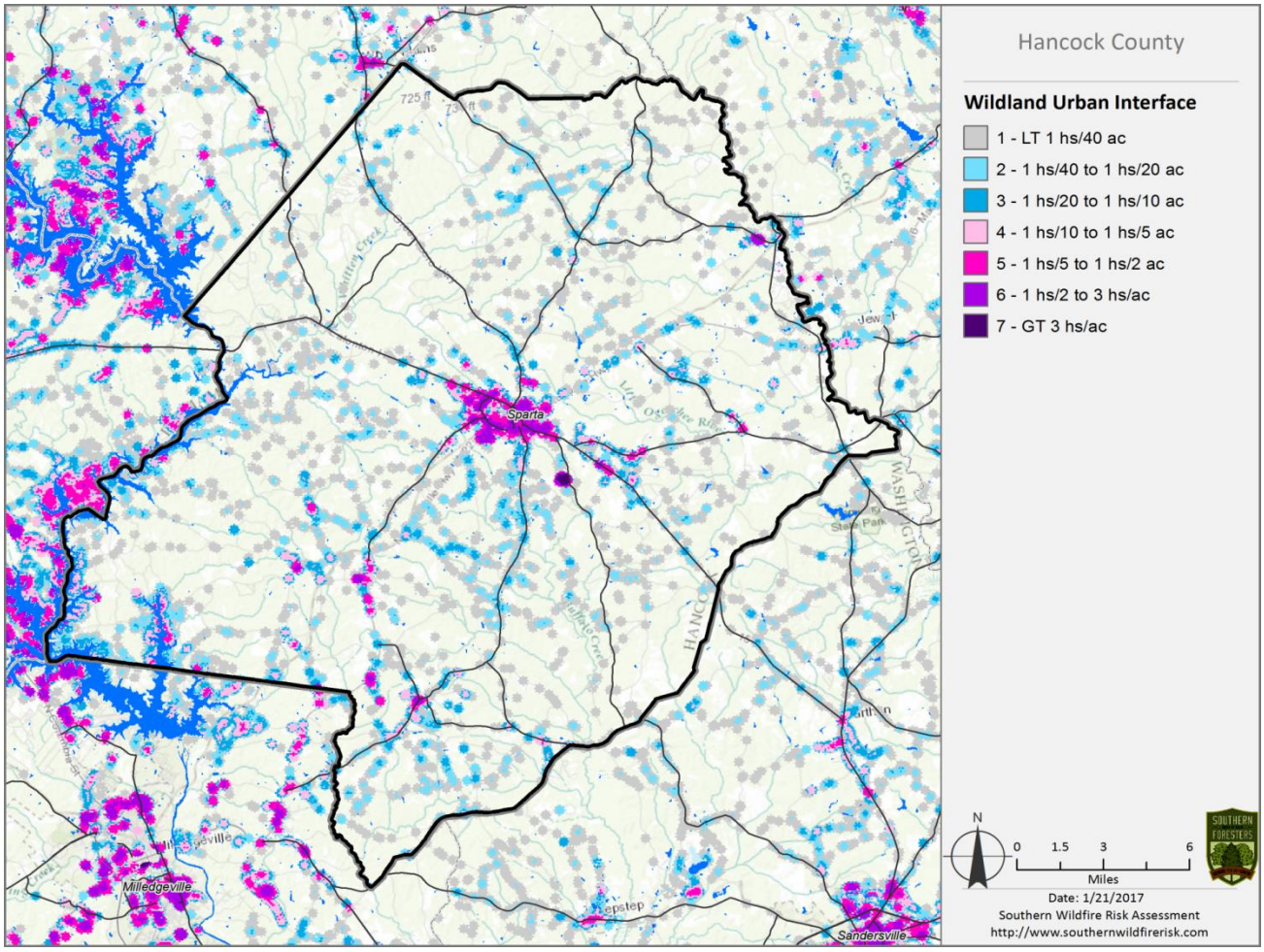
V. SOUTHERN WILDFIRE RISK ASSESSMENT & RISK HAZARD MAPS

The Southern Wildfire Risk Assessment tool, developed by the Southern Group of State Foresters, was released to the public in July 2014. This tool allows users of the Professional Viewer application of the Southern Wildfire Risk Assessment (SWRA) web Portal (SouthWRAP) to define a specific project area and summarize wildfire related information for this area. A detailed risk summary report is generated using a set of predefined map products developed by the Southern Wildfire Risk Assessment project which have been summarized explicitly for the user defined project area. A risk assessment summary was generated for Hancock County. The SouthWRAP (SWRA) products included in this report are designed to provide the information needed to support the following key priorities:

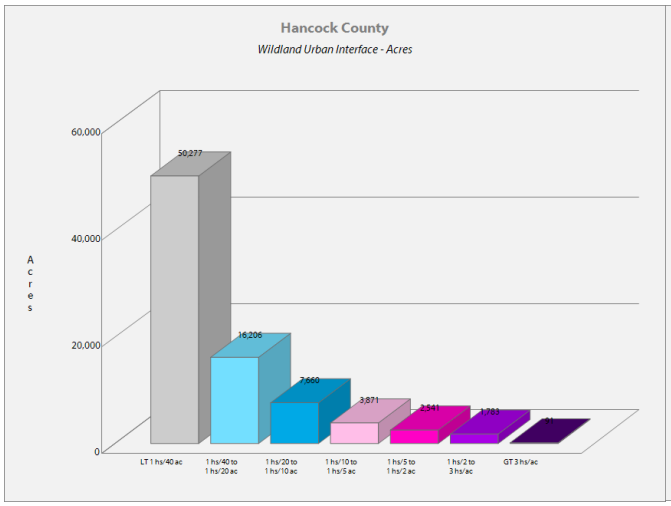
- Identify areas that are most prone to wildfire.
- Identify areas that may require additional tactical planning, specifically related to mitigation projects and Community Wildfire Protection Planning.
- Provide the information necessary to justify resource, budget and funding requests.
- Allow agencies to work together to better define priorities and improve emergency response, particularly across jurisdictional boundaries.
- Define wildland communities and identify the risk to those communities.
- Increase communication and outreach with local residents and the public to create awareness and address community priorities and needs.
- Plan for response and suppression resource needs.
- Plan and prioritize hazardous fuel treatment programs.

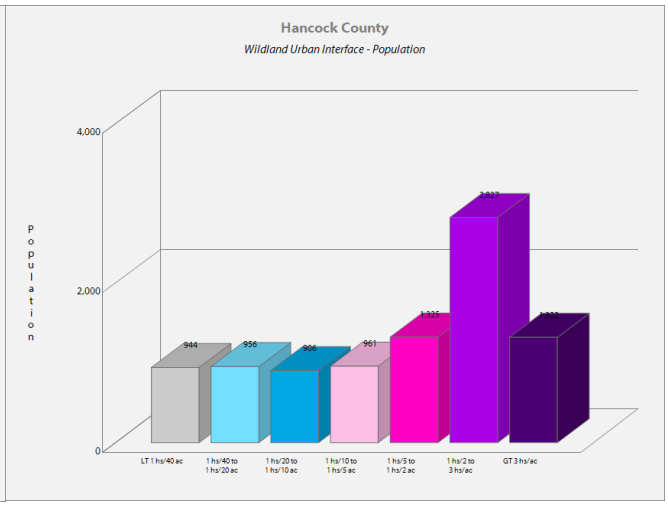


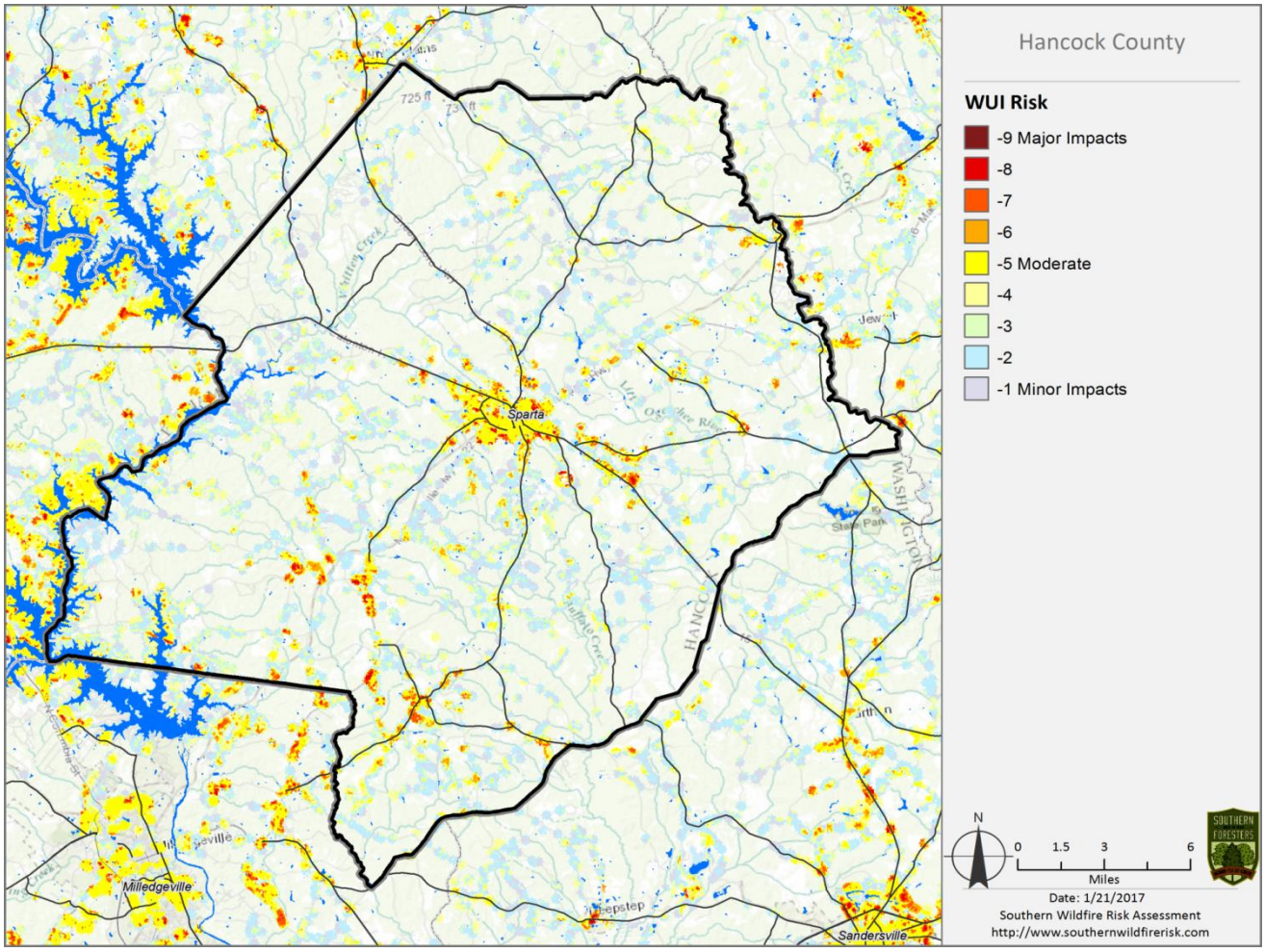
Community Protection Zones map from the Hancock County SWRA



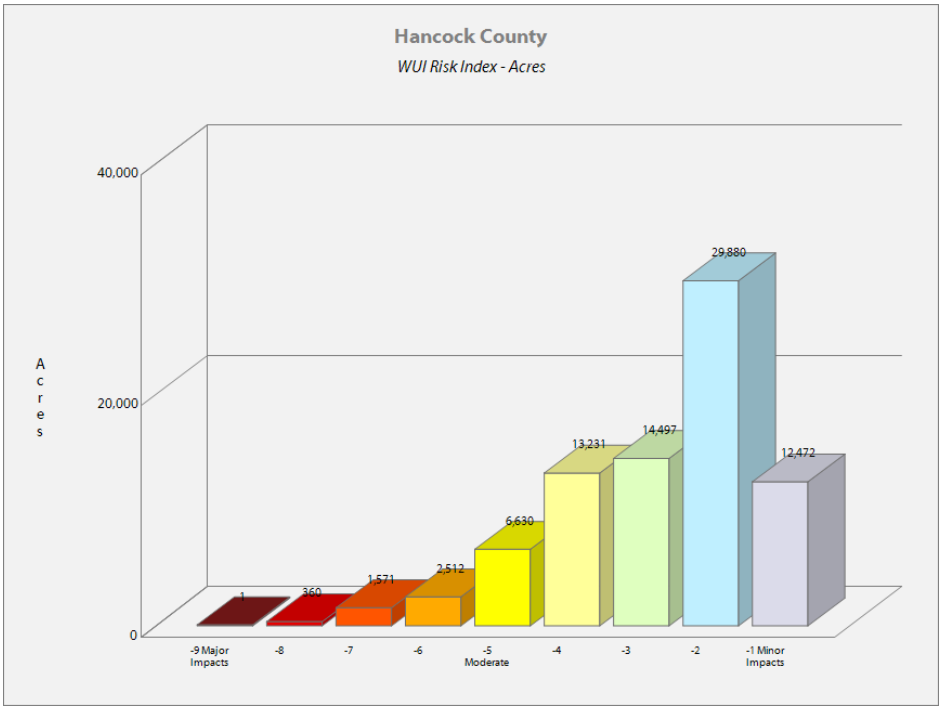
Above: Wildland Urban Interface (WUI) map Below: WUI Acres (left) WUI Population (right)

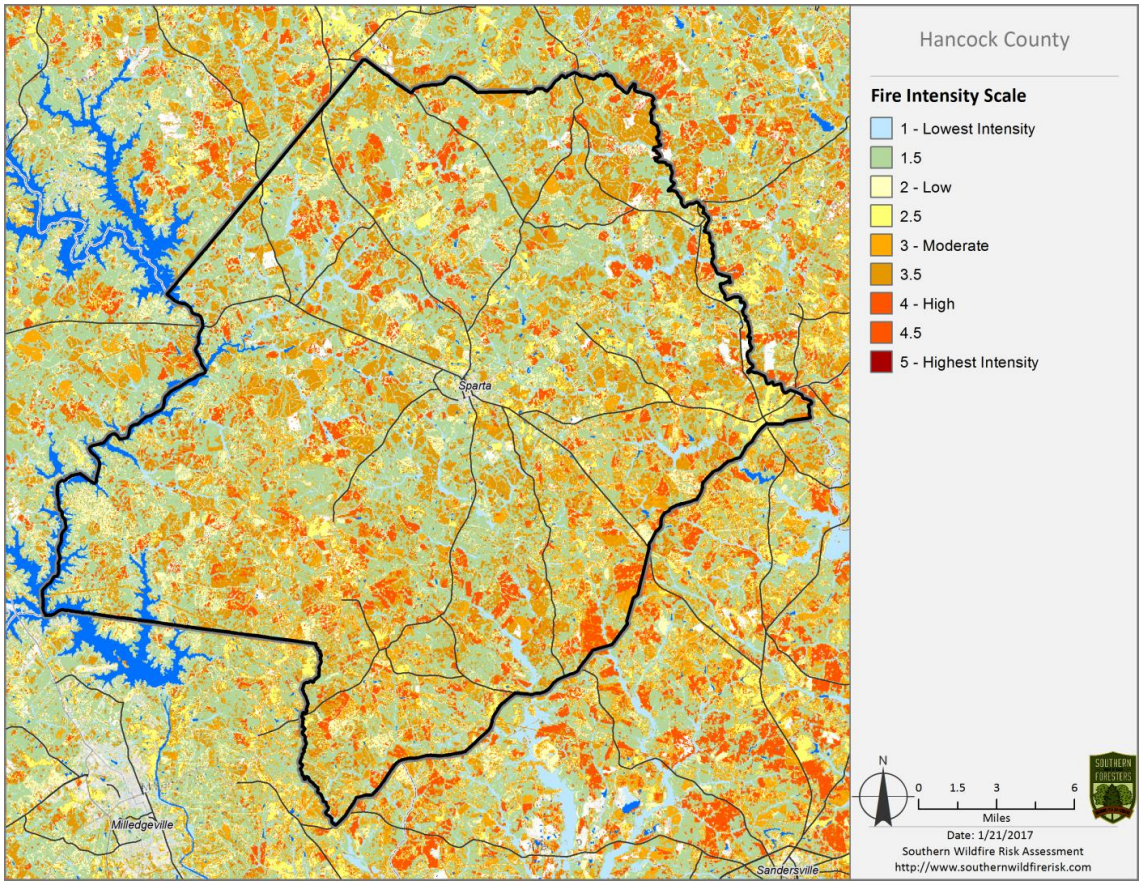




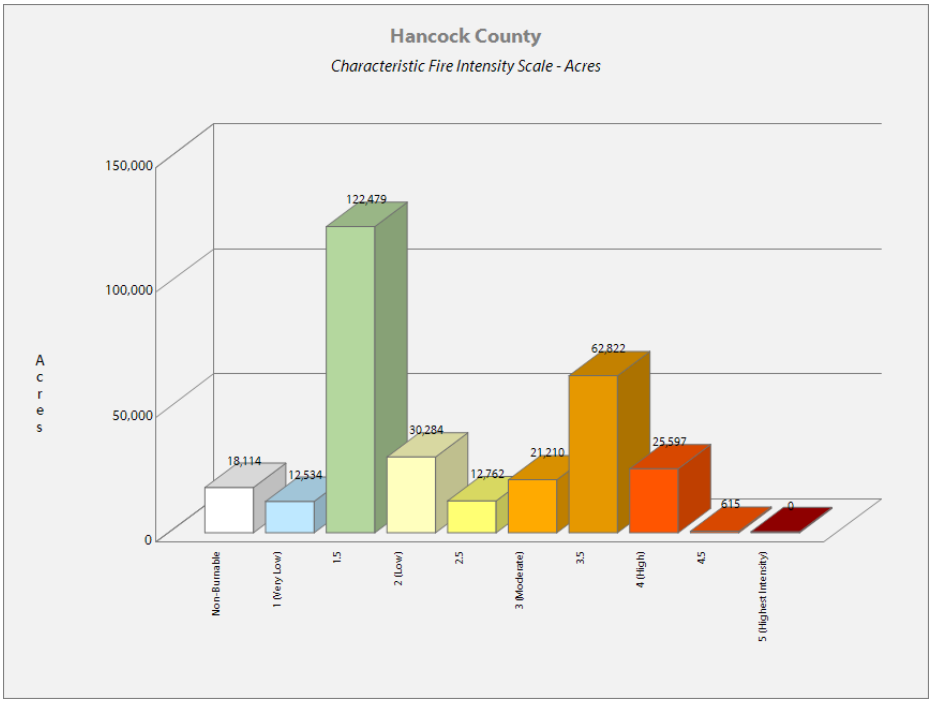


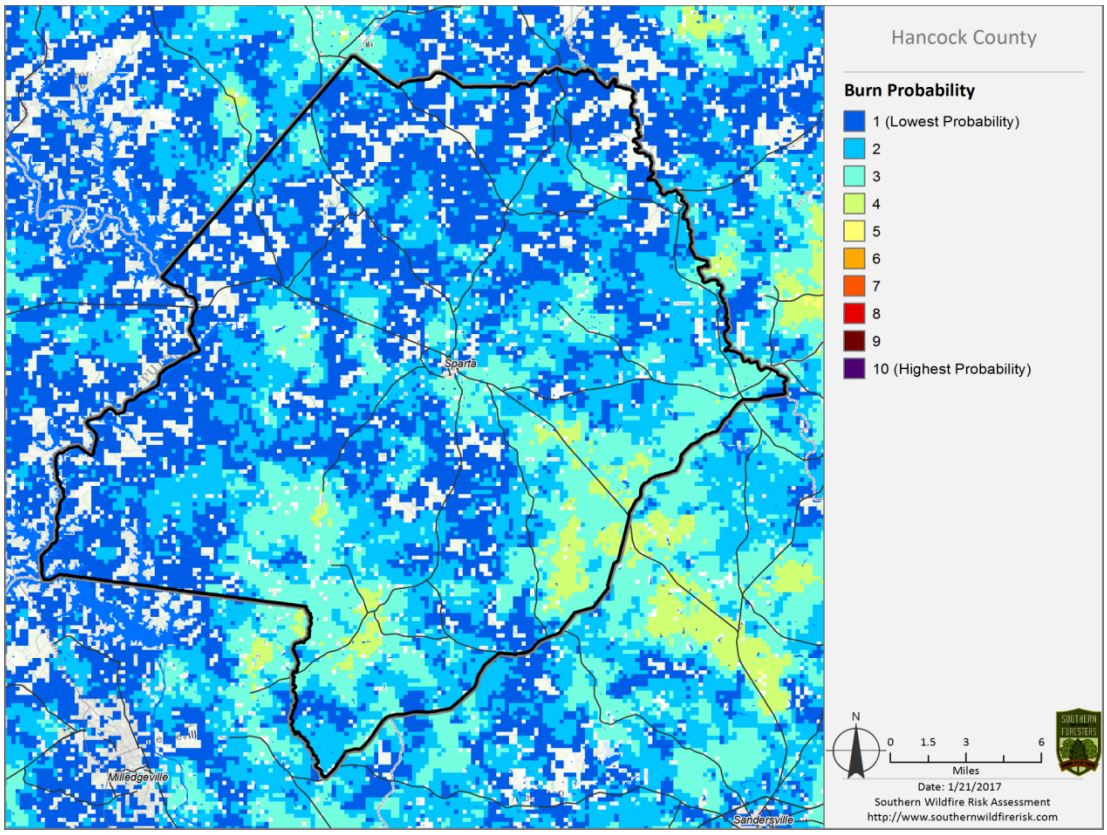
Above: Wildland Urban Interface (WUI) Below: WUI Risk Index - Acres



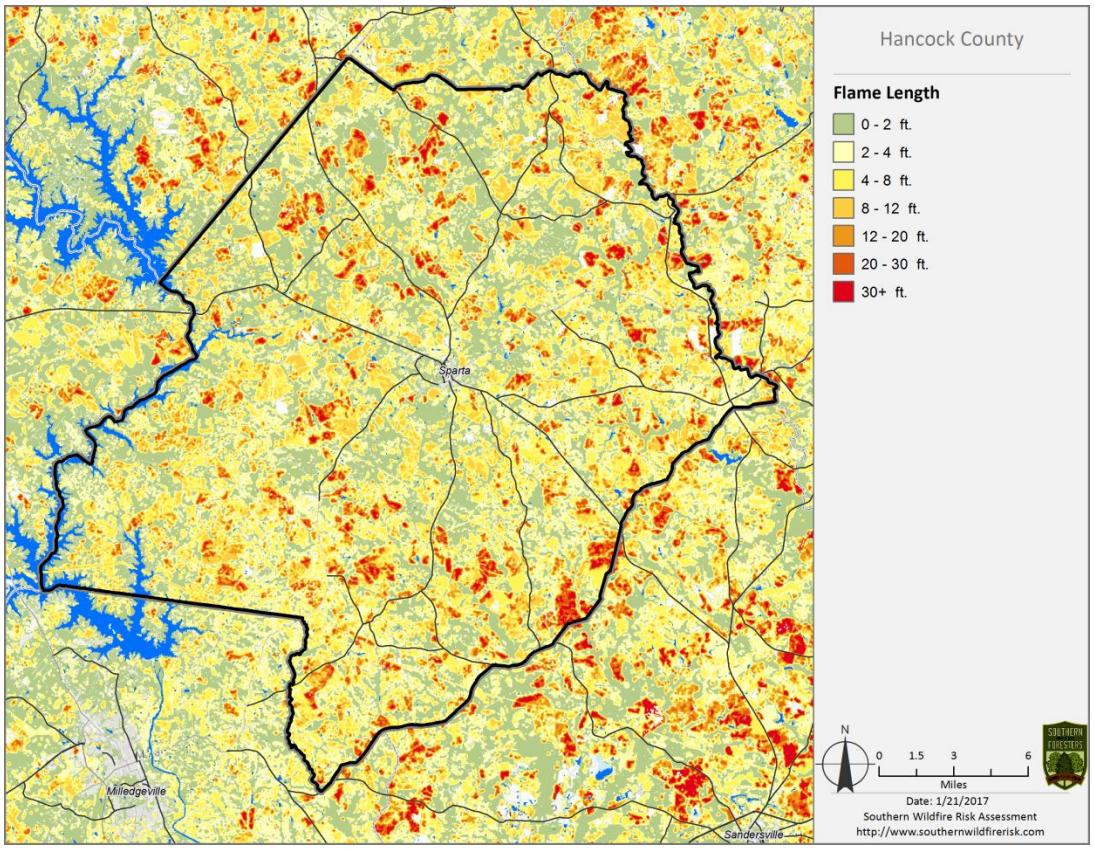


Above: Fire Intensity Scale map Below: Fire Intensity Scale - Acres





Above: Burn Probability map Below: Flame length map



VI. PRIORITIZED MITIGATION RECOMMENDATIONS

Executive Summary

As Georgia continues to see increased growth from other areas seeking less crowded and warmer climes, new development will occur more frequently on forest and wildland areas, particularly along the lakefront. Hancock County will have an opportunity to significantly influence the wildland fire safety of new developments. It is important that new development be planned and constructed to provide for public safety in the event of a wildland fire emergency.

Over the past 20 years, much has been learned about how and why homes burn during wildland fire emergencies. Perhaps most importantly, case histories and research have shown that even in the most severe circumstances, wildland fire disasters can be avoided. Homes can be designed, built and maintained to withstand a wildfire even in the absence of fire services on the scene. The national Firewise Communities program is a national awareness initiative to help people understand that they don't have to be victims in a wildfire emergency. The National Fire Protection Association has produced two standards for reference: NFPA 1144 Standard for Reducing Structure Ignition Hazards from Wildland Fire. 2008 Edition and NFPA 1141 Standard for Fire Protection Infrastructure for Land Development in Suburban and Rural Areas.

The International Wildland Urban Interface Code (IWUIC) was developed by the International Code Council in 2012. Georgia Congress adopted the code in 2014 for counties to use in local code development to reduce wildfire risk.

When new developments are built in the Wildland/Urban Interface, a number of public safety challenges may be created for the local fire services: (1) the water supply in the immediate areas may be inadequate for fire suppression; (2) if the Development is in an outlying area, there may be a longer response time for emergency services; (3) in a wildfire emergency, the access road(s) may need to simultaneously support evacuation of residents and the arrival of emergency vehicles; and (4) when wildland fire disasters strike, many structures may be involved simultaneously, quickly exceeding the capability of even the best equipped fire departments.

The following recommendations were developed by the Hancock County CWPP Core team as a result of surveying and assessing fuels and structures and by conducting meetings and interviews with county and city officials. A priority order was determined based on which mitigation projects would best reduce the hazard of wildfire in the assessment area.

Proposed Community Hazard and Structural Ignitability Reduction Priorities

Primary Protection for Community and Its Essential Infrastructure		
Treatment Area	Treatment Types	Treatment Method(s)
1. All Structures	Create minimum of 30-feet of defensible space**	Trim shrubs and vines to 30 feet from structures, trim overhanging limbs, replace flammable plants near homes with less flammable varieties, remove vegetation around chimneys.
2. Applicable Structures	Reduce structural ignitability**	Clean flammable vegetative material from roofs and gutters, store firewood appropriately, install skirting around raised structures, store water hoses for ready access, and replace pine straw and mulch around plantings with less flammable landscaping materials.
3. Community Clean-up Day National Wildfire Preparedness Day is the 1st Saturday in May.	Cutting, mowing, pruning**	Cut, prune, and mow vegetation in shared community spaces.
4. Driveway Access	Right of Way Clearance	Maintain vertical and horizontal clearance for emergency equipment. See that adequate lengths of culverts are installed to allow emergency vehicle access.
5. Road Access	Identify needed road improvements	As roads are upgraded, widen to minimum standards with at least 50 foot diameter cul de sacs or turn arounds.
6. Codes and Ordinances	Examine existing codes and ordinances. Utilize the International Wildland Urban Interface Code (IWUIC)	Amend and enforce existing building codes as they relate to skirting, propane tank locations, public nuisances (trash/debris on property), Property address marking standards and other relevant concerns Review Subdivision and development ordinances for public safety concerns. Enforce uniform addressing ordinance.
7. Burn Permits	Education and Enforcement	Greater Burn Permit enforcement and education from the Georgia Forestry Commission.

Proposed Community Wildland Fuel Reduction Priorities		
Treatment Area	Treatment Types	Treatment Method(s)
1. Adjacent WUI Lands	Reduce hazardous fuels	Encourage prescribed burning for private landowners and industrial timberlands particularly adjacent to residential areas. Seek grant for mowing or prescribed burning in WUI areas.
2. Lakefront Communities	Reduce hazardous fuels	Encourage lakefront homeowners associations and Georgia Power to consider eliminating brush and grass through burning, herbicide and mowing on common and undeveloped areas in the communities. Maintain firebreaks adjacent to residential areas.
3. Existing Fire Lines	Reduce hazardous fuels	Clean and re-harrow existing lines.
Proposed Improved Community Wildland Fire Response Priorities		
1. Water Sources	Dry Hydrants	Inspect, maintain and improve access to existing dry hydrants. Add signage along road to mark the hydrants. Locate additional dry hydrants as needed. Locate and pre-clear helicopter dip sites
2. Fire Stations	Equipment	Wildland hand tools. Lightweight Wildland PPE Gear. Floating pumps
3. Mapping	GIS	Up do date mapping of roads and water sources.
4. Road Names	Road Signage	More timely replacement of missing Road Signage. “Dead End” or “No Outlet” Tags on Road Signs
5. Personnel	Training	Obtain Wildland Fire Suppression training for Fire Personnel.
**Actions to be taken by homeowners and community stakeholders		

Proposed Education and Outreach Priorities

1. Conduct "How to Have a Firewise Home" Workshop for Hancock County Residents
Set up and conduct a workshop for homeowners that teach the principles of making homes and properties safe from wildfire. Topics for discussion include defensible space, landscaping, building construction, etc. Workshop will be scheduled for evenings or weekends when most homeowners are available and advertised through local media outlets. Target local schools, community groups and local senior centers. Distribute materials promoting firewise practices and planning through local community and governmental meetings.
2. Conduct "Firewise" Workshop for Community Leaders
Arrange for GFC Firewise program to work with local community leaders and governmental officials on the importance of "Firewise Planning" in developing ordinances and codes as the county as the need arises. Identify "Communities at Risk" within the county for possible firewise community recognition.
3. Spring Clean-up Event
Conduct clean-up event every spring involving the Georgia Forestry Commission, Hancock County Sparta Fire Department and community residents. Set up information table with educational materials and refreshments. Initiate the event with a morning briefing by GFC Firewise coordinator and local fire officials detailing plans for the day and safety precautions. Activities to include the following: • Clean flammable vegetative material from roofs and gutters • Trim shrubs and vines to 30 feet away from structures • Trim overhanging limbs • Clean hazardous or flammable debris from adjacent properties Celebrate the work with a community cookout, with Community officials, GFC and Hancock County Sparta Fire Department discussing and commending the work accomplished.
4. Informational Packets
Develop and distribute informational packets to be distributed by realtors and insurance agents. Included in the packets are the following: • Be Firewise Around Your Home • Firewise Guide to Landscape and Construction • Firewise Communities USA materials • Ready Set Go materials • Fire Adapted Community information

5. Wildfire Protection Display
Create and exhibit a display for the general public at local events. Display can be independent or combined with the Georgia Forestry Commission display. Hold Open House at individual Fire Stations to promote Community Firewise Safety and develop community support and understanding of local fire departments and current issues.
6. Media
Invite the local news media to community "Firewise" functions for news coverage and regularly submit press releases documenting wildfire risk improvements in Hancock County. Utilize social media to reach new audiences.

Prescribed burning is a best management practice to reduce hazardous fuel buildup. The Georgia Forestry Commission can assist by developing a prescribed burning plan, installation of firebreaks, and can provide equipment standby and burning assistance when personnel are available. Consulting Foresters and other contractors can also provide this service for landowners.

VII. ACTION PLAN

Roles and Responsibilities

The following roles and responsibilities have been developed to implement the action plan:

Role	Responsibility
Hazardous Fuels and Structural Ignitability Reduction	
Hancock County WUI Fire Council	Create this informal team or council comprised of residents, GFC officials, Hancock County Sparta Fire Department officials, a representative from the city and county governments along with Dept. of Correction Fire officials and the EMA Director for Hancock County. Meet periodically to review progress towards mitigation goals, appoint and delegate special activities, work with federal, state, and local officials to assess progress and develop future goals and action plans. Work with residents to implement projects and firewise activities.
Key Messages to focus on	1 Defensible Space and Firewise Landscaping 2 Debris Burning Safety 3 Firewise information for homeowners 4 Prescribed burning benefits
Communications objectives	1 Create public awareness for fire danger and defensible space issues 2 Identify most significant human cause fire issues 3 Enlist public support to help prevent these causes 4 Encourage people to employ fire prevention and defensible space in their communities.
Target Audiences	1 Homeowners 2 Forest Landowners and users 3 Civic Groups & Homeowners Associations 4 School Groups
Methods	1 News Releases 2 Radio and TV PSA's for area stations and cable access channels 3 Personal Contacts 4 Key messages and prevention tips 5 Visuals such as signs, brochures and posters 6 Fire Department Web Sites 7 Social Media

Spring Clean-up Day (National Wildfire Preparedness Day – 1st Saturday of May each year)	
Event Coordinator	Coordinate day's events and schedule, catering for cookout, guest attendance, and moderate activities the day of the day of the event.
Event Treasurer	Collect funds from residents to cover food, equipment rentals, and supplies.
Publicity Coordinator	Advertise event through neighborhood newsletter, letters to officials, and public service announcements (PSAs) for local media outlets. Publicize post-event through local paper and radio PSAs.
Work Supervisor	Develop volunteer labor force of community residents; develop labor/advisory force from Georgia Forestry Commission, Hancock County Sparta Fire Department, GA DoC and Emergency Management Agency. Procure needed equipment and supplies. In cooperation with local city and county officials, develop safety protocol. Supervise work and monitor activities for safety the day of the event.

Funding Needs

The following funding is needed to implement the action plan:

Project	Estimated Cost	Potential Funding Source(s)
1. Create a minimum of 30 feet of defensible space around structures	Varies	Residents will supply labor and fund required work on their own properties.
2. Reduce structural ignitability by cleaning flammable vegetation from roofs and gutters; appropriately storing firewood, installing skirting around raised structures, storing water hoses for ready access, replacing pine needles and mulch around plantings with less flammable material.	Varies	Residents will supply labor and fund required work on their own properties.
3. Amend codes and ordinances to provide better driveway access, increased visibility of house numbers, properly stored firewood, minimum defensible space brush clearance, required Class A roofing materials and skirting around raised structures, planned maintenance of community lots.	No Cost	To be adopted by city and county governments. International Wildland Urban Interface Code (IWUIC)
4. Spring Cleanup Day National Wildfire Preparedness Day	Varies	Community Business Donations.
5. Fuel Reduction Activities	$35/acre	FEMA & USFS Grants

Assessment Strategy

To accurately assess progress and effectiveness for the action plan, the Hancock County WUI Fire Council will implement the following:

- Annual wildfire risk assessment will be conducted to re-assess wildfire hazards and prioritize needed actions.

- Mitigation efforts that are recurring (such as mowing, burning, and clearing of defensible space) will be incorporated into an annual renewal of the original action plan.

- Mitigation efforts that could not be funded in the requested year will be incorporated into the annual renewal of the original action plan.

- Continuing educational and outreach programs will be conducted and assessed for effectiveness. Workshops will be evaluated based on attendance and post surveys that are distributed by mail 1 month and 6 months following workshop date.

- The Hancock County WUI Council will publish an annual report detailing mitigation projects initiated and completed, progress for ongoing actions, funds received, funds spent, and in-kind services utilized. The report will include a "state of the community" section that critically evaluates mitigation progress and identifies areas for improvement. Recommendations will be incorporated into the annual renewal of the action plan.

- An annual survey will be distributed to residents soliciting information on individual mitigation efforts on their own property (e.g., defensible space). Responses will be tallied and reviewed at the next Hancock County WUI Council meeting. Needed actions will be discussed and delegated.

This plan should become a working document that is shared by local, state, and federal agencies that will use it to accomplish common goals. An agreed-upon schedule for meeting to review accomplishments, solve problems, and plan for the future should extend beyond the scope of this plan. Without this follow up this plan will have limited value.

IX. MITIGATION ASSISTANCE & GRANT FUNDING

Community Protection Grant: US Forest Service sponsored prescribed fire program. Communities with "at-risk" properties that lie within ten miles of a National Forest, National Park Service or Bureau of Land Management tracts may apply with the Georgia Forestry Commission to have their land prescribe burned free-of-charge. Forest mastication, where it is practical with Georgia Forestry Commission equipment, is also available under this grant program.

FEMA Mitigation Policy MRR-2-08-01: through GEMA – Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation Program (PDM).

1. To provide technical and financial assistance to local governments to assist in the implementation of long term, cost effective hazard mitigation accomplishments.

2. This policy addresses wildfire mitigation for the purpose of reducing the threat to all-risk structures through creating defensible space, structural protection through the application of ignition resistant construction and limited hazardous fuel reduction to protect life and property.

3. With a completed registered plan (addendum to the State Plan) counties can apply for pre-mitigation funding. They will also be eligible for HMGP funding if the county is declared under a wildfire disaster.

Georgia Forestry Commission: Plowing and prescribed burning assistance, as well as forest mastication, can be obtained from the GFC as a low-cost option for mitigation efforts.

The Georgia Forestry Commission Firewise Community Mitigation Assistance Grants – Nationally recognized Firewise Communities can receive up to $5000 grants to help address potential wildfire risk reduction projects. Grant submission can be made through local Georgia Forestry Commission offices or your Regional Wildfire Prevention Specialist.

The International Association of Fire Chiefs (IAFC) and American International Group, Inc. (AIG) offer grants to assist local fire departments in establishing or enhancing their community fuels mitigation programs while educating members of the community about community wildfire readiness and encouraging personal action.

X. GLOSSARY

Community-At-Risk – *A group of two or more structures whose proximity to forested or wildland areas places homes and residents at some degree of risk.*

Critical Facilities – *Buildings, structures or other parts of the community infrastructure that require special protection from an approaching wildfire.*

CWPP – *The Community Wildfire Protection Plan.*

Defensible Space – *The immediate landscaped area around a structure (usually a minimum of 30 ft.) kept "lean, clean and green" to prevent an approaching wildfire from igniting the structure.*

Dry Hydrant - *A non-pressurized pipe system permanently installed in existing lakes, ponds and streams that provides a suction supply of water to a fire department tank truck.*

FEMA – *The Federal Emergency Management Agency whose mission is to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards.*

Fire Adapted Community – *A community fully prepared for its wildfire risk by taking actions to address safety, homes, neighborhoods, businesses and infrastructure, forest, parks, open spaces, and other community assets.*

Firewise Program – *A national initiative with a purpose to reduce structural losses from wildland fires.*

Firewise Community/USA – *A national recognition program for communities that take action to protect themselves from wildland fire. To qualify a community must have a wildfire risk assessment by the Georgia Forestry Commission, develop a mitigation action plan, have an annual firewise mitigation/education event, have dedicated firewise leadership, and complete the certification application.*

Fuels – *All combustible materials within the wildland/urban interface or intermix including, but not limited to, vegetation and structures.*

Fuel Modification – *Any manipulation or removal of fuels to reduce the likelihood of ignition or the resistance to fire control.*

Hazard & Wildfire Risk Assessment – *An evaluation to determine an area's (community's) potential to be impacted by an approaching wildland fire.*

Healthy Forests Initiative - *Launched in August 2002 by President Bush (following passage of the Healthy Forests Restoration Act by Congress) with the intent to reduce the risks severe wildfires pose to people, communities, and the environment.*

Home Ignition Zone (Structure Ignition Zone) - *Treatment area for wildfire protection. The "zone" includes the structure(s) and their immediate surroundings from 0-200 ft.*
Mitigation – An a*ction that moderates the severity of a fire hazard or risk.*

National Fire Plan – *National initiative, passed by Congress in the year 2000, following a landmark wildland fire season, with the intent of actively responding to severe wildland fires and their impacts to communities while ensuring sufficient firefighting capacity for the future.*

National Fire Protection Association (NFPA) - *An international nonprofit organization established in 1896, whose mission is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating consensus codes and standards, research, training, and education.*

National Wildfire Preparedness Day – *Started in 2014 by the National Fire Protection Association as a day for communities to work together to prepare for the approaching wildfire season. It is held annually on the first Saturday in May.*

Prescribed Burning (prescribed fire) –*The use of planned fire that is deliberately set under specific fuel and weather condition to accomplish a variety of management objectives and is under control until it burns out or is extinguished.*

Ready, Set, Go - *A program fire services use to help homeowners understand wildfire preparedness, awareness, and planning procedures for evacuation.*

Southern Group of State Foresters – *Organization whose members are the agency heads of the forestry agencies of the 13 southern states, Puerto Rico and the Virgin Islands.*

Stakeholders– *Individuals, groups, organizations, businesses or others who have an interest in wildland fire protection and may wish to review and/or contribute to the CWPP content.*

Wildfire or Wildland Fire – *An unplanned and uncontrolled fire spreading through vegetative fuels.*

Wildland/Urban Interface - *The presence of structures in locations in which the authority having jurisdiction (AHJ) determines that topographical features, vegetation, fuel types, local weather conditions and prevailing winds result in the potential for ignition of the structures within the area from flames and firebrands from a wildland fire* (NFPA 1144, 2008).

XI. SOURCES OF INFORMATION

Publications/Brochures/Websites:

- FIREWISE materials can be ordered at www.firewise.org
- Georgia Forestry Commission www.georgiafirewise.org
- Examples of successful wildfire mitigation programs can be viewed at the website for National Database of State and Local wildfire Hazard Mitigation Programs sponsored by the U.S. Forest Service and the Southern Group of State Foresters www.wildfireprograms.com
- Information about a variety of interface issues (including wildfire) can be found at the USFS website for Interface South: www.interfacesouth.org
- Information on codes and standards for emergency services including wildfire can be found at www.nfpa.org
- Information on FEMA Assistance to Firefighters Grants (AFG) can be found at www.firegrantsupport.com
- Information on National Fire Plan grants can be found at http://www.federalgrantswire.com/national-fire-plan--rural-fire-assistance.html
- Southern Wildfire Risk Assessment website SouthWRAP www.SouthernWildfireRisk.com
- Fire Adapted Communities www.fireadapted.org
- Ready, Set, Go www.wildlandfirersg.org
- National Wildfire Preparedness Day www.wildfireprepday.org

Appended Documents:

Hancock County Southern Wildfire Risk Assessment Summary Report (SWRA)
Hancock County Wildfire assessment scoresheets

All files that make up this plan are available in an electronic format from the Georgia Forestry Commission.

Georgia Forestry Commission
5645 Riggins Mill Rd.
Dry Branch, GA 30120

1-800-GA-TREES
GaTrees.org

The Georgia Forestry Commission provides leadership, service, and education in the protection and conservation of Georgia's forest resources.

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TIMBER IMPACT ASSESSMENT

Georgia Ice Storm, February 11-13, 2014

By: James Johnson, Chip Bates & Gary White, Georgia Forestry Commission
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BACKGROUND

A winter storm impacted multiple southern states and more than 90 Georgia counties experienced some form of winter precipitation, beginning February 11th and lasting through the 13th. Northern tier counties recorded snowfalls of up to 13" (Rabun County), and although some timber / tree impacts occurred in this "snow zone," they were not widespread or considered severe.

During the storm, ice accumulation was measured from between a tenth of an inch and one inch (or possibly higher) in a zone from roughly north metro Atlanta to Augusta in northern Georgia, and from Macon to Sylvania in central Georgia. Because ice is much heavier than snow, widespread tree damage occurred, resulting in power disruption to nearly a million customers.

Governor Deal declared a state of emergency on Monday, February 10th, and a presidential declaration of emergency was issued as the storm hit the state. The map below depicts this zone (*Figure 1*).

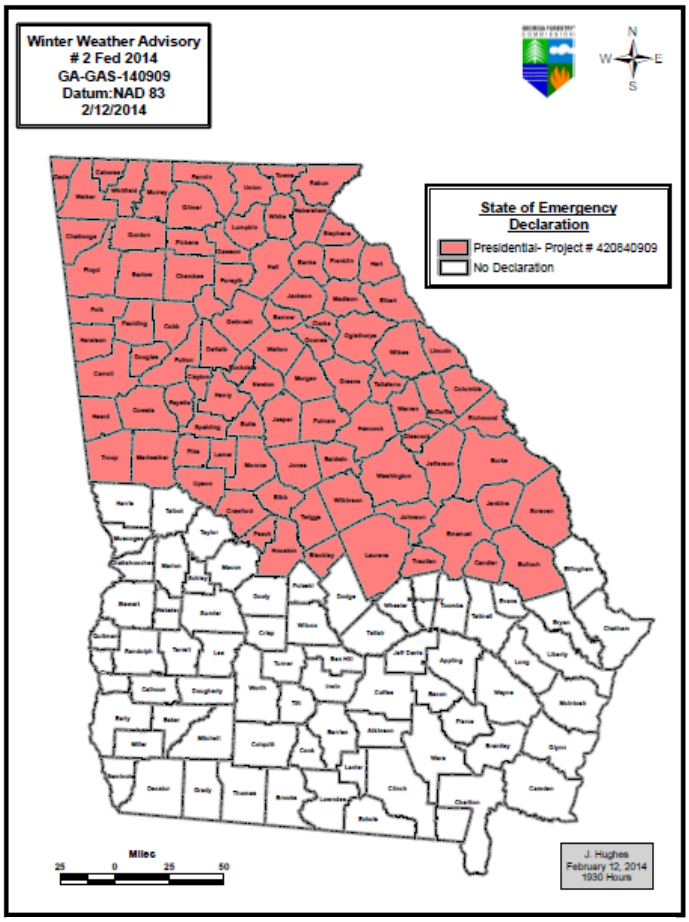

Figure 1: Counties included in the presidential declaration zone

The National Weather Service provided estimates of ice accumulations, and this information, coupled with field observation reports, helped define the area surveyed by the Georgia Forestry Commission for timber impact accounts. Small amounts of ice are known to affect trees, and higher amounts (especially exceeding three-fourths of an inch) can cause serious damage to certain timber types and age classes.

Another factor that affects tree damage is wind. Once ice accumulations peaked, a cold front moved through the state. Although wind speed varied, some areas reported winds of up to 35mph. Even minor winds during ice-loading can break or uproot trees. These occurrences were a major factor in the timber / tree damage associated with this storm, and may account for some of the variability detected.

OBSERVATIONS

A team of Georgia Forestry Commission foresters surveyed the zone believed to have endured the greatest impacts to our forests, and developed the map below. Please note that damage was observed beyond these counties, but it tended to be less intense than those shown by the map's shaded areas. Some of the highlighted counties had tremendous variations in the amount of damage observed. In addition, timber damage evaluation surveys were separated into rough categories of damage (at the county level), isolated timber stands within counties in the two lesser categories may have severe damage, and stands in the severe counties may only have minor damage. The variability of damage to similar stands even a few miles apart was extreme, so mangers should carefully evaluate timber throughout this broad region.

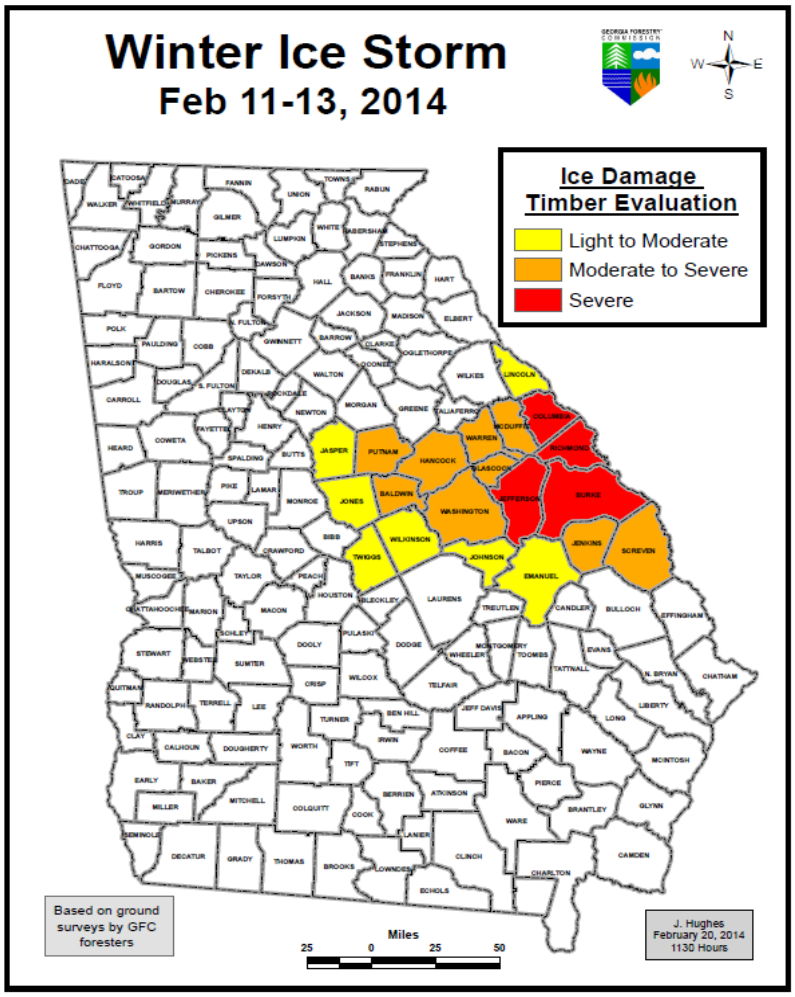

Figure 2: Counties with widespread Ice Damage

This survey examined landscape-level impacts and classifies them accordingly.

The categories of damage are based upon field observations about:

- Occurrence (frequency) of damage within a county.
- Levels of damage within two types of pine that were most frequently damaged (young pine stands, and pine stands on which a first-thinning had recently occurred.)

Ice Damage Intensity:

Light to moderate damage – Only branches and limbs broken from the tree, with minor damage to the overall stand and trees bent less than 45 degrees. No salvage operation will be necessary and the stand should recover with no additional management requirements, though long term yields will likely be impacted.

Moderate to severe damage – Branches and limbs broken from the trees with damage to the overall stand. More than 25% of stems broken and a salvage operation should be considered to minimize losses and remove trees that likely will not survive.

Severe damage – More than 30% of stems broken, tops broken out across the stand, limbs stripped, and trees bent more than 45 degrees. A salvage operation must be considered and a clearcut may be the prudent management decision.

Ice damage was not detected on most timber types but was concentrated on two types of pine: recently thinned pine stands, and younger stands less than 25 feet in height.

Recently thinned pine stands: These are primarily pine plantations that were thinned for the *first time* within the past several years. Trees adjust to the amount of space and competition within a stand, and those that have been thinned for the first time are adjusting to reduced protection from neighboring trees and are growing in diameter, which strengthens the main stem. They also respond by accelerating root growth which helps anchor the tree and aids in the increased moisture uptake needed to support larger live crowns. Depending on residual stand-density after thinning, it takes trees about five years to fully respond to the increased growing space. In the meantime, they are more prone to wind (and ice) damage.

These stands were particularly hard hit, which is unfortunate for landowners who have invested 15 to 20-plus years of growth getting their trees to this size. First-thinnings typically remove lower value wood (such as pulpwood / fuel wood), with the objective of allowing the residual stand to produce higher value products (such as sawtimber, plywood, and poles). From an investment standpoint, timber growth following a first thinning maximizes profits, so salvaging an ice-damaged stand is a devastating blow to expected returns.

Photo (left) – Twenty-one year old loblolly stand in Burke County; suffered over 30% stem breakage.

Thinning likely occurred two years ago.

Photo (right) – Nineteen year old loblolly stand in Jefferson County; suffered almost 50% stem breakage.

Thinning occurred within the past year.

Numerous older pine stands that had been thinned twice (or more) were also examined. Although some had damage, most would be considered minor, with many not requiring a salvage operation. The damage in these stands tended to be uprooted trees rather than stem breakage. This type of wind throw (tree that is completely uprooted) in older stands seemed prevalent throughout the region.

Landowners and managers of storm-damaged stands are highly encouraged to read and understand the implications of ice on different types of stands. Web links which provide detailed guidance are provided on the last page of this document.

Young pine stands: Pine plantations (of most species) that were 25 feet and taller - and *had never been thinned* - seemed to weather this ice storm well. The ability of dense stands to provide tree-to-tree support and prevent winds from uprooting individual trees was a big factor in these stands' withstanding minimal damage. Younger (and shorter) stands, however, didn't fare as well. One of the critical factors seemed to be that the trees still had many live branches almost to ground level, which likely accumulated so much ice that breaking points were reached for limbs and main stems.

Young stands of about six feet in height also seemed to fair well. Some of these have many bent stems (with some breakage), but young trees tend to correct this problem.

Some younger loblolly stands were damaged (especially in the counties noted as "Severe" on the map on page 2), but more damage occurred on longleaf and slash pine. Longleaf stands suffered the worst damage with stem and limb breakage but no stands seen were completely leveled. The resiliency of nature can be surprising, and the fate of these stands will become evident over the next few years. When tops break out, a lateral branch will assume dominance and there will be variation in long-term stem straightness.

Careful examination will be needed to determine the amount of permanent problems this storm has inflicted on each stand. Re-evaluation after the next growing season should give managers a better perspective on what lies ahead.

Photo (Left) – Five year old slash pine stand in Burke County showing many bent and leaning trees, with some breakage. Note the many leaning trees with limb breakage.

Photo (Right) – Nine year old longleaf pine stand in Burke County showing top and limb breakage. Note the many tops broken and some limb breakage.

EXTENT OF DAMAGE

GFC foresters evaluated the counties noted on the previous map and developed estimates of damage based upon a combination of this field work combined with a geospatial analysis of this region. These estimates do not include areas outside this zone, nor do they include hardwood, which was also impacted. Most hardwood damage consisted of limb and top breakage with most trees retaining enough live branches to support survival. Damage can be expected in the growth form of these trees and possibly in sluggish growth rates.

For pine type timber, an estimated 70,000+ acres were impacted, valued in excess of $65 million. The majority of these acres (61,000+) were in the recently thinned pine category. This estimate doesn't include damage outside of the zone shown on the map (page 2), and it does not account for hardwood damage acreages or values, so it should be considered conservative. Some of the merchantable pine will likely be salvaged, which could reduce the damage estimate somewhat. However, the values used were based upon landowners intending to grow these stands for at least 30 years, with the growing objective of solid wood products (sawtimber, plywood, and poles). So even if salvage occurs, part of the "loss" is in the future growth of these higher value products.

RECOMMENDATIONS

With the wide range of damage inflicted by this ice storm, there will likely be three distinct categories by which landowners make their evaluations:

1) Light damage or losses that may not warrant a salvage operation. This could include merchantable stands (trees are large enough to sell), which simply don't have enough timber damage to warrant a commercial harvest, or pre-merchantable stands where there is a good chance they will recover over time.

2) Stands with significant damage, mandating a salvage operation to recoup whatever value can be obtained from the stand. This might include a complete harvest for widespread damage, or a partial harvest of damaged timber to provide a commercial harvest.

3) Situations falling between the two scenarios above, in which a good bit of the timber is damaged but there might be enough timber to leave growing. In these cases, landowners are encouraged to use the services of a professional forester to help make the best decision for the situation. Immediately following a storm, it is difficult for landowners to accurately gauge how well a stand may recover, or to measure the amount of timber that could be allowed to remain for future growth and income.

For landowners facing a complete harvest to salvage their damaged timber, please consider reforesting the area. The Farm Service Agency has a cost share program that can assist with site preparation and planting costs called the Emergency Forest Restoration Program (EFRP). Apply at your local office.

Special thanks to other GFC foresters who helped develop this information:
Jeff Kastle, Chris Thompson, Chris Howell, Chris Barnes, Jeremy Hughes and Charles Bailey

URBAN TREE ASSESSMENTS

Georgia Forestry Commission certified arborist/foresters surveyed damage and storm-generated tree debris left to be removed from urban and rural communities. Survey results showed counties that experienced the most damage to their rural stands also suffered the most damage to their urban trees. The highest amount of damage, as one might expect, was found in Burke County.

Neighborhoods with large pine trees experienced the most loss, with the bulk of damage to branches and tree tops which were broken by the weight of ice. Additionally, "leaf on" trees, such as magnolia and cherry laurel, and old water oaks with structural issues, made up a large component of community forest tree failure. Crews observed very few trees that were completely destroyed or uprooted by the storm.

Much debris remains to be cut and stacked by homeowners and tree care companies before its removal from community rights-of-way can begin. Many trees that have lost more than 50% of their limbs, and trees that have been uprooted or split so that heartwood of the main trunk is evident, will need to be removed. Otherwise, impacted trees will require pruning, with particular attention being paid to higher risk trees with “hangers” (limbs broken, but not yet detached) and split limbs (see photo below). This will likely increase beyond initial assessments the total biomass that will eventually be collected.

Although the tree at left suffered minor ice damage, notice the branches that are broken and still hanging in the tree. These could impact the structure, the vehicle or humans. These “hangers” should be removed.

The pine tree at right lost half of the living portion of its crown and pruning is needed to remove branch stubs.

Special thanks to GFC foresters who helped with field work: Gary White, Joe Burgess, Joan Scales, Mark McClellan, Jeremy Hughes, Keith Murphy, Chris Howell and also Mark Millirons.

These resources can help forest landowners learn more about options and considerations for situations in which trees have been damaged by winter weather:

TIMBERLAND WIND / ICE DAMAGE:

How to Evaluate and Manage Storm-Damaged Forest Areas:
http://www.fs.fed.us/r8/foresthealth/pubs/storm_damage/contents.html

Evaluating wind / ice damage stands:
http://www.forestry.uga.edu/outreach/pubs/pdf/forestry/assessing_tornado_damaged_forest_stands5-30-08_1.pdf

Wind Wood Utilization (this has numerous documents and links that are beneficial):
http://www.windwoodutilization.org/salvage.asp

URBAN AND HAZARD TREE SAFETY:

http://www.gatrees.org/community-forests/management/trees-storm-safety/

Excellent site for Storm Damage…with an Urban Forestry angle:
http://hort.ifas.ufl.edu/treesandhurricanes/

TAXES:

National Timber Tax website (Master Index has good list of subject areas):
http://www.timbertax.org/

TIMBER SALES:

General information:
http://www.gatrees.org/forest-management/private-forest-management/timber-selling/

Landowners are encouraged to utilize professional foresters and arborists to help with decisions about timber management or potentially hazardous trees around homes and urban environments. Seeking independent advice is a sound way to reduce hasty judgments and insure all available options are considered.

CSRA REGIONAL PLAN 2035

Regional Assessment

Stakeholder Involvement Program

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CSRA REGIONAL PLAN 2035

Regional Assessment

Section 1: INTRODUCTION

1.1 Regional Plan Overview

The CSRA Regional Plan 2035 (hereinafter "the Plan") is the long-range plan for the management of the region's projected growth by local governments and the CSRA Regional Commission. The Plan's horizon is twenty years but will be updated in ten years to address changing regional conditions. The process is divided into three distinct parts, per the *Regional Planning Requirements* established by the Georgia Department of Community Affairs (DCA):

- Regional Assessment: Identification and analysis of existing conditions using available data
- Stakeholder Involvement Program: Strategy for public participation in the development of the Regional Agenda
- Regional Agenda: Regional vision and implementation program

The resulting analysis will assess the state of the region's socioeconomic, land use, and environmental opportunities and threats. The CSRA's vision and goals, together with an appraisal of the region, will set the strategic direction for the regional agenda. The regional agenda establishes program priorities for implementation.

This document contains the Regional Assessment and the Stakeholder Involvement Program, which will set the stage for the development of the Regional Agenda.

1.2 Regional Assessment Overview

This Regional Assessment includes a thorough analysis of issues and opportunities backed by extensive data gathering and analysis. It contains a map of Projected Development Patterns and an assessment of Areas Requiring Special Attention, which includes a range of categories, such as areas where rapid development is occurring or where infill or redevelopment is desirable. Finally, it includes an assessment of the region's development patterns in light of the state's Quality Community Objectives.

1.3 Stakeholder Involvement Program

This program outlines the process for participation by stakeholders in the creation of the Regional Agenda. It identifies stakeholders, outlines participation techniques and includes a schedule for the completion of the Regional Agenda.

1.4 Regional Agenda

The Regional Agenda is the culmination of the planning process. It will include a vision of the CSRA's future, along with an implementation program for how to get there.

1.5 How to Use This Plan

The CSRA Regional Plan is intended to serve as a reference and implementation point for potential users. A number of companion planning documents should be used in conjunction with the Regional Plan. These include:

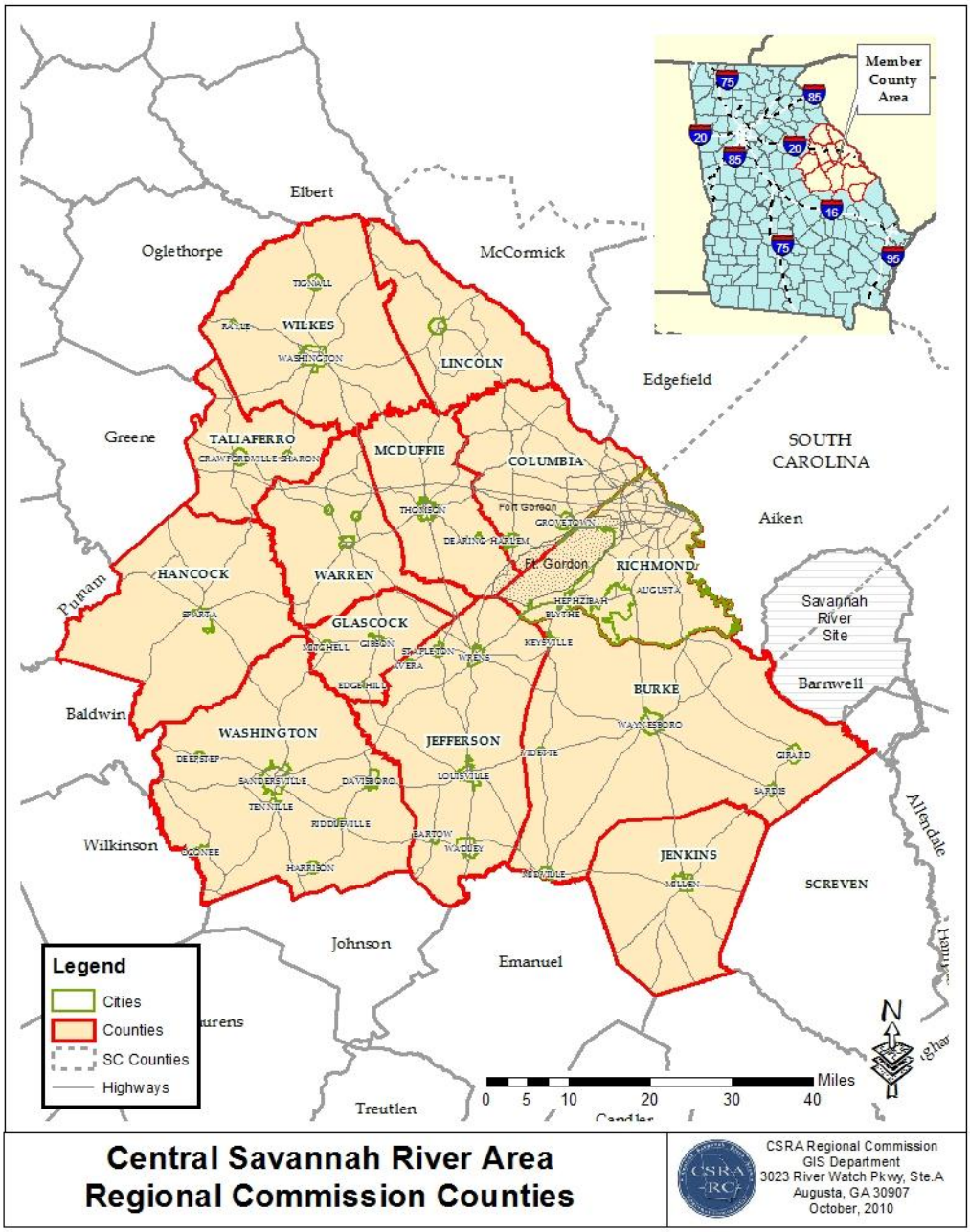
- CSRA Comprehensive Economic Development Strategy
- Augusta Area Diversification Initiative
- Fort Gordon Joint Land Use Study
- CSRA Regionally Important Resources Plan
- County and City Comprehensive Plans

- Statewide Plans

1.6 The Central Savannah River Area

The Central Savannah River Area (CSRA) encompasses an area nearly 6,500 square miles ð the largest political region in the state. Located in the east-central Georgia, along the Savannah River, the CSRA includes 13 counties: Burke, Columbia, Glascock, Hancock, Jefferson, Jenkins, Lincoln, McDuffie, Richmond, Taliaferro, Warren, Washington, and Wilkes (Figure 1). The largest city in the CSRA is Augusta ï the economic core of the region.

Figure 1: CSRA Location Map



1.6 About the CSRA Regional Commission

The CSRA Regional Commission (CSRA RC) serves thirteen counties and 41 municipalities in east-central Georgia, providing services in the areas of planning and land-use development, grant writing and administration, economic development, historic preservation, and geographic information systems development and implementation to member jurisdictions.

Additionally, the CSRA RC serves as the state-designated Area Agency on Aging (AAA) for the region. In this capacity, the CSRA RC works with local providers to ensure that services for the elderly are provided and monitored. By utilizing pass-through funds from state and federal sources, the Commissionôs AAA serves as a gateway for programs and resources aimed at helping senior citizens improve the quality of their lives during their retirement years.

The CSRA RC is also the parent company of the CSRA Business Lending. CSRA Business Lending makes loans to small and start-up businesses for the purposes of creating jobs and economic development opportunities within its service area.

Section 2: POTENTIAL REGIONAL ISSUES AND OPPORTUNITIES