DRAFT

Chatham County, GA

FLOODPLAIN MANAGEMENT PLAN

wsp

2024

EXECUTIVE SUMMARY

The purpose of this Floodplain Management Plan (FMP) is to reduce or eliminate risk to people and property from flood hazards. Every community faces different hazards and every community has different resources to draw upon in combating problems along with different interests that influence the solutions to those problems. Because there are many ways to deal with flood hazards and many agencies that can help, there is no one solution for managing or mitigating their effects. Planning is one of the best ways to develop a customized program that will mitigate the impacts of flood hazards while taking into account the unique character of a community.

The plan provides a framework for all interested parties to work together and reach consensus on identifying priority risks and selecting the preferred activities to mitigate those risks. A well-prepared FMP will ensure that all possible activities are reviewed and implemented so that the problem is addressed by the most appropriate and efficient solutions. It can also ensure that activities are coordinated with each other and with other goals and activities, preventing conflicts and reducing the costs of implementing each individual activity.

Chatham County followed the planning process prescribed by the Federal Emergency Management Agency (FEMA) and the 2017 Community Rating System (CRS) Coordinator's Manual. This plan was developed under the guidance of a Floodplain Management Planning Committee (FMPC) comprised of representatives of County Departments, citizens and other stakeholders. The FMPC conducted a risk assessment that identified and profiled flood hazards that pose a risk to the County, assessed the County's vulnerability to these hazards, and examined the capabilities in place to mitigate them. The flood hazards profiled in this plan include:

- Climate Change and Sea Level Rise
- Coastal and Inland Flooding
- Coastal and Stream Bank Erosion
- Dam Failure
- Hurricane and Tropical Storm
- Stormwater/Localized Flooding

This plan identifies activities that can be implemented for flood hazard reduction to protect the health and safety of the people of Chatham County and reduce property damage caused by floods. Based on the risk assessment developed for each of the flood hazards identified above, the FMPC identified goals and objectives for reducing the County's vulnerability to the hazards. The goals and objectives are summarized as follows:

Goal 1 – Reduce vulnerability of people, property, critical facilities and infrastructure to flood hazards to protect the health, safety and welfare of residents and visitors.

Objective 1.1: Advise the community of the safety and health precautions to implement before, during, and after a flood.
Objective 1.2: Educate residents and businesses on the benefits of improved water quality and the positive impacts on associated habitat.
Objective 1.3: Identify the location of vulnerable populations to aid in emergency evacuations.
Objective 1.4: Conduct site investigations, research exposure and hazard data, and evaluate proposed modifications to repair and mitigate stormwater management problems.
Objective 1.5: Implement flood mitigation measures or strategies, as necessary, to protect critical facilities.

Goal 2 – Reduce damage to development through flood resilient strategies and measures.

Objective 2.1: Prioritize capital improvement projects to address areas where poor drainage causes substantial flooding.
Objective 2.2: Promote development only in areas outside the special flood hazard area (1%-annual-chance flood).
Objective 2.3: Use a variety of mitigation techniques to protect buildings from flood damage, including elevation, acquisition, and other retrofitting techniques where appropriate.
Objective 2.4: Encourage property owners to assume an appropriate level of responsibility for their own protection, including the purchase of flood insurance.
Objective 2.5: Integrate the County's relevant resilience strategies to support mitigation and prevention efforts that reduce future flood risk and increase the ability to respond and recover from future hazards.

Goal 3 – Protect natural resources by employing watershed-based approaches that balance environmental, economic and engineering considerations.

Objective 3.1: Maintain and enforce regulations to protect and restore wetlands and ecological functions for long-term environmental, economic and recreational values.
Objective 3.2: Pursue water management approaches and techniques that improve water quality and protect public health.
Objective 3.3: Preserve and maintain open space in flood prone areas to reduce flood damage to buildings and to provide recreational benefits.
Objective 3.4: Continue to protect wetlands and environmentally sensitive areas from encroachment of development by requiring buffers and other setback mechanisms.

Goal 4 – Encourage property owners, through education and outreach measures, to protect their homes and businesses from flood damage.

Objective 4.1: Educate property owners, including repetitive loss properties, on FEMA grant programs and other methods to mitigate possible flood damage.
Objective 4.2: Provide current flood-proofing and retrofitting information to property owners.
Objective 4.3: Effectively communicate flood risk to residents, businesses, contractors, realtors and prospective buyers.

To meet the identified goals, this plan recommends 16 mitigation actions, which are summarized in the table that follows. Note: Item number does not indicate an order of priority.

Action Item No.	Action	Related to Goal	Address Current Development	Address Future Development	Continued Compliance with NFIP	Mitigation Category
1	Acquire and demolish high-risk flood-prone buildings and repetitive loss structures and preserve land as open space.	2, 3		✓		Property Protection
2	Consider higher regulatory standards to better protect existing and future development.	1, 2	✓			Prevention
3	Update stormwater conveyance systems to alleviate flooding for existing and new development.	1, 2	✓	✓	✓	Structural Projects
4	Improve stormwater management regulations to include higher standards for design storm, size of development regulated, low-impact development, and public maintenance of detention and retention facilities to improve water quality.	1, 2	✓	✓		Prevention
5	Relocate, elevate, or retrofit substantially damaged and/or pre-FIRM properties.	1, 2	✓			Property Protection
6	Encourage the purchase of flood insurance and educate public on Increased Cost of Compliance (ICC) coverage through the County's CRS Flood Insurance Advocate. The advocate will facilitate face-to-face meetings, outreach events, and presentations to HOAs, and maintain a record of events attended and the number of people reached.	2, 4	✓		✓	Property Protection, Public Information & Outreach
7	Display signs along roads and canals at entrances to high, moderate, and low flood risk areas.	4	✓	✓	✓	Public Information & Outreach
8	Enact deed restrictions and other growth management tools to preserve wetland and natural resource areas and conserve their natural and ecological functions.	3	✓	✓	✓	Prevention
9	Improve recurring local funding for Public Works maintenance and flood management activities implemented through the Capital Improvements Program.	1, 2	✓		✓	Structural Projects
10	Elevate lift stations and electrical components above the base flood elevation (BFE).	1	✓	✓		Property Protection
11	Partner with Georgia Tech to install additional tidal and riverine flood gauges at various locations	1, 4			✓	Emergency Services, Public

Action Item No.	Action	Related to Goal	Address Current Development	Address Future Development	Continued Compliance with NFIP	Mitigation Category
	throughout the County to help provide real-time flood data on the County website.					Information & Outreach
12	Develop a long-range regional plan for sea level rise and compounding hazards like subsidence which evaluates multiple adaptation methods, including updated codes and ordinances that protect property based on the report findings.	2, 3		✓		Prevention
13	Evaluate sanitary sewer basins for possible transition from septic to public sewer.	1, 2	✓	✓		Structural
14	Strengthen policies and ordinances limiting allowable impervious coverage for new development.	1		✓		Prevention
15	Develop Watershed Master Plan	1, 3	✓	✓	✓	Prevention
16	Publish the locations (roads and intersections) that often flood after heavy rain events, major storms, or tidal flooding.	1, 4	✓	✓		Public Information & Outreach

This plan fulfills the requirements of Section 104 of the Disaster Mitigation Act of 2000 and qualifies for CRS credit. The following table provides the 10-step CRS planning credit activity checklist and the section within this plan that describes the completion of each planning step in more detail.

CRS Planning Credit Activity Checklist

CRS Step	Section/Page
1. Organize to prepare the plan.	
a. Involvement of office responsible for community planning	Section 2.1
b. Planning committee of department staff	Section 2.1 / Table 2.1
c. Process formally created by the community's governing board	--
2. Involve the public.	
a. Planning process conducted through a planning committee	Section 2.1 / Table 2.1 & 2.2 / Appendix A
b. Public meetings held at the beginning of the planning process	Section 2.2.1 / Table 2.6 /Appendix. A
c. Public meeting held on draft plan	Section 2.2.1 / Table 2.6 /Appendix. A
d. Other public information activities to encourage input	Section 2.2.1, Table 2.7 / Appendix. A
3. Coordinate with other agencies.	
a. Review of existing studies and plans	Section 2.2.1, Table 2.8
b. Coordinating with communities and other agencies	Section 2.2.1, p. 10/ Appendix A
4. Assess the hazard.	
a. Plan includes an assessment of the flood hazard with:	Sections 5.1 – 5.7
(1) A map of known flood hazards	Figure 4.9 / Figure 4.14 / Figures 5.17 – 4.20/ Figures 4.22, 4.23 / Figures 4.25 / Figures 4.27 – 4.32 / Figures 4.34 – 4.43
(2) A description of known flood hazards	Sections 4.4 & 4.5
(3) A discussion of past floods	Sections 4.4 & 4.5
b. Plan includes assessment of less frequent floods	Sections 4.4.3 & 4.4.4
c. Plan includes assessment of areas likely to flood	Section 4.5.2
d. The plan describes other natural hazards	Sections 4.4.5 and 4.4.3
5. Assess the problem.	
a. Summary of each hazard identified in the hazard assessment and their community impact	Section 4.4
b. Description of the impact of the hazards on:	
(1) Life, safety, health, procedures for warning and evacuation	Section 4.5.4
(2) Public health including health hazards to floodwaters/mold	Section 4.5.4
(3) Critical facilities and infrastructure	Section 4.3, Table 4.7 & 4.8, Figure 4.7 / Section 4.4, Table 4.19, Figure 4.19
(4) The community's economy and tax base	Section 3.5
(5) Number and type of affected buildings	Section 4.4, Table 4.16, p. 72-73
c. Review of all damaged buildings/flood insurance claims	Section 4.4.2, Tables 4.20 – 4.23, p.77-78
d. Areas that provide natural floodplain functions	Section 3.3, p. 18-23
e. Development/Redevelopment/Population Trends	Sections 3.9 & 4.5.3
f. Impact of future flooding conditions outlined in Step 4, item c	Section 4.5.3
6. Set goals.	Section 6.2, p. 153-155

CRS Step	Section/Page
7. Review possible activities.	
a. Preventive activities	Section 6.3 / Appendix B
b. Floodplain Management Regulatory/current & future conditions	Section 6.3 / Appendix B
c. Property protection activities	Section 6.3 / Appendix B
d. Natural resource protection activities	Section 6.3 / Appendix B
e. Emergency services activities	Section 6.3 / Appendix B
f. Structural projects	Section 6.3 / Appendix B
g. Public information activities	Section 6.3 / Appendix B
8. Draft an action plan.	
a. Actions must be prioritized	Section 6.3.1 / Appendix B
(1) Recommendations for activities from two of the six categories	Section 6.3.1 / Appendix B
(2) Recommendations for activities from three of the six categories	Section 6.3.1 / Appendix B
(3) Recommendations for activities from four of the six categories	Section 6.3.1 / Appendix B
(4) Recommendations for activities from five of the six categories	Section 6.3.1 / Appendix B
b. Post-disaster mitigation policies and procedures	Section 6.2.1 / Section 5.1 / Appendix B
c. Action items for mitigation of other hazards	Section 6.3.1 / Appendix B
9. Adopt the plan.	Section 7
10. Implement, evaluate and revise.	
a. Procedures to monitor and recommend revisions	Sections 8.2 – 8.3
b. Same planning committee or successor committee that qualifies under Section 511.a.2 (a) does the evaluation	Section 9.1.2

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1 INTRODUCTION

Chapter 1 provides a general introduction to hazard mitigation and an introduction to the Chatham County Floodplain Management Plan. This chapter contains the following subsections:

- 1.1 Purpose and Authority
- 1.2 Background
- 1.3 Scope
- 1.4 References
- 1.5 Plan Organization

1.1 PURPOSE AND AUTHORITY

As defined by FEMA, "hazard mitigation" means any sustained action taken to reduce or eliminate the long-term risk to life and property from a hazard event. Hazard mitigation planning is the process through which hazards are identified, likely impacts determined, mitigation goals set, and appropriate mitigation strategies determined, prioritized, and implemented. The purpose of this plan is to identify, assess and mitigate flood risk to better protect the people and property of Chatham County from the effects of flood hazards. This plan documents Chatham County's hazard mitigation planning process and identifies relevant flood hazards and vulnerabilities and strategies the County will use to decrease vulnerability and increase resiliency and sustainability.

This plan was developed in a joint and cooperative venture by members of a Floodplain Management Planning Committee (FMPC) which included representatives of County departments, federal and state agencies, citizens and other stakeholders. This Plan will ensure Chatham County's continued eligibility for federal disaster assistance including the Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation Program (PDM), and the Flood Mitigation Assistance Program (FMA). This Plan has been prepared in compliance with Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act or the Act), 42 U.S.C. 5165, enacted under Section 104 of the Disaster Mitigation Act of 2000, (DMA 2000) Public Law 106-390 of October 30, 2000, as implemented at CFR 201.6 and 201.7 dated October 2007.

1.2 BACKGROUND

Chatham County currently participates in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) and qualifies for a Class 5 Rating. The CRS recognizes and encourages community floodplain management activities that exceed the minimum standards. Under the CRS, flood insurance premium rates are adjusted to reflect the reduced flood risk resulting from community activities that (1) reduce flood losses, (2) facilitate accurate insurance ratings, and (3) promote the awareness of flood insurance.

It is the goal of the FMPC to continue to work to make improvements to this plan so as to better serve the citizens of Chatham County, and to strive to maintain or improve the Class 5 Rating for the County, so that the highest reduction in flood insurance premium rates can be available for its citizens. Through the County's participation in the NFIP and a Class 5 rating with the CRS, flood insurance policyholders are entitled to a 25% discount on their flood insurance premiums.

1.3 SCOPE

This document comprises a Floodplain Management Plan for Chatham County, Georgia. This plan includes only the unincorporated areas of the County. This plan is an update to the County's existing Floodplain Management Plan, which was originally developed and adopted in 2018.

1.4 REFERENCES

The following FEMA guides and reference documents were used to prepare this document:

- FEMA 386-1: Getting Started. September 2002.
- FEMA 386-2: Understanding Your Risks: Identifying Hazards and Estimating Losses. August 2001.
- FEMA 386-3: Developing the Mitigation Plan. April 2003.
- FEMA 386-4: Bringing the Plan to Life. August 2003.
- FEMA 386-5: Using Benefit-Cost Review in Mitigation Planning. May 2007.
- FEMA 386-6: Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning. May 2005.
- FEMA 386-9: Using the Hazard Mitigation Plan to Prepare Successful Mitigation Projects. August 2008.
- FEMA. Local Mitigation Planning Handbook. March 2013.
- FEMA. Local Mitigation Plan Review Guide. October 1, 2011.
- FEMA. Local Mitigation Planning Policy Guide. April 19, 2023.
- FEMA Hazard Mitigation Assistance Unified Guidance. June 1, 2010.
- FEMA. Integrating Hazard Mitigation into Local Planning: Case Studies and Tools for Community Officials. March 1, 2013.
- FEMA. Mitigation Ideas. A Resource for Reducing Risk to Natural Hazards. January 2013.

Specific DMA requirements are referenced under each section heading, where applicable.

1.5 PLAN ORGANIZATION

The Chatham County Floodplain Management Plan is organized as follows:

- Chapter 2: Planning Process
- Chapter 3: Community Profile
- Chapter 4: Flood Risk Assessment
- Chapter 5: Capability Assessment
- Chapter 6: Mitigation Strategy
- Chapter 7: Plan Adoption
- Chapter 8: Plan Implementation and Maintenance
- Appendix A: Planning Process Documentation
- Appendix B: Mitigation Strategy
- Appendix C: References

2 PLANNING PROCESS

Requirement §201.6(b): An open public involvement process is essential to the development of an effective plan. To develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:
1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process; and
3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.
Requirement §201.6(c)(1): The plan shall include the following:
1) Documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

This Chapter reviews the process that was followed to develop this plan. It contains the following subsections:

- 2.1 Local Government Participation
- 2.2 The 10-Step Planning Process

This Floodplain Management Plan was developed in accordance with DMA and CRS planning process requirements under the guidance of a Floodplain Management Planning Committee (FMPC). The Committee's representatives included representatives of County Departments as well as local citizens and stakeholders. As a result of this process and the collective input of City staff, stakeholders, and the public, this plan analyzes flood risks and vulnerabilities, sets goals and objectives for mitigation, and identifies activities that can be undertaken by both public and private entities to reduce safety hazards, health hazards, and property damage caused by floods. Information in this plan will be used to help guide and coordinate mitigation activities to help reduce the cost of disaster response and recovery by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruptions.

Appendix A provides additional information and documentation of the planning process that was implemented for the development of this FMP.

2.1 LOCAL GOVERNMENT PARTICIPATION

The DMA planning regulations and guidance stress that each local government seeking FEMA approval of their mitigation plan must participate in the planning effort in the following ways:

- Participate in the process as part of the FMPC;
- Detail where within the planning area the risk differs from that facing the entire area;
- Identify potential mitigation actions; and
- Formally adopt the plan.

These participation requirements were fulfilled by the FMPC, which included County staff representatives. For the Chatham County FMPC, "participation" meant the following:

- Providing facilities for meetings;
- Attending and participating in the FMPC meetings;
- Collecting and providing requested data (as available);

- Managing administrative details;
- Making decisions on plan process and content;
- Identifying mitigation actions for the plan;
- Reviewing and providing comments on plan drafts;
- Informing the public, local officials, and other interested parties about the planning process and providing opportunity for them to comment on the plan;
- Coordinating, and participating in the public input process; and
- Coordinating the formal adoption of the plan by the Board of Commissioners.

Through the planning process, the FMPC met the above participation requirements. The FMPC included five representatives from County departments, and five outside stakeholders. The members of the FMPC are listed in Table 2.1. In keeping with CRS requirements, the FMPC included a representative from the Metropolitan Planning Commission, which is responsible for community land use and comprehensive planning in Chatham County. Appendix A provides additional information and documentation of the planning process that was implemented for the development of this FMP.

Table 2.1 – Floodplain Management Planning Committee (FMPC) Members

Name	Title/Position	Department/Organization	Stakeholder
Dr. Angela C. Bliss, CFM	Floodplain Administrator / CRS Program Manager	Chatham County Engineering	
Jackie Jackson	Resilience Program Administrator	Chatham County Manger's Office	
David Anderson	GIS Analyst	Chatham County GIS	
Randall Mathews	Deputy Director	Chatham Emergency Management Agency	
Edward Morrow	Director of Current Planning/Development Services	Metropolitan Planning Commission	✓
Tom McDonald	Floodplain Administrator	City of Savannah	✓
Jeffrey Brady	Insurance Agent, Rountree Brady INS	Allstate Insurance	✓
Amy Growe	--	Resident	✓
Don Sullens*	--	Resident	✓
Michael Blakely*	Floodplain Administrator; CRS Program Manager	Department of Engineering	
Greg Harris	--	Resident	✓

* Previous FMPC member, replaced by Angela Bliss and Greg Harris

Table 2.2 details the FMPC meeting dates and the FMPC members in attendance. A more detailed summary of FMPC meeting dates including topics discussed and meeting locations follows in Table 2.5. Although all FMPC members could not be present at every meeting, coordination was ongoing throughout the entire planning process through emails and phone conversations and by direct contact with the Chatham County Department of Engineering.

Table 2.2 – FMPC Meeting Attendance Record

Member Name	Affiliation	Meeting Date			
		11/21/2023	2/21/2024	5/14/2024	7/16/2024
Dr. Angela C. Bliss, CFM	Chatham County Engineering	✓	✓	✓	✓
Jackie Jackson	Chatham County Manger's Office		✓	✓	✓

Member Name	Affiliation	Meeting Date			
		11/21/2023	2/21/2024	5/14/2024	7/16/2024
David Anderson	Chatham County GIS		✓		✓
Randall Mathews	Chatham Emergency Management Agency			✓	
Edward Morrow	Metropolitan Planning Commission	✓	✓		✓
Tom McDonald	City of Savannah		✓	✓	✓
Jeffrey Brady	Allstate Insurance	✓	✓	✓	✓
Amy Growe	Resident			✓	
Don Sullens	Resident	✓		N/A	N/A
Michael Blakely	Chatham County Engineering	✓	N/A	N/A	N/A
Greg Harris	Resident	N/A	N/A	N/A	✓

Based on the area of expertise of each County representative participating on the FMPC, Table 2.3 demonstrates the County staff's capability in the six mitigation categories (Prevention, Property Protection, Natural Resource Protection, Emergency Services, Structural Flood Control Projects and Public Information).

Table 2.3 – Chatham County Staff Capability with Six Mitigation Categories

Community Department/Office	Prevention	Property Protection	Natural Resource Protection	Emergency Services	Structural Flood Control	Public Information
Metropolitan Planning Commission	✓	✓	✓		✓	✓
Emergency Management				✓	✓	✓
Public Works	✓	✓	✓		✓	
Engineering	✓	✓	✓		✓	
GIS	✓					✓

2.2 THE 10-STEP PLANNING PROCESS

The planning process for preparing the Chatham County Floodplain Management Plan was based on DMA planning requirements and FEMA's associated guidance. This guidance is structured around a four-phase process:

1. Planning Process
2. Risk Assessment
3. Mitigation Strategy
4. Plan Maintenance

Into this process, the County integrated a more detailed 10-step planning process used for FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. Thus, the modified 10-step process used for this plan meets the requirements of six major programs: FEMA's Hazard Mitigation Grant Program; Pre-Disaster Mitigation Program; Community Rating System; Flood Mitigation Assistance Program; Severe Repetitive Loss Program; and new flood control projects authorized by the U.S. Army Corps of Engineers.

Table 2.4 shows how the 10-step CRS planning process aligns with the four phases of hazard mitigation planning pursuant to the Disaster Mitigation Act of 2000.

Table 2.4 – Mitigation Planning and CRS 10-Step Process Reference Table

DMA Process	CRS Process
Phase I – Planning Process	
§201.6(c)(1)	Step 1. Organize to Prepare the Plan
§201.6(b)(1)	Step 2. Involve the Public
§201.6(b)(2) & (3)	Step 3. Coordinate
Phase II – Risk Assessment	
§201.6(c)(2)(i)	Step 4. Assess the Hazard
§201.6(c)(2)(ii) & (iii)	Step 5. Assess the Problem
Phase III – Mitigation Strategy	
§201.6(c)(3)(i)	Step 6. Set Goals
§201.6(c)(3)(ii)	Step 7. Review Possible Activities
§201.6(c)(3)(iii)	Step 8. Draft an Action Plan
Phase IV – Plan Maintenance	
§201.6(c)(5)	Step 9. Adopt the Plan
§201.6(c)(4)	Step 10. Implement, Evaluate and Revise the Plan

2.2.1 PHASE I – PLANNING PROCESS

PLANNING STEP 1: ORGANIZE TO PREPARE THE PLAN

With Chatham County's commitment to participate in the DMA planning process and the CRS, County officials worked to establish the framework and organization for development of the plan. An initial meeting was held with key community representatives to discuss the organizational aspects of the plan development process. The FMPC established for the development of the County's 2018 Floodplain Management Plan was reconvened for this update.

During the planning process, the FMPC communicated through formal in-person and virtual meetings and via email and phone conversations. Draft documents were posted on the County's website so that FMPC members could easily access and review them.

Committee meetings were organized to familiarize the FMPC with the planning process and facilitate discussion on CRS Steps 4 through 8. The FMPC Kick-Off meeting was held on November 21, 2023 at 11:00 a.m. in the Metropolitan Planning Commission hearing room. The meeting covered the scope of work and an introduction to the DMA, CRS, and FMA requirements. The committee also discussed the hazard identification and ways to involve the public throughout the planning process. The next two FMPC meetings, which took place on February 21, 2024 and May 14, 2024, were held in person and virtually via Microsoft Teams. At these meetings, the FMPC discussed the plan goals and objectives, local capability, mitigation action updates, new mitigation actions, and hazard risk and vulnerability assessment findings. The last FMPC meeting, held at Chatham County Administrative Center on July 16, 2024, provided the FMPC the opportunity to finalize the action plan and review the draft plan.

Agendas, minutes, and attendance records for the FMPC meetings are included in Appendix A. The meeting dates and topics discussed are summarized below in Table 2.5. All FMPC meetings were open to the public and all public meetings were properly advertised in the newspaper and on the County's website.

Table 2.5 – Summary of FMPC Meeting Dates

Meeting Type	Meeting Topic	Meeting Date	Meeting Location
FMPC #1 (Kick-off)	1) Introduction to DMA, CRS and the planning process 2) Organize resources: the role of the FMPC, planning for public involvement, and coordinating with other agencies and stakeholders	November 21, 2023 11:00 a.m. – 12:00 p.m.	Metropolitan Planning Commission Mendonsa Hearing Room 110 E. State St & Microsoft Teams
FMPC #2	1) Review Public Flood Protection Questionnaire and other public feedback 2) Discuss/develop mitigation goals for the FMP 3) Discuss mitigation capability 4) Review status updates for mitigation actions	February 21, 2024 3:30 – 4:30 p.m.	Microsoft Teams
FMPC #3	1) Review/discussion of Flood Risk Assessment (Assess the Hazard) 2) Review/discussion of Vulnerability Assessment (Assess the Problem) 3) Discuss and finalize goals and objectives 4) Review potential mitigation actions	May 14, 2024 11:00a.m. – 12:00 p.m.	Microsoft Teams
FMPC #4	1) Review "Draft" Floodplain Management Plan 2) Solicit comments and feedback from the FMPC 3) Review and finalize Mitigation Action Plan	July 16, 2024 3:00 – 4:00 p.m.	124 Bull St. & Zoom

PLANNING STEP 2: INVOLVE THE PUBLIC

Two public meetings were held during the planning process, one at the beginning of the process to introduce the plan update and gather public input, and another at the end of the planning process to share the draft plan and solicit feedback. The planning process officially began with a public meeting held on November 21, 2023 at 5:00PM. A press release was distributed on July 8, 2024, and made available on the County website. Documentation of public outreach efforts is provided in Appendix A. The formal public meetings held during the planning process are summarized in Table 2.6.

Table 2.6 – Summary of Public Meeting Dates

Meeting Type	Meeting Topic	Meeting Date	Meeting Locations
Public Meeting #1	1) Introduction to DMA, CRS and the planning process 2) Introduction to hazard identification	November 21, 2023 5:00 – 6:00 p.m.	Metropolitan Planning Commission Mendonsa Hearing Room 110 E. State St & Microsoft Teams

Meeting Type	Meeting Topic	Meeting Date	Meeting Locations
Public Meeting #2	1) Review "Draft" Floodplain Management Plan 2) Solicit comments and feedback from the public	July 16, 2024 5:30 – 6:30 p.m.	124 Bull St. & Zoom

INVOLVING THE PUBLIC BEYOND ATTENDING PUBLIC MEETINGS

Early discussions with the FMPC established the initial plan for public involvement. The FMPC agreed to an approach using established public information mechanisms and resources within the community. Public involvement activities for this plan update included press releases, stakeholder and public meetings, public surveys, and the collection of public and stakeholder comments on the draft plan.

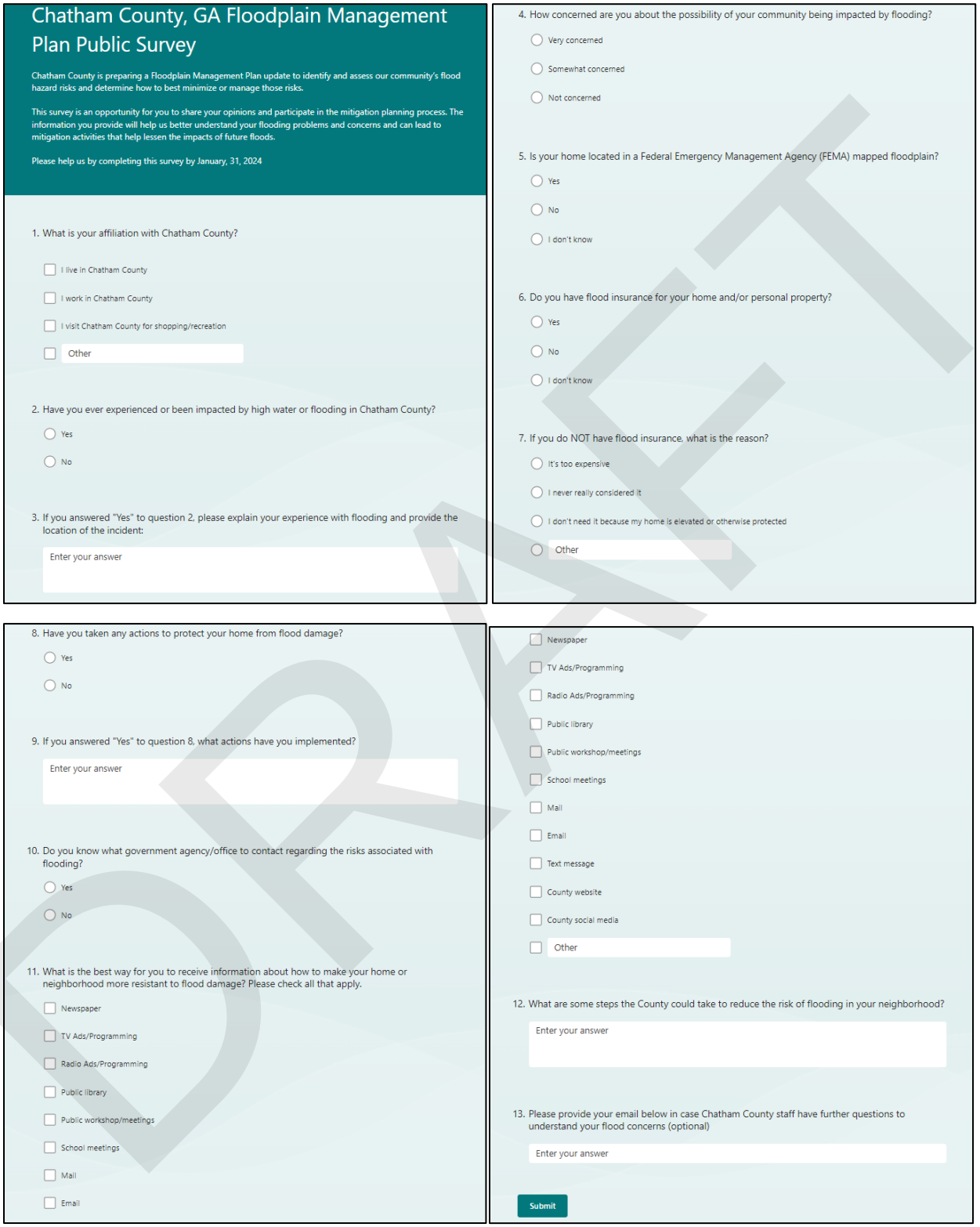
The FMPC found six different ways to involve the public beyond attending public meetings. Documentation to support the additional public outreach efforts can be found in Appendix A. The public outreach activities beyond the formal public meetings are summarized below in Table 2.7.

Table 2.7 – Public Outreach Efforts

	Location	Event/Message	Date
1	County website	Public Survey on flood risk and mitigation strategies	November 2023
2	County/CEMA social media	Public Survey on flood risk and mitigation strategies	November 2023
3	County website	Draft plan posted for public comment	July 2024
4	Stakeholder Outreach	Draft HIRA was sent to stakeholders for review	July 8 2024
5	Stakeholder Outreach	Draft plan was sent to stakeholders for review	July 2024
6	County website	Planning meeting and information updates posted throughout planning process	November 2023 – July 2024
7	County/CEMA social media	Updates on planning meetings and process posted throughout plan development	November 2023 – June 2024
8	County/CEMA social media	Meeting publicity on for final FMP meeting posted on County website and social media	July 2024

The public survey which requested public input into the Floodplain Management Plan planning process and the identification of mitigation activities to lessen the risk and impact of future flood hazard events is shown in Figure 2-1. Chatham County placed the survey on its website, social media, and on Chatham Emergency Management Agency's social media pages. A copy of the complete survey is presented in Appendix A along with a full summary of the results.

Figure 2-1 – Public Survey



Chatham County, GA Floodplain Management Plan Public Survey

Chatham County is preparing a Floodplain Management Plan update to identify and assess our community's flood hazard risks and determine how to best minimize or manage those risks.

This survey is an opportunity for you to share your opinions and participate in the mitigation planning process. The information you provide will help us better understand your flooding problems and concerns and can lead to mitigation activities that help lessen the impacts of future floods.

Please help us by completing this survey by January, 31, 2024

1. What is your affiliation with Chatham County?
   - [ ] I live in Chatham County
   - [ ] I work in Chatham County
   - [ ] I visit Chatham County for shopping/recreation
   - [ ] Other
2. Have you ever experienced or been impacted by high water or flooding in Chatham County?
   - ( ) Yes
   - ( ) No
3. If you answered "Yes" to question 2, please explain your experience with flooding and provide the location of the incident:
   Enter your answer
4. How concerned are you about the possibility of your community being impacted by flooding?
   - ( ) Very concerned
   - ( ) Somewhat concerned
   - ( ) Not concerned
5. Is your home located in a Federal Emergency Management Agency (FEMA) mapped floodplain?
   - ( ) Yes
   - ( ) No
   - ( ) I don't know
6. Do you have flood insurance for your home and/or personal property?
   - ( ) Yes
   - ( ) No
   - ( ) I don't know
7. If you do NOT have flood insurance, what is the reason?
   - ( ) It's too expensive
   - ( ) I never really considered it
   - ( ) I don't need it because my home is elevated or otherwise protected
   - ( ) Other
8. Have you taken any actions to protect your home from flood damage?
   - ( ) Yes
   - ( ) No
9. If you answered "Yes" to question 8, what actions have you implemented?
   Enter your answer
10. Do you know what government agency/office to contact regarding the risks associated with flooding?
    - ( ) Yes
    - ( ) No
11. What is the best way for you to receive information about how to make your home or neighborhood more resistant to flood damage? Please check all that apply.
    - [ ] Newspaper
    - [ ] TV Ads/Programming
    - [ ] Radio Ads/Programming
    - [ ] Public library
    - [ ] Public workshop/meetings
    - [ ] School meetings
    - [ ] Mail
    - [ ] Email
    - [ ] Text message
    - [ ] County website
    - [ ] County social media
    - [ ] Other
12. What are some steps the County could take to reduce the risk of flooding in your neighborhood?
    Enter your answer
13. Please provide your email below in case Chatham County staff have further questions to understand your flood concerns (optional)
    Enter your answer

Submit

PLANNING STEP 3: COORDINATE

Early in the planning process, the FMPC determined that the risk assessment, mitigation strategy development, and plan approval would be greatly enhanced by inviting other local, state and federal agencies and organizations to participate in the process. Invitations to support the FMPC and the planning process were extended to the following federal, state, and local stakeholders that might have an interest in the County's floodplain management efforts:

Neighboring Communities

- Effingham County, GA
- Bryan County. GA
- Liberty County, GA
- Beaufort County, SC
- Jasper County, SC
- City of Bloomingdale
- City of Pooler
- City of Port Wentworth
- City of Tybee Island

State and Federal Government

- Georgia Emergency Management and Homeland Security Agency
- Georgia State Hazard Mitigation Officer
- Georgia Department of Natural Resources
- FEMA Region 4
- ISO/CRS
- United States Geological Survey
- National Oceanic and Atmospheric Administration
- U.S. Army Corps of Engineers

Educational Institutions

- Savannah State University
- Savannah College of Art & Design
- Georgia Southern University
- Armstrong State University

Other Stakeholders

- American Red Cross
- WTOC News
- Savannah Water Supply
- WSAV
- The Georgia Conservancy
- Savannah Tree Foundation
- Sierra Club

A detailed list of the stakeholders that were invited to participate in the planning process is included in Appendix A.

Coordination began with contacting these stakeholders via email and informing them of the plan update process and opportunities to participate. Stakeholders were invited to attend public meetings, provide data and technical information to the FMPC, review draft documents, and otherwise participate in the planning process. A sample coordination letter is provided in Appendix A. Further coordination with interested stakeholders included email correspondence to provide opportunities to review the draft HIRA, attend committee and public meetings, and offer input to the FMPC.

COORDINATION WITH OTHER COMMUNITY PLANNING EFFORTS AND HAZARD MITIGATION ACTIVITIES

Coordination with other community planning efforts is also paramount to the success of this plan. Mitigation planning involves identifying existing policies, tools, and actions that will reduce a community's risk and vulnerability to hazards. Chatham County uses a variety of comprehensive planning mechanisms, such as a Comprehensive Plan, land development regulations, and ordinances to guide growth and development. Integrating existing planning efforts, mitigation policies, and action strategies into this plan establishes a credible and comprehensive plan that ties into and supports other community programs. The development of this plan incorporated information from the existing plans, studies, reports, and initiatives as well as other relevant data listed in Table 2.8.

Table 2.8 – Summary of Existing Studies and Plans Reviewed

Resource Referenced	Use in this Plan
Plan 2040 Chatham County – Savannah Comprehensive Plan, 2020	Use to identify growth and development goals and develop the community profile in Chapter 3.
Chatham County Code Book • Zoning Ordinance • Subdivision Regulation • Flood Damage Prevention Ordinance • Land-Disturbing Activities Ordinance • Stormwater Management Ordinance • Soil Erosion and Sedimentation Control Ordinance	Used to evaluate mitigation capabilities in Chapter 5 and to inform the review of mitigation action alternatives in Chapter 6 and Appendix B.
Chatham County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan, 2020	Used to identify flood hazards and develop hazard profiles in Chapter 4, evaluate mitigation capabilities in Chapter 5, and inform the review of mitigation action alternatives in Chapter 6 and Appendix B.
Georgia Coastal Hazards Portal	Used to develop the erosion hazard profile in Chapter 4.
Chatham County and Incorporated Areas Flood Insurance Study (FIS), August 2018	Use to develop the flood hazard profile and identify flooding sources in the County and to prepare the flood vulnerability assessment in Chapter 4.
Chatham County Emergency Operations Plan, 2020	Used to evaluate mitigation capabilities in Chapter 5 and to inform the review of mitigation action alternatives in Chapter 6 and Appendix B.
Chatham County Disaster Recovery Plan, 2015	Used to develop the flood risk and vulnerability conclusions in Chapter 4, evaluate mitigation capabilities in Chapter 5, and inform the review of mitigation action alternatives in Chapter 6 and Appendix B.
Chatham County Stormwater System Sea-Level Rise Vulnerability Assessment and Coastal Watershed Management Plan, 2020	Used to evaluate mitigation capabilities in Chapter 5 and to integrate relevant recommended CIP projects into the mitigation action plan in Chapter 6 and a review of mitigation alternatives in Appendix B.

These and other documents were reviewed and considered, as appropriate, during the collection of data to support Planning Steps 4 and 5, which include the hazard identification, risk and vulnerability assessment, and capability assessment, and in Planning Steps 6, 7, and 8 to develop the mitigation strategy. Each source document is referenced where its data is used in this plan.

2.2.2 PHASE II – RISK ASSESSMENT

PLANNING STEPS 4 AND 5: IDENTIFY/ASSESS THE HAZARD AND ASSESS THE PROBLEM

The FMPC completed a comprehensive effort to identify, document, and profile all flood hazards that have, or could have, an impact on the planning area. Geographic information systems (GIS) were used to display, analyze, and quantify hazards and vulnerabilities. A draft of the risk and vulnerability assessment was posted on the County's website for FMPC and public review and comment. A more detailed description of the risk assessment process and the results are included in Chapter 4 Flood Risk Assessment.

The FMPC also conducted a capability assessment to review and document the County's capabilities to mitigate flood risk and vulnerability. By collecting information about existing government programs, policies, regulations, ordinances, and emergency plans, the FMPC could assess those activities and measures already in place that contribute to mitigating some of the risks and vulnerabilities identified. The capability assessment is documented in Chapter 5.

2.2.3 PHASE III – MITIGATION STRATEGY

PLANNING STEPS 6 AND 7: SET GOALS AND REVIEW POSSIBLE ACTIVITIES

WSP facilitated brainstorming and discussion sessions with the FMPC that described the purpose and process of developing planning goals and objectives, a comprehensive range of mitigation alternatives, and a method of selecting and defending recommended mitigation actions using a series of selection criteria. This information is included in Chapter 6 Mitigation Strategy. Additional documentation of the alternatives the FMPC assessed to develop the mitigation strategy is included in Appendix B.

PLANNING STEP 8: DRAFT AN ACTION PLAN

A complete first draft of the plan was prepared based on input from the FMPC regarding the draft risk assessment and the goals and activities identified in Planning Steps 6 and 7. This draft was posted for FMPC and public review and comment on the County's website. Stakeholders were invited to comment on this draft as well. FMPC, public, and stakeholder comments were integrated into the final draft for ISO to review and approve, contingent upon final adoption by the County.

2.2.4 PHASE IV – PLAN MAINTENANCE

PLANNING STEP 9: ADOPT THE PLAN

To secure buy-in and officially implement the plan, the plan will be reviewed and adopted by the Chatham County Board of Commissioners, as documented by the resolution in Chapter 7 Plan Adoption.

PLANNING STEP 10: IMPLEMENT, EVALUATE AND REVISE THE PLAN

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning. Up to this point in the planning process, the FMPC's efforts have been directed at researching data, coordinating input from participating entities, and developing appropriate mitigation actions. Chapter 8 Plan Implementation and Maintenance provides an overview of the overall strategy for plan implementation and maintenance and outlines the method and schedule for monitoring, updating, and evaluating the plan. Chapter 8 also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

3 COMMUNITY PROFILE

This section provides an overview of past and current conditions in the planning area. It contains the following subsections:

- 3.1 Overview of the Community
- 3.2 Topography and Climate
- 3.3 Cultural, Historic, and Natural Resources
- 3.4 History
- 3.5 Economy
- 3.6 Housing
- 3.7 Population
- 3.8 Social Vulnerability
- 3.9 Growth and Development Trend

3.1 OVERVIEW OF THE COMMUNITY

Chatham County is the northernmost coastal county in Georgia. It is bounded by the Savannah River and Jasper County, South Carolina to the northeast, Effingham County to the northwest, Bryan County and the Ogeechee River to the south and southwest, and the Atlantic Ocean on its coast. The County has a total area of 632 square miles, of which approximately 426 square miles is land area and 206 square miles is water area.

Chatham County encompasses eight incorporated municipalities – Bloomingdale, Garden City, Pooler, Port Wentworth, Tybee, the City of Savannah, the County seat, and the towns of Thunderbolt and Vernonburg.

The County is served by Interstate 95, Interstate 16, Interstate 516, as well as U.S. Route 17, U.S. Route 80, and several state routes that connect the County to the surrounding region. Chatham County is also home to the Port of Savannah, which is the largest and fastest growing single-operator container terminal in North America and the fourth largest in total volume, according to Georgia Ports Authority.

According to the U.S. Census Bureau's American Community Survey, the County had a total population of 295,291 in 2020. Therefore, the County's average population density is approximately 693 people per square mile. Chatham is the sixth most populous county in Georgia, and the most populous Georgia county outside the Atlanta metropolitan area.

Figure 3-1 reflects Chatham County's location within the State. Figure 3-2 provides a base map showing the boundaries of all incorporated municipalities, the location of federal lands within the County, and major transportation routes in the County.

Figure 3-1 – Location Map

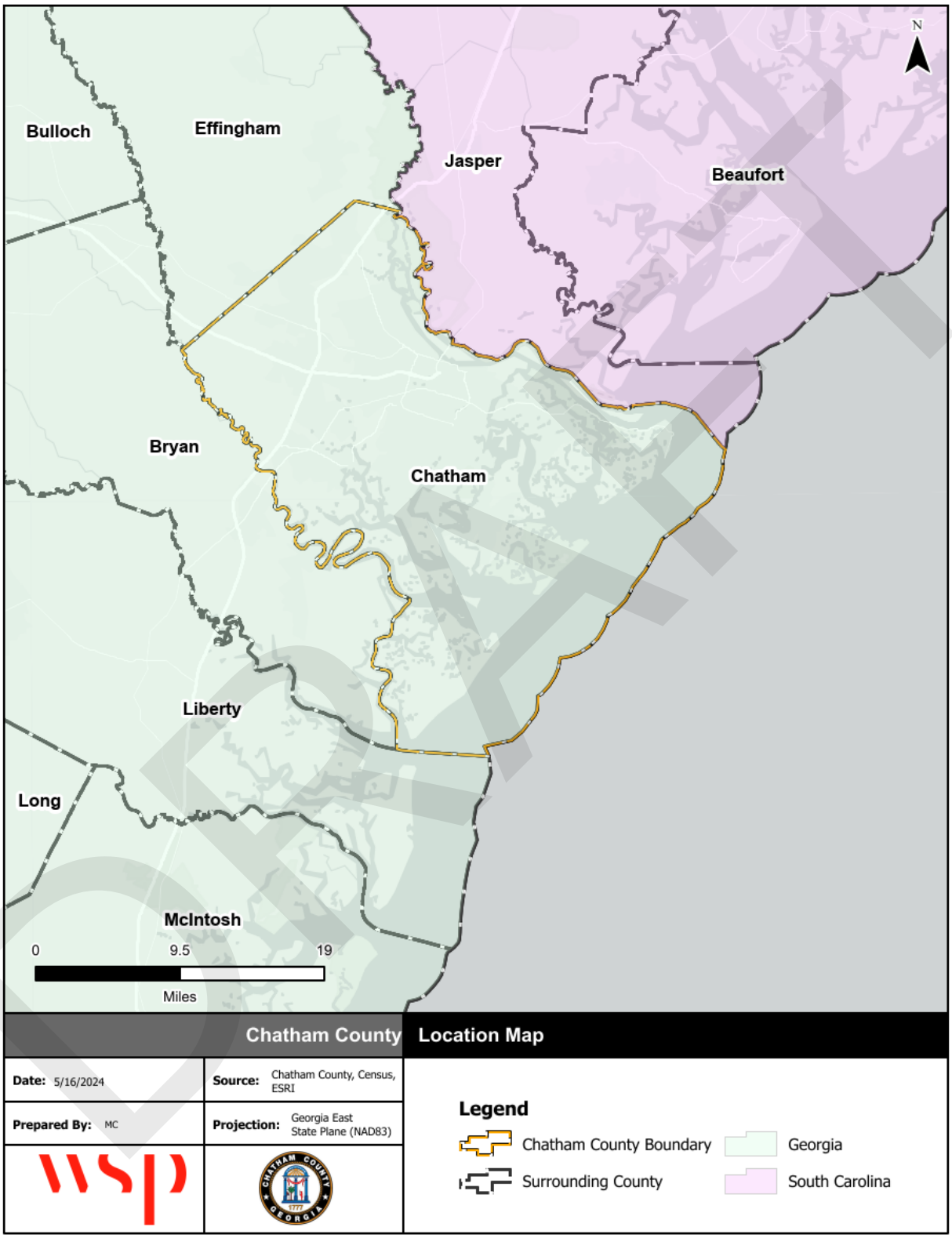
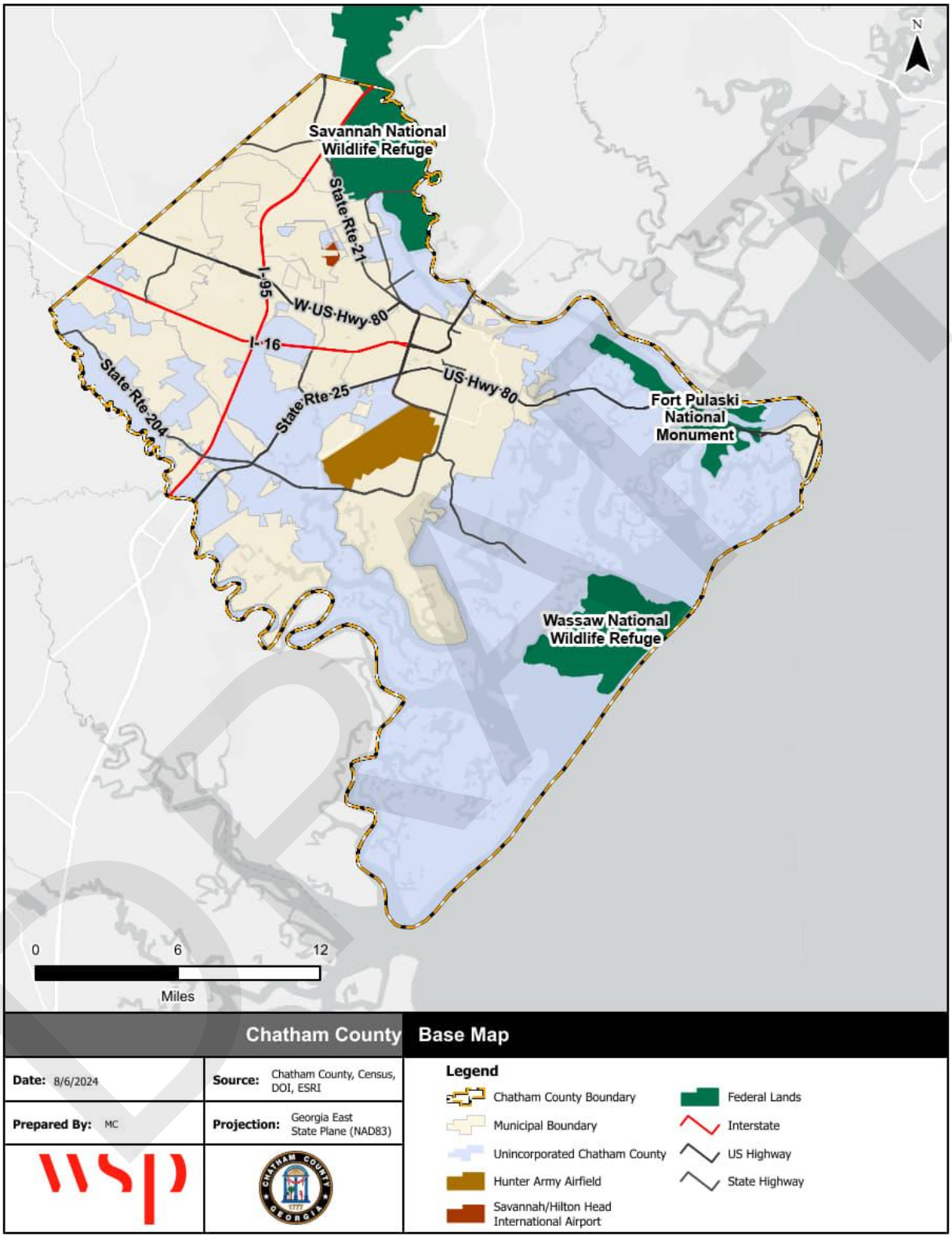


Figure 3-2 – Base Map

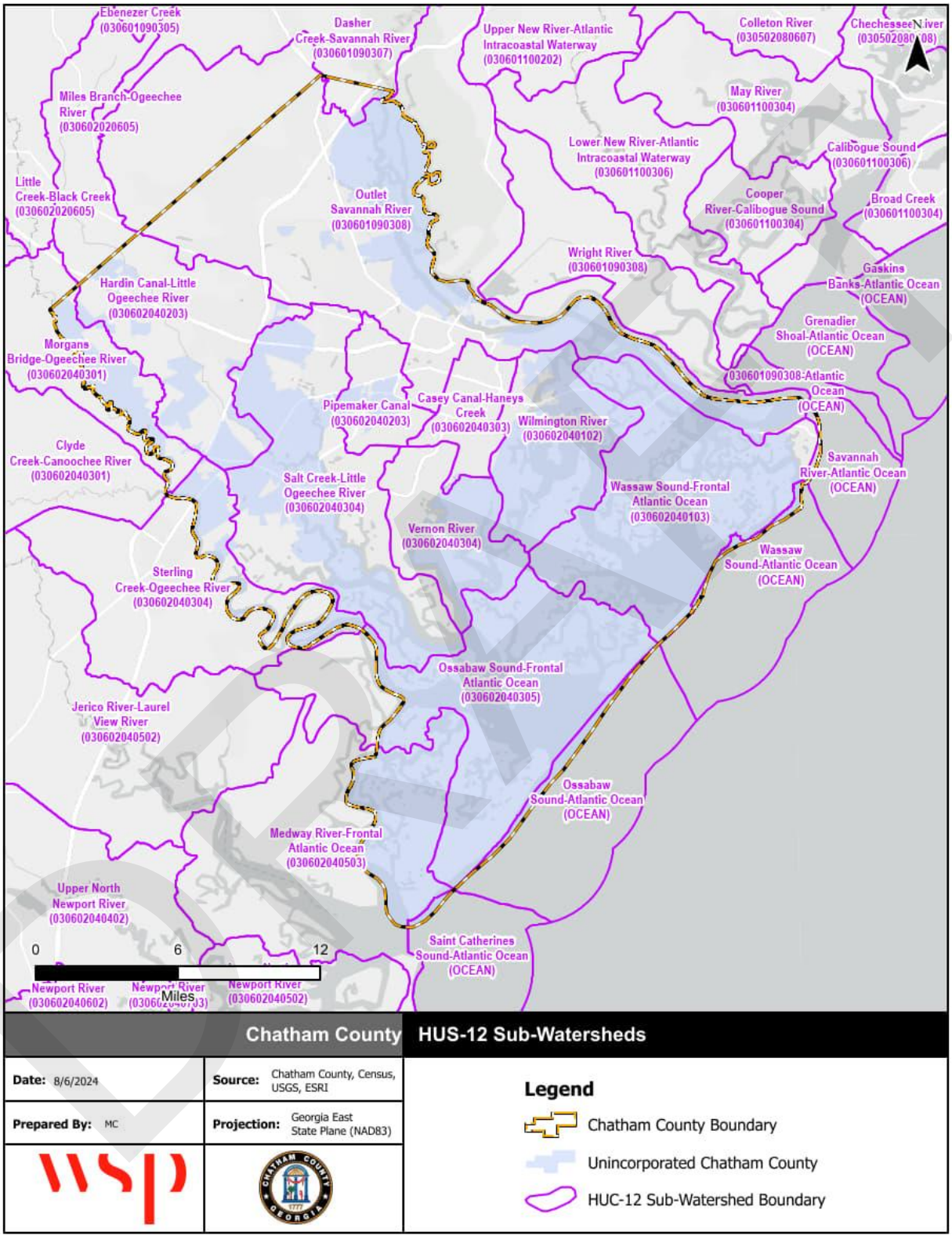


3.2 TOPOGRAPHY AND CLIMATE

Chatham County has a moderate climate, with an average annual high temperature of 76.6 degrees Fahrenheit and an average annual low temperature of 55.6 degrees Fahrenheit. Average annual rainfall is approximately 48.98 inches. The County experiences a rainy season from June through August, with average precipitation around 6 inches per month.

Much of Chatham County is comprised of open water, tidal creeks, or estuarine marsh and has a generally flat topography and low elevation, ranging from sea level at the coast to a high point of approximately 49 feet above sea level in Savannah. Much of the County is covered by wetlands and tidal marshes. The USGS measures watersheds based on surface hydrologic features measured by a hierarchical hydrologic unit code (HUC) system; the HUC-12 level represents subbasins, shown for the Chatham County in Figure 3-3.

Figure 3-3 – HUC-12 Drainage Basins



Data Source: USGS, 2021

3.3 CULTURAL, HISTORIC AND NATURAL RESOURCES

HISTORIC RESOURCES

Chatham County has 74 listings on the National Register of Historic Places including 28 Historic Districts, 42 Historic Buildings, and 4 Historic Sites. Listing on the National Register signifies that these structures and districts have been determined to be worthy of preservation for their historical values.

Table 3.1 – Historic Property and District Listings in Chatham County

	Name on the Register	Date Listed	Location
1	Abrahams, Edmund and Mildred, Raised Tybee Cottage	1/27/2020	4 8th St.
2	Ardsley Park-Chatham Crescent Historic District	8/15/1985	Roughly bounded by Ardsley Pk., Chatham Crescent, Bull St., Baldwin Pk. and Ardmore
3	Atlantic Greyhound Bus Terminal	12/13/2016	109 Martin Luther King, Jr. Blvd.
4	Bethesda Home for Boys	9/12/1973	S of Savannah at Ferguson Ave. and Bethesda Rd.
5	Bonaventure Cemetery	2/2/2001	Bonaventure Rd., 1 mi. N of US 80
6	Bordley Cottage-Beach View House	6/27/2014	1701 Butler Ave.
7	The Carbo House	5/21/2010	9 Tybrisa St.
8	Carver Village Historic District	1/24/2019	Bounded by W Gwinnett & Endley Sts., Allen Blun, & Collat Aves.
9	Central of Georgia Depot and Trainshed	12/8/1976	W. Broad and Liberty Sts.
10	Central of Georgia Railroad: Savannah Shops and Terminal Facilities	6/2/1978	W. Broad St. and Railroad Ave.
11	Central of Georgia Railway Company Shop Property	3/5/1970	Between W. Jones St. and Louisville Rd.
12	Charity Hospital	5/2/1985	644 W. 36th St.
13	CSS GEORGIA (ironclad)	2/10/1987	Address Restricted
14	Curry-Miller-Byrd Cottage	3/29/2021	16 Izlar Ave.
15	Cuyler-Brownville Historic District	2/13/1998	Roughly bounded by Anderson Ln., W. 31st St., Montgomery St., Victory Dr., Ogeechee Rd., and Hopkins St.
16	Daffin Park-Parkside Place Historic District	5/12/1999	Bounded by Victory Dr., Waters Ave., Bee St. and 51st Street Ln.
17	Davenport, Isaiah, House	9/22/1972	324 E. State St.
18	Drayton Arms Apartments	10/16/2013	102 E. Liberty St.
19	Drouillard-Maupas House	5/13/1991	2422 Abercorn St.
20	Dutton-Waller Raised Tybee Cottage	7/24/2008	1416 7th Ave.
21	Eastside Historic District	11/7/2002	Roughly bounded by E. Broad, Cedar, Gwinnett and Anderson Sts.
22	Eureka Club-Farr's Point	7/8/2009	2326 E. Blvd.
23	Fairway Oaks-Greenview Historic District	3/31/2009	Bounded approx. by DeRenne Dr., Waters Ave., Truman Pkwy., and Casey Canal, and the Live Oaks Golf Course
24	Federal Building and U.S. Courthouse	6/7/1974	Wright Sq.
25	First Bryan Baptist Church	5/22/1978	575 W. Bryan St.

	Name on the Register	Date Listed	Location
26	Fort James Jackson	2/18/1970	Islands Expwy.
27	Fort Pulaski National Monument	10/15/1966	17 mi. W of Savannah, Cockspur Island
28	Fort Screven Historic District	5/25/1982	Tilton, Butler, Van Horn, Railroad and Alger Aves., and Pulaski Rd.
29	Gordonston Historic District	10/11/2001	Roughly bounded by Skidaway Rd., Goebel Ave., Gwinnett St., and Pennslyvania Ave.
30	Green-Meldrim House	1/21/1974	Macon and Bull Sts.
31	Hill Hall at Savannah State College	4/23/1981	Savannah State College campus
32	Hodgson, W. B., Hall	3/25/1977	501 Whitaker St.
33	Isle of Hope Historic District	9/7/1984	Roughly bounded by Skidaway River, Parkersburg Rd., Island, Cornus, and Noble Glen Drs.
34	Johnson, J. Herbert and Julia, Raised Tybee Cottage	5/21/2008	1306 Jones Ave.
35	Kensington Park-Groveland Historic District	8/30/2014	Roughly bounded by DeRenne & Waters Aves., Abercorn & Johnston Sts.
36	Laurel Grove-North Cemetery	8/4/1983	W. Anderson St.
37	Laurel Grove-South Cemetery	9/6/1978	37th St.
38	Lebanon Plantation	11/29/1979	SW of Savannah
39	Low, Juliette Gordon, Historic District	10/15/1966	10 Oglethorpe Ave., E., 330 Drayton St., 329 Abercorn St.
40	Massie Common School House	4/13/1977	207 E. Gordon St.
41	Morgan-Ille Cottage	7/24/2008	703 2nd Ave.
42	Mulberry Grove Site	7/17/1975	Address Restricted
43	Mulherin-Righton Raised Tybee Cottage	4/29/2008	14 8th Pl.
44	New Ogeechee Missionary Baptist Church	8/8/2001	751 Chevis Rd.
45	Nicholsonville Baptist Church	5/22/1978	White Bluff Rd.
46	Ossabaw Island	5/6/1996	7 mi. S of Savannah, bounded by the Atlantic Ocean, Bear R., Ogeechee R., and St. Catherine's Sound
47	Owens-Thomas House	5/11/1976	124 Abercorn St.
48	Pine Gardens Historic District	11/5/2014	Roughly bounded by Goebel Ave., Beech & Capitol Sts.
49	Rourke, James and Odessa, Jr., Raised Tybee Cottage	9/23/2010	702 14th St
50	Savannah and Ogeechee Canal	8/11/1997	Roughly along I-95, between the Savannah and Ogeechee Rs.
51	Savannah Beach Town Hall and Auditorium	5/27/2022	403 Butler Ave.
52	Savannah Historic District	11/13/1966	Bounded by E. Broad, Gwinnett, and W. Broad Sts. and the Savannah River
53	Savannah Pharmacy and Fonvielle Office Building	2/20/2013	914-918 Martin Luther King, Jr. Blvd.
54	Savannah Victorian Historic District	12/11/1974	Roughly bounded by Gwinnett, Price, Anderson, and Montgomery Sts.
55	Savannah Victorian Historic District (Boundary Increase)	5/20/1982	Bounded by Gwinnett, Anderson and 31st Sts.

	Name on the Register	Date Listed	Location
56	Savannah Water Works Pump House	1/24/2022	1204 West Gwinnett St.
57	Scarbrough, William, House	6/22/1970	41 W. Broad St.
58	Sea View Apartments	4/22/2003	7 18th St.
59	Slotin Building	3/24/1983	101 W. Broad St.
60	Springfield Terrace School	3/9/2022	707 Hastings St.
61	St. Bartholomew's Church	6/17/1982	Cheves Rd.
62	St. Philip AME Church	8/2/1984	613 W. Broad St.
63	Sturges, Oliver, House	7/14/1971	27 Abercorn St.
64	Telfair Academy	5/11/1976	121 Barnard St.
65	Thomas Square Streetcar Historic District	7/29/1997	Roughly bounded by Anderson Ln., 42nd St., Victory Dr., E. Broad St., and Martin Luther King, Jr. Blvd.
66	Two Pierpont Circle	4/4/1990	2 Pierpont Cir.
67	Tybee Island Back River Historic District	8/5/1999	Along Chatham Ave., from Tybee River to Venetian Dr.
68	Tybee Island Strand Cottages Historic District	4/2/1999	Along Butler Ave., between 12 St. and 14th St.
69	U.S. Customhouse	5/29/1974	1--3 E. Bay St.
70	Vernonburg Historic District	6/22/2000	Dancy Ave., Rockwell Ave. and S. Rockwell Ave.
71	Weil, Edgar A., House	10/4/2016	802 14th St.
72	Wild Heron	12/16/1977	15 mi. SW of Savannah off U.S. 17
73	Williams, Clarence and Louise Golden, House	5/15/2023	2211 Norwood Ave, Sandfly Community
74	Wormsloe Plantation	4/26/1973	Isle of Hope and Long Island

Source: National Register of Historic Places Database

CULTURAL RESOURCES

Chatham County is home to many institutions of higher education, including Savannah College of Art and Design, Savannah State University, Savannah Technical College, Armstrong University, Georgia Tech - Savannah and Georgia Southern University.

The County is also a popular tourist destination, for both the City of Savannah and the Tybee Island beaches. Savannah is famous for its history, art, architecture, parks, and culture. Tybee Island is the popular beach for locals and visitors and is home to the Tybee Island Light Station, the Fort Screven Historic District, and the Tybee Island Marine Science Center, and neighbors the Fort Pulaski National Monument.

NATURAL FEATURES AND RESOURCES

PARKS, PRESERVES, AND CONSERVATION

Chatham County Parks and Recreation manages 6 community parks, 12 neighborhood parks, 4 community centers, 7 sports facilities, 2 multipurpose trails, 5 nature preserves, the Al Henderson Golf Club, the Chatham County Aquatic Center, and the Anderson-Cohen Weightlifting Center.

Chatham County is home to Skidaway Island State Park, a 588-acre park bordering Skidaway narrows. The park contains camping and picnicking facilities; hiking, birding, and biking trails, playgrounds, trolley tours, and volleyball facilities.

Chatham County also contains three national protected areas:

- **Fort Pulaski National Monument** is a site famous for its importance as turning point in the Civil War but also relevant for its natural features. The 6,307-acre monument preserves approximately 4,800 acres of salt marsh wetlands.
- **Wassaw National Wildlife Refuge** was established in 1969 and contains 10,726 acres of marsh, mudflats, tidal creeks, and beaches. It is part of the Savannah Coastal Refuges Complex, which extends from Pinkney Island in South Carolina to Wolf Island in Georgia. The refuge sits on the coast, southeast of Skidaway Island.
- **Savannah National Wildlife Refuge** was established in 1927 and contains 29,452 acres of freshwater marshes, tidal rivers and creeks, and bottomland hardwoods. The refuge covers 6,464 acres of northeastern Chatham County and also spans Effingham County and parts of South Carolina.

The locations of these federal lands within Chatham County are shown in Figure 3-2.

WATER BODIES AND FLOODPLAINS

Approximately 28% of the County's unincorporated areas are open water, and another 37% are tidal marshes. These lands are primarily found in the southern and eastern portions of the County's planning jurisdiction and along the County's waterways. Traditional land uses are not desirable in these areas, but current protections are not sufficient to prevent development in many areas, particularly given that much of the County's land outside the SFHA is already built out.

According to the Effective FIRMs, over 166,683 acres of the land within the County is located within a 100-year floodplain and an additional 14,775 acres are located within the 500-year floodplain. With over 80% of the County at high risk to flooding in the SFHA and an additional 7% at moderate risk to flooding, Chatham County must seek ways to balance its continued development with strategies to preserve sensitive lands and natural drainage features.

Natural and Beneficial Floodplain Functions: Under natural conditions, a flood causes little or no damage in floodplains. Nature ensures that floodplain flora and fauna can survive the more frequent inundations, and the vegetation stabilizes soils during flooding. Natural floodplains include marsh areas and low-lying areas along canals. Open parks such as Henderson and Wilmington Island Golf Courses also have natural floodplains. Natural floodplains reduce damage by allowing flood waters to spread out over large areas, aiding absorption into the ground, reducing flow rates and acting as a flood storage area to reduce downstream peaks.

WETLANDS

Based on the U.S. Fish & Wildlife Service's National Wetlands Inventory (NWI), the wetlands in Chatham County are characterized as freshwater emergent, freshwater forested/shrub, estuarine and marine, and marine deepwater. There is a patchwork of freshwater pond and lake wetlands spread throughout the County. The estuarine and marine wetlands boarder the coast while emergent wetland and forested shrubs border the creeks that run around and throughout the County.

A 2020 assessment by the Savannah Tree Foundation indicates Chatham County has 228 square miles of wetlands. Wetlands in Chatham County generally follow the major hydrology, and many are found within areas that are deemed flood hazard areas which provide additional regulations that make these areas difficult to develop. Chatham County has adopted a Wetland Protection Ordinance that helps foster conservation of wetlands by coordinating federal and local wetland permitting and limiting development disturbances.

Natural and Beneficial Wetland Functions: The benefits of wetlands are hard to overestimate. They provide critical habitat for many plant and animal species that could not survive in other habitats. They

are also critical for water management as they absorb and store vast quantities of storm water, helping reduce floods and recharge aquifers. Not only do wetlands store water like sponges, they also filter and clean water as well, absorbing toxins and other pollutants.

Wetland areas are shown in Figure 3-4.

THREATENED AND ENDANGERED SPECIES

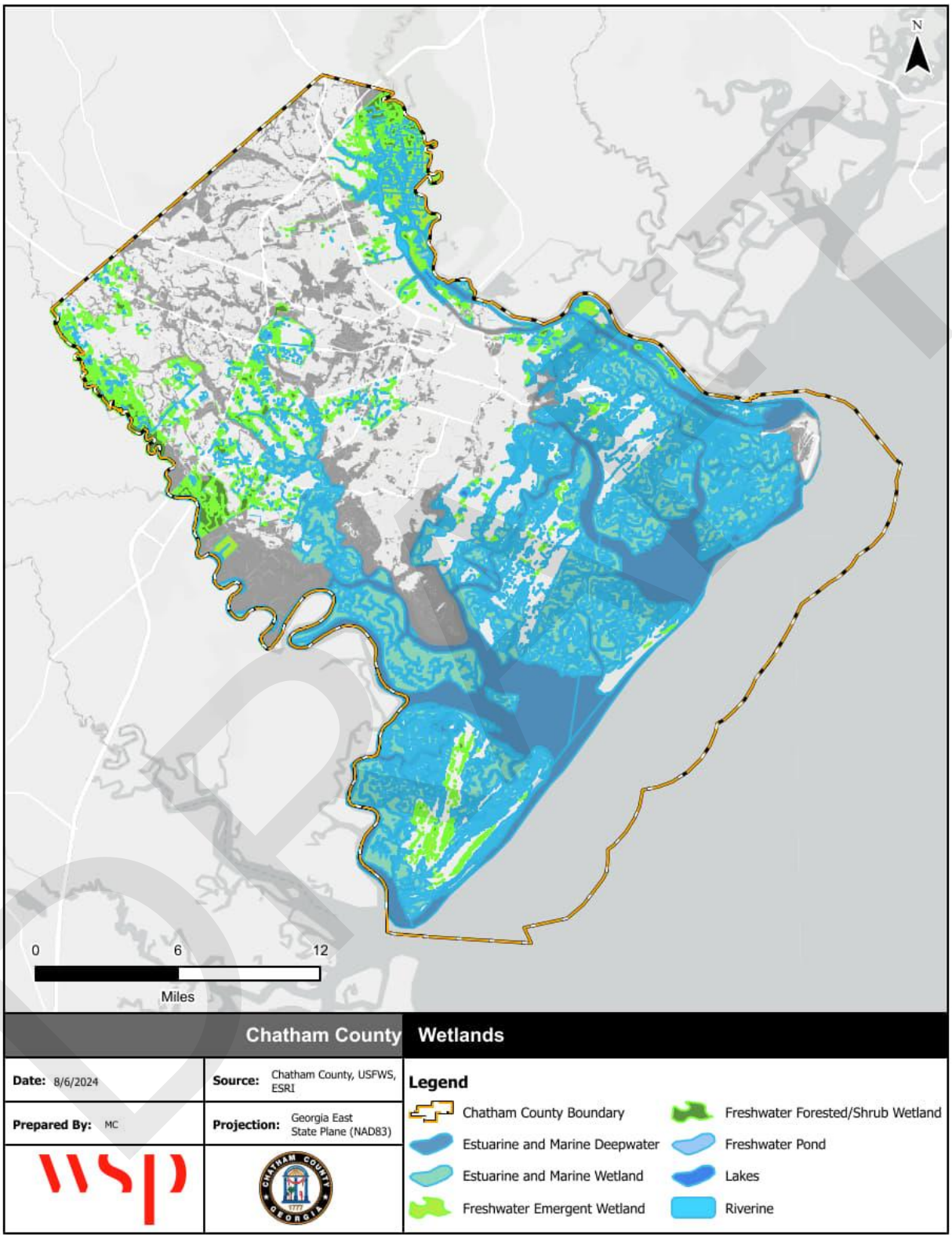
The U.S. Fish and Wildlife Service maintains a regular listing of threatened species, endangered species, species of concern, and candidate species for counties across the United States. Chatham County has 21 species that are listed with the U.S. Fish and Wildlife Services. Table 3.2 below shows the species identified as threatened, endangered, or other classification in Chatham County.

Table 3.2 – Threatened and Endangered Species

Common Name	Scientific Name	Federal Status
Eastern Black Rail	*Laterallus jamaicensis*	Threatened
Eastern Diamondback Rattlesnake	*Crotalus adamanteus*	Under Review
Eastern Indigo Snake	*Drymarchon couperi*	Threatened
Georgia Lead-Plant	*Amorpha georgiana*	Under Review
Gopher Frog	*Lithobates capito*	Under Review
Hawksbill Sea Turtle	*Eretmochelys imbricata*	Endangered
Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	Endangered
Leatherback Sea Turtle	*Dermochelys coriacea*	Endangered
Little Brown Bat	*Myotis Lucifugus*	Under Review
Loggerhead Sea Turtle	*Caretta caretta*	Threatened
Monarch Butterfly	*Danaus plexippus*	Candidate
Northern Long-Eared Bat	*Myotis septentrionalis*	Endangered
Piping Plover	*Charadrius melodus*	Threatened
Pondberry	*Lindera melissifolia*	Endangered
Red Knot	*Calidris canutus rufa*	Threatened
Red-Cockaded Woodpecker	*Picoides borealis*	Endangered
Robust Redhorse	*Moxostoma robustum*	Under Review
Spotted Turtle	*Clemmys guttata*	Under Review
Tricolored Bat	*Perimyotis subflavus*	Proposed Endangered
West Indian Manatee	*Trichechus manatus*	Threatened
Wood Stork	*Mycteria americana*	Threatened

Source: U.S. Fish & Wildlife Service (https://ecos.fws.gov/ecp/report/species-listings-by-current-range-county?fips=13051)

Figure 3-4 – National Wetlands Inventory, Chatham County, GA



3.4 HISTORY

Originally inhabited by the Native American Creek tribe, Chatham County was settled by the British in 1733. James Oglethorpe founded Savannah as the colony seat along the Savannah River. The City was unique for its planned development based on a system of wards, each part of a larger regional land system. This plan resulted in a dense grid of town lots and squares, garden lots, and farm lots, surrounded by agricultural villages.

Chatham County grew more significant during the Revolutionary War and Civil War due to the port in Savannah. After the Civil War, the streetcar induced expansion and suburban development into the County. This trend gained strength after World War II with the increase of automobile use. Though once entirely rural outside the limits of the City of Savannah, much of Chatham County is now developed.

3.5 ECONOMY

3.5.1 WAGES AND EMPLOYMENT

Per the 2018-2022 American Community Survey 5-Year Estimates, the median household income for Chatham County is $66,171 and mean household income is $92,238. An estimated 14.0% of the population is considered to be living below the poverty level. Table 3.3 shows employment and unemployment rates along with industry employment by major classification for the County. Major employers for Chatham County according to the Savannah Area Chamber of Commerce are listed in Table 3.4 along with an estimate of the number of employees.

Table 3.3 – Employment and Occupation Statistics for Chatham County, GA

Employment Status	Percentage
In labor force	64.6
Employed	59.2
Unemployed	4.0
Armed Forces	1.4
Not in labor force	35.4
Occupation	
Management, business, science and arts	38.3
Service	19.5
Sales and office	20.9
Natural resources, construction and maintenance	6.5
Production, transportation and material moving	14.9

Source: U.S. Census Bureau, 2017-2021 American Community Survey 5-Year Estimates

Table 3.4 – Major Employers in Chatham County, 2023

Corporation/Organization	Service/Product by SIC Code	# of Employees
Major Employers (Non-Manufacturing)		
St. Joseph's Candler	Hospital	4,652
Memorial University Medical Center	Hospital	3,869
Walmart	Retail	3,300 – 4,999
Colonial Group	Energy, Chemicals, Logistics	2,241
Target Distribution Center	Distribution	1,200

Corporation/Organization	Service/Product by SIC Code	# of Employees
Major Employers (Non-Manufacturing)		
Major Education, Government, and Public Service Employers		
Savannah-Chatham County Board of Education	Public Schools	5,700
Ft. Stewart / Hunter Army Airfield (HAAF)	Civilian personnel on bases	4,300
Georgia Southern University	Education	2,864
City of Savannah	Government	2,147
Chatham County	Government	1,810

Source: Savannah Area Chamber of Commerce

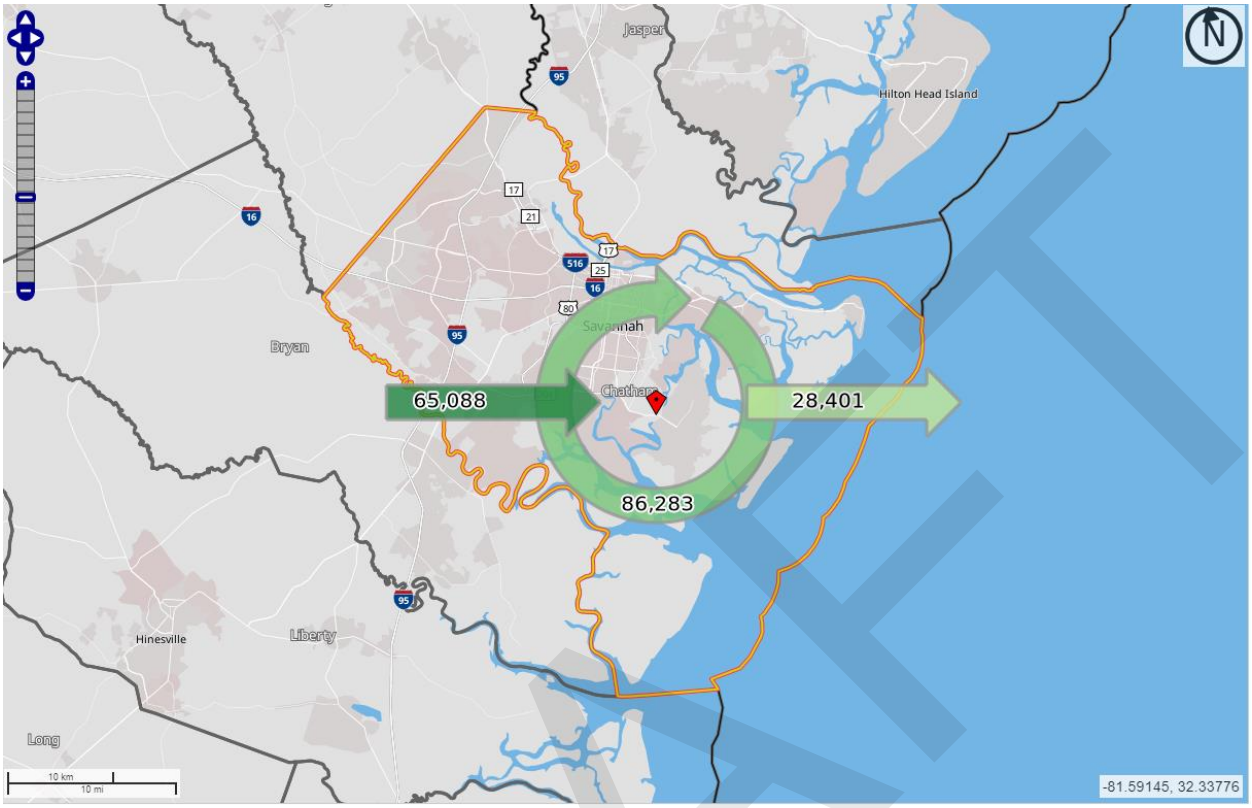
Employer statistics provided by the Savannah Chamber of Commerce do not include manufacturing; however, manufacturing is an extremely important piece of the local economy, as noted in the Chatham County – Savannah Comprehensive Plan. Also important to the local economy, as indicated by the marine cargo handling industry employers, is the Port of Savannah, which is the largest single terminal container facility in North America and the busiest container port in the U.S. Southeast. Per the Savannah Chamber of Commerce, the Port contributes $33 billion in income, $140 billion in sales, and $3.8 billion in state and local taxes annually. It also supports over half a million jobs throughout the state.

Another important component of the Chatham County economy not captured by employer statistics is tourism, which has been steadily growing since the 1990s, due in part to Savannah's historic assets, architecture, and monuments, and the County's coastal setting. According to the Savannah Chamber of Commerce, Savannah had nearly 15.2 million visitors during the year of 2021.

Also of note is Chatham County's role as an employment hub for the surrounding area. As of 2020, 75% of Chatham County residents also worked within the County, and over 42% of people working in the County lived outside the County according to the U.S. Census Bureau's Center for Economic Studies, as showing in Figure 3-5. Residents of Effingham, Bryan, Liberty, and Bulloch Counties account for most of Chatham Counties commuters.

The Coastal FIS Technical Report estimates that between 2023 – 2025 Chatham County will see a direct capital investment of 216 million and creation of 1,642 in-county jobs. The report also predicts projected population increase of 5,279 people and 2,367 new households within in the same time period.

Figure 3-5 - Chatham County Job Worker Inflow/Outflow



Source: U.S. Census Bureau, Center for Economic Studies, 2020

3.6 HOUSING

According to the 2018-2022 American Community Survey 5-Year Estimates, there are 134,190 housing units in Chatham County, 87.5% of which are occupied. Approximately 43.1% of occupied units are renter-occupied, while 56.9% are owner-occupied. This indicates a high level of pre- and post-disaster vulnerability because, renters often do not have the financial resources of homeowners, are more transient, are less likely to have information about or access to recovery aid following a disaster and are more likely to require temporary shelter following a disaster (Cutter, et al., 2003).

Median home value in Chatham County is $256,400. Of the County' owner-occupied housing units, 64.4% have a mortgage. More than half of all householders (67.8%) moved into their current homes since 2010; 27.6% moved in between 2017 and 2020, and 7.2% moved in 2021 or later. Householders of 7.3% of occupied housing units have no vehicle available to them, which suggests these residents may have difficulty in the event of an evacuation.

3.7 POPULATION

According to the Savannah Comprehensive Plan 2020 Update, Chatham County had 289,649 residents at the time of the 2020 U.S. Census with 92,034 residents living in the unincorporated county and a population density of 281 people per square mile. Table 3.5 provides demographic profile data from the 2022 American Community Survey 5-Year Estimates.

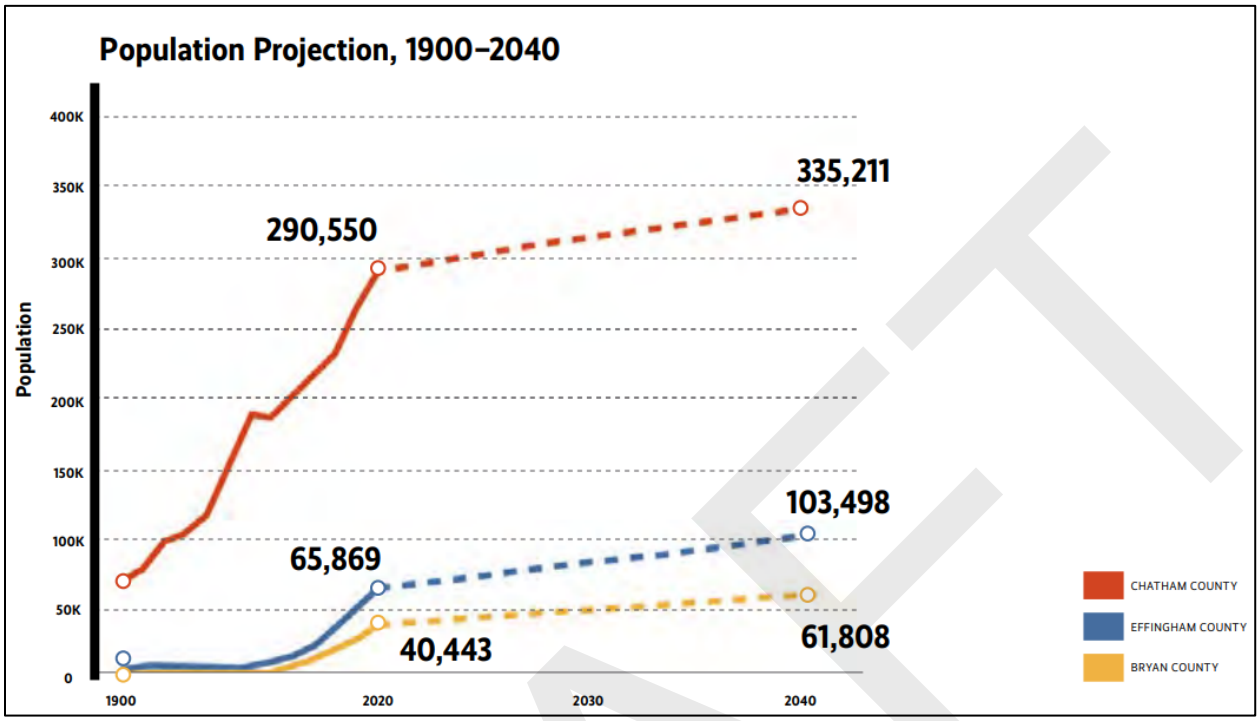
Table 3.5 – Chatham County Demographic Profile Data, 2022

Demographic	Chatham County (%)
Gender/Age	
Male	48.2
Female	51.8
Median Age (years)	36.7
Under 5 Years	5.9
65 Years and Over	16.2
Race/Ethnicity (One Race)	
White	49.1
Black or African American	40.2
American Indian and Alaska Native	0.2
Asian	2.9
Native Hawaiian and Other Pacific Islander	0.1
Some other race	2.4
Two or more Races	5.0
Hispanic or Latino[1]	6.8
Education	
High School Graduate or Higher	91.4
Bachelor's Degree or Higher	36.1

Source: U.S. Census Bureau, 2017-2021 American Community Survey 5-Year Estimates
[1]Hispanic or Latino individuals may be of any race, so are also included in applicable race categories.

According to data from the Governor's Office of Planning and Budget (OPB), as of 2019, Chatham County was the sixth largest county in the State, following five counties in the Atlanta metropolitan area (Fulton, Gwinnett, Cobb, DeKalb, and Clayton). From 2010 to 2020, unincorporated Chatham County grew at a rate of 7.0% which is a faster population growth than the state of Georgia as a whole. As shown in Figure 3-6, according to the Chatham County – Savannah Comprehensive Plan 2020 Update, the County's population is projected to grow by 15.5% making it home to 335,211 residents by the year 2040.

Figure 3-6 – Population Projection Trends in Chatham County

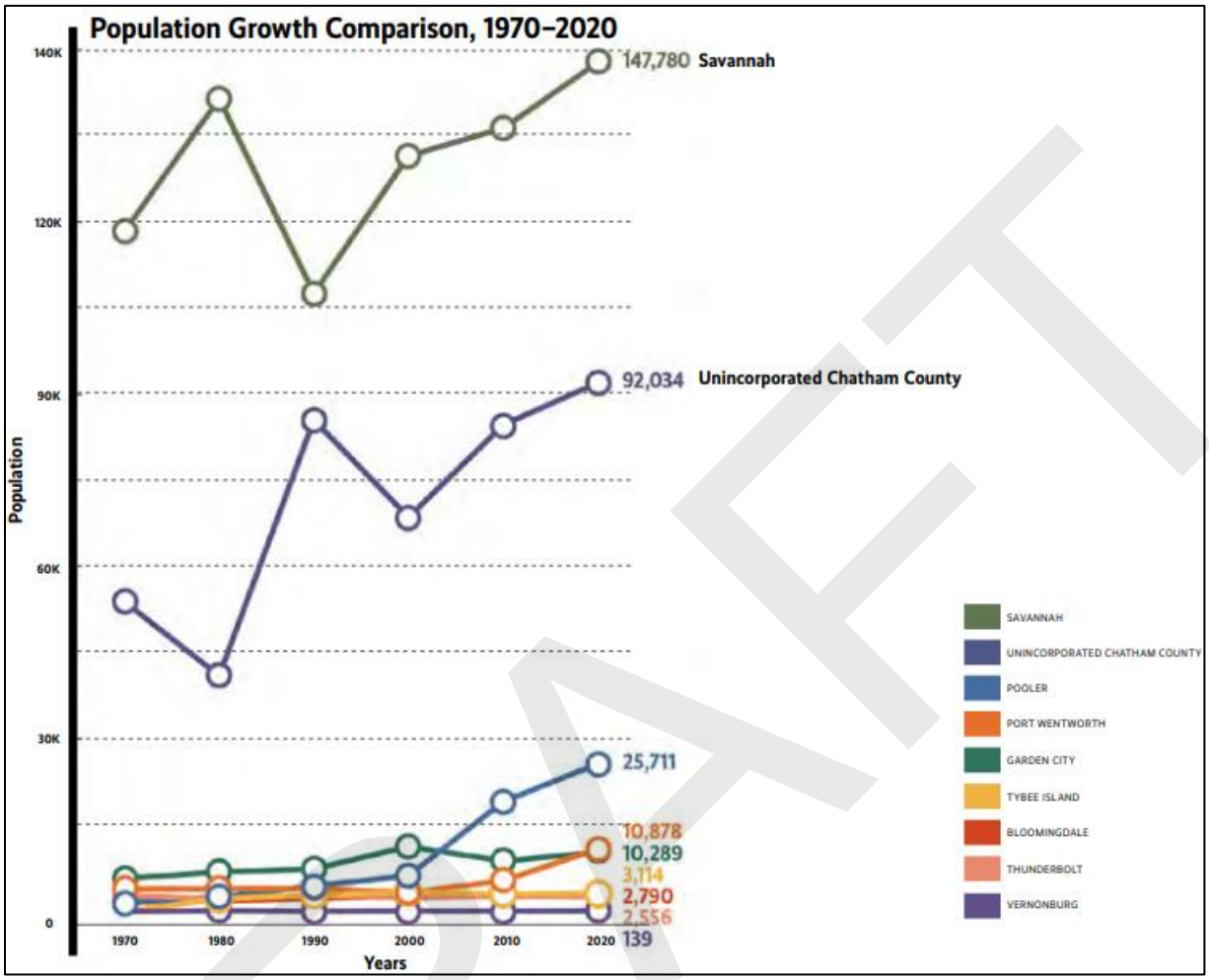


Source: Chatham County – Savannah Comprehensive Plan, 2020

The Chatham County – Savannah Comprehensive Plan focuses on the Savannah Metropolitan Statistical Area (MSA) which includes Chatham, Bryan, and Effingham County, making Chatham County the largest of the three within the MSA boundary. As established by the U.S. Office of Management and Budget, the MSA consists of a city and the surrounding communities that are linked by social and economic factors. Although neighboring counties are forecasted to experience a greater rate of growth in the future, Chatham County is expected to retain its status as the largest population center in the Savannah metropolitan area. The Chatham County – Savannah Comprehensive Plan focuses primarily on the unincorporated areas of the county while also encompassing the eight incorporated cities of Bloomingdale, Garden City, Pooler, Port Wentworth, Savannah, Tybee Island, and the towns of Thunderbolt and Vernonburg.

As of 2020, the plan indicates that the unincorporated areas and the City of Savannah made up 83.1% of the total population of Chatham County and that most of the county's population increase over the past 40 years occurred in the unincorporated areas to the east and southwest of Savannah as larger neighborhoods and subdivisions were developed. Population growth comparisons from 1970 to 2020 are shown in Figure 3-7 to showcase the difference in population totals between the unincorporated Chatham County and the incorporated municipalities.

Figure 3-7 – Population Growth Comparison for Unincorporated Chatham County



Source: Chatham County – Savannah Comprehensive Plan, 2020

3.8 SOCIAL VULNERABILITY

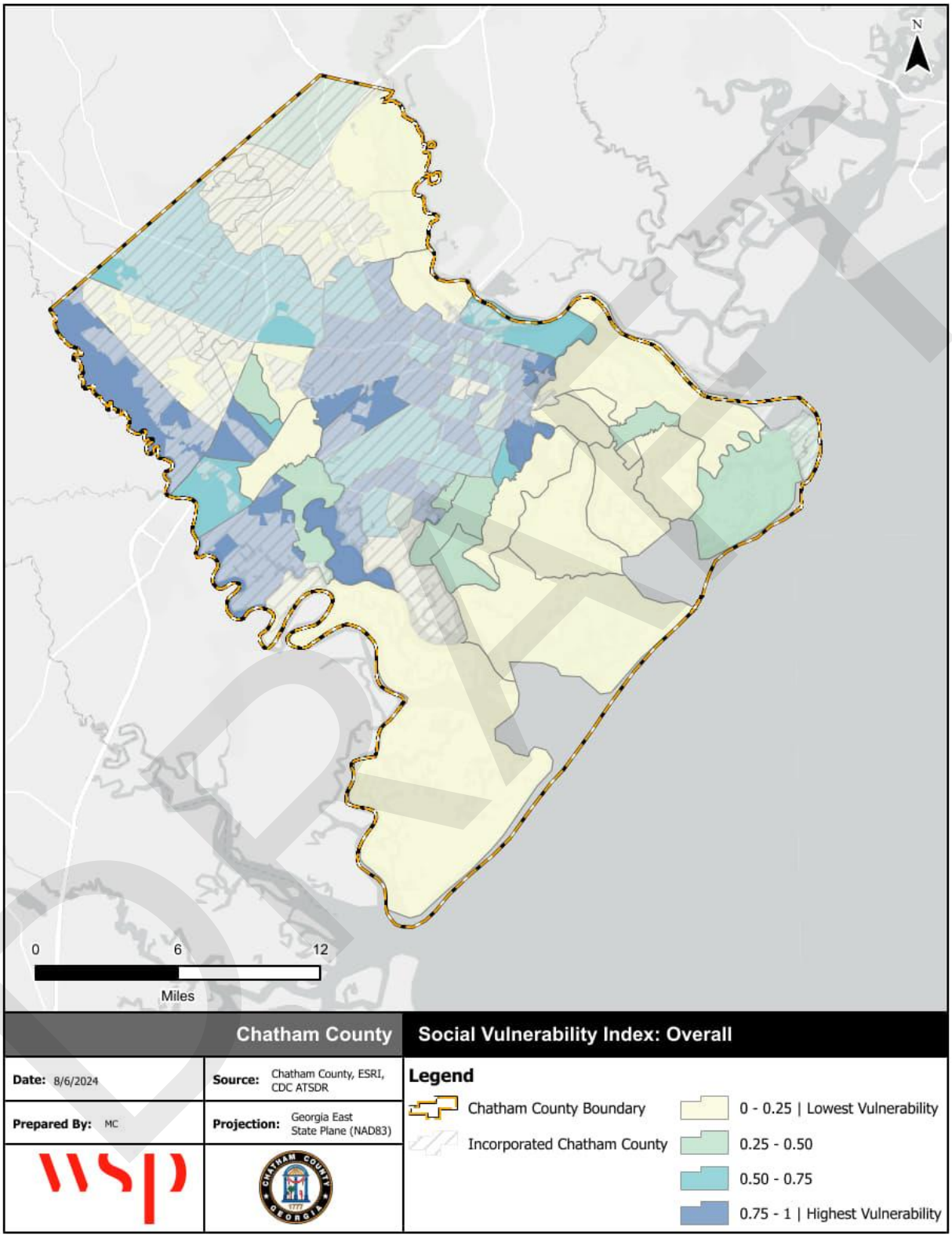
Social vulnerability refers to the factors that may weaken a community's capacity to prepare for and respond to hazard events. Understanding where social vulnerability is higher and what factors are contributing to it can enable the community to mitigate that vulnerability and improve local resilience.

The Center for Disease Control and Prevention (CDC) has developed a social vulnerability index (SVI) to measure the resilience of communities when confronted by external stresses such as natural hazards. The SVI indicates the relative vulnerability within Census tracts based on 15 social factors: poverty, unemployment, income, education, age, disability, household composition, minority status, language, housing type, and transportation access. These factors are summarized into four themes: socioeconomic status, household composition/disability, race/ethnicity/language, and housing type/transportation. Using this SVI information can help the County to prioritize pre-disaster aid, allocate emergency preparedness and response resources, and plan for the provision of recovery support.

Figure 3-8 shows the relative social vulnerability for Chatham Census tracts according to SVI data in 2020.

Per the CDC SVI information, social vulnerability is highest in the central portion of the County throughout incorporated areas. Most Census tracts that make up the unincorporated County have low to low-medium social vulnerability, with the exception of the western edge of the County along the Ogeechee River.

Figure 3-8 – Social Vulnerability Index by Census Tract



3.9 GROWTH AND DEVELOPMENT TRENDS

Based on the County's Comprehensive Plan, Chatham County is the most urbanized and populous county in the 200-mile coastal area between Charleston, South Carolina, and Jacksonville, Florida. Currently, the county remains an economic and cultural hub as it serves as an international focal point for trade in the region. According to the Comprehensive Plan, the region has seen a high rate of growth over the past 25 years and is expected to continue at or slightly above the same level. Part of this growth is expected due to the attractiveness of the region to retirees and second home residents. Economic growth is expected to remain strong to help support the existing and projected population growth in the future.

Within the unincorporated areas east of Savannah, high growth rates were experienced during the 1980s and 1990s. Overtime these areas approached build-out, and growth began to move to the western region of the county including unincorporated Chatham County and the municipalities of Bloomingdale, Garden City, Pooler, and Port Wentworth. These regions of the county continue to experience a significant amount of the overall growth for the region according to the County's Comprehensive Plan. East Chatham County is developed at low densities while West Chatham County has a higher proportion of undeveloped area. While the city of Savannah and unincorporated eastern Chatham have built out overtime, the western portion of Chatham County has begun to emerge as a high growth area.

3.9.1 FUTURE GROWTH AND DEVELOPMENT

EXISTING LAND USE

Unincorporated Chatham County comprises 210,511 acres, 28.0% of which is open water. Of the remaining 151,586 acres, 37.1% is emergent herbaceous wetlands and 9.8% is woody wetlands. Only 7% of the unincorporated County is developed.

Table 3.6 – Land Cover in Chatham County, GA

NLCD Category	Acreage	Percent of Total (%)
Barren Land	2,104.4	1.0%
Deciduous Forest	70.8	0.0%
Developed, High Intensity	3,218.5	1.5%
Developed, Low Intensity	7,254.7	3.4%
Developed, Medium Intensity	4,295.0	2.0%
Developed, Open Space	11,333.2	5.4%
Emergent Herbaceous Wetlands	78,177.5	37.1%
Evergreen Forest	21,180.4	10.1%
Hay/Pasture	514.4	0.2%
Herbaceous	1,331.6	0.6%
Mixed Forest	524.3	0.2%
Open Water	58,924.4	28.0%
Shrub/Scrub	926.5	0.4%
Woody Wetlands	20,655.5	9.8%
Total	**210,511.3**	--

Source: National Land Cover Database 2021

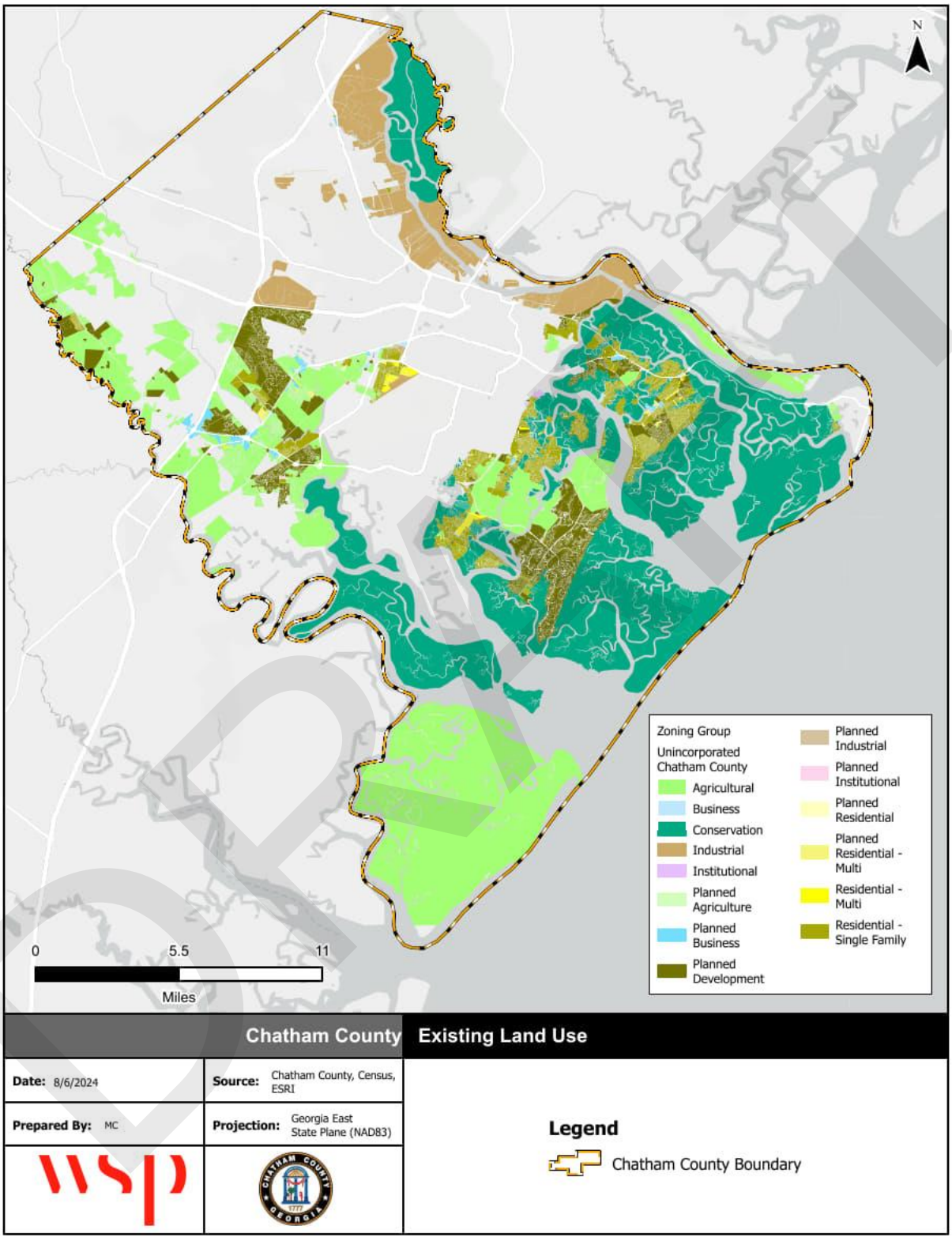
The City's zoning, summarized by acreage in Table 3.7, provides an estimate of existing land use. Table 3.7 shows that approximately 7% of land within the unincorporated County is zoned for residential use. Commercial and mixed uses represent approximately 0.8% of existing land use. Agriculture and conservation represent approximately 75% of land use, planned development represents 8.5% and office

and industrial make up about 10% of the planning area. On the following page, Figure 3-9 shows the current zoning for each parcel in the planning area. The map shows that the abundant conservation and tidal marsh lands are clustered along the coast and riverfronts, while agricultural land is clustered in the west of and southern portion of the County, residential land is scattered throughout, and a large portion of industrial land lines the Savannah River.

Table 3.7 – Existing Zoning (Acreage)

Existing Land Use Category	Acreage	Percent of Total (%)
Agricultural	51,178.9	33.9%
Business	2,30.1	0.2%
Conservation	62,208.2	41.2%
Industrial	13,352.2	8.8%
Institutional	87.2	0.1%
Planned Agriculture	24.4	0.0%
Planned Business	855.4	0.6%
Planned Development	12,835.8	8.5%
Planned Industrial	110.7	0.1%
Planned Institutional	33.6	0.0%
Planned Residential	27.6	0.0%
Planned Residential - Multi	205.1	0.1%
Residential - Multi	528.1	0.3%
Residential - Single Family	9,370.9	6.2%
Total	**124,434.8**	--

Figure 3-9 – Chatham County Existing Land Use Map



Source: Chatham County SAGIS, 2024

FUTURE LAND USE

The purpose of the Future Land Use Map is to graphically depict Chatham County's policies for growth and land development and the projected patterns of future land use. The Future Land Use Map has been prepared with consideration given to land development objectives and policies, natural constraints and limitations, overall land suitability, and the ability to provide the infrastructure to support growth and development.

The Comprehensive Plan recommends compact/mixed-use development, walkable neighborhoods, increased connectivity, and open space preservation. The Future Land Use Map was created to allow for further coordination among municipalities with the goal of promoting responsible growth while utilizing small area and corridor plans to help protect the character of existing areas. Additionally, the plan recognizes that the Chatham County Zoning Ordinance has not been updated since 2009 and recommends adopting new zoning ordinances specifically within the City of Savannah to address any inconsistencies between land use policy and the Comprehensive Plan.

The County's Future Land Use Map classifications include the following categories and subcategories:

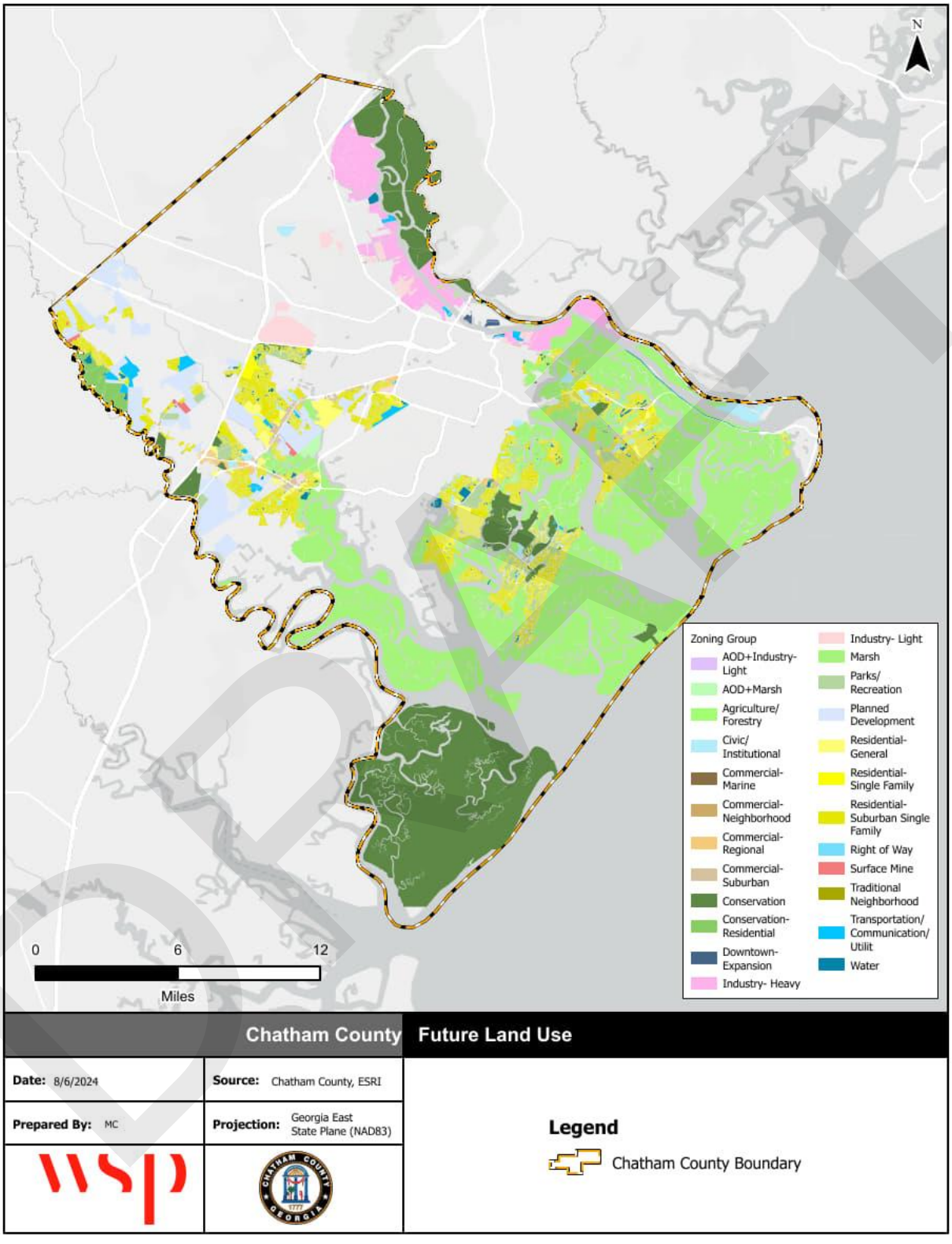
- Downtown
- Downtown Expansion
- Traditional Commercial
- Traditional Neighborhood
- Commercial (Neighborhood, Suburban, Regional, and Marine)
- Residential (Suburban Single Family, Single Family, General)
- Planned Development
- Agriculture/Forestry
- Industry (Light, Heavy)
- Civic/Institutional
- Transportation/Communication/Utility
- Parks/Recreation
- Conservation
- Conservation- Residential
- Tidal Marsh
- Environmental Overlay
- Airport Overlay
- Arterial Corridor Overlay
- Landfill
- Surface Mining

Generally, some growth and land development is anticipated to occur in all future land use categories except for the Parks/Recreation and Conservation classifications. The type and intensity of projected development varies within each future land use map classification. A simplified version of the Future Land Use Map is shown in Figure 3-10. To manage growth and promote sustainable development within the county, the comprehensive plan structures future development around a "Strong Corridors" growth scenario. This scenario focuses on the reinvestment along existing multi-modal transportation nodes and corridors in unincorporated Chatham County.

Under the Strong Corridors growth scenario, the focus for future growth decisions will be based on:

- Managed growth of development
- Focus on urban rehab and infill of existing developed areas
- Priority for mixed-use zoning
- Interest in diversity of housing choices
- Concentrate development at existing transportation nodes
- Prioritize land for parks, trails and natural areas
- Manage land for conservation and preservation
- Regional cooperation between municipalities
- Preserve undeveloped natural resource areas
- Brownfield redevelopment

Figure 3-10 – Chatham County Future Land Use



Source: Chatham County SAGIS, 2024

4 FLOOD RISK ASSESSMENT

4.1 HAZARD IDENTIFICATION

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

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

This chapter describes the Hazard Identification and Risk Assessment process for the development of the Chatham County Floodplain Management Plan. It describes how the County met the following requirements from the 10-step planning process:

- Planning Step 4: Assess the Hazard
- Planning Step 5: Assess the Problem

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

This flood risk assessment covers the unincorporated areas of Chatham County. The risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property, and infrastructure to these hazards. The process allows for a better understanding of the County's potential risk to natural hazards and provides a basis for developing and prioritizing mitigation actions to reduce risk from future hazard events. This risk assessment followed the methodology described in the FEMA publication Understanding Your Risks—Identifying Hazards and Estimating Losses (FEMA 386-2, 2002), which breaks the assessment down to a four-step process:

Data collected through this process has been incorporated into the following sections of this chapter:

- **Section 4.1 Hazard Identification** identifies the natural flood hazards that threaten the planning area.
- **Section 4.2 Risk Assessment Methodology** reviews the methodology for evaluating risk and outlines the organization of each hazard profile.
- **Section 4.3 Asset Inventory** summarizes overall asset exposure, including people; buildings; critical facilities; and future growth and development. Cultural, historic, and natural resources and the local economy are detailed in Chapter 3.
- **Section 4.4 Hazard Profiles, Analysis, and Vulnerability** discusses the threat to the planning area, describes previous occurrences of flood hazard events, and estimates the likelihood of future occurrences. For all moderate and high priority flood hazards, this section assesses the planning area's exposure and potential losses that may occur.
- **Section 4.5 Risk and Vulnerability Conclusions** summarizes areas likely to flood, discusses the potential impact of future flooding conditions, and evaluates the health and safety consequences of the flood hazards.

4.1.1 METHODOLOGY

To identify flood hazards relevant to the planning area, the FMPC reviewed existing state and local plans, disaster declarations and past flood occurrences, flood hazard data, and input from committee members and the public. Observations and projections of climate change were also evaluated to better identify and understand potential future hazards.

Table 4.1 provides the flood-related hazards that were evaluated in the previous Chatham County Floodplain Management Plan, the 2020 Chatham County Hazard Mitigation Plan, and the 2019 Georgia Hazard Mitigation Strategy. This list provided a starting point for hazard identification and ensured consistency across relevant mitigation planning efforts. Using existing flood hazard data, local knowledge, and input gained through planning meetings, the FMPC agreed upon a list of natural flood hazards that could affect the County.

Table 4.1 – Summary of Flood Hazard Identification

Flood Hazard	Included in 2019 Georgia Hazard Mitigation Strategy?	Included in 2020 Chatham County HMP?	Included in 2018 Chatham County FMP?
Climate Change/Sea Level Rise	No*	Yes	Yes
Dam/Levee Failure	Yes	Yes	Yes
Flood: 100-/500-year	Yes	Yes	Yes
Flood: Stormwater/Localized	No	No	Yes
Hurricane/Tropical Storm	Yes	Yes	Yes
Coastal/Stream Bank Erosion	No	Yes	Yes

*The 2019 Georgia State Hazard Mitigation Strategy describes the impacts of climate change on the hazards that have been identified within the state but does not profile climate change independently.

All hazards listed above were evaluated for this plan update. Flood hazard data from the Chatham County Hazard Mitigation Plan, Georgia Emergency Management Agency (GEMA), FEMA, the National Oceanic and Atmospheric Administration (NOAA), and other sources were examined to assess the significance of these hazards to the planning area. Significance was measured in general terms and focused on key criteria such as frequency and resulting damage, which includes deaths and injuries, as well as property and economic damage. The Dam/Levee Failure hazard was revised to remove levee failure due to the lack of identified levees in the County.

4.1.2 DISASTER DECLARATION HISTORY

To identify priority flood hazards, the FMPC researched past events that resulted in a federal and/or state emergency or disaster declaration in the planning area for Chatham County. Federal and/or state disaster declarations may be granted when the Governor certifies that the combined local, county and state resources are insufficient and that the situation is beyond their recovery capabilities. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. If the disaster is so severe that both the local and state government capacities are exceeded, a federal disaster declaration may be issued allowing for the provision of federal assistance. Federal emergency declarations are issued prior to local or state requests, when a disaster is anticipated to exceed state recovery capacity.

Records of designated counties for FEMA major disaster declarations start in 1964. Since then, Chatham County has been designated in 10 emergency and major disaster declarations, which are listed in Table 4.2 below.

Table 4.2 – FEMA Emergency and Major Disaster Declarations for Chatham County since 1965

Hazard Type	Disaster #	Date
Hurricane Irma	DR-4338	September 15, 2017
Hurricane Matthew	DR-4284	October 8, 2016
Hurricane Michael	EM-3406	October 10, 2018
Hurricane Irma	EM-3387	September 8, 2017
Hurricane Matthew	EM-3379	October 6, 2016
Hurricane Katrina Evacuation	EM-3218	September 5, 2005
Hurricane Floyd Emergency Declarations	EM-3144	September 14, 1999
Severe Storms and Flooding	DR-1209	March 11, 1998
Heavy Rains, Tornados, Flooding, High Winds	DR-1042	October 19, 1994
Hurricane Dorian	EM-3422	September 1, 2019

Source: FEMA Disaster Declaration Summaries; November 8, 2023
Note: Date indicates the date of the disaster declaration, which may not coincide with the actual date of the event.

4.1.3 FLOOD EVENT HISTORY

The National Oceanic and Atmospheric Administration's National Centers for Environmental Information (NCEI) has been tracking various types of severe weather since 1950. Their Storm Events Database contains an archive of destructive storm or weather data and information which includes local, intense and damaging events. NCEI receives storm data from the National Weather Service (NWS). The NWS receives their information from a variety of sources, which include but are not limited to: county, state and federal emergency management officials, local law enforcement officials, SkyWarn spotters, NWS damage surveys, newspaper clipping services, the insurance industry and the general public, among others. This database contains 185 unique records of flood-related severe weather events that occurred in Chatham County between January 1996 and October 2023. Table 4.3 summarizes these events. Where multiple entries exist in the NCEI database for the same event, the impacts (damages, deaths, and injuries) have been consolidated into a single line of data for each event date to simplify reporting in this plan and provide a more accurate count of events and avoid reporting duplicate impacts. These NCEI events are provided in more detail within each hazard profile.

Table 4.3 – NCEI Severe Weather Reports for Chatham County, January 1996 – October 2023

Type	# of Events	Property Damage	Crop Damage	Deaths	Injuries
Coastal Flood	22	$40,000	$0	0	0
Flash Flood	35	$8,430,000	$0	0	2
Flood	1	$2,000	$0	0	0
Heavy Rain	2	$0	$0	0	0
Hurricane/Typhoon	4	$0	$0	1	2
Storm Surge/Tide	4	$10,000,000	$0	0	0
Tropical Depression	2	$0	$0	0	0
Tropical Storm	26	$10,114,500	$0	0	0
Total:	**96**	**$28,486,500**	**$0**	**1**	**4**

Source: National Centers for Environmental Information Storm Events Database, retrieved May 2024
Note: Losses reflect totals for all impacted areas for each event.

4.1.4 CLIMATE CHANGE

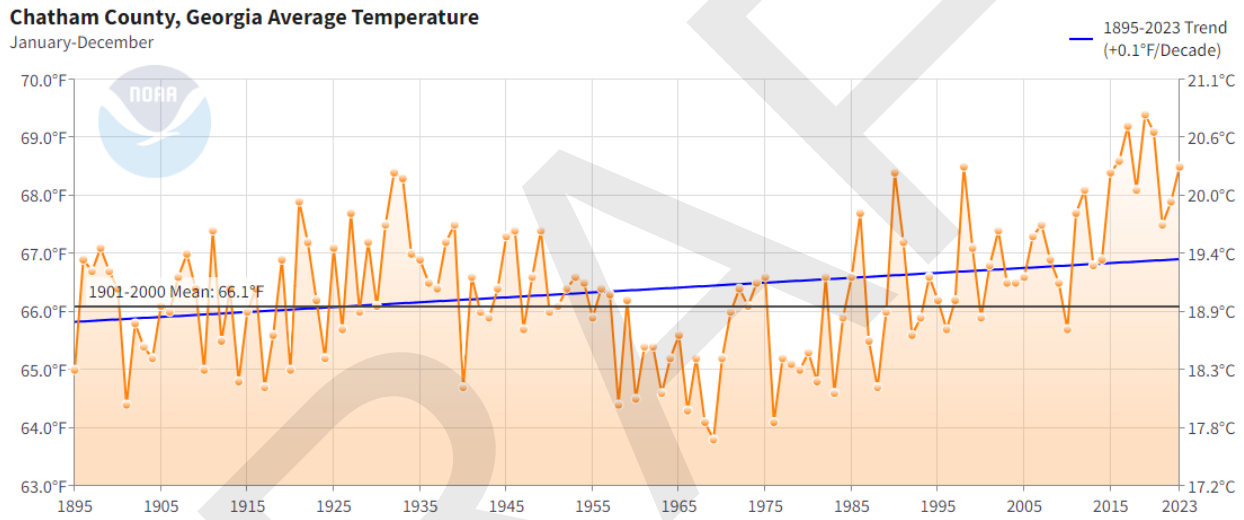
Climate change refers to long-term shifts in temperature and weather patterns. Climate change can be due to natural internal processes or external forces such as modulations of the solar cycles, volcanic eruptions, and persistent anthropogenic changes in the composition of the atmosphere or in land use (IPCC, 2014). However, the recent and rapid warming of the earth that has been observed over the past century has been

cause for concern, as this warming is due to the accumulation of human-caused greenhouse gases, such as CO_2, in the atmosphere (IPCC, 2007). Global average temperature is estimated to have increased by about 1 degree Celsius since the pre-industrial period, and it is currently increasing by about 0.2 degrees Celsius per decade. This global increase in temperatures is having broad range of effects on global, regional and local climates. According to the IPCC, the extent of climate change effects on individual regions will vary over time and with the ability of different societal and environmental systems to mitigate or adapt to change.

TEMPERATURE

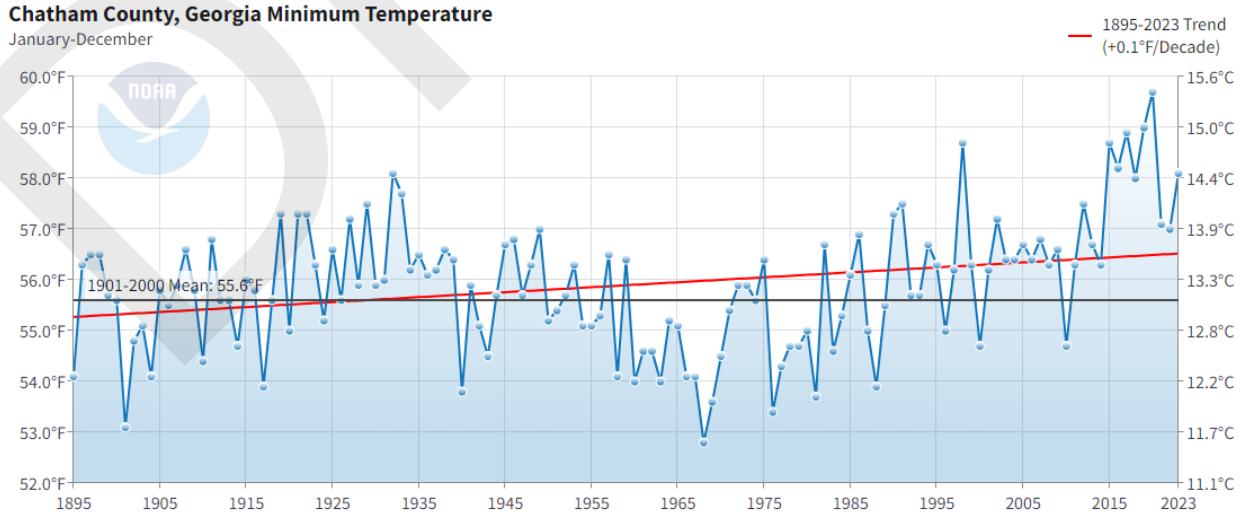
NOAA's Climate at a Glance tool provides records of past temperature averages in Chatham County since 1895. These records show an increasing annual trend of 0.1 degrees Fahrenheit in average temperature, average minimum temperature, and average maximum temperature, as shown in Figure 4-1 through Figure 4-3. This trend is expected to continue and may even accelerate, depending on future emissions.

Figure 4-1 – Average Annual Temperature in Chatham County



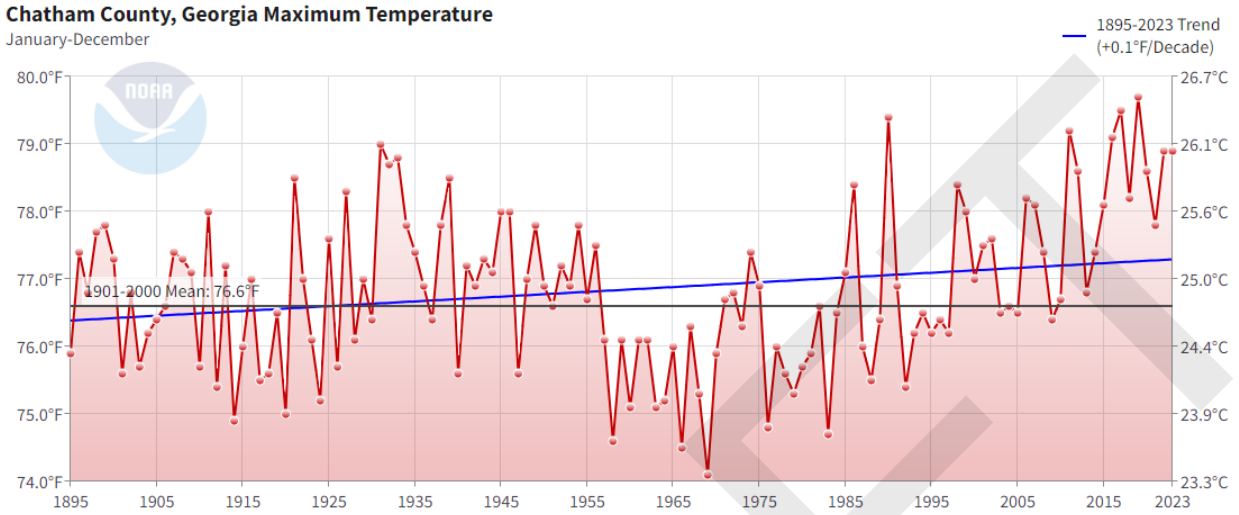
Source: NOAA Climate at a Glance

Figure 4-2 – Average Annual Minimum Temperature in Chatham County



Source: NOAA Climate at a Glance

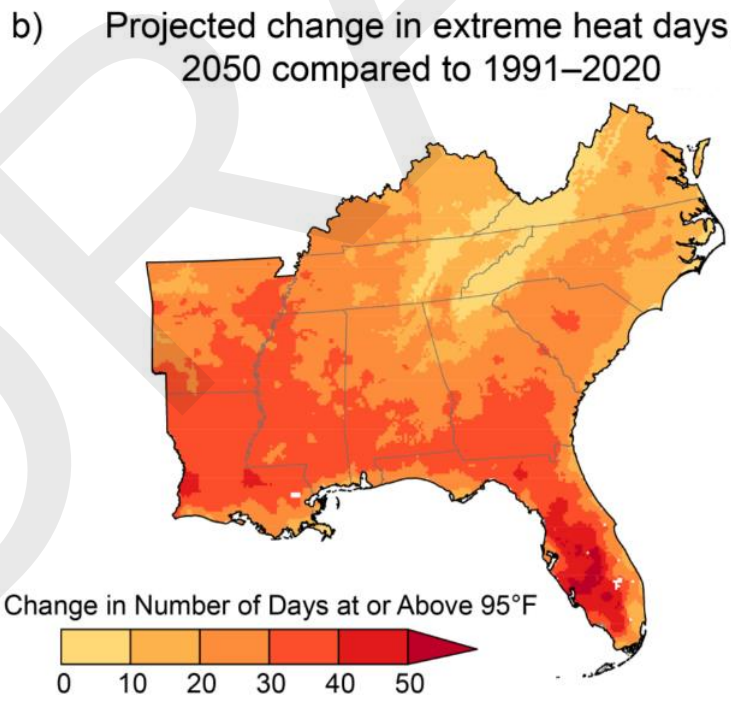
Figure 4-3 – Average Annual Maximum Temperature in Chatham County



Source: NOAA Climate at a Glance

Extreme heat is also projected to increase in Chatham County and throughout the Southeast United States. According to the Fifth National Climate Assessment, by 2050 Chatham County is expected to experience 20 to 30 more extreme heat days per year compared to the 1991 to 2020 average, as shown in Figure 4-4.

Figure 4-4 – Future Extreme Heat Days

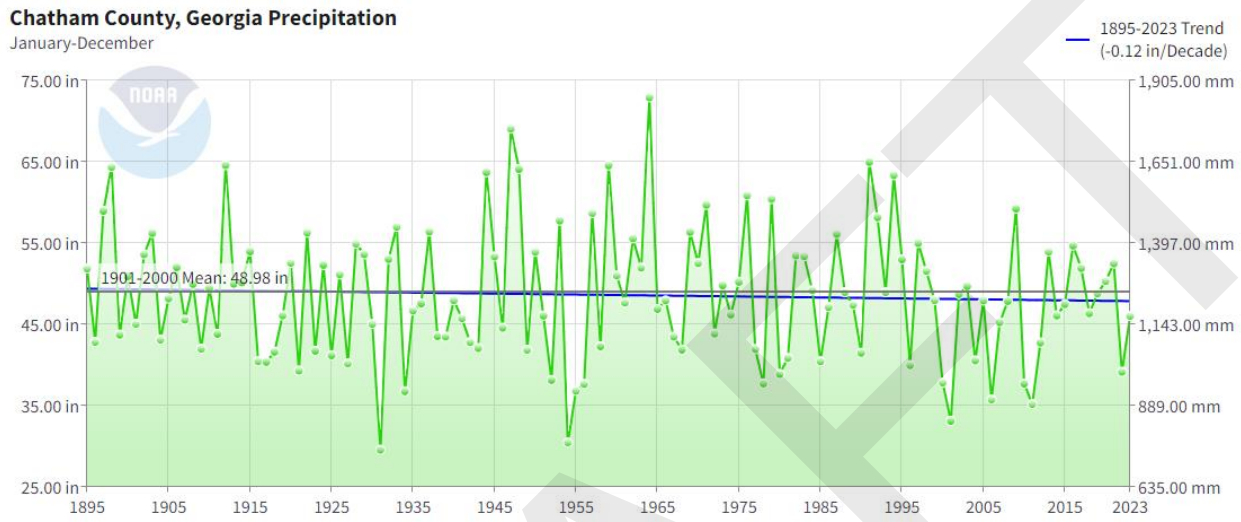


Source: Fifth National Climate Assessment, NOAA NCEI and CISESS NC

PRECIPITATION

Chatham County averages 48.62 inches of rainfall annually, with August being the wettest month of the year on average. A review of precipitation data from 1895 to 2023 shows a small observable systematic trend of -0.12 inches of precipitation by decade.

Figure 4-5 – Annual Precipitation in Chatham County



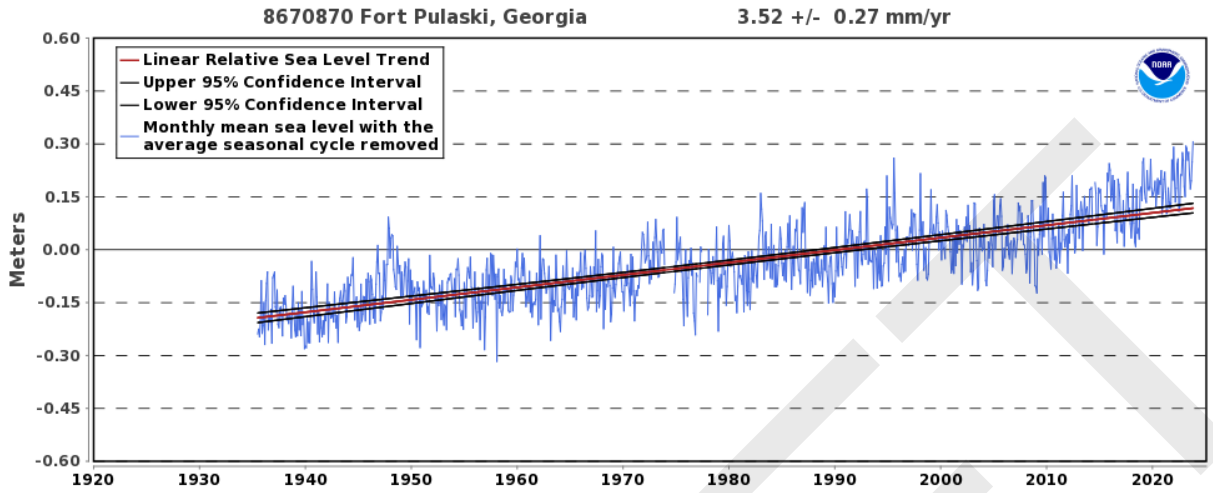
Source: NOAA Climate at a Glance

Although overall precipitation is decreasing, the Fourth National Climate Assessment indicates that the number of days with heavy precipitation has increased across most of the Southeast, particularly since the 1980s. Heavy precipitation is largely driven by more extreme events such as tropical cyclones, which are expected to bring more rainfall in the future. The Fifth National Climate Assessment reports that higher levels of warming will result in more extreme events, which may increase some seasonal, annual average, and extreme precipitation amounts across the Southeast.

SEA LEVEL RISE

Chatham County's coastal plain and inland low-lying regions are highly vulnerable to sea level rise. Figure 4-6 shows the relative sea level trend for the Fort Pulaski, Georgia tidal gauge. Based on monthly mean sea level data from 1935 to 2022, the relative sea level trend is 3.52 mm/year with a 95% confidence interval of +/- 0.27 mm/year. This trend is equivalent to a change of 1.15 feet in 100 years.

Figure 4-6 – Sea Level Trend in Fort Pulaski, Georgia



Source: NOAA Tides & Currents

HIGH TIDE FLOODING

Accelerated sea level rise is expected to increase the occurrence of regular high tide flooding. High tide events within Chatham County have been known to impact access to the coastal islands, particularly Tybee Island and U.S. 80, the only roadway connecting the islands to the mainland. The impact of these high tide events can lead to highway closures, essentially cutting off the islands' residents for approximately 24 hours at a time.

SALTWATER INTRUSION

Saltwater intrusion is caused by increasing sea levels and/or a reduction in inland freshwater levels and can compromise well fields and lead to contamination of drinking water supplies. According to the Comprehensive Plan Update, Chatham County was identified in the 2006 Coastal Georgia Water and Wastewater Permitting Plan for Managing Saltwater Intrusion as having the highest vulnerability for the groundwater cone of depression that extends into South Carolina, where saltwater intrusion has already occurred.

4.1.5 IDENTIFIED HAZARDS

Based on preliminary review of disaster declaration history, flood event history, and discussion by the FMPC, the following hazards were identified for full risk and vulnerability analysis in this plan:

- Climate Change and Sea Level Rise
- Coastal and Stream Bank Erosion
- Coastal and Inland Flooding
- Dam Failure
- Hurricane and Tropical Storm
- Stormwater/Localized Flooding

4.2 RISK ASSESSMENT METHODOLOGY

The hazards identified in Section 4.1 Hazard Identification, are profiled individually in Section 4.4. The DMA regulations require that the FMPC evaluate the risks and impacts associated with each of the hazards identified in the planning process.

Each hazard is profiled in the following format:

HAZARD DESCRIPTION

This section provides a description of the hazard followed by details specific to the Chatham County planning area. Where available, this section also includes information on the hazard extent, seasonal patterns, speed of onset/duration, magnitude and any secondary effects.

LOCATION

This section includes information on the hazard extent, seasonal patterns, speed of onset/duration, magnitude and any secondary effects.

EXTENT

This section provides information on the magnitude of the hazard and describes how the severity of the hazard can be measured. If known, the most severe event on record is noted.

PAST OCCURRENCES

This section contains information on historical events, including the extent or location of the hazard within or near the Chatham County planning area.

PROBABILITY OF FUTURE OCCURRENCE

This section gauges the likelihood of future occurrences based on past events and existing data. The frequency is determined by dividing the number of events observed by the number of years on record and multiplying by 100. This provides the percent chance of the event happening in any given year according to historical occurrence (e.g. 10 hurricanes or tropical storms over a 30-year period equates to a 33 percent chance of experiencing a hurricane or tropical storm in any given year).

CLIMATE CHANGE AND FUTURE CONDITIONS

This section discusses how climate change may or may not influence the risk posed by the hazard on the planning area in the future.

PRIORITY RISK INDEX

The findings from the above sections of the hazard profiles are summarized using the Priority Risk Index (PRI) to score and rank each hazard's significance to the planning area (the higher the PRI value, the greater the hazard risk). The PRI provides a standardized numerical value so that hazards can be compared against one another. PRI values are obtained by assigning varying degrees of risk to five categories for each hazard (probability, impact, spatial extent, warning time, and duration). Each degree of risk has been assigned a value (1 to 4) and a weighting factor as summarized below in Table 4.4

Table 4.4 – Priority Risk Index

RISK ASSESSMENT CATEGORY	LEVEL	DEGREE OF RISK CRITERIA	INDEX	WEIGHT
PROBABILITY What is the likelihood of a hazard event occurring in a given year?	**UNLIKELY**	LESS THAN 1% ANNUAL PROBABILITY	1	30%
	POSSIBLE	BETWEEN 1 & 10% ANNUAL PROBABILITY	2	
	LIKELY	BETWEEN 10 &100% ANNUAL PROBABILITY	3	
	HIGHLY LIKELY	100% ANNUAL PROBABILTY	4	
IMPACT In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs?	**MINOR**	VERY FEW INJURIES, IF ANY. ONLY MINOR PROPERTY DAMAGE & MINIMAL DISRUPTION ON QUALITY OF LIFE. TEMPORARY SHUTDOWN OF CRITICAL FACILITIES.	1	30%
	LIMITED	MINOR INJURIES ONLY. MORE THAN 10% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR > 1 DAY	2	
	CRITICAL	MULTIPLE DEATHS/INJURIES POSSIBLE. MORE THAN 25% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR > 1	3	
	CATASTROPHIC	HIGH NUMBER OF DEATHS/INJURIES POSSIBLE. MORE THAN 50% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES > 30 DAYS.	4	
SPATIAL EXTENT How large of an area could be impacted by a hazard event? Are impacts localized or regional?	**NEGLIGIBLE**	LESS THAN 1% OF AREA AFFECTED	1	20%
	SMALL	BETWEEN 1 & 10% OF AREA AFFECTED	2	
	MODERATE	BETWEEN 10 & 50% OF AREA AFFECTED	3	
	LARGE	BETWEEN 50 & 100% OF AREA AFFECTED	4	
WARNING TIME Is there usually some lead time associated with the hazard event? Have warning measures been implemented?	**MORE THAN 24 HRS**	SELF DEFINED	1	10%
	12 TO 24 HRS	SELF DEFINED	2	
	6 TO 12 HRS	SELF DEFINED	3	
	LESS THAN 6 HRS	SELF DEFINED	4	
DURATION How long does the hazard event usually last?	**LESS THAN 6 HRS**	SELF DEFINED	1	10%
	LESS THAN 24 HRS	SELF DEFINED	2	
	LESS THAN 1 WEEK	SELF DEFINED	3	
	MORE THAN 1 WEEK	SELF DEFINED	4	

The sum of all five risk assessment categories equals the final PRI value, demonstrated in the equation below (the highest possible PRI value is 4.0).

PRI = [(Probability x .30) + (Impact x .30) + (Spatial Event x .20) + (Warning Time x .10) + (Duration x .10)]

The purpose of the PRI is to categorize and prioritize all potential hazards for the Chatham County planning area as high, moderate, or low risk. The summary hazard classifications generated through the PRI allows for the prioritization of high hazard risks for mitigation planning purposes.

VULNERABILITY ASSESSMENT

This section quantifies, to the extent feasible using best available data, assets at risk to natural hazards and estimates potential losses. Properties, people, and critical facilities that are vulnerable to the hazard are identified. Future development is also discussed in this section, including how exposure to the hazard may change in the future or how development may affect hazard risk.

The vulnerability assessments followed the methodology described in the FEMA publication Understanding Your Risks—Identifying Hazards and Estimating Losses (August 2001). The vulnerability assessment first describes the total vulnerability and values at risk and then discusses vulnerability by hazard. Data used to support this assessment included the following:

- Geographic Information System (GIS) datasets, including building footprints, topography, aerial photography, and transportation layers;
- Hazard layer GIS datasets from state and federal agencies;
- Written descriptions of risks provided by the State Hazard Mitigation Plan; and
- Written descriptions of inventory and risks provided by the Regional Hazard Mitigation Plan.

Two distinct risk assessment methodologies were used in the formation of the vulnerability assessment. The first consists of a ***quantitative*** analysis that relies upon best available data and technology, while the second approach consists of a ***qualitative*** analysis that relies on local knowledge and rational decision making. The quantitative analysis involved the use of FEMA's Hazus-MH, a nationally applicable standardized set of models for estimating potential losses from earthquakes, floods, and hurricanes. Hazus uses a statistical approach and mathematical modeling of risk to predict a hazard's frequency of occurrence and estimated impacts based on recorded or historic damage information. The Hazus risk assessment methodology is parametric, in that distinct hazard and inventory parameters—such as wind speed and building type—were modeled using the Hazus software to determine the impact on the built environment. Chatham County's GIS-based flood risk assessment was completed using data collected from local, regional and national sources that included Chatham County, GEMA/HS, and FEMA.

Vulnerability is summarized in general, qualitative terms and encompasses the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low** – The occurrence and potential cost of damage to life and property is very minimal to non-existent.
- **Low** – Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium** – Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High** – Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High** – Very widespread with catastrophic impact.

Vulnerability can be quantified in instances where there is a known, defined hazard area, such as a mapped floodplain. In these instances, the numbers and types of buildings subject to the identified hazard can be counted and their values tabulated. Additional information, such as the location of critical community facilities (e.g., a fire station), historic structures, and valued natural resources (e.g., an identified wetland or endangered species habitat) can also be evaluated in relation to known hazard areas. Together, this information conveys the vulnerability of that area to that hazard.

4.3 ASSET INVENTORY

An inventory of assets within Chatham County was compiled to identify those structures and people potentially at risk to the identified hazards. This asset inventory is divided into property, people, critical facilities and infrastructure, and future land use. By understanding the type and number of assets that exist and where they are in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed.

4.3.1 PROPERTY

Property exposure includes all improved properties in unincorporated Chatham County. Building footprint and parcel data were retrieved from the Savannah Area Geographic Information System (SAGIS) open data site and used to compile this inventory. Property exposure is summarized by occupancy type in Table 4.5. Property exposure is further detailed by flood zone in Section 4.4.2.

Table 4.5 – Chatham County Building Exposure

Occupancy Type	Total Number of Buildings	Total Building Value	Estimated Content Value	Total Value
Agricultural	177	$12,936,576	$12,936,576	$25,873,153
Commercial	2993	$1,388,874,279	$1,388,874,279	$2,777,748,559
Education	18	$5,786,841	$5,786,841	$11,573,682
Government	448	$1,325,753,614	$1,325,753,614	$2,651,507,229
Industrial	1606	$944,103,159	$1,416,154,739	$2,360,257,898
Religious	327	$154,971,313	$154,971,313	$309,942,626
Residential	37588	$8,316,859,194	$4,161,579,166	$12,478,438,361
Total	**43,157**	**$12,149,284,977**	**$8,466,056,530**	**$20,615,341,507**

Data sources: SAGIS Open Data Site

Note: Content value estimations are based on the FEMA Hazus methodology of estimating value as a percent of improved structure values by property type. The residential property type assumes a content replacement value equal to 50% of the building value. Agricultural, commercial, education, government, and religious property types assume a content replacement value equal to 100% of the building value. The industrial property type assumes a content replacement value equal to 150% of the building value.

4.3.2 PEOPLE

An estimate of people at risk by location was derived using residential property data and the average household size in Chatham County as estimated by the U.S. Census. Table 4.6 shows the total population at risk according to this methodology.

Table 4.6 – Estimated Population at Risk

Residential Property Count	Average Household Size	People at Risk
37,588	2.43	91,338

Data sources: American Community Survey 2018-2022 5-Year Estimates; Chatham County parcel data, 2024

4.3.3 CRITICAL FACILITIES AND INFRASTRUCTURE

Of significant concern with respect to any disaster event is the location of critical facilities and infrastructure in the planning area. Critical facilities are often defined as those essential services and facilities in a major emergency which, if damaged, would result in severe consequences to public health and safety or a facility which, if unusable or unreachable because of a major emergency, would seriously and adversely affect the health, safety, and welfare of the public.

The critical facility inventory is summarized by FEMA community lifelines and total structure value in Table 4.7. Structure values were estimated using Chatham County parcel data; values were not available for all critical facilities. Values for some facilities were not able to be determined. A full inventory of identified critical facilities and infrastructure is provided in Table 4.8 and their locations are shown in Figure 4-7.

Table 4.7 – Critical Facilities and Infrastructure in Chatham County

FEMA Lifeline	Count	Structure Value
Energy	1	N/A
Food, Hydration, Shelter	5	$32,481,011
Health and Medical	7	$1,513,900
Safety and Security	10	$8,777,035
Transportation	4	$931,200
Water Systems	3	$49,000
Total	**30**	**$41,160,944**

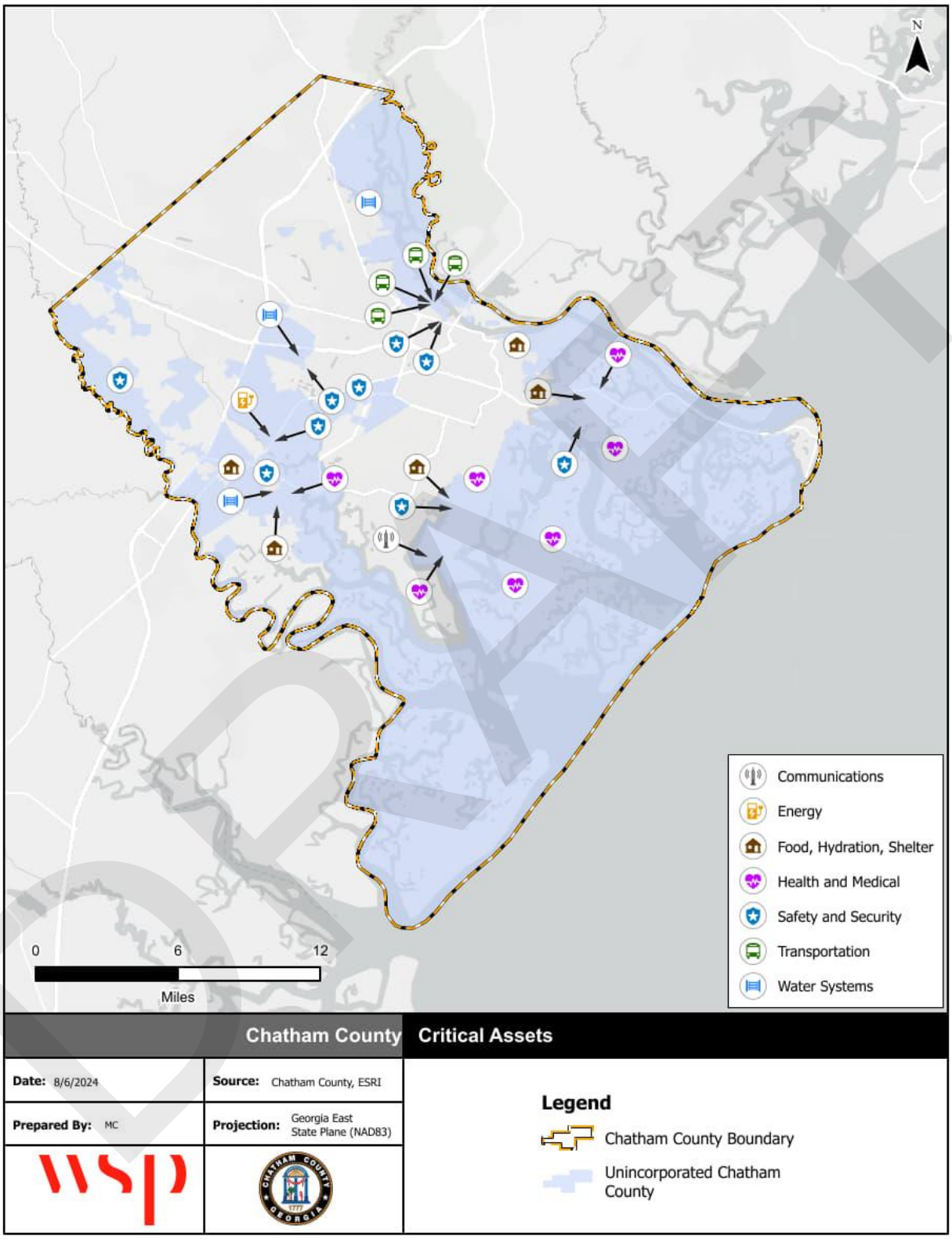
Table 4.8 – Inventory of Critical Facilities and Infrastructure

Facility Name	Facility Type	Structure Value
Pump Station #2	Water Systems	NA
Georgetown Treatment Plant	Water Systems	$49,000
Lift Station #134	Water Systems	N/A
Pooler Tower Site, Chatham County	Energy	NA
Chatham Emer. Services Station #2	Health and Medical	$444,102
Chatham Emer. Services Station #3	Health and Medical	$690,000
Chatham Emer. Services Station #4	Health and Medical	$80,700
Chatham Emer. Services Station #5	Health and Medical	$60,000
Chatham Emer. Services Station #6	Health and Medical	$92,100
Chatham Emer. Services Station #8	Health and Medical	$56,100
Chatham Emer. Services Station #9	Health and Medical	$90,900
Police Precinct	Safety and Security	$1,388,600
Chatham Fire Station #7	Safety and Security	$249,800
Chatham Fire Station #10	Safety and Security	$66,200
Chatham Fire Station #11	Safety and Security	$72,664
Chatham Fire Station #24	Safety and Security	$70,070
Chatham Fire Training Center	Safety and Security	$427,299
Police Precinct – Northwest, Police Traffic Operations	Safety and Security	$2,625,637
Police Precinct	Safety and Security	$1,043,600
Radio Tower – South	Safety and Security	$10,300
Police Traffic Operations	Safety and Security	$2,625,636

Southwest Middle School	Food, Hydration, Shelter	$14,189,697
Hesse Primary School	Food, Hydration, Shelter	$18,078,999
Parker's Store #27	Food, Hydration, Shelter	$212,314
Islands High School	Food, Hydration, Shelter	$5,840,100
Georgetown K-8 School	Food, Hydration, Shelter	$162,700
Fell Street Station #01, Fell Street Station #02	Transportation	$310,400
Lathrop St Station #01, Lathrop St Station #02	Transportation	$155,200

The previous 2018 Chatham County FMP included critical facilities within both the incorporated and unincorporated County. The inventory in this plan update only includes critical facilities located in the unincorporated County.

Figure 4-7 – Chatham County Critical Facilities



4.4 HAZARD PROFILES, ANALYSIS, AND VULNERABILITY

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

44 CFR Subsection D §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. Plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of:
A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;
(B): An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate; and
(C): Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

The following sections, detailed in the table below, provide profiles of the flood hazards that the FMPC identified for inclusion in this plan.

Table 4.9 – Flood Hazard Profile Organization and PRI Summary

Section	Hazard	PRI Score	PRI Rating
4.4.1	Climate Change & Sea Level Rise	2.9	Medium
4.4.2	Coastal & Inland Flooding	3.5	High
4.4.3	Coastal & Stream Bank Erosion	2.4	Medium
4.4.4	Dam Failure	1.4	Low
4.4.5	Hurricane/Tropical Storm	3.3	High
4.4.6	Stormwater/Localized Flooding	2.7	Medium

4.4.1 CLIMATE CHANGE AND SEA LEVEL RISE

Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Climate Change & Sea Level Rise	Highly Likely	Limited	Moderate	More than 24 hours	More than 1 week	2.9

HAZARD DESCRIPTION

Climate change refers to a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change is a natural occurrence in which the earth has warmed and cooled periodically over geologic time. However, the recent and rapid warming of the earth over the past century has been cause for concern, as this warming is due to the accumulation of human-caused greenhouse gases, such as CO_2, in the atmosphere (IPCC, 2007). Global average temperature is estimated to have increased by about 1 degree Celsius since the pre-industrial period, and it is currently increasing by about 0.2 degrees Celsius per decade. This global increase in temperatures is having broad range of effects on global, regional, and local climates.

It can reasonably be assumed that the following climate risks could impact the Chatham County planning area: 1) increasing temperatures; 2) increasing frequency and strength of severe weather events; 3) more heavy rain/flooding; and 4) more frequent and prolonged drought. A discussion of the effect of climate change on the individual hazards in this plan is included in each hazard profile.

Sea level rise is the increase in sea levels as a result of atmospheric and oceanic warming which causes water expansion as well as ice melt from ice sheets and glaciers. There are generally two separate mechanics involved in global sea level rise. The first is directly attributed to global temperature increases, which warm the oceans waters and cause them to expand. The second is attributed to the melting of ice over land which simply adds water to the oceans. Global sea level rise is likely caused by a combination of these two mechanics and can be exasperated on the local level by factors such as erosion and subsidence. The rate of sea level rise has varied throughout geologic history, and studies have shown that global temperature and sea level are strongly correlated.

Due to sea-level rise projected throughout the 21st century and beyond, coastal systems and low-lying areas will increasingly experience adverse impacts such as submergence, coastal flooding, and coastal erosion. The population and assets projected to be exposed to coastal risks as well as human pressures on coastal ecosystems will increase significantly in the coming decades due to population growth, economic development, and urbanization (IPCC, 2014).

Warning Time: More than 24 hours

Duration: More than 1 week

LOCATION

Sea level rise can occur anywhere along the coast of Chatham County. The United State Geological Survey's (USGS) Coastal Vulnerability Index (CVI) provides a preliminary overview of the relative susceptibility of the United States coast to sea level rise. The CVI is based on geomorphology, regional coastal slope, tide range, wave height, relative sea level rise, and shoreline erosion and acceleration rates. For each study area, each variable is scored on a 1-5 scale based on defined parameters, where "1" indicates low contribution to coastal vulnerability and "5" indicates high contribution to vulnerability. These scores are then aggregated into a single index through a mathematical formula. The resulting index gives an overview of where physical changes may occur due to sea-level rise.

Figure 4-8 shows the CVI for Chatham County. The majority of the Chatham County coast has a CVI rating of moderate. Tybee Island has high vulnerability, and the several river inlets have low vulnerability.

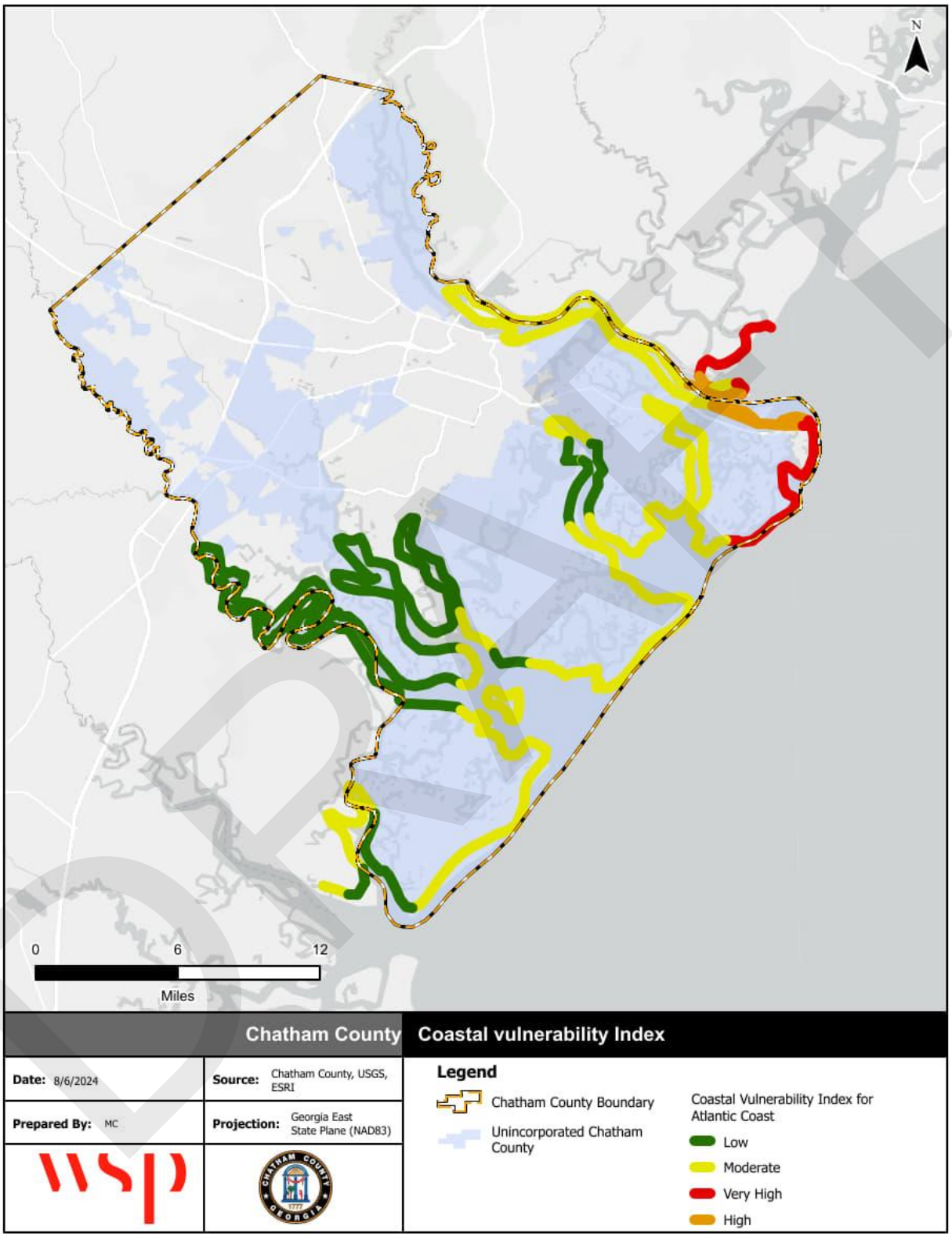
Spatial Extent: Moderate

EXTENT

The estimated impacts of 1-foot, 2-foot, and 3-foot, sea level rise are shown in Figure 4-9 according to data from the NOAA Sea Level Rise viewer. This map of estimated sea level rise shows inundation above mean higher high water (the average of each day's higher high tide line). Sea level rise will likely affect coastal marsh lands as well as land along the Ogeechee and Savannah rivers and their tributaries. Additionally, sea level rise will likely increase future risk of flooding from the other flood hazards discussed in this chapter, as more land will have a lower elevation relative to sea level. For example, with much of the barrier islands and marsh land inundated, inland areas will lose their natural protection and may become susceptible to coastal flooding with velocity wave action.

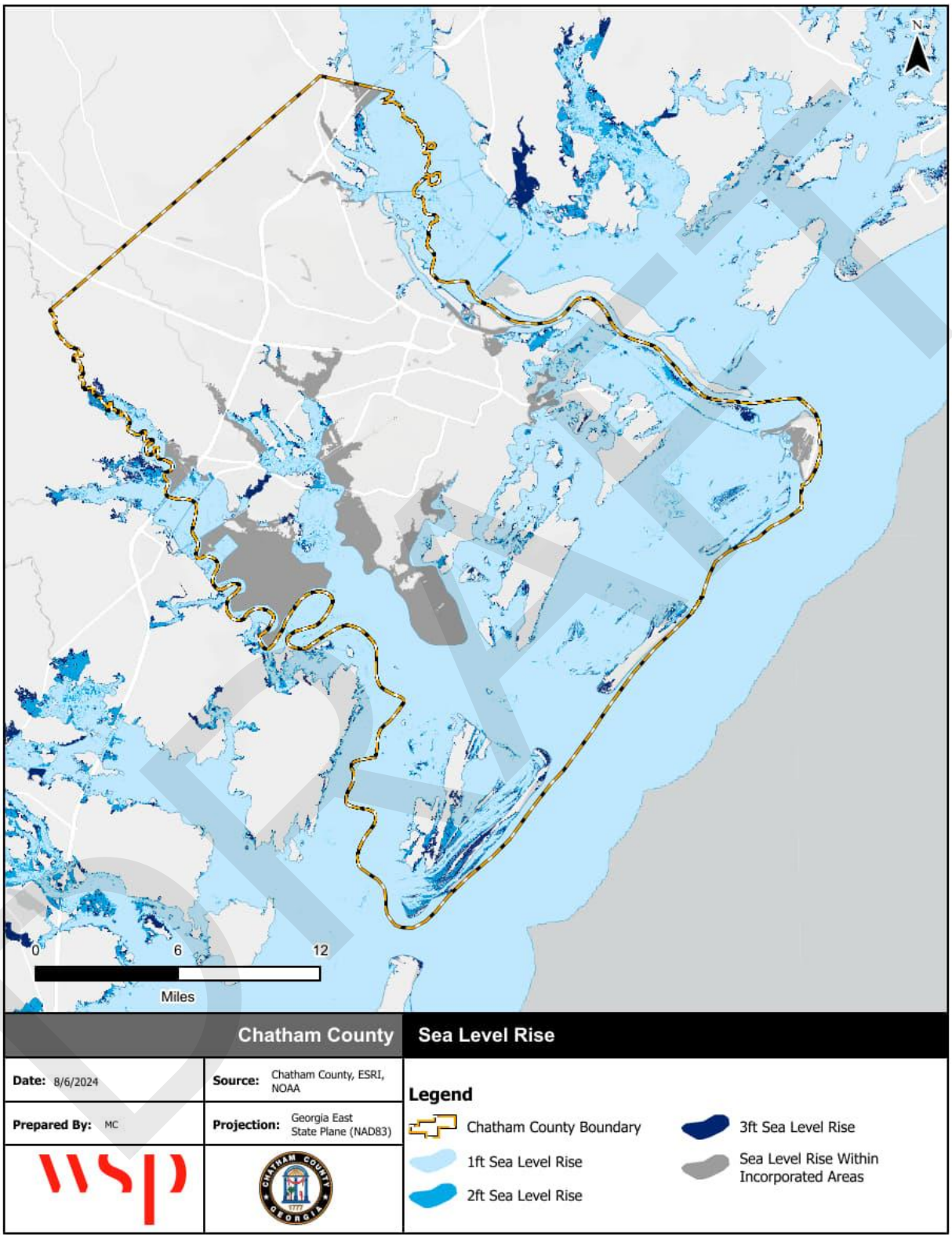
Impact: Limited

Figure 4-8 – Coastal Vulnerability Index, Chatham County, GA



Source: USGS Coastal Change Hazards Portal, Coastal Vulnerability Index

Figure 4-9 – Extent of Sea Level Rise



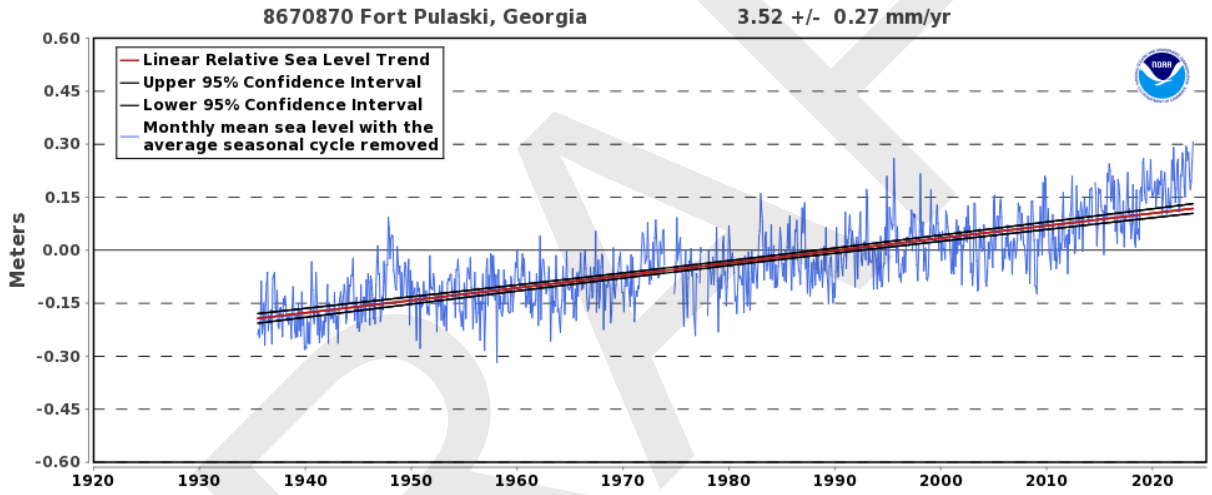
Source: NOAA Office for Coastal Management Sea Level Rise Viewer, April 2024

PAST OCCURRENCES

The rate of sea level rise has varied throughout geologic history, and studies have shown that global temperature and sea level are strongly correlated. Historic trends in local Relative Sea Level (RSL) are best determined from tide gauge records. Tide gauge measurements are made with respect to a local fixed reference on land. The Center for Operational Oceanographic Products and Services (CO-OPS) has been measuring sea level for over 150 years, with tide stations operating on all U.S. coasts. Changes in RSL, either a sea level rise or sea level fall, have been computed at 142 long-term water level stations using a minimum span of 30 years of observations at each location. These measurements have been averaged by month to remove the effect of higher frequency phenomena (e.g. storm surge) in order to compute an accurate linear sea level trend. At the Fort Pulaski, GA station, the mean sea level trend is 3.52 mm/year with a 95% confidence interval of +/- 0.27 mm/year based on monthly mean sea level data from 1935 to 2022 which is equivalent to a change of 1.15 feet in 100 years.

Figure 4-10 shows the monthly mean sea level at NOAA's Fort Pulaski, GA station without the regular seasonal fluctuations due to coastal ocean temperatures, salinities, winds, atmospheric pressures, and ocean currents. The long-term linear trend is also shown, including its 95% confidence interval. The plotted values are relative to the most recent Mean Sea Level datum established by CO-OPS.

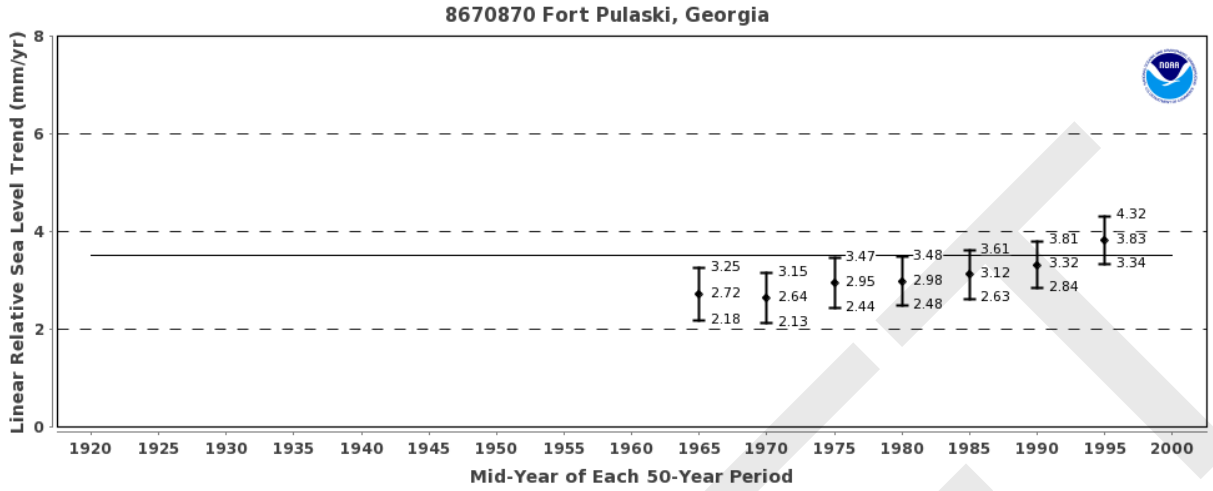
Figure 4-10 – Relative Sea Level Trend for Fort Pulaski, Georgia



Source: NOAA Tides and Currents, 2023

As more data are collected at water level stations, the linear mean sea level trends can be recalculated each year. Figure 4-11 compares linear mean sea level trends and 95% confidence intervals calculated from the beginning of the Fort Pulaski, GA station record to recent years. The values do not indicate the trend in each year, but the trend of the entire data period up to that year.

Figure 4-11 – Previous Mean Sea Level Trends for Fort Pulaski, GA



Source: NOAA Tides and Currents, 2023

Sea level rise and climate change have also driven an increase in high tide flooding. Tidal flooding causes temporary inundation of low-lying areas during high-tide events. While tidal flooding is not caused by sea level rise itself, a 2015 tidal flooding report published by NOAA notes that tidal flood rates are steadily increasing, and daily highest tides surpass fixed elevations increasingly frequently, due in part to sea level rise. Per the Fourth National Climate Assessment, annual occurrences of high tide coastal flooding have increased 5- to 10-fold since the 1960s in several low-lying coastal cities in the Southeast. In 2016, the all-time record of coastal flooding occurrences in Savannah was broken, with 38 days of high tides exceeding the flood warning threshold at the Fort Pulaski tide gauge.

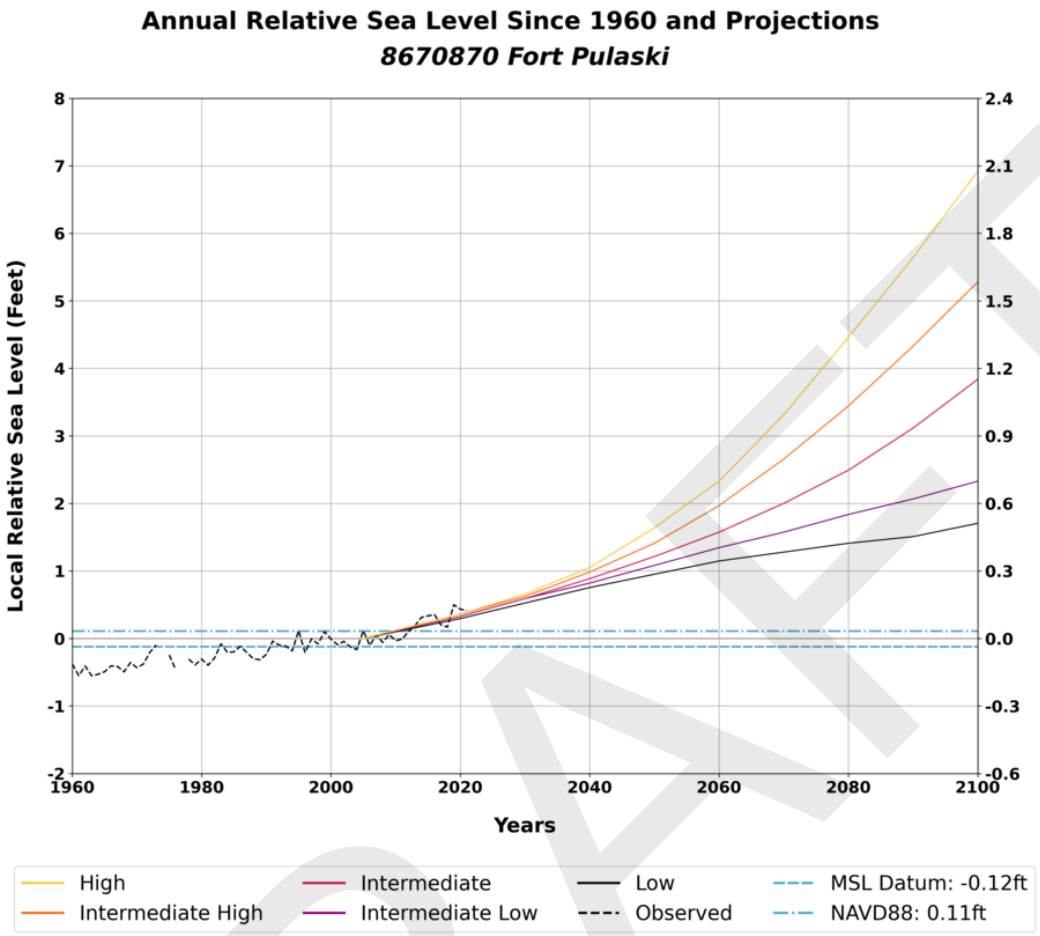
PROBABILITY OF FUTURE OCCURRENCE

Probability: Highly Likely

Under current climate change models, changes in global temperatures, hydrologic cycles, and storm frequency and intensity are expected to continue. Figure 4.12 from NOAA Tides & Currents shows five regionalized sea level rise scenarios plotted relative to a 1996-2014 baseline period with the year 2005 as the "zero" point. The five scenarios are generated to account for emissions uncertainty and process uncertainty. Emissions uncertainty relates to the unknown amount of greenhouse gases that will be emitted in the future, and process uncertainty relates to ice-mass loss, ocean thermal expansion, and local ocean dynamic changes, which will be affected by increased emissions. According to these projections, under the Intermediate High scenario, Chatham County could experience 1 foot of SLR by 2040 and 2 feet of SLR by 2060.

- **Short term:** by 2040, sea level in the region is projected to rise approximately 1 foot
- **Medium term:** by 2060 sea level in the region is projected to rise about 2 feet
- **Long term:** by 2100 sea level in the region is projected to rise almost 5.3 feet

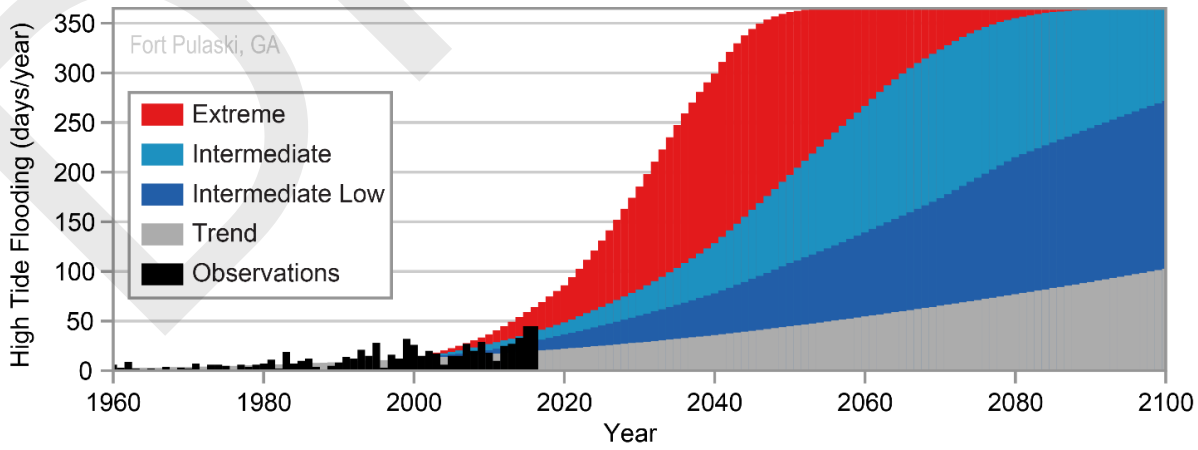
Figure 4-12 – Relative Sea Level Rise Projections for Fort Pulaski, GA



Source: NOAA Tides & Currents, 2024

Figure 4-13 from the Fourth National Climate Assessment illustrates projected increases in high tide flooding at the Fort Pulaski tide gauge. Under the Intermediate scenario, Chatham County is projected to experience between roughly 75 to 125 days of high tide flooding annually by 2040.

Figure 4-13 – Annual Number of High Tide Flooding Days, Observed and Projected



Source: Fourth National Climate Assessment

VULNERABILITY ASSESSMENT

Vulnerability: Moderate

Chatham County is highly vulnerable to the potential impacts of climate change and sea level rise. Climate-driven hazards such as hurricanes and flooding are likely to increase in intensity, and possibly frequency, in the future. Thus the 25-year flood of today may become the 10-year event in the future. Refer to the vulnerability assessment discussions in each hazard profile for the current exposure and risk to these hazards with the perspective that climate change has the potential to exacerbate the existing risk and vulnerabilities. The potential impacts of climate change include increased flooding frequency, potential damage to critical infrastructure, and increasing public costs associated with flood insurance claims, infrastructure repair and maintenance, environmental impacts, and emergency management efforts.

PROPERTY AT RISK

An estimate of affected property by occupancy type and sea level rise extent is summarized in Table 4.10 The categories are cumulative, such that the estimates for 3-foot SLR include all property also exposed to 1-foot and 2-foot SLR.

Table 4.10 – Property Exposure to Sea Level Rise

Occupancy	Number of Buildings	Structure Value	Estimated Content Value	Total Value
1-Foot SLR	**403**	**$472,427,524**	**$494,564,829**	**$966,992,354**
Agriculture	37	$2,904,170	$2,904,170	$5,808,340
Commercial	24	$71,254,497	$71,254,497	$142,508,995
Education	0	-	-	-
Government	14	$269,472,048	$269,472,048	$538,944,096
Industrial	38	$86,224,791	$129,337,187	$215,561,978
Religious	1	$21,583	$21,583	$43,167
Residential	289	$42,550,435	$21,575,344	$64,125,779
2-Foot SLR	**679**	**$507,071,607**	**$539,839,450**	**$1,046,911,057**
Agriculture	38	$2,990,643	$2,990,643	$5,981,285
Commercial	34	$84,211,180	$84,211,180	$168,422,360
Education	0	-	-	-
Government	25	$269,779,638	$269,779,638	$539,559,276
Industrial	97	$107,485,866	$161,228,800	$268,714,666
Religious	3	$53,845	$53,845	$107,691
Residential	482	$85,522,366	$43,152,778	$128,675,144
3-Foot SLR	**1,534**	**$550,043,539**	**$561,416,884**	**$1,111,460,423**
Agriculture	42	$3,250,248	$3,250,248	$6,500,497
Commercial	69	$121,232,874	$121,232,874	$242,465,747
Education	0	-	-	-
Government	46	$276,867,607	$276,867,607	$553,735,213
Industrial	150	$111,687,006	$167,530,509	$279,217,515
Religious	26	$15,882,984	$15,882,984	$31,765,968
Residential	1201	$291,669,300	$146,511,714	$438,181,013

POPULATION AT RISK

Sea level rise will lead to increased flooding and the associated harms to humans, such as illness, or injury or death from driving into flooded waters and drowning.

People at risk to sea level rise was estimated based on the exposure of residential property and the U.S. Census Bureau's average household size estimate for Chatham County of 2.43 persons per household. The resulting estimated population at risk to 1-foot, 2-foot, and 3-foot SLR is summarized in Table 4.11.

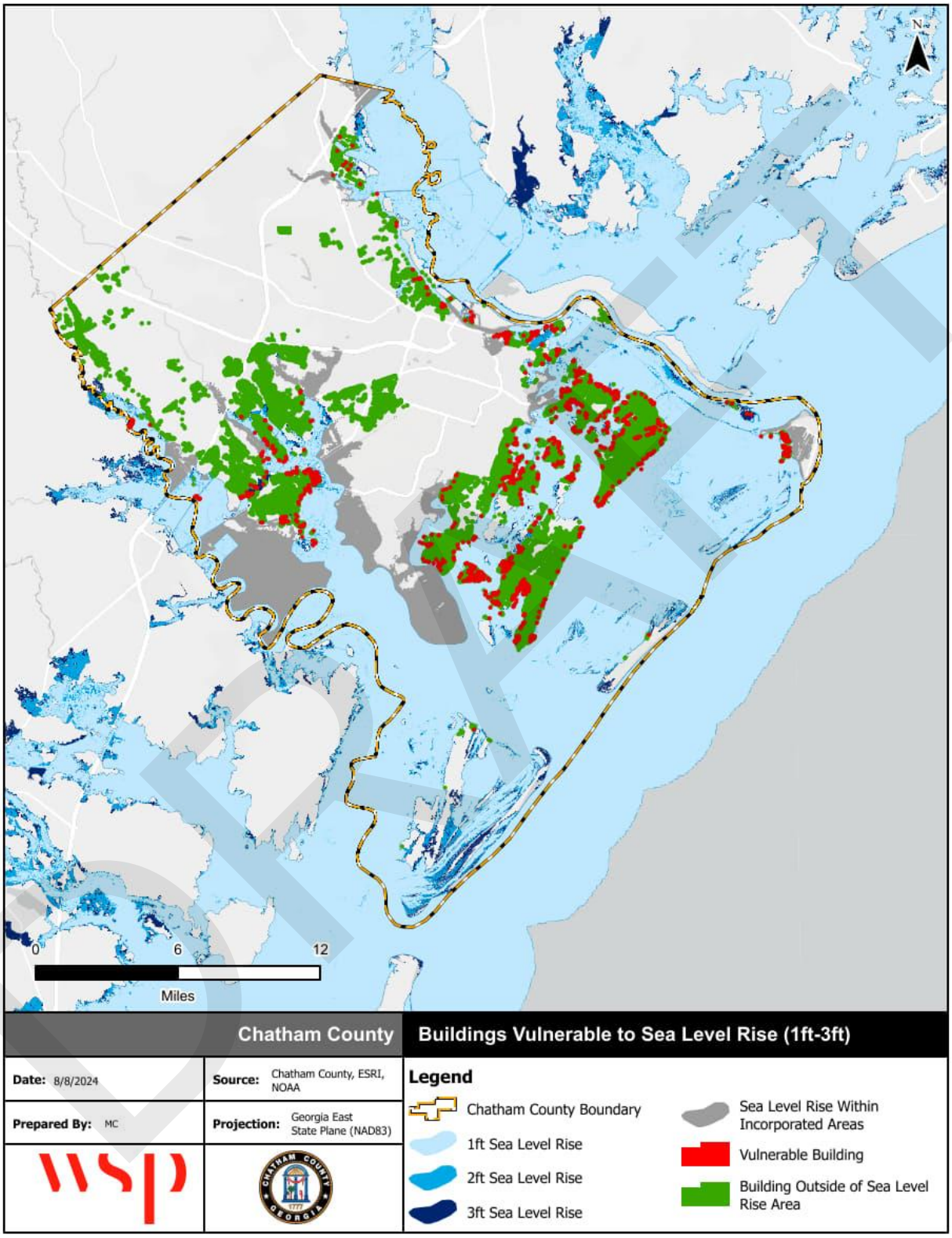
Table 4.11 – Estimated People at Risk to Sea Level Rise

Sea Level Rise Extent	Residential Property Count	People at Risk
1-foot	289	702
2-foot	482	1,171
3-foot	1,201	2,918

CRITICAL FACILITIES AT RISK

The Police Precinct on Mercer Blvd is in an area that could be vulnerable to three feet of sea level rise. Additional data on the elevation of the building would be needed to determine the potential extent of impacts.

Figure 4-14 – Estimated Impact of SLR on Property



4.4.2 COASTAL AND INLAND FLOODING

Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Coastal and Inland Flooding	Highly Likely	Critical	Large	6 to 12 hours	Less than 1 week	3.5

HAZARD DESCRIPTION

Flooding is defined by the rising and overflowing of a body of water onto normally dry land. As defined by FEMA, a flood is a general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties. Flooding can result from overflow of inland waters, unusual accumulation or runoff of surface waters from any source, or wind- and tide-driven coastal waters. Flooding is the most frequent and costly of all natural hazards in the United States. Ninety percent of all natural disasters in the U.S. involve flooding.

TYPES AND SOURCES OF FLOODING

Three types of flooding generally occur within Chatham County, as noted below.

Coastal or Tidal Flooding: All lands bordering the coast along the Atlantic Ocean and in low-lying coastal plains are susceptible to tidal effects and coastal flooding. Coastal land such as sand bars, barrier islands and deltas provide a buffer zone to help protect human life and real property relative to the sea much as floodplains provide a buffer zone along rivers and other bodies of water. Coastal floods usually occur because of abnormally high tides, storm surge, and tropical storms and hurricanes. The 2018 Flood Insurance Study (FIS) report notes that Chatham County is particularly susceptible to coastal flooding due to "its openness to Atlantic Ocean surges and unfavorable bathymetry extending offshore. Many of the large streams near the coast have wide mouths and are bordered by extensive areas of low marsh. In addition, the terrain at the coast is generally too low to provide an effective barrier, and the offshore ocean depths are shallow for great distances, generating a high Atlantic Ocean surge."

Riverine Flooding: Chatham County has numerous rivers and canals running throughout its jurisdiction that are susceptible to overflowing their banks during and following excessive precipitation events. Riverine flood events (such as the "100-year flood") will cause significant damage and economic disruption for the area. Chatham County's Effective FIS report, dated August 16, 2018, evaluates the following riverine flood sources: Savannah River, Ogeechee River, Little Ogeechee River and its tributaries, St. Augustine Creek, Black Creek, and a number of canals.

Flash or Rapid Flooding: Flash flooding is the result of heavy, localized rainfall, often from slow-moving intense thunderstorms that cause small streams and drainage systems to overflow. Flash flooding caused by surface water runoff is most common in urban areas, where greater density generally equates to more impervious surface (e.g., pavement and buildings) which reduces infiltration and increases the amount of runoff generated. Flooding can occur when the capacity of the stormwater system is exceeded or if conveyance is obstructed by debris, sediment and other materials that limit the volume of drainage. This type of flooding is discussed in more detail in Section 4.4.6 Stormwater/Localized Flooding.

Warning time can vary significantly depending on the source and type of flooding but can be as little as six hours in the case of flash flooding. Flooding can often last longer than 24 hours but is typically cleared in less than 1 week.

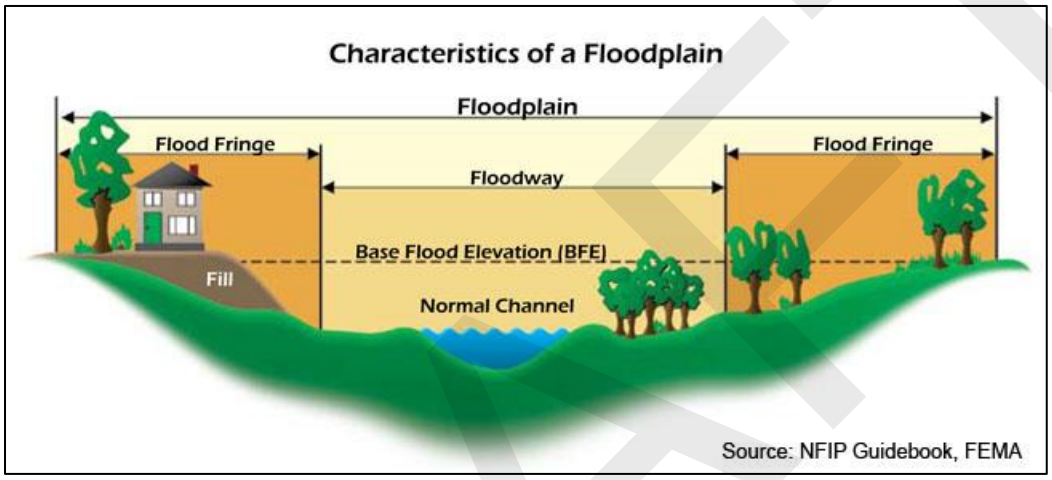
Warning Time: 6 to 12 hours

Duration: Less than 1 week

FLOODING AND FLOODPLAINS

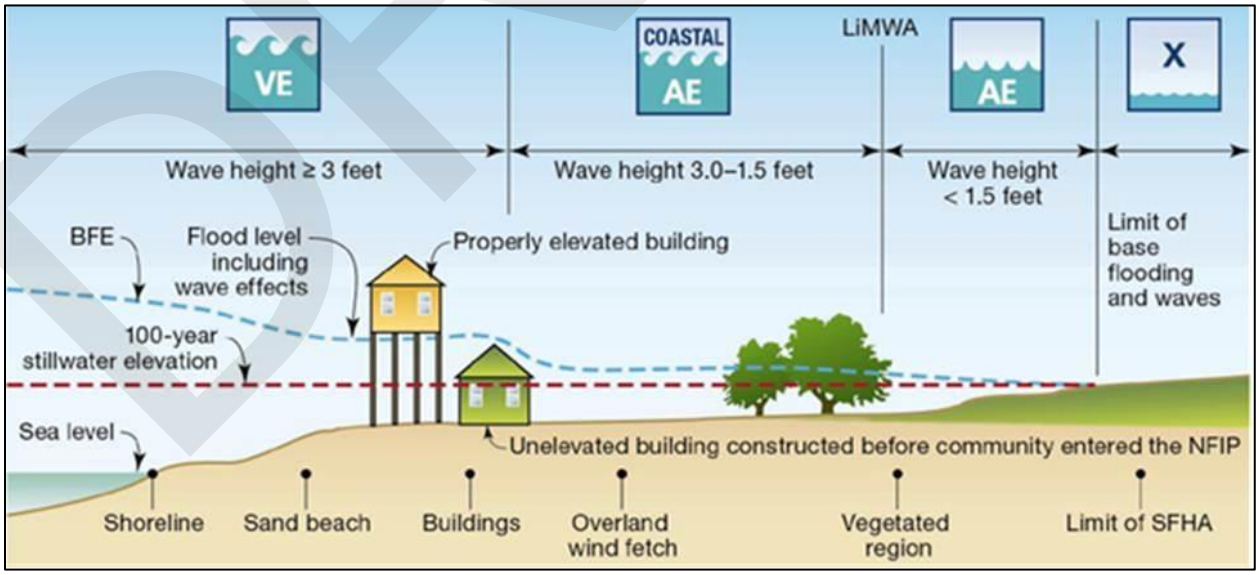
In the case of riverine flooding, the floodplain is the flat or nearly flat land adjacent to a stream or river that experiences occasional or periodic flooding, as shown in Figure 4-15. The floodplain includes the floodway, which consists of the stream channel and adjacent areas that carry flood flows, and the flood fringe, which are areas covered by the flood, but which do not experience a strong current. Floodplains are made when floodwaters exceed the capacity of the main channel or escape the channel by eroding its banks. When this occurs, sediments (including rocks and debris) are deposited that gradually build up over time to create the floor of the floodplain. Floodplains generally contain unconsolidated sediments, often extending below the bed of the stream.

Figure 4-15 – Characteristics of a Riverine Floodplain



In coastal areas, flooding occurs due to high tides, tidal waves, storm surge, or heavy rains in combination with these other sources. In these areas, flood hazards typically include the added risk of wave action delineated on Flood Insurance Rate Maps (FIRMs) by the VE Zone and Coastal AE Zone. Wave height and intensity decreases as floodwaters move inland. Figure 4-16 shows the typical coastal floodplain and the breakdown of flood zones in these settings. These flood zones are discussed further in Table 4.12.

Figure 4-16 – Characteristics of a Coastal Floodplain



Source: FEMA

In its common usage, the floodplain most often refers to that area that is inundated by the "100-year flood," which is the flood that has a 1% chance in any given year of being equaled or exceeded. The 500-year flood is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year. The potential for flooding can change and increase through various land use changes and changes to land surface, which result in a change to the floodplain. A change in environment can also create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

The 1%-annual-chance flood, which is the minimum standard used by most federal and state agencies, is used by the NFIP as the standard for floodplain management and to determine the need for flood insurance. The area inundated by the 1%-annual-chance flood is designated as the Special Flood Hazard Area (SFHA) for regulatory purposes. Participation in the NFIP requires adoption and enforcement of a local floodplain management ordinance which is intended to prevent unsafe development in the SFHA, thereby reducing future flood damages. Participation in the NFIP allows for the federal government to make flood insurance available within the community as a financial protection against flood losses. Since floods have an annual probability of occurrence, have a known magnitude, depth and velocity for each event, and in most cases, have a map indicating where they will occur, they are in many ways often the most predictable and manageable hazard.

LOCATION

Regulated floodplains are illustrated on inundation maps called Flood Insurance Rate Maps (FIRMs). The FIRM is the official map for a community on which FEMA has delineated both the SFHAs and the risk premium zones applicable to the community. Flood prone areas were identified within Chatham County using the Effective FIS and FIRMs revised August 16, 2018. Table 4.12 summarizes the flood insurance zones identified by the DFIRMs.

Table 4.12 – Mapped Flood Insurance Zones within Chatham County, GA

Zone	Description
VE	Also known as the coastal high hazard areas. They are areas subject to high velocity water including waves; they are defined by the 1% annual chance (base) flood limits (also known as the 100-year flood) and wave effects 3 feet or greater. The hazard zone is mapped with base flood elevations (BFEs) that reflect the combined influence of stillwater flood elevations, primary frontal dunes, and wave effects 3 feet or greater.
AE	AE Zones, also within the 100-year flood limits, are defined with BFEs that reflect the combined influence of stillwater flood elevations and wave effects less than 3 feet. The AE Zone generally extends from the landward VE zone limit to the limits of the 100-year flood from coastal sources, or until it reaches the confluence with riverine flood sources. The AE Zones also depict the SFHA due to riverine flood sources, but instead of being subdivided into separate zones of differing BFEs with possible wave effects added, they represent the flood profile determined by hydrologic and hydraulic investigations and have no wave effects. The Coastal AE Zone is differentiated from the AE Zone by the Limit of Moderate Wave Action (LiMWA) and includes areas susceptible to wave action between 1.5 to 3 feet.
A	Areas with a 1% annual chance of flooding. Because detailed analyses are not performed for such areas, no depths or base flood elevations are shown within these zones.
Shaded Zone X (0.2% Annual Chance)	Moderate risk areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, and areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile. No BFEs or base flood depths are shown within these zones. (Zone X (shaded) is used on new and revised maps in place of Zone B.)
Unshaded Zone X	Minimal risk areas outside the 1-percent and 0.2-percent-annual-chance floodplains. No BFEs or base flood depths are shown within these zones. Zone X (unshaded) is used on new and revised maps in place of Zone C.

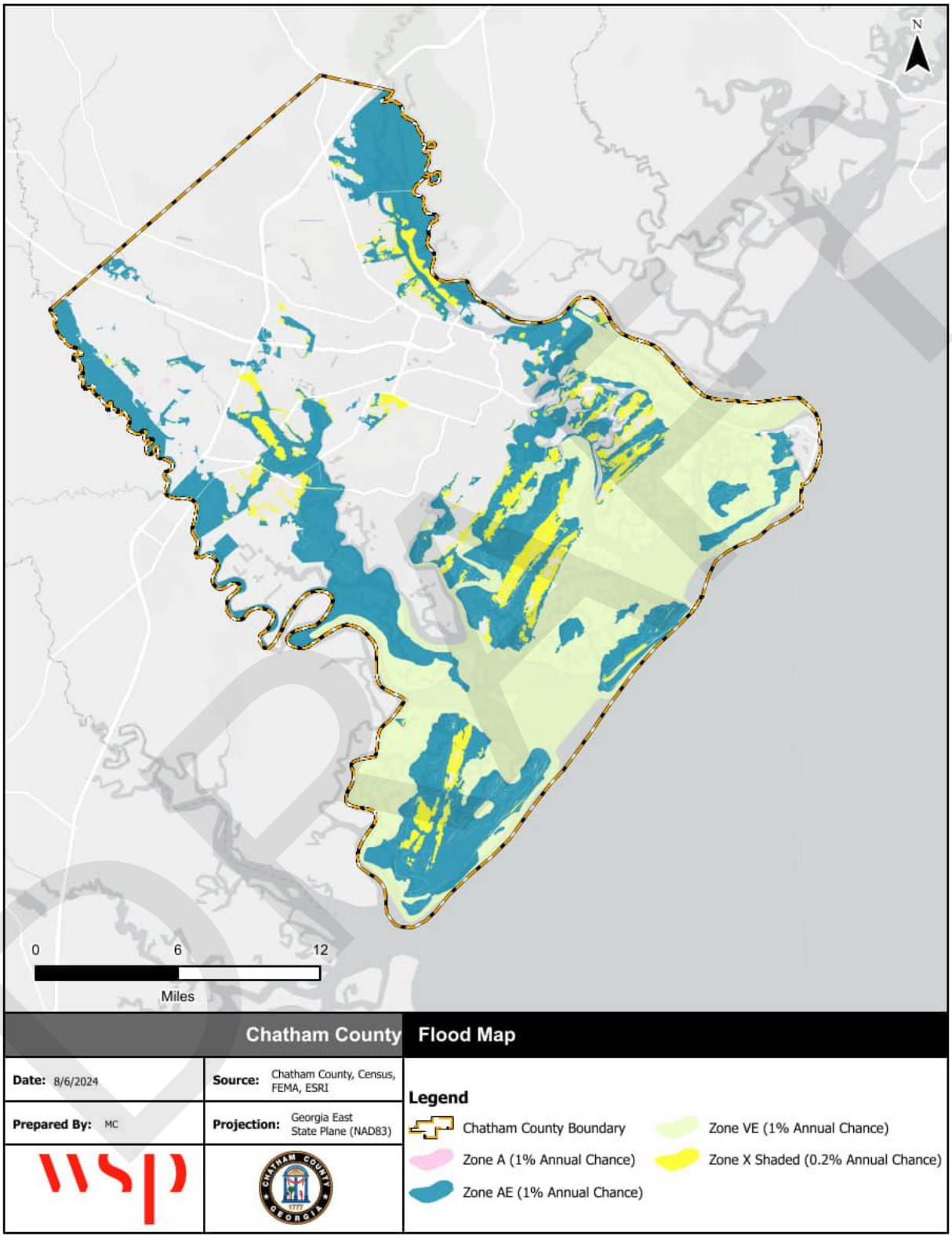
Figure 4-17 reflects the effective mapped flood insurance zones for Chatham County. Approximately 80% of the County's unincorporated areas fall within the SFHA. Table 4.13 below summarizes the unincorporated County's acreage by flood zone according to the 2018 FIRM.

Table 4.13 – Flood Zone Acreage in Chatham County

Flood Zone	Acreage	Percent of Total
AE	84,665.8	41.1%
A	61.8	0.0%
VE	81,956.0	39.8%
X (Shaded)	14,775.7	7.2%
X (Unshaded)	24,457.6	11.9%
Total	**205,916.8**	--
SFHA Total	**166,683.5**	**80.9%**

Spatial Extent: Large

Figure 4-17 – Chatham County 2018 Effective DFIRM Flood Zones



EXTENT

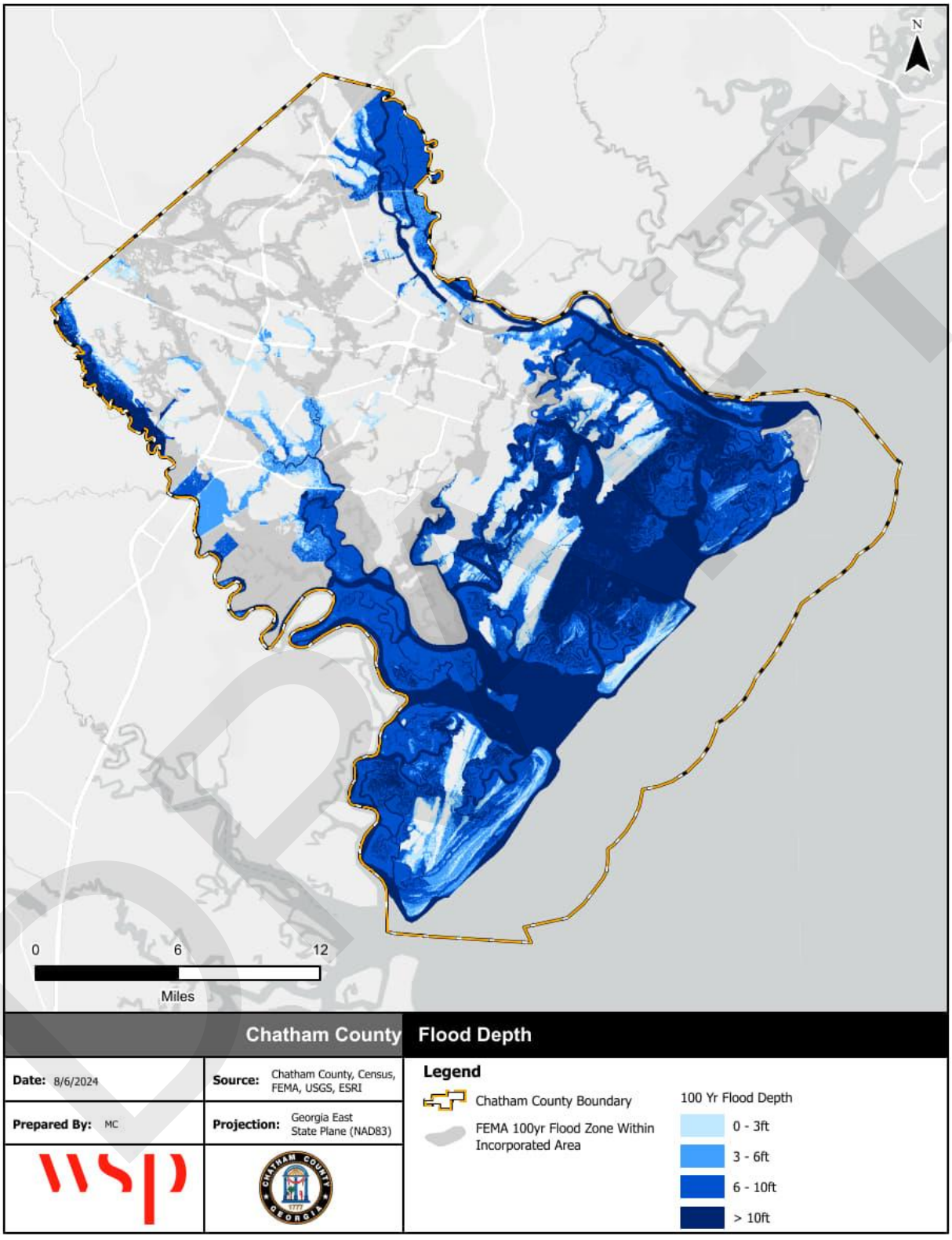
The severity of a flood can be measured by its depth and velocity. The depth of flooding that impacts a property is correlated with the property damages that result, where greater depths cause more substantial damages.

Figure 4-18 depicts the depth of flooding that can be expected within the County during the 1%-annual-chance flood event as derived from the 2018 Effective DFIRM and elevation data for the County.

Flood extent varies throughout the floodplain, but overall flooding impacts can be critical, with the potential for severe damage and destruction of property and the possibility of injuries and deaths.

Impact: Critical

Figure 4-18 – 1-Percent Annual-Chance Flood Depths, 2018 Effective FIRM



Source: FEMA 2018 Effective DFIRM

PAST OCCURRENCES

NCEI contains records for 43 coastal flood events, 1 flood event, and 3 heavy rain events that were reported since 1996 in Chatham County. Additionally, 66 flash flood events were reported during this time; a review of the event narratives indicates that five of the flash flood events involved large scale impacts associated with coastal and riverine flooding. In total, these events occurred on 27 separate days. Events from NCEI associated with coastal and riverine flooding are summarized by date in Table 4.14.

The remainder of the flash flood events involved stormwater flooding throughout the county with localized impacts on streets, vehicles, and structures; these events are discussed in Section 4.4.6 Stormwater/Localized Flooding.

Table 4.14 – NCEI Reported Flooding Events in Chatham County (January 1996 to October 2023)

Location	Date	Event Type	Injuries/ Deaths	Property Damage	Crop Damage
Chatham Co.	7/5/1996	Flash Flood	0/2	$1,000,000	$0
Chatham Co.	6/29/1999	Flash Flood	0/0	$0	$0
Coastal Chatham (Zone)	9/30/2007	Coastal Flood	0/0	$0	$0
Coastal Chatham (Zone)	6/22/2009	Coastal Flood	0/0	$0	$0
Coastal Chatham (Zone)	6/23/2009	Coastal Flood	0/0	$25,000	$0
Coastal Chatham (Zone)	1/30/2010	Coastal Flood	0/0	$15,000	$0
Coastal Chatham (Zone)	5/7/2012	Coastal Flood	0/0	$0	$0
Coastal Chatham (Zone)	6/5/2012	Coastal Flood	0/0	$0	$0
Coastal Chatham (Zone)	6/6/2012	Coastal Flood	0/0	$0	$0
Coastal Chatham (Zone)	8/19/2013	Coastal Flood	0/0	$0	$0
Chatham Co.	6/23/2014	Heavy Rain	0/0	$0	$0
Coastal Chatham (Zone)	9/28/2015	Coastal Flood	0/0	$0	$0
Coastal Chatham (Zone)	9/29/2015	Coastal Flood	0/0	$0	$0
Coastal Chatham (Zone)	9/30/2015	Coastal Flood	0/0	$0	$0
Coastal Chatham (Zone)	10/27/2015	Coastal Flood	0/0	$0	$0
Coastal Chatham (Zone)	10/28/2015	Coastal Flood	0/0	$0	$0
Coastal Chatham (Zone)	11/25/2015	Coastal Flood	0/0	$0	$0
Coastal Chatham (Zone)	11/26/2015	Coastal Flood	0/0	$0	$0
Coastal Chatham (Zone)	10/17/2016	Coastal Flood	0/0	$0	$0
Coastal Chatham (Zone)	11/13/2016	Coastal Flood	0/0	$0	$0
Chatham Co.	5/22/2017	Heavy Rain	0/0	$0	$0
Chatham Co.	9/11/2017	Flash Flood	0/0	$25,000	$0
Chatham Co.	4/23/2018	Flood	0/0	$2,000	$0
Coastal Chatham (Zone)	11/23/2018	Coastal Flood	0/0	$0	$0
Coastal Chatham (Zone)	11/24/2018	Coastal Flood	0/0	$0	$0
Coastal Chatham (Zone)	8/29/2019	Coastal Flood	0/0	$0	$0
Coastal Chatham (Zone)	8/30/2019	Coastal Flood	0/0	$0	$0
Coastal Chatham (Zone)	8/31/2019	Coastal Flood	0/0	$0	$0
		Total	**0/2**	**$1,067,000**	**$0**

Source: NCEI, 2024

The following provides details on select flood events recorded in the NCEI database as well as other known flood events that have occurred in Chatham County. These scenarios represent the types of flood events that can be expected in the future in the Chatham County.

July 5, 1996 – Eight to ten (8-10) inches of rain fell in 3-4 hours in and around Savannah. As a result, 50 streets and 100 homes were flooded to various degrees. Numerous businesses had water several inches

deep. There were 31,000 residents without power for several hours. This event also occurred close to high tide. Some streets had water up to headlights on cars while some homes had water almost knee deep. Several car dealerships had significant damage to some cars. Two elderly men barely escaped with their lives when their car stalled. By the time they were rescued, water was within six (6) inches of filling the inside of the car.

June 29, 1999 – Slow moving showers and thunderstorms developed repeatedly across Chatham County and Effingham County during the day. Twenty-four hour rainfall amounts ranged from about 7 inches to over 13 inches. As a result of the flooding, over 500 homes and businesses were damaged to varying degrees and almost 600 automobiles were damaged. Water was as much as 6 ft deep in some places. Numerous roads were washed out and/or closed during the flooding. Estimated dollar damage for public property was 4.5 million dollars and at least another 2.5 million dollars for private property.

July 30, 2007 – Numerous road closures were reported in Downtown Savannah. High water was reported entering some apartments. Cars floating down the roadway at 65th and Abercorn Street.

June 22, 2009 – Anomalously high Perigean Spring Tides resulted in significant coastal flooding along the Georgia coast. The Chatham County Emergency Manager reported numerous yards flooded in Wilmington Island and Burnside areas of the County. Highway 80 was severely flooded between Bull Street and Tybee Island. Law Enforcement reported flooding on 5th Avenue, 10th Street, 14th Street, and the intersection of 6th Street and Lewis Avenue in Savannah.

January 30, 2010 – The combination of astronomical high tides and strong easterly winds due to strong high pressure north of the region and strong low pressure to the south, resulted in coastal flooding along the Georgia coast. The Tybee Island, Georgia Police reported that Highway 80 between Savannah and Tybee Island was flooded for around 20 to 30 minutes near the time of high tide Saturday morning. One lane was closed in various sections due to salt water flooding. Two cars were stuck in the flooding and it took about an hour to remove both vehicles. Several properties on Tybee Island, mainly on 6th Street were also flooded as waters rose from nearby creeks. The Fort Pulaski tide gauge peaked at 9.95 feet mean lower low water at 8:06 am.

June 23, 2014 – A line of stationary thunderstorms produced between 4-10 inches of rain across Chatham County, which resulted in flash flooding. KSAV observed the wettest June day on record since observations began in 1871. A trained spotter measured 4.75 inches of rainfall in under two hours. The Savannah Airport ASOS measured 6.65 inches of rainfall for the day.

October 27, 2015 – A combination of persistent and strong east/northeast winds, the Perigean spring tide and a full moon produced 2 days of elevated high tide cycles along the southeast Georgia coast. Major coastal flood stage levels were recorded at the Fort Pulaski, GA (FPKG1) tide gauge on Oct 27, 2015, which claimed 3rd place on the all-time historic crest list with a high tide of 10.43 feet mean lower low water. Moderate coastal flood stage levels were also recorded at the Fort Pulaski, GA (FPKG1) tide gauge on Oct 28, 2015, which claimed 9th place on the all-time historic crest list. Roads reported closed included Highway 80 between Savannah and Tybee Island; Shipyard Road to Burnside Island; La Roche Avenue near Norwood Avenue and Raleigh Drive; Barley Drive near the Islands Expressway; the road to Elba Island; Jones Avenue, 6th Avenue, 10th Street, Chatham Avenue and Lewis Avenue in Tybee Island; Mercer Road; Whippoorwill Road and Bobwhite Road on Wilmington Island; and Catalina Boulevard leading to Spanish Hammock Island.

November 13, 2016 – A combination of astronomical and meteorological influences resulted in a very high high tide cycle along the southeast Georgia coast. A full moon and the annual proxigee produced an elevated astronomical influence and elevated northeast winds further locally enhanced the tide. The result was a high tide measured at Fort Pulaski, GA that ranked in the top 10 highest on record, at 10.05 feet above Mean Lower Low Water.

September 11, 2017 – Feeder bands around Hurricane Irma continuously moved onshore on September 11th and produced very heavy rainfall rates with rainfall totals generally ranging from 3 to 9 inches. Daily record rainfall totals for September 11th were recorded at all 3 climate sites in the area: 5.51 at the Charleston International Airport (KCHS), 4.53 at Downtown Charleston (KCXM), and 4.74 at the Savannah-Hilton Head International Airport (KSAV). This widespread heavy rain resulted in several reports of flash flooding with water entering homes and businesses. Chatham County Emergency Management reported 11 people and 2 dogs were rescued from a home on Beaulie Farm Bend.

November 23, 2018 – A maximum tide level of 10.25 feet above Mean Lower Low Water (MLLW), or 2.75 feet above Mean Higher High Water (MHHW), was observed at the Fort Pulaski tide gage. Major coastal flooding typically begins along the southeast Georgia coast when tide levels reach 10.0 feet above MLLW, or 2.5 feet above MHHW, at the Fort Pulaski tide gage. Coastal flooding impacted portions of coastal Chatham County. Chatham County Police closed Highway 80 near Tybee Island due to the roadway being inundated with saltwater. This caused the National Park Service to close the Fort Pulaski National Monument for a period of time due to the park being inaccessible. Also, flooding of homes, yards, and several roadways was reported around the Plantation golf course on Skidaway Island.

August 29, 2019 – Strong and persistent northeast winds in the wake of a storm front, along with favorable astronomical factors led to a few days of moderate to major coastal flooding during high tide cycles near the Southeast Georgia coast. A maximum tide level of 10.05 feet above Mean Lower Low Water (MLLW), or 2.55 feet above Mean Higher High Water (MHHW), was recorded at the Fort Pulaski tide gage.

PROBABILITY OF FUTURE OCCURRENCE

Probability: Highly Likely

FEMA defines the probability of flooding based on flood events of a magnitude which are expected to be equaled or exceeded once on the average during a given time period, known as a recurrence interval. The NFIP utilizes the 1%-annual-chance flood event as a basis for floodplain management. By definition, SFHAs are those areas that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. Structures located within the SFHA have a 26-percent chance of flooding during the life of a standard 30-year mortgage. Flooding of other magnitudes have different recurrence intervals. Less severe flooding could be expected to occur more frequently, while more severe flooding could also occur but may be less probable or frequent.

Based on the historical record of 27 days of inland and coastal flood related events over the 28-year period from 1996 through October 2023, Chatham County has an annual probability of flooding of approximately 96 percent. Using historical frequency as an indicator of future probability, inland and coastal flooding has between a 10% and 100% annual probability of occurrence.

CLIMATE CHANGE AND FUTURE CONDITIONS

Per the Fourth National Climate Assessment, the frequency and intensity of heavy precipitation events is expected to increase across the country. Specifically, it is “very likely” (90-100% probability) that most areas of the United States will exhibit an increase of at least 5% in the maximum 5-day precipitation by late 21st century. Additionally, increases in precipitation totals are expected in the Southeast. The mean change in the annual number of days with rainfall over 1 inch for the Southeastern U.S. is 0.5 to 1.5 days. With more rainfall falling in more intense incidents, the region may experience more frequent flash flooding. Increased flooding may also result from more intense tropical cyclone; researchers have noted the occurrence of more intense storms bringing greater rainfall totals, a trend that is expected to continue as ocean and air temperatures rise.

VULNERABILITY ASSESSMENT

Vulnerability: High

Flood damage is directly related to the depth of flooding by the application of a depth damage curve. In applying the curve, a specific depth of water translates to a specific percent damage to the structure, which translates to the same percentage of the structure's replacement value. Figure 4-18 depicts the depth of flooding that can be expected within the County during the 1%-annual-chance flood event as derived from the 2018 Effective DFIRM and elevation data for the County.

Vulnerability to flooding was evaluated using GIS analysis and FEMA's Hazus Flood Assessment Structure Tool (FAST). To estimate exposure to flood risk, building counts and values by FEMA flood zone were determined using a spatial intersection of building footprints provided by the Chatham County GIS Department, associated values from Chatham County tax parcel data, and the FEMA DFIRM database. In the case of buildings affected by multiple zones, the entire parcel value was applied to the highest risk flood zone that intersected the building, or the parcel centroid if no building footprint was available for an improved parcel. Occupancy types were derived from parcel data and translated into occupancy classes used in Hazus FAST to facilitate an accurate loss estimate. An occupancy class is required in Hazus to apply the correct depth damage factor which ensures the most accurate damage assessment. Content value estimations are based on FEMA Hazus methodologies of estimating value as a percent of improved structure values by property type. The percent value applied is based on Hazus FAST standards that take into account several factors like occupancy type, building type and flood hazard area.

PROPERTY AT RISK

The loss estimate for flood is based on the total of improved building value and contents value. Land value is not included in any of the loss estimates as generally the land is not subject to loss from floods. Once the potential value of affected parcels was calculated, damage factors were applied to obtain loss estimates by flood zone.

Properties at risk are detailed by flood zone in Table 4.15, below. Building footprint data was used to provide an accurate assessment of how many buildings are located in hazard areas.

Table 4.15 – Properties at Risk by Flood Zone

Occupancy Type	Total Number of Buildings	Total Building Value	Estimated Content Value	Total Value
Zone A				
Agricultural	0	-	-	-
Commercial	0	-	-	-
Education	0	-	-	-
Government	0	-	-	-
Industrial	0	-	-	-
Religious	0	-	-	-
Residential	0	-	-	-
Total	**0**	-	-	-
Zone AE				
Agricultural	60	$6,010,588	$6,010,588	$12,021,175
Commercial	348	$275,108,756	$275,108,756	$550,217,511
Education	5	$2,686,700	$2,686,700	$5,373,400
Government	129	$640,163,256	$640,163,256	$1,280,326,512
Industrial	495	$441,052,170	$661,578,255	$1,102,630,425
Religious	89	$37,920,969	$37,920,969	$75,841,939
Residential	9,888	$2,683,441,774	$1,344,165,765	$4,027,607,539
Total	**11,014**	**$4,086,384,213**	**$2,967,634,288**	**$7,054,018,501**
Zone VE				
Agricultural	6	$687,431	$687,431	$1,374,862
Commercial	3	$899,900	$899,900	$1,799,800
Education	0	-	-	-
Government	17	$9,345,949	$9,345,949	$18,691,898
Industrial	0	-	-	-
Religious	0	-	-	-
Residential	68	$8,421,883	$4,306,237	$12,728,120
Total	**94**	**$19,355,162**	**$15,239,517**	**$34,594,679**
Zone X (Shaded)				
Agricultural	14	$1,081,437	$1,081,437	$2,162,874
Commercial	915	$401,104,330	$401,104,330	$802,208,660
Education	0	-	-	-
Government	93	$67,929,691	$67,929,691	$135,859,382
Industrial	332	$230,374,954	$345,562,431	$575,937,386
Religious	81	$43,818,149	$43,818,149	$87,636,298
Residential	11,245	$2,775,364,043	$1,388,045,602	$4,163,409,645
Total	**12,680**	**$3,519,672,604**	**$2,247,541,640**	**$5,767,214,244**
Zone X (Unshaded)				
Agricultural	97	$5,157,121	$5,157,121	$10,314,241

Occupancy Type	Total Number of Buildings	Total Building Value	Estimated Content Value	Total Value
Commercial	1,727	$711,761,294	$711,761,294	$1,423,522,588
Education	13	$3,100,141	$3,100,141	$6,200,282
Government	209	$608,314,719	$608,314,719	$1,216,629,437
Industrial	779	$272,676,035	$409,014,053	$681,690,088
Religious	157	$73,232,194	$73,232,194	$146,464,389
Residential	16,387	$2,849,631,495	$1,425,061,562	$4,274,693,057
Total	**19,369**	**$4,523,872,998**	**$3,235,641,084**	**$7,759,514,082**

Source: Chatham County, parcel data, 2024; FEMA Effective FIRM
Note: There are only 62 acres in Flood Zone A in unincorporated Chatham County which is why there are no structures in this flood hazard area.

FEMA's Hazus Flood Assessment Structure Tool (FAST) was performed by leveraging the 2024 Chatham County spatial data. A depth raster for all areas of the SFHA was developed and loaded this raster as well as the building data into FAST. Losses were calculated based on Hazus FAST standard depth damage functions. In all, there are around 43,157 buildings in unincorporated Chatham County. Of these, 11,108 fall within the SFHA. The following assumptions were made as part of this analysis:

- Where foundation type was not provided in the parcel data, buildings were randomly assigned a foundation type based on the following percentage breakdown: crawl space: 35%, slab on grade: 45%, basement: 10%, elevated: 10% Parcels with unknown occupancy were treated as residential properties.
- Where year built was not provided in the parcel data, a standard year built of 2024 was assigned.
- Buildings were assumed to be single story if not otherwise defined in the parcel data.

Table 4.16 shows the building count, total value, estimated damages and loss ratio for buildings that fall within the 100-year floodplain of the Effective FIRM, detailed by land use type.

The loss ratio is the loss estimate divided by the total potential exposure (i.e., total of improved and contents value for all buildings located within the 100-year floodplain) and displayed as a percentage of loss. FEMA considers loss ratios greater than 10% to be significant and an indicator a community may have more difficulties recovering from a flood.

Loss ratios for agricultural and residential structures in unincorporated Chatham County are above 10%, meaning that in the event of a flood with a magnitude of the 1%-annual-chance event or greater, the occupants in these buildings would face extreme difficulty in recovery. The remaining occupancy types have very low loss ratios.

Table 4.16 – Estimated Building Damage and Content Loss

Occupancy Type	Total Number of Buildings with Loss	Total Value (Building & Contents)	Estimated Building Damage	Estimated Content Loss	Estimated Total Damage	Loss Ratio
Agricultural	55	$13,396,037	$1,675,198	$2,700,864	$4,376,062	33%
Commercial	199	$552,017,311	$13,026,411	$24,349,242	$37,375,653	7%
Education	0	-	-	-	-	-
Government	71	$1,299,018,410	$14,148,581	$96,460,369	$110,608,951	9%
Industrial	174	$1,102,630,425	$10,693,376	$30,598,168	$41,291,544	4%
Religious	49	$75,841,939	$614,038	$4,156,081	$4,770,120	6%
Residential	6,284	$4,039,931,973	$212,715,870	$121,632,888	$334,348,758	8%
Total	**6,832**	**$7,082,836,095**	**$252,873,475**	**$279,897,612**	**$532,771,087**	**8%**

Source: FEMA Hazus FAST, FEMA 2018 Effective DFIRM
*All Education buildings identified in this analysis are located outside the 1%-annual-chance floodplain modeled for losses.

Based on the Hazus FAST analysis using the Effective DFIRM, unincorporated Chatham County would sustain over $500 million in property damages from a 1-percent-annual-chance flood event. This level of flooding would not exceed a 8% loss ratio which predicts a moderately challenging recovery.

Mortgage lenders require that owners of properties with federally-backed mortgages located within SFHAs purchase and maintain flood insurance policies on their properties. Consequently, newer and recently purchased properties in the community are typically insured against flooding.

POPULATION AT RISK

A separate analysis was performed to determine the population at risk in each FEMA flood zone. Using GIS, the DFIRM flood zones were intersected with the building footprint layer. Those residential buildings that intersected the flood zones were counted and multiplied by a household factor for Chatham County of 2.43. This household factor was derived from a weighted average of the 2018 – 2022 American Community Survey's average household size for owner- and renter-occupied housing. The resulting estimates of population at risk are shown in Table 4.17.

Table 4.17 - Chatham County Population at Risk to Flood

Flood Zone	Residential Property Count	Population at Risk
Zone VE	68	165
Zone AE	9,888	24,027
Zone A	0	0
Zone X (Shaded)	11,245	27,325
Zone X (Unshaded)	16,387	39,820
Total	**37,588**	**91,338**

Source: FEMA 2018 Effective DFIRM; 2018-2022 ACS 5-Year Estimate

CRITICAL FACILITIES AT RISK

A separate analysis was performed to determine critical facilities located in the 1%-and-0.2%-annual-change floodplains. Using GIS, the DFIRM flood zones were overlaid on the critical facility location data. Critical facilities are detailed by facility type and flood zone in Table 4.18. Figure 4-19 depicts the location of these critical facilities relative to flood zones for the Effective FIRM.

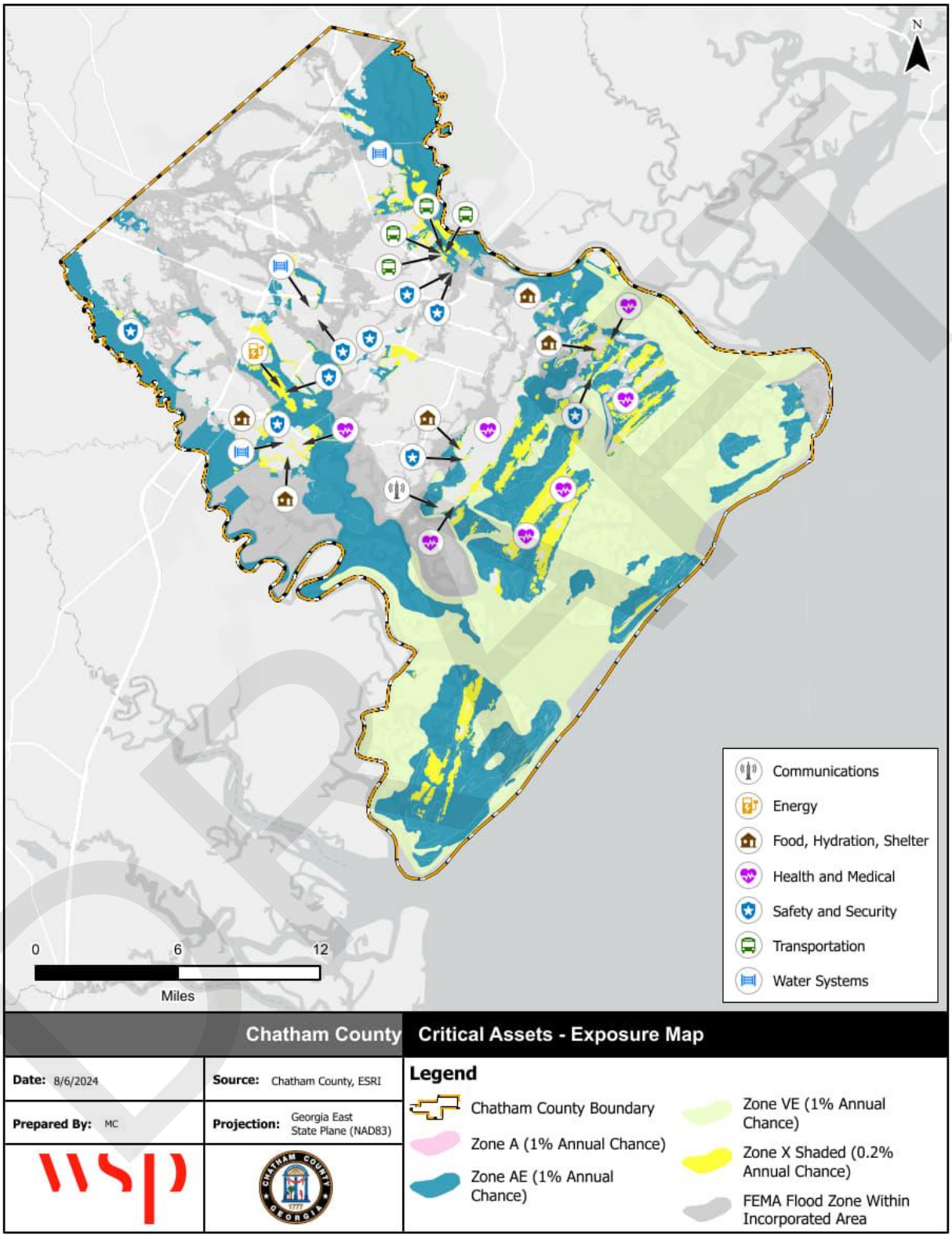
Table 4.18 – Critical Facilities by Flood Zone

Facility Name	Location	Facility Type	Estimated 100-yr Flood Depth (Ft)
Zone AE			
Pump Station #2	Coldstream Rd	Water Systems	1.7
Chatham Emer. Services Station #2	1831 E. Montgomery Xrds.	Health and Medical	N/A
Chatham Fire Station #11	1615 Ft. Argyle Rd	Safety and Security	1.6
Fell Street Station #01, Fell Street Station #02	E Lathrop near GPA Gate and Colonial Oil	Transportation	N/A
Lathrop St Station #01, Lathrop St Station #02	Southside of Lathrop Ave, next to NW Precinct	Transportation	N/A
Police Precinct	54 Johnny Mercer Blvd	Safety and Security	4.3
Zone A			
N/A	N/A	N/A	N/A
Zone VE			
N/A	N/A	N/A	N/A
Zone X (Shaded)			
Pooler Tower Site, Chatham County	116 Quacco Rd	Energy	N/A
Police Precinct	9306 Whitefield Ave	Safety and Security	N/A
Chatham Fire Station #5	553 McWhorter Drive	Safety and Security	N/A
Chatham Fire Station #7	1440 Grove Point Road	Safety and Security	N/A
Chatham Fire Station #8	4800 US Hwy 80 East	Safety and Security	N/A
Chatham Fire Station #9	59 Log Landing Road	Safety and Security	N/A
Chatham Fire Station #24	105 Quacco Rd.	Safety and Security	N/A
Police Precinct – Northwest	602 E. Lathrop Ave	Safety and Security	N/A
Police Traffic Operations	602 E. Lathrop Ave	Safety and Security	N/A
Zone X (Unshaded)			
Lift Station #134	Wedgefield Crossing at 415 Southbridge	Water Systems	N/A
Georgetown Treatment Plant	14 Beaver Run Road	Water Systems	N/A
Southwest Middle School	6030 Ogeechee Rd	Food, Hydration, Shelter	N/A
Hesse Primary School	9116 Whitfield Ave.	Food, Hydration, Shelter	N/A
Parker's Store #27	1910 E. President St	Food, Hydration, Shelter	N/A

Facility Name	Location	Facility Type	Estimated 100-yr Flood Depth (Ft)
Islands High School	170 Whitemarsh Island Rd	Food, Hydration, Shelter	N/A
Georgetown K-8 School	1516 King George Blvd	Food, Hydration, Shelter	N/A
Radio Tower – South	55 Queen Aire Drive	Safety and Security	N/A
Chatham Fire Station #10	4501 Ogeechee Road	Safety and Security	N/A
Chatham Fire Training Center	1381 Dean Forrest Rd	Safety and Security	N/A
Chatham Emer. Services Station #3	2009 Grove Point Road	Health and Medical	N/A
Chatham Emer. Services Station #4	155 Wilmington Isl. Rd	Health and Medical	N/A
Chatham Emer. Services Station #6	214 Shipyard Road	Health and Medical	N/A

Source: Chatham County, FEMA 2018 Effective DFIRM

Figure 4-19 – Critical Facilities and FEMA Flood Zones, Effective FIRM



FLOOD INSURANCE ANALYSIS

One valuable source of information on flood hazards is current flood insurance data for active policies and past claims. Flood insurance is required as a condition of federal aid or a mortgage or loan that is federally insured for a building located in a FEMA flood zone.

Chatham County has been a Regular participant in the NFIP since August 1980 and a participant in the CRS program since October 2009. Participation in the NFIP's Community Rating System at a Class 9 or better rewards all policyholders in the County with a percent reduction in their flood insurance premiums. Chatham County is currently a Class 5 community, which provides policyholders with a 25% discount. Table 4.19 through Source: FEMA Community Information System as of 01/02/2024

Table 4.22 reflect NFIP policy and claims data for the County categorized by structure type, flood zone, Pre-FIRM and Post-FIRM.

The previous Floodplain Management Plan reported that as of May 2017 there were 17,087 policies in force in Chatham County and 827 total closed paid losses. Since that time, the number of flood insurance policies in the County has decreased by nearly 30 percent while the number of closed paid losses has increased by over 136 percent.

Table 4.19 – NFIP Policy and Claims Data by Occupancy Type – Chatham County

Occupancy	Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Single Family	11,035	$7,178,915	$3,514,083,000	1,854	$25,232,413.10
2-4 Family	115	$47,688	$27,424,000	24	$216,228.38
All Other Residential	735	$120,801	$122,779,000	23	$400,128.55
Non Residential	234	$354,816	$124,060,000	58	$1,033,344.08
Total	**12,119**	**$7,702,220**	**$3,788,346,000**	**1,959**	**$26,882,114.11**

Source: FEMA Community Information System as of 01/02/2024

Table 4.20 – NFIP Policy and Claims Data by Flood Zone – Chatham County

Flood Zone	Policies in Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
A01-30 & AE Zones	6,178	$4,213,464	$1,819,752,000	1,440	$22,298,391.87
A Zones	2	$1,491	$519,000	30	$292,466.23
V01-30 & VE Zones	3	$8,210	$913,000	23	$217,703.88
B, C & X Zone					
Standard	5,936	$3,479,055	$1,967,162,000	99	$1,046,319.93
Preferred	0	$0	$0	340	$2,995,822.27
Total	**12,119**	**$7,702,220**	**$3,788,346,000**	**1,932**	**$26,850,704.18**

Source: FEMA Community Information System as of 01/02/2024

Table 4.21 – NFIP Policy and Claims Data Pre-FIRM – Chatham County

Flood Zone	Policies in Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
A01-30 & AE Zones	1,209	$1,388,506	$347,743,000	684	$16,932,972.15
A Zones	0	$0	$0	29	$292,466.23
V01-30 & VE Zones	0	$0	$0	7	$68,897.22
B, C & X Zone					
Standard	1,633	$997,682	$546,489,000	61	$698,636.58
Preferred	0	$0	$0	186	$1,999,400.87
Total	**2,842**	**$2,386,188**	**$894,232,000**	**966**	**$19,939,513.88**

Source: FEMA Community Information System as of 01/02/2024

Table 4.22 – NFIP Policy and Claims Data Post-FIRM – Chatham County

Flood Zone	Policies in Force	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
A01-30 & AE Zones	4,969	$2,824,958	$1,472,009,000	756	$5,365,419.72
A Zones	2	$1,491	$519,000	1	$0.00
V01-30 & VE Zones	3	$8,210	$913,000	16	$148,806.66
B, C & X Zone					
Standard	4,303	$2,481,373	$1,420,673,000	38	$347,683.35
Preferred	0	$0	$0	154	$996,421.40
Total	**9,277**	**$5,316,032**	**$2,894,114,000**	**965**	**$6,845,645.47**

Source: FEMA Community Information System as of 01/02/2024

REPETITIVE LOSS ANALYSIS

A repetitive loss property is a property for which two or more flood insurance claims of more than $1,000 have been paid by the NFIP within any 10-year period since 1978. Because they are known to be susceptible to flood damage, repetitive loss properties are a high priority for flood protection. An analysis of repetitive loss was completed to examine repetitive loss properties against FEMA flood zones.

According to 2023 NFIP records, there are five mitigated and 106 unmitigated repetitive loss properties in Unincorporated Chatham County. The unmitigated repetitive loss properties were analyzed because they are a priority for mitigation for the County. Two of the properties are commercial structures and the rest of the 104 are residential. over 32% are currently uninsured. Table 4.23 details the FEMA flood zones, losses, payments, occupancy, and current insurance status for the unmitigated repetitive loss properties.

Repetitive loss can be attributed to development within the SFHA as well as localized stormwater flooding. As mentioned above, both types of flooding could increase in the future if measures are not taken to mitigate the effects of development. Therefore, it is very likely that unmitigated repetitive loss properties will continue to flood in the future.

Table 4.23 – Unmitigated Repetitive Loss Summary

Flood Zone[1]	Residential		Insured		Losses	Total Building Payment	Total Content Payment	Total Paid
	Yes	No	Yes	No				
AE	X			X	5	$54,769.83	$25,675.37	$80,445.20
X	X		X		3	$21,044.41	$2,329.35	$23,373.76
AE	X		X		4	$83,644.40	$14,600.00	$98,244.40
AE	X			X	2	$10,974.67	$0.00	$10,974.67
AE	X		X		3	$86,671.19	$0.00	$86,671.19
AE	X		X		5	$55,854.36	$21,727.07	$77,581.43
A15	X			X	2	$6,395.41	$0.00	$6,395.41
AE	X			X	4	$178,803.77	$32,775.04	$211,578.81
X	X			X	2	$6,988.22	$316.41	$7,304.63
X	X			X	2	$32,340.39	$3,193.56	$35,533.95
AE	X		X		2	$2,519.49	$0.00	$2,519.49
X	X			X	3	$21,603.84	$2,239.14	$23,842.98
X	X		X		3	$12,487.71	$872.86	$13,360.57
AE	X		X		2	$59,345.87	$0.00	$59,345.87
AE	X		X		2	$10,070.78	$3,112.25	$13,183.03
AE	X			X	4	$19,303.94	$8,004.69	$27,308.63
X	X		X		2	$56,362.39	$42,638.07	$99,000.46
AE	X			X	3	$50,263.02	$0.00	$50,263.02
X	X			X	2	$17,976.84	$5,630.53	$23,607.37
AE	X		X		2	$40,047.60	$21,752.56	$61,800.16
X	X		X		3	$159,586.56	$10,046.15	$169,632.71
X	X			X	2	$4,849.47	$0.00	$4,849.47
X	X			X	2	$24,744.95	$15,304.17	$40,049.12
AE	X			X	3	$156,547.12	$34,042.68	$190,589.80
AE	X		X		2	$25,366.78	$5,900.00	$31,266.78
X	X			X	2	$9,390.65	$2,307.35	$11,698.00
AE	X		X		3	$108,354.40	$5,182.07	$113,536.47
AE	X		X		5	$138,502.67	$0.00	$138,502.67
AE	X		X		2	$51,419.58	$4,708.25	$56,127.83
X	X			X	2	$18,480.53	$2,914.08	$21,394.61
AE	X		X		2	$51,213.54	$38,638.26	$89,851.80
AE	X		X		2	$8,112.97	$0.00	$8,112.97
A15	X			X	2	$62,892.40	$0.00	$62,892.40
AE	X		X		2	$24,523.91	$11,740.90	$36,264.81
A15	X			X	2	$7,201.74	$0.00	$7,201.74
AE	X		X		2	$5,086.73	$0.00	$5,086.73
AE	X			X	2	$25,929.43	$0.00	$25,929.43
AE	X		X		4	$21,645.18	$0.00	$21,645.18
X		X		X	2	$11,524.26	$0.00	$11,524.26
AE	X		X		3	$73,819.39	$3,919.62	$77,739.01
AE	X		X		3	$4,737.68	$17,379.40	$22,117.08
AE	X		X		3	$192,668.34	$158,843.15	$351,511.49
AE	X			X	3	$8,069.65	$0.00	$8,069.65
AE	X		X		3	$19,001.77	$0.00	$19,001.77
AE	X		X		4	$90,426.59	$4,435.84	$94,862.43
AE	X		X		2	$14,429.11	$0.00	$14,429.11

Flood Zone[1]	Residential		Insured		Losses	Total Building Payment	Total Content Payment	Total Paid
	Yes	No	Yes	No				
AE	X			X	2	$11,035.12	$0.00	$11,035.12
AE	X		X		2	$10,218.24	$0.00	$10,218.24
AE	X		X		2	$129,099.10	$86,348.24	$215,447.34
AE	X		X		2	$5,122.49	$0.00	$5,122.49
AE	X			X	2	$177,679.49	$58,734.86	$236,414.35
AE	X		X		2	$67,643.50	$0.00	$67,643.50
AE	X		X		2	$80,514.48	$0.00	$80,514.48
AE	X		X		2	$115,549.00	$0.00	$115,549.00
AE	X		X		2	$88,540.97	$24,311.33	$112,852.30
AE	X		X		2	$6,412.59	$0.00	$6,412.59
AE	X		X		2	$40,256.41	$0.00	$40,256.41
AE	X		X		2	$5,777.68	$559.35	$6,337.03
AE	X		X		2	$239,815.88	$100,000.00	$339,815.88
AE	X		X		2	$195,849.11	$55,155.49	$251,004.60
AE	X		X		2	$38,455.72	$0.00	$38,455.72
AE	X		X		2	$17,553.95	$22,474.24	$40,028.19
AE	X			X	2	$13,861.69	$5,000.00	$18,861.69
AE	X		X		2	$22,139.25	$34,929.24	$57,068.49
AE	X			X	2	$214,478.68	$0.00	$214,478.68
AE	X		X		2	$22,931.50	$0.00	$22,931.50
AE	X			X	2	$92,814.77	$0.00	$92,814.77
AE		X	X		2	$192,239.32	$8,275.58	$200,514.90
AE	X		X		2	$39,051.42	$0.00	$39,051.42
AE	X			X	2	$210,977.52	$30,466.98	$241,444.50
AE	X		X		2	$139,530.73	$3,539.58	$143,070.31
AE	X		X		2	$192,889.71	$60,359.94	$253,249.65
A15	X		X		2	$52,209.66	$6,418.45	$58,628.11
AE	X		X		2	$133,923.80	$2,904.00	$136,827.80
AE	X		X		2	$39,879.78	$831.86	$40,711.64
AE	X		X		2	$21,146.31	$0.00	$21,146.31
AE	X			X	2	$82,332.33	$0.00	$82,332.33
AE	X			X	2	$83,018.39	$2,770.67	$85,789.06
AE	X		X		2	$7,904.85	$0.00	$7,904.85
AE	X		X		2	$15,054.85	$5,000.00	$20,054.85
AE	X		X		2	$304,200.04	$74,337.10	$378,537.14
AE	X		X		2	$29,938.04	$0.00	$29,938.04
AE	X		X		2	$132,811.63	$25,362.37	$158,174.00
AE	X		X		2	$5,910.46	$0.00	$5,910.46
AE	X		X		2	$56,760.65	$0.00	$56,760.65
AE	X		X		2	$39,293.63	$0.00	$39,293.63
AE	X		X		2	$24,364.51	$0.00	$24,364.51
AE	X		X		2	$196,592.69	$50,563.52	$247,156.21
AE	X		X		2	$104,504.95	$33,178.25	$137,683.20
AE	X			X	2	$44,619.51	$0.00	$44,619.51
AE	X		X		2	$96,939.27	$0.00	$96,939.27
AE	X		X		2	$55,550.92	$0.00	$55,550.92
AE	X		X		2	$42,549.86	$17,409.82	$59,959.68

Flood Zone[1]	Residential		Insured		Losses	Total Building Payment	Total Content Payment	Total Paid
	Yes	No	Yes	No				
AE	X		X		2	$31,820.94	$2,623.47	$34,444.41
AE	X		X		2	$15,209.71	$3,883.97	$19,093.68
AE	X		X		2	$66,552.65	$2,570.60	$69,123.25
VE	X			X	2	$75,667.84	$2,693.75	$78,361.59
AE	X		X		3	$24,456.66	$24,625.28	$49,081.94
VE	X		X		2	$62,233.13	$1,971.80	$64,204.93
AE	X		X		2	$5,353.83	$1,154.05	$6,507.88
AE	X		X		2	$22,258.38	$2,912.59	$25,170.97
X	X			X	2	$52,983.74	$31,843.91	$84,827.65
X	X			X	2	$22,014.92	$0.00	$22,014.92
AE	X			X	2	$65,743.72	$32,788.37	$98,532.09
A15	X			X	2	$6,728.76	$5,472.51	$12,201.27
AE	X		X		2	$69,814.04	$13,802.99	$83,617.03
	104	**2**	**72**	**34**	**321**	**$7,957,151.44**	**$1,759,379.97**	**$9,716,531.41**

Source: NFIP Repetitive Loss Data, 4/20/2022

[1]Flood Zone is based on the FIRM when the first loss occurred. These zones do not reflect the current Effective FIRM zone for each property.

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REPETITIVE LOSS AREA MAPPING

The above list of unmitigated repetitive loss properties is not a complete list of properties at risk to repeat flood events. Additional properties with only one past flood claim or with similar flood conditions may also be at risk of becoming repetitive loss properties. To evaluate these properties and identify potential mitigation solutions, Chatham County conducted a Repetitive Loss Area Analysis, which was first completed in 2017 and subsequently updated in conjunction with this plan. In accordance with the principles outlined in the CRS guidance titled Mapping Repetitive Loss Areas dated August 15, 2008, 20 repetitive loss areas were identified in Chatham County by mapping the above list of FEMA-identified repetitive loss properties along with historical claim properties (those with one claim paid against the NFIP) and additional surrounding properties with similar flood conditions. All properties in repetitive loss areas should be assessed for mitigation.

The 72 repetitive loss areas are indexed in Figure 4-20 in relation to the FEMA flood zones. The structure count within each repetitive loss area is detailed in Table 4.24 below. Detailed mapping and analysis of each area is included in the County's Repetitive Loss Area Analysis report.

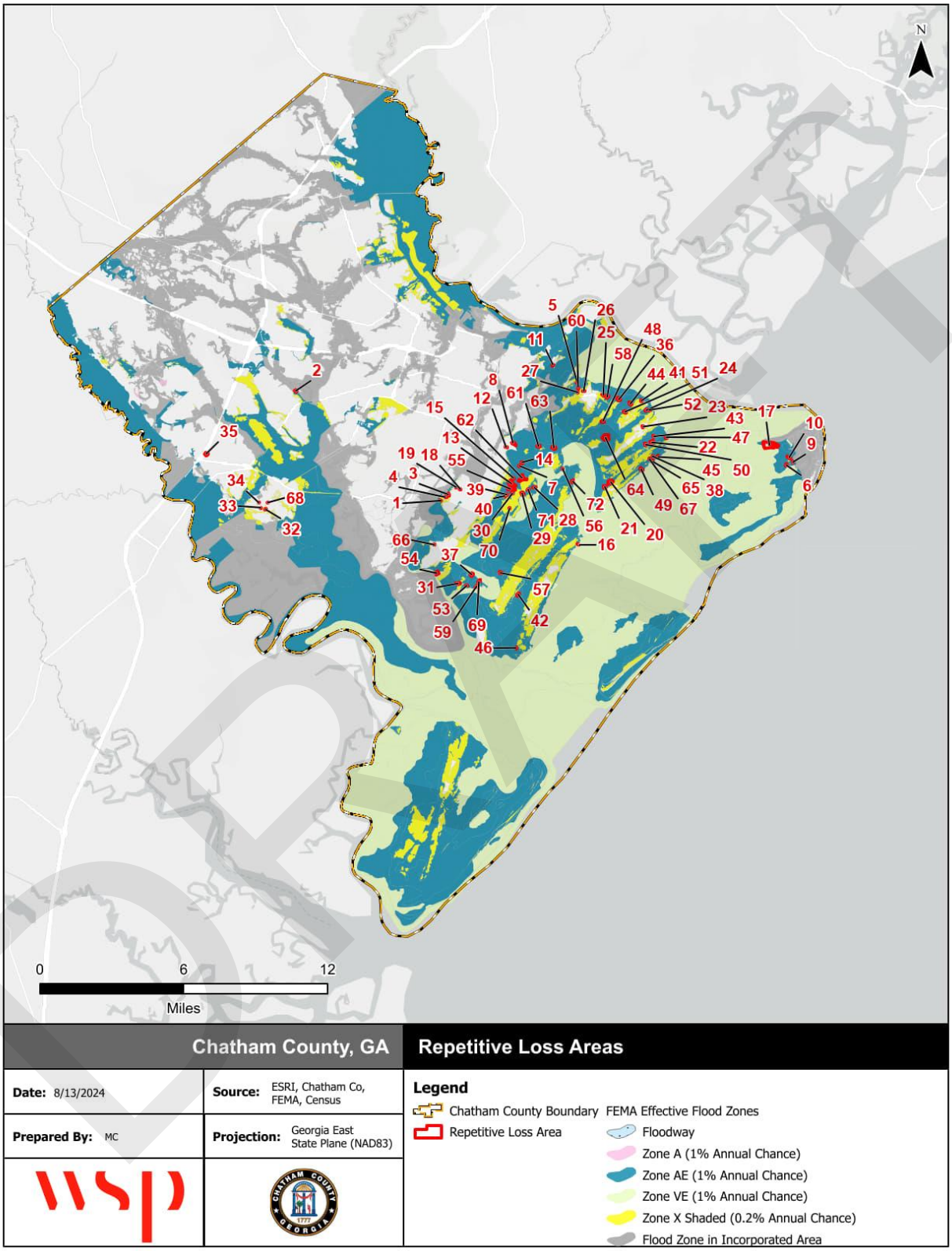
Table 4.24 – Structures in Repetitive Loss Areas

Repetitive Loss Area	Number of Repetitive Loss Properties	Number of Additional Structures	Total Number of Properties
1	1	3	4
2	1	2	3
3	2	6	8
4	1	4	5
5	1	1	2
6	1	3	4
7	1	2	3
8	1	2	3
9	1	2	3
10	1	8	9

11	1	3	4
12	1	3	4
13	4	7	11
14	1	3	4
15	1	2	3
16	1	2	3
17	1	6	7
18	1	2	3
19	1	4	5
20	9	20	29
21	2	5	7
22	4	4	8
23	1	6	7
24	2	4	6
25	1	5	6
26	2	4	6
27	1	2	3
28	1	4	5
29	1	2	3
30	1	4	5
31	1	2	3
32	1	5	6
33	1	2	3
34	2	2	4
35	1	1	2
36	5	4	9
37	2	7	9
38	1	2	3
39	2	2	4
40	2	2	4
41	1	2	3
42	1	2	3
43	2	4	6
44	1	4	5
45	1	2	3
46	1	5	6
47	1	2	3
48	2	5	7
49	1	5	6
50	1	3	4
51	1	2	3
52	2	5	7
53	1	2	3
54	1	3	4
55	2	12	14
56	1	4	5
57	1	3	4
58	2	2	4
59	1	5	6
60	2	3	5

61	1	2	3
62	3	3	6
63	1	3	4
64	1	2	3
65	1	3	4
66	1	2	3
67	1	2	3
68	1	2	3
69	1	5	6
70	1	2	3
71	1	2	3
72	1	4	5
Total	**106**	**261**	**367**

Figure 4-20 – Chatham County Repetitive Loss Areas and FEMA Flood Zones



Source: NFIP Repetitive Loss Data, 10/31/2023

4.4.3 COASTAL AND STREAM BANK EROSION

Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Coastal & Stream Bank Erosion	Likely	Limited	Small	More than 24 hours	More than 1 week	2.4

HAZARD DESCRIPTION

COASTAL EROSION

Coastal erosion is a process whereby large storms, flooding, strong wave action, sea level rise, and human activities, such as inappropriate land use, alterations, and shore protection structures, wear away the beaches and bluffs along the coast. Erosion undermines and often destroys homes, businesses, and public infrastructure and can have long-term economic and social consequences. According to NOAA, coastal erosion is responsible for approximately $500 million per year in coastal property loss in the United States, including damage to structures and loss of land. To mitigate coastal erosion, the federal government spends an average of $150 million every year on beach nourishment and other shoreline erosion control measures.

Coastal erosion has both natural causes and causes related to human activities. Gradual coastal erosion and replenishment results naturally from the impacts of tidal longshore currents. Severe coastal erosion can occur over a very short period of time when the state is impacted by hurricanes, tropical storms and other weather systems. Sand is continually removed by longshore currents in some areas but it is also continually replaced by sand carried in by the same type of currents. Structures such as piers or sea walls, jetties, and navigational inlets may interrupt the movement of sand. Sand can become "trapped" in one place by these types of structures. The currents will, of course, continue to flow, though depleted of sand trapped elsewhere. With significant amounts of sand trapped in the system, the continuing motion of currents (now deficient in sand) results in erosion. In this way, human construction activities that result in the unnatural trapping of sand have the potential to result in significant coastal erosion.

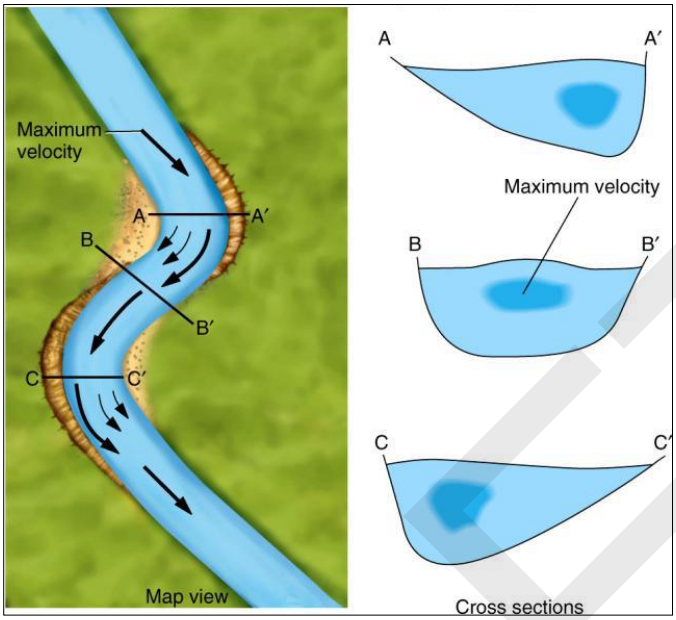
Erosion rates and potential impacts are highly localized. Severe storms can remove wide beaches, along with substantial dunes, in a single event. In undeveloped areas, these high recession rates are not likely to cause significant concern, but in some heavily populated locations, one or two feet of erosion may be considered catastrophic (NOAA, 2014).

STREAM BANK EROSION

Stream banks erode by a combination of direct stream processes, like down cutting and lateral erosion, and indirect processes, like mass-wasting accompanied by transportation. When the channel bends, water on the outside of the bend (the cut-bank) flows faster and water on the inside of the bend (the point) flows slower as shown in Figure 4-21 on the following page. This distribution of velocity results in erosion occurring on the outside of the bend and deposition occurring on the inside of the bend.

Stream bank erosion is a natural process, but acceleration of this natural process leads to a disproportionate sediment supply, stream channel instability, land loss, habitat loss and other adverse effects. Numerous studies have demonstrated that stream bank erosion contributes a large portion of the annual sediment yield. Stream bank erosion processes, although complex, are driven by two major components: stream bank characteristics (erodibility) and hydraulic/gravitational forces. Many land use activities can affect both of these components and lead to accelerated bank erosion. The vegetation rooting characteristics can protect banks from fluvial entrainment and collapse, and also provide internal bank strength. When riparian vegetation is changed from woody species to annual grasses and/or forbs, the internal strength is weakened, causing acceleration of mass wasting processes. Stream bank aggradation or degradation is often a response to stream channel instability.

Figure 4-21 – Stream Meanders



Since bank erosion is often a symptom of a larger, more complex problem, the long-term solutions often involve much more than just bank stabilization. Determining the cause of accelerated streambank erosion is the first step in solving the problem. When a stream is straightened or widened, streambank erosion increases. Accelerated streambank erosion is part of the process as the stream seeks to re-establish a stable size and pattern. Damaging or removing streamside vegetation to the point where it no longer provides for bank stability can cause a dramatic increase in bank erosion. A degrading streambed results in higher and often unstable, eroding banks. When land use changes occur in a watershed, such as clearing land for agriculture or development, runoff increases. With this increase in runoff the stream channel will adjust to accommodate the additional flow, increasing streambank erosion. Addressing the problem of streambank erosion requires an understanding of both stream dynamics and the management of streamside vegetation.

If streams are monitored, unstable areas and the potential for erosion can be identified well in advance. However, a heavy rain event could cause substantial erosion with limited warning. The effects of erosion are long lasting, as permanent changes to the stream occur, including channel alterations and downstream sedimentation.

Warning Time: More than 24 hours

Duration: More than 1 week

LOCATION

The Chatham County Hazard Mitigation Plan notes that soils along the coast, which are primarily fine-grained sands, have a high erosion hazard. Erosion in the County is typically caused by coastal tides, ocean currents, and storm events. Areas near the coast, like Tybee Island, where natural erosion processes are limited by development are most susceptible to erosion.

Spatial Extent: Small

EXTENT

At the watershed scale, streambank erosion is influenced by the amount of impervious surface cover such as parking lots, buildings, and roads, which increase runoff that flows to streams. Larger volumes of

stream flow create increased stress on the stream bed and banks and higher streambank erosion rates. At the stream scale, streambank erosion is influenced by activities that impact riparian vegetation, soil stability, and channel characteristics. The severity of streambank erosion can also depend on topography, soils, farming practices, engineering and construction types and materials.

The severity of coastal erosion is influenced by local sea level rise, wave action, and the rocks, soils, and sands along the coast. Severe coastal erosion is typically driven by tropical storms, which can remove beaches and dunes in a single event. Coastal marshes and wetlands can mitigate erosion by trapping sediments and absorbing the impact of waves.

Extent: 2 – Limited

PAST OCCURRENCES

Erosion is generally an ongoing process rather than an episodic hazard, and its impacts are easier to see and understand over time.

The Georgia Coastal Hazards Portal shows long-term shoreline change rates along the Georgia coast. Shoreline change rates in Chatham County from 1930 to 2000 are shown in Figure 4-22. The Chatham County coast has experienced erosion along portions of the coast and accretion in others. The Georgia Coastal Hazard Portal also provides locations for erosional hotspots in Georgia, based on research from the Applied Coastal Research Laboratory at Georgia Southern University, shown in Figure 4-23.

Though shoreline erosion is typically an ongoing process, it can intensify during storm events, particularly with hurricane storm tides. The following instances of major erosion are noted in flood-related events recorded by NCEI for Chatham County:

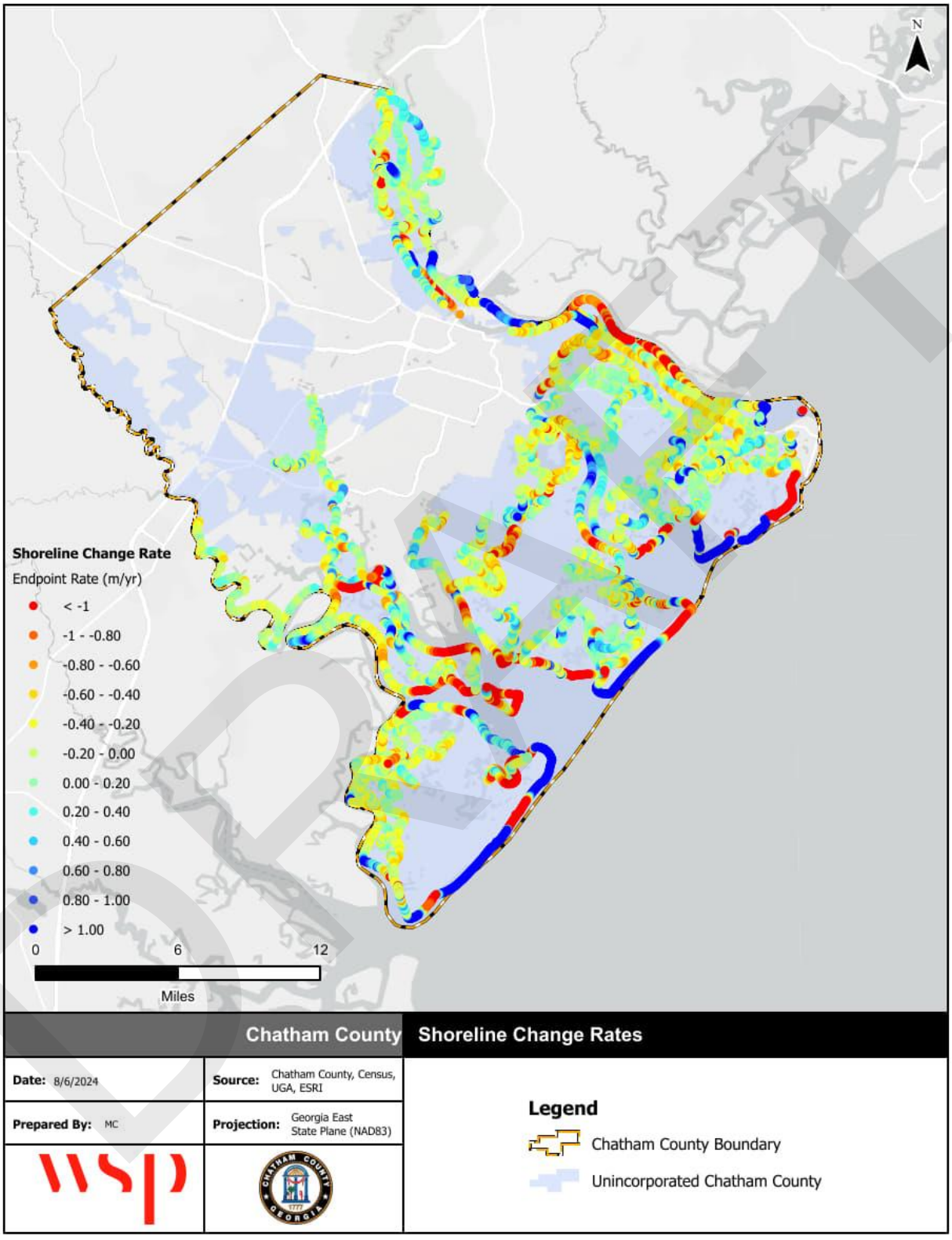
October 10, 2005 – Tropical Storm Tammy moved ashore in northeast Florida but the strongest effects were felt well north of the actual center. Tropical Storm force wind gusts as high as 50 mph affected the Georgia coast for many hours. Numerous trees were blown down, a few of which fell on houses and cars. Coastal flooding and high surf also occurred due to Tammy. Significant beach erosion occurred at Tybee Island.

September 30, 2007 – Severe Beach Erosion took place along area beaches as High Astronomical Tides combined with strong Northeast winds across the coastal waters. Severe Beach Erosion was reported at Tybee Island. Lifeguard towers were undermined or destroyed. Several homes were damaged due to high surf and coastal flooding. The beach was completely washed away in several areas.

October 7, 2016 – A Hurricane Matthew NWS survey on Tybee Island revealed a dune line escarpment of 7 to 10 feet high near 19th Street near the southern end of Tybee Beach. The dune line held the storm surge oceanside from Lovell Avenue and points south. Moderate erosion was noted near the Tybee Island Pier and oceanside of Center Street. An escarpment 1-2 feet high was noted in dunes in this area. Based on visual confirmation and interviews with business owners no water entered homes or businesses in this area. Sand was noted approaching and touching a few side streets including Center Street.

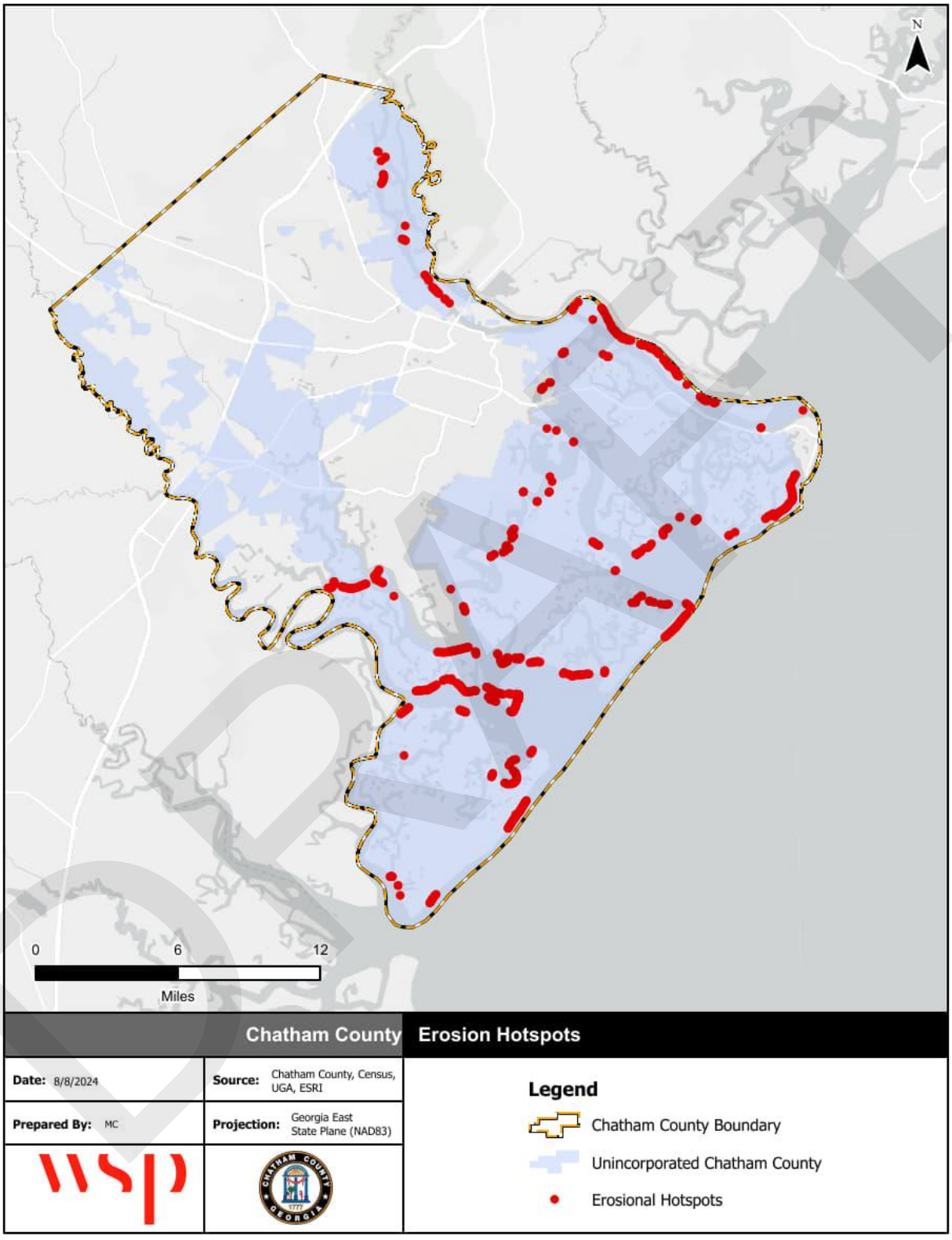
September 11, 2017 – Peak surge of 5.63 feet occurred at the Fort Pulaski tide gauge at 5:42 am from Hurricane Irma. Significant beach erosion occurred at area beaches with widespread damage to docks and piers all along the coast. A National Weather Service storm survey team found significant erosion on Tybee Island with most if not all of the dune line eroded away by storm surge and wave action. Furthermore, in some areas on the Tybee Island beach, approximately 6-10 feet of dune escarpment was found washed away.

Figure 4-22 – Shoreline Change Rates



Source: Georgia Coastal Hazards Portal, 2024

Figure 4-23 – Erosional Hotspots



Source: Georgia Coastal Hazards Portal, 2024

PROBABILITY OF FUTURE OCCURRENCE

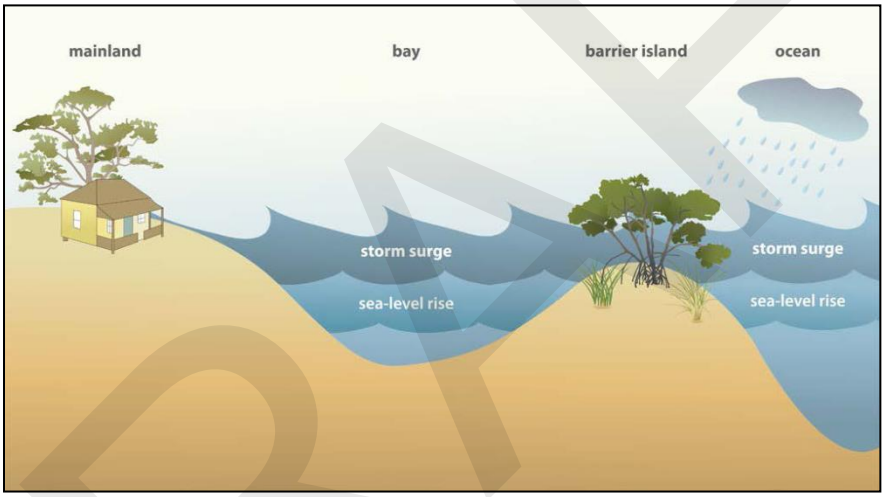
Probability: Likely

Erosion is a natural, dynamic, and continuous process that can be expected to occur in the future. Erosion of coastal and estuarine shorelines is an ongoing and natural process along the Chatham County coast. Erosion rates are extremely variable, but given Chatham County's coastal setting, soils, and topography, as well as the likelihood of hurricane and tropical storm events that may exacerbate erosion, the probability of occurrence for coastal/estuarine erosion is likely. NCEI records describe four instances of severe erosion from storm events during the 28-year period from 1996 to October 2023, which equates to a 14% annual chance of severe erosion.

CLIMATE CHANGE AND FUTURE CONDITIONS

Sea-level rise will raise all tide levels, from low tide to storm surge (see Figure 4-24). Wave action at higher tide levels may increase erosion of sandy beaches. The combined effects of wind and waves could damage dunes, leaving the beachfront more vulnerable (UF/IFAS Extension, 2013).

Figure 4-24 – Sea Level Rise and Coastal Erosion of Dunes



Source: Jane Hawkey, IAN Image Library (ian.umces.edu/imagelibrary/)

VULNERABILITY ASSESSMENT

Vulnerability: Moderate

Given past erosion rates and locations mapped by the Georgia Coastal Hazards Portal, it can be reasonably assumed that coastal erosion will continue to affect Chatham County's shorelines. Properties most at risk to erosion are those located in and along the tidal marshes and islands in southeastern Chatham County. Properties built directly on coastlines face a higher level of risk for erosion-related damage. However, if a streambank collapses and blocks the normal streamflow, this may cause properties further upstream to experience flooding as a result of the poor drainage downstream.

4.4.4 DAM FAILURE

Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Dam Failure	Unlikely	Minor	Negligible	Less than 6 hours	Less than 24 hours	1.4

HAZARD DESCRIPTION

A dam is a barrier constructed across a watercourse that stores, controls, or diverts water. Dams are usually constructed of earth, rock, or concrete. The water impounded behind a dam is referred to as the reservoir and is measured in acre-feet. One acre-foot is the volume of water that covers one acre of land to a depth of one foot. Dams can benefit farmland, provide recreation areas, generate electrical power, and help control erosion and flooding issues.

A dam failure is the collapse or breach of a dam that causes downstream flooding. Dam failures may be caused by natural events, human-caused events, or a combination. Due to the lack of advance warning, failures resulting from natural events, such as hurricanes, earthquakes, or landslides, may be particularly severe. Prolonged rainfall and subsequent flooding is the most common cause of dam failure.

Dam failures usually occur when the spillway capacity is inadequate and water overtops the dam or when internal erosion in dam foundation occurs (also known as piping). If internal erosion or overtopping cause a full structural breach, a high-velocity, debris-laden wall of water is released and rushes downstream, damaging or destroying anything in its path. Overtopping is the primary cause of earthen dam failure in the United States.

Dam failures can result from any one or a combination of the following:

- Prolonged periods of rainfall and flooding;
- Inadequate spillway capacity, resulting in excess overtopping flows;
- Internal erosion caused by embankment or foundation leakage or piping;
- Improper maintenance, including failure to remove trees, repair internal seepage problems, replace lost material from the cross-section of the dam and abutments, or maintain gates, valves, and other operational components;
- Improper design, including the use of improper construction materials and construction practices;
- Negligent operation, including the failure to remove or open gates or valves during high flow periods;
- Failure of upstream dams on the same waterway; and
- High winds, which can cause significant wave action and result in substantial erosion.

Water released by a failed dam generates tremendous energy and can cause a flood that is catastrophic to life and property. A catastrophic dam failure could challenge local response capabilities and require evacuations to save lives. Impacts to life safety will depend on the warning time and the resources available to notify and evacuate the public. Major casualties and loss of life could result, as well as water quality and health issues. Potentially catastrophic effects to roads, bridges, and homes are also of major concern. Associated water quality and health concerns could also be issues. Factors that influence the potential severity of a full or partial dam failure are the amount of water impounded; the density, type, and value of development and infrastructure located downstream; and the speed of failure.

Dam failure can occur with little warning. Intense storms may produce flash flooding within a few hours or even minutes of the beginning of heavy rainfall, and dam failure may occur within hours of the first signs of breaching. Other failures and breaches can take much longer to occur, from days to weeks, as a result of debris jams or the accumulation of melting snow. The duration of the flood will vary but may last as long as a week.

The National Inventory of Dams (NID) is a database of dams in the United States which was developed and is maintained by the USACE. Congress authorized the USACE to inventory dams as part of the 1972 National Dam Inspection Act. Several subsequent acts have authorized maintenance of the NID and provided funding. The USACE collaborates with FEMA and state regulatory offices to collect data on dams.

Warning Time: Less than 6 hours

Duration: Less than 24 hours

LOCATION

Table 4.25 provides details for seven dams listed in the Army Corps of Engineers' National Inventory of Dams (NID) that are located within Chatham County. Figure 4-25 on the following page reflects the location of these dams within the County. There are no high hazard dams in Chatham County or upstream in close proximity to the county.

Table 4.25 – Dams Located Within Chatham County, GA

Dam Name	NIDID	Owner	Height (Ft.)	NID Storage (acre-feet)	Primary Purpose	Hazard Category
Lake Mayer Dam[1]	GA00927	Chatham County Board of Commissioners	9	382	Recreation	Low
Forest City Gun Club Lake Dam[1]	GA00928	Forest City Gun Club	10	273	Recreation	Low
Proposed Ottowa Farms Lake Dam[1]	GA04907	Ottowa Farm Properties I LLC	8.5	144	Fire Protection, Stock, or Small Fish Pond	Low
Savannah Raw Water Storage Impoundment Dam[1]	GA07180	City of Savannah	29.00	450.00	Water Supply	Low
Jones Millpond Dam	GA03217	Rogers Correctional Institution	11	164	Other	Low
Pond 29	GA82309	Fort Stewart/HAAF	19	71	Recreation, Fish & Wildlife Pond	Low
Pond 24	GA82208	Fort Stewart/HAAF	26	45	Recreation, Fish & Wildlife Pond	Low

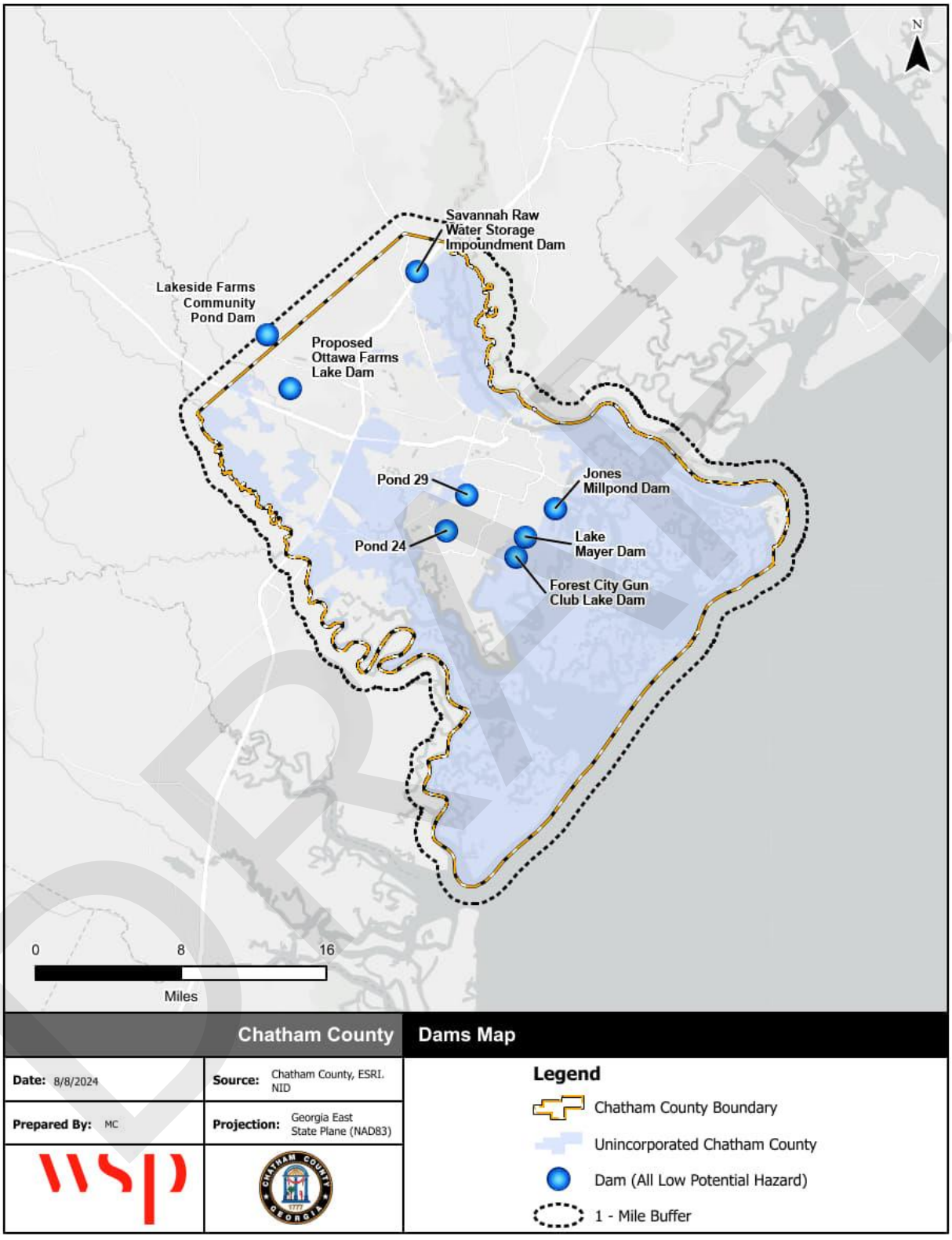
Source: National Inventory of Dams, 2024

[1]These dams are also listed in the Georgia Inventory of Dams, which was last updated in November 2019.

Dam inundation areas were not available to evaluate these dams. However, given the size of the impoundments and the low hazard category for these dams, the spatial extent of exposure to dam failure is assumed to be less than 1% of the County's total area.

Spatial Extent: Negligible

Figure 4-25 – Location of Dams in Chatham County, GA



Source: National Inventory of Dams

EXTENT

Each state has definitions and methods to determine the Hazard Potential of a dam. In Georgia, dams are recognized by the state if they are 25 feet or more in height or impound 100 acre-feet or more. The height of a dam is from the highest point on the crest of the dam to the lowest point on the downstream toe, and the storage capacity is the volume impounded at the elevation of the highest point on the crest of the dam. A dam is regulated only if it is deemed that its failure would result in loss of human life.

Georgia Safe Dams Program engineers determine the "hazard potential" of a dam, meaning the probable damage that would occur if the structure failed, in terms of loss of human life. Dams are assigned one of two categories based on the nature of their hazard potential:

- Category II (Low Hazard) includes dams located where failure will not cause loss of human life.
- Category I (High Hazard) includes dams located where failure will likely cause loss of human life.

Category I dams are then further classified by their size with corresponding minimum spillway design requirements expressed in terms of probable maximum precipitation (PMP), as follows:

- Small: 25% PMP
- Medium: 33.3% PMP
- Large: 50% PMP
- Very Large: 100% PMP

Category I dams are assessed bi-annually by Georgia Environmental Protection Division staff and quarterly by their owners to ensure safety and compliance with regulations. Category II dams are reevaluated every 5 years for any hazard potential. The Safe Dams Program notes that there is a significant backlog in work which means many Category II and proposed dams throughout the state need further study.

Based on the most recent available data and dam assessments, there are no Category I dams in Chatham County. A dam failure in Chatham County would not be expected to threaten life safety or cause significant property damages.

Impact: Minor

PAST OCCURRENCES

There are no past reported dam breaches within Chatham County. In 2013, a dam breach occurred upstream in Screven County on the Ogeechee River but little to no impact was reported in Chatham County.

PROBABILITY OF FUTURE OCCURRENCE

There are seven low hazard dams within Chatham County that could impact the County, but a flood event from future dam failure is unlikely. However, regular monitoring is still necessary to prevent these events from occurring by identifying and addressing maintenance needs.

Probability: Unlikely

CLIMATE CHANGE AND FUTURE CONDITIONS

Future development may increase the overall risk of dam failure by increasing downstream exposure of people and property. Regular inspection and evaluation of dam hazard potential can ensure appropriate safety precautions, such as the preparation of an Emergency Action Plan and the establishment of procedures for warning and evacuation of all at-risk structures should a failure occur.

Studies have been conducted to investigate the impact of climate change scenarios on dam safety. Dam failure is already tied to flooding and the increased pressure flooding places on dams. Climate change impacts on dam failure will most likely be those related to changes in precipitation and flood probability. Climate change projections suggest that precipitation may increase and occur in more extreme events, which may increase risk of flooding, putting stress on dams and increasing likelihood of dam failure. The safety of dams for the future climate can be based on an evaluation of changes in design floods and the freeboard available to accommodate an increase in flood levels. The results from the studies indicate that the design floods with the corresponding outflow floods and flood water levels will increase in the future, and this increase will affect the safety of the dams in the future. Studies concluded that the total hydrological failure probability of a dam will increase in the future climate and that the extent and depth of flood waters will increase by the future dam break scenario (Chernet, 2013).

VULNERABILITY ASSESSMENT

Vulnerability: Low

The 2021 Georgia Infrastructure Report Card prepared by ASCE, gave Georgia dams a grade of D for a high number of state-regulated deficient dams, a high number of private dams, and significant cost associated with dam operation and maintenance which is a challenge for many property owners. The report does note improved staffing levels at the Georgia Safe Dams Program and progress in developing Emergency Action Plans for high hazard dams. Overall, this report indicates a high level of vulnerability in the State to dam failure.

Given the location and size of dams in Chatham County and its nearby upstream areas, the County's vulnerability to flooding from dam failure or overtopping is very low. Still, regular monitoring and maintenance is needed. The average age of dams in Chatham County is 85 years.

Regarding preparedness, Pond 29 and Pond 24 have Emergency Action Plans which were last revised in 2010. No other dams in the County have EAPs, but none are required.

In terms of maintenance, Pond 29 and Pond 24 were last inspected in March 2023, the Proposed Ottawa Farms Lake Dam was last inspected in 2016, and Jones Millpond Dam was last inspected in 2010. No other dams in Chatham County have inspection records.

4.4.5 HURRICANE AND TROPICAL STORM

Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Hurricane & Tropical Storm	Highly Likely	Critical	Large	More than 24 hours	Less than 1 week	3.3

HAZARD DESCRIPTION

A hurricane is a type of tropical cyclone or severe tropical storm that forms in the southern Atlantic Ocean, Caribbean Sea, Gulf of Mexico, and in the eastern Pacific Ocean. All Atlantic and Gulf of Mexico coastal areas are subject to hurricanes. The Atlantic hurricane season lasts from June to November, with the peak season from mid-August to late October.

While hurricanes pose the greatest threat to life and property, tropical storms and depressions also can be devastating. A tropical disturbance can grow to a more intense stage through an increase in sustained wind speeds. The progression of a tropical disturbance is described below.

- **Tropical Depression:** A tropical cyclone with maximum sustained winds of 38 mph (33 knots) or less.
- **Tropical Storm:** A tropical cyclone with maximum sustained winds of 39 to 73 mph (34 to 63 knots).
- **Hurricane:** A tropical cyclone with maximum sustained winds of 74 mph (64 knots) or higher. In the western North Pacific, hurricanes are called typhoons; similar storms in the Indian Ocean and South Pacific Ocean are called cyclones.
- **Major Hurricane:** A tropical cyclone with maximum sustained winds of 111 mph (96 knots) or higher, corresponding to a Category 3, 4 or 5 on the Saffir-Simpson Hurricane Wind Scale.

The Saffir-Simpson Hurricane Wind Scale classifies hurricanes by intensity into one of five categories as shown in Table 5.9. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures.

Table 4.26 – Saffir-Simpson Hurricane Wind Scale

Category	Wind Speed (mph)	Potential Damage
1	74-95	**Very dangerous winds will produce some damage**: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96-110	**Extremely dangerous winds will cause extensive damage:** Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3	111-129	**Devastating damage will occur:** Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4	130-156	**Catastrophic damage will occur:** Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Category	Wind Speed (mph)	Potential Damage
5	≥ 157	**Catastrophic damage will occur:** A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

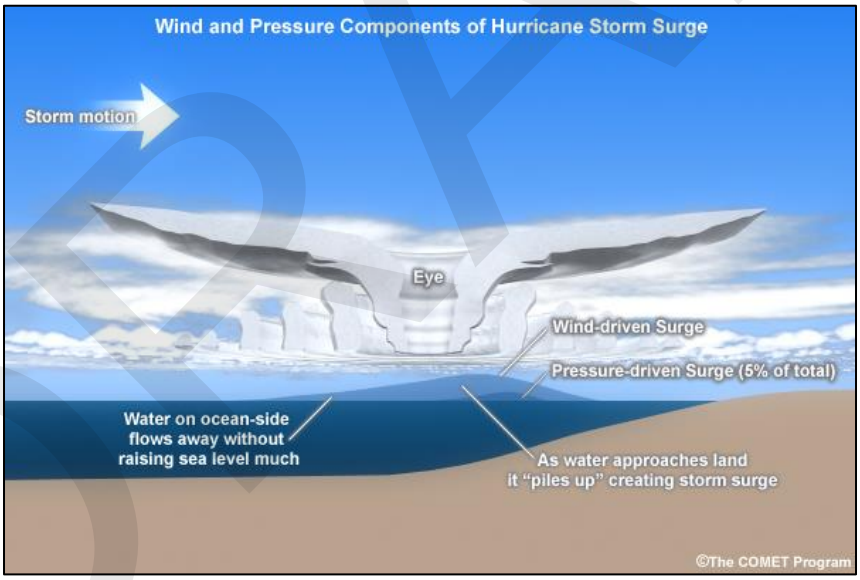
Source: National Hurricane Center/NOAA

STORM SURGE

The greatest potential for loss of life related to a hurricane is from the storm surge. Storm surge is water that is pushed toward the shore by the force of the winds swirling around the storm as shown in Figure 4-26. This advancing surge combines with the normal tides to create the hurricane storm tide, which can increase the mean water level to heights impacting roads, homes and other critical infrastructure. In addition, wind driven waves are superimposed on the storm tide. This rise in water level can cause severe flooding in coastal areas, particularly when the storm tide coincides with the normal high tides.

The maximum potential storm surge for a location depends on several different factors. Storm surge is a very complex phenomenon because it is sensitive to the slightest changes in storm intensity, forward speed, size (radius of maximum winds-RMW), angle of approach to the coast, central pressure (minimal contribution in comparison to the wind), and the shape and characteristics of coastal features such as bays and estuaries. Other factors which can impact storm surge are the width and slope of the continental shelf. A shallow slope, as is found off the coast of Chatham County, will produce a greater storm surge than a steep shelf.

Figure 4-26 – Components of Hurricane Storm Surge



Source: NOAA/The COMET Program

Warning Time: More than 24 hours

Duration: Less than 1 week

LOCATION

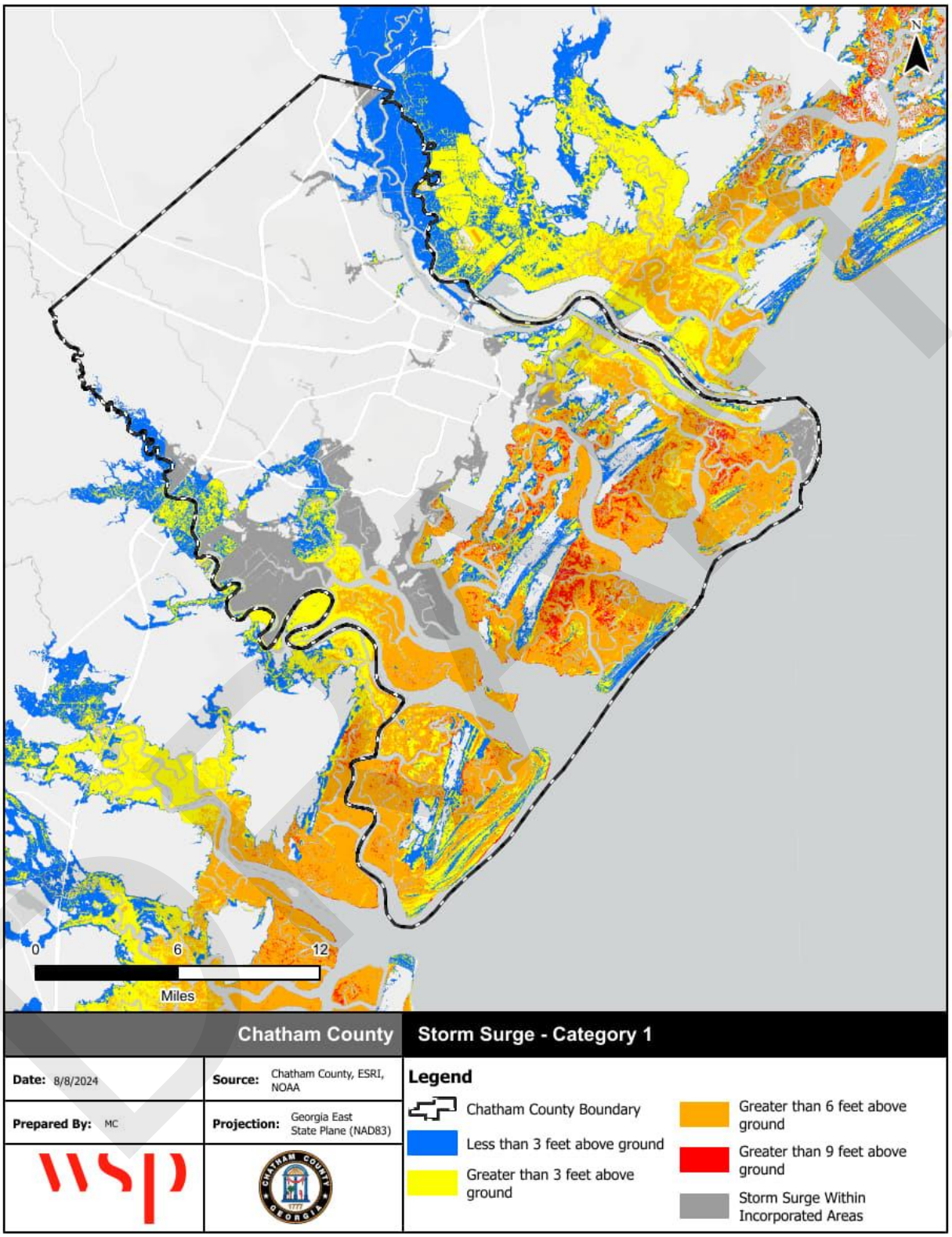
Much of Chatham County is at risk to flooding from hurricanes and tropical storms storm surge, but to varying degrees, with areas closer to the coast and water bodies that drain into the coast (namely the Savannah and Ogeechee Rivers and their tributaries) facing greater risk than areas further inland.

The Sea, Lake and Overland Surges from Hurricanes (SLOSH) model is a computerized numerical model developed by the National Weather Service to estimate storm surge heights resulting from historical, hypothetical, or predicted hurricanes by taking into account the atmospheric pressure, size, forward speed, and track data. These parameters are used to create a model of the wind field which drives the storm surge. The SLOSH model consists of a set of physics equations which are applied to a specific locale's shoreline, incorporating the unique bay and river configurations, water depths, bridges, roads, levees and other physical features. The model creates outputs for all different storm simulations from all points of the compass. Each direction has a MEOW (maximum envelope of water) for each category of storm (1-5), and all directions combined result in a MOMs (maximum of maximums) set of data.

Anticipated SLOSH model surge elevations for Category 1 – Category 5 hurricanes are shown for Chatham County in Figure 4-27 through Figure 4-31 the following pages. Given Chatham County's coastal location and low elevation, it is extremely vulnerable to storm surge flooding. Even a Category 1 storm surge has the potential to cause significant damage to the County.

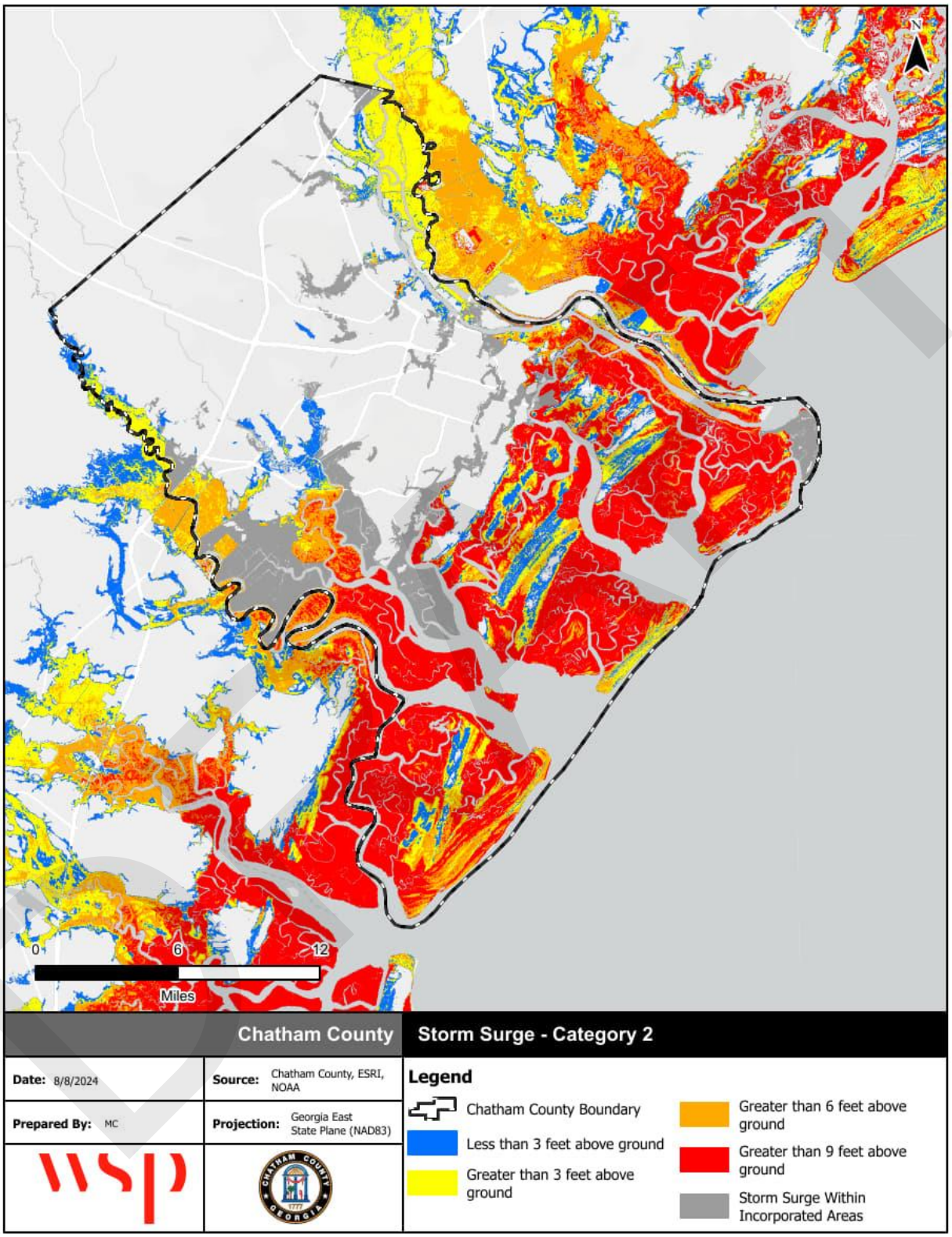
Spatial Extent: Large

Figure 4-27 - SLOSH Storm Surge Model for a Category 1 Storm



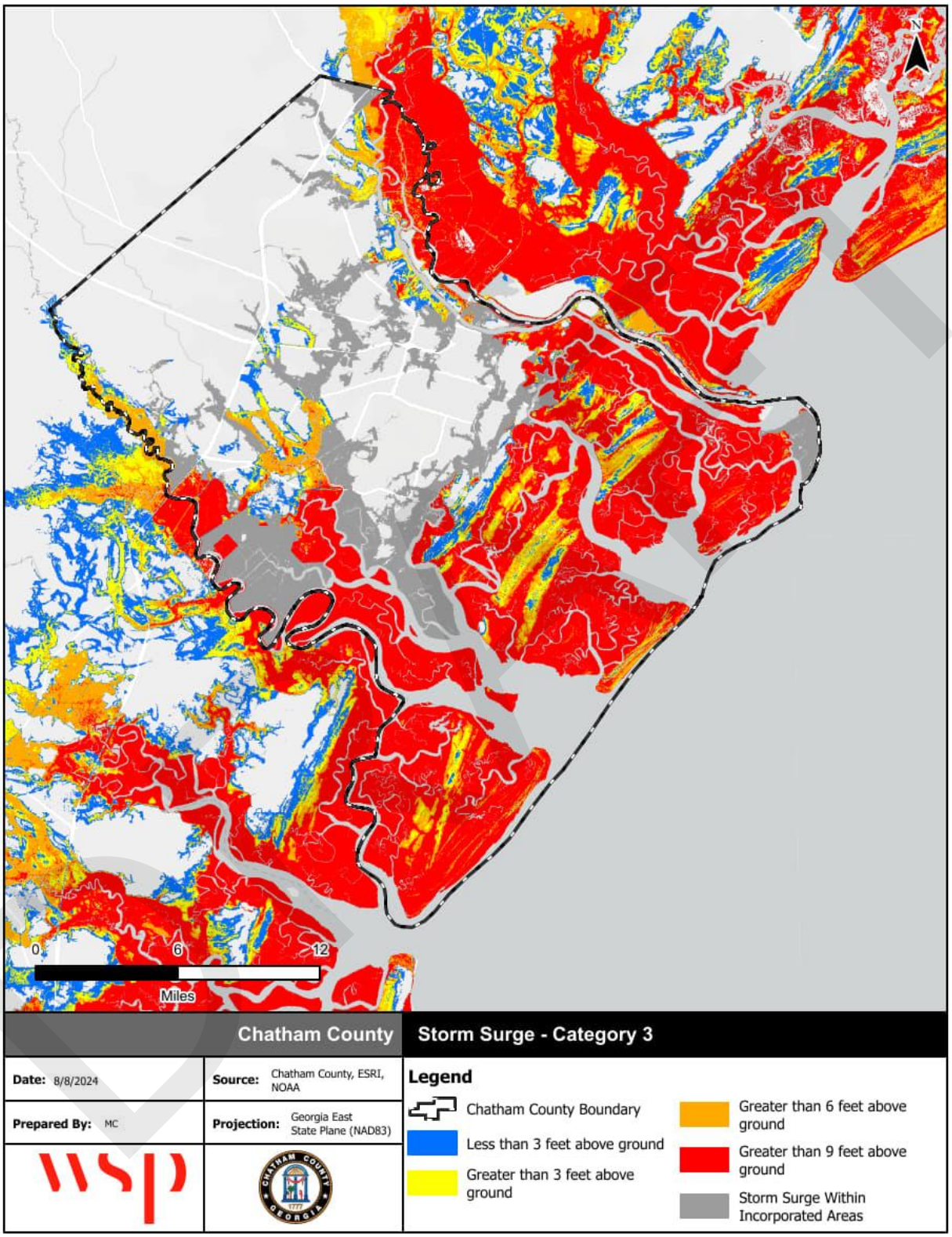
Source: NOAA/NWS/NHC Storm Surge Unit

Figure 4-28 - SLOSH Storm Surge Model for a Category 2 Storm



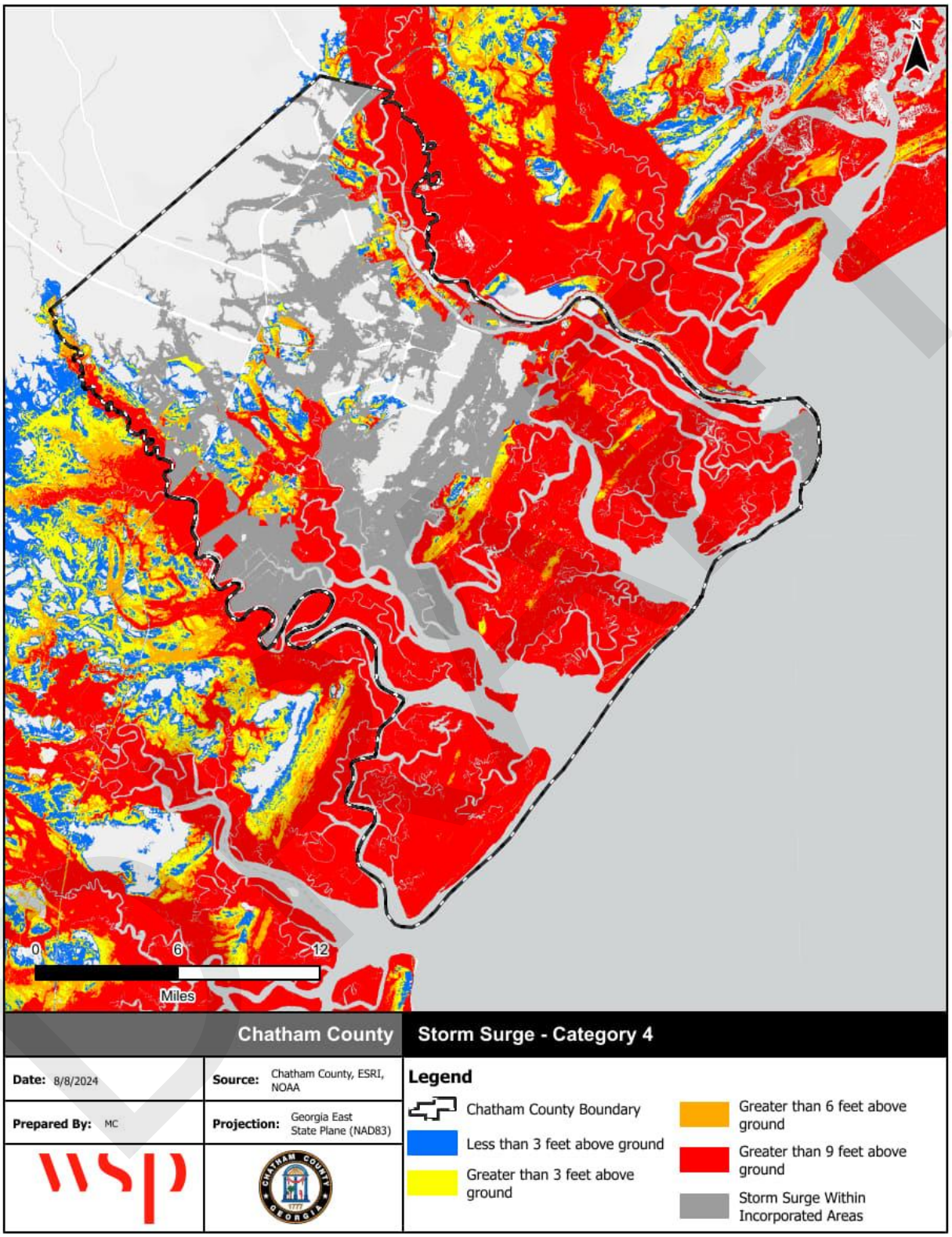
Source: NOAA/NWS/NHC Storm Surge Unit

Figure 4-29 - SLOSH Storm Surge Model for a Category 3 Storm



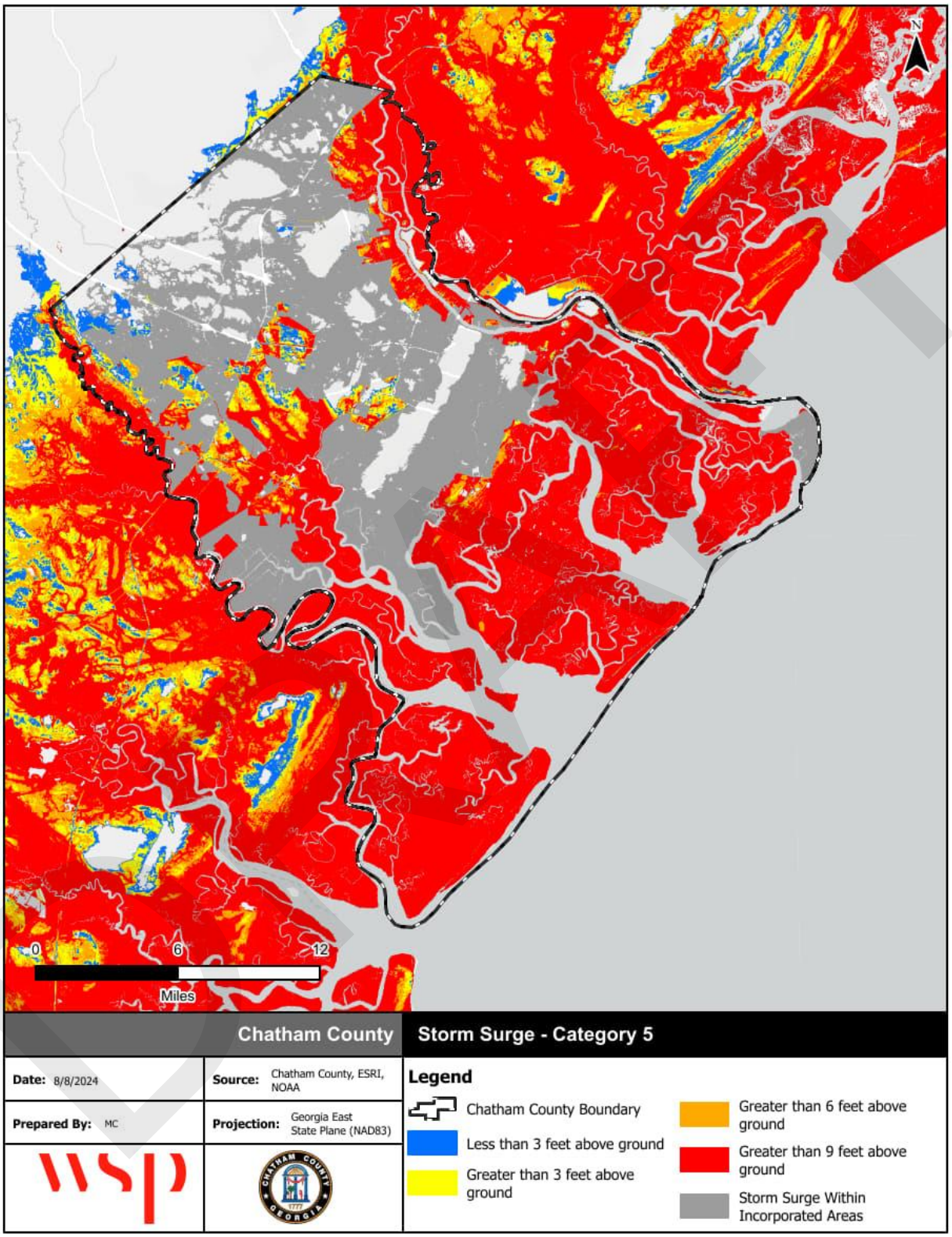
Source: NOAA/NWS/NHC Storm Surge Unit

Figure 4-30 – SLOSH Storm Surge Model for a Category 4 Storm



Source: NOAA/NWS/NHC Storm Surge Unit

Figure 4-31 – SLOSH Storm Surge Model for a Category 5 Storm



Source: NOAA/NWS/NHC Storm Surge Unit

EXTENT

Hurricanes and tropical storms can cause catastrophic damage to coastlines and several hundred miles inland. Hurricanes can produce winds exceeding 157 miles per hour as well as tornadoes and microbursts. Additionally, hurricanes and tropical storms can create storm surges along the coast and cause flash flooding from heavy rainfall. Floods and flying debris from the excessive winds are often the deadly and destructive results of these weather events. Wind speed is the determining factor in the Saffir-Simpson scale, which is used as a measure of hurricane intensity. Storm surge is also significant to a hurricane's magnitude, and storm surge projections are often tied to a storm's category on the Saffir-Simpson scale; however, storm surge values are highly dependent on the slope of the continental shelf, the shape of the coastline in the landfall region, and the storm's path.

Storm surge can raise the sea level as high as 25 feet or more in the strongest hurricanes. As a hurricane approaches the coast, its winds drive water toward the shore. Once the edge of the storm reaches the shallow waters of the continental shelf, the water begins to pile up. Winds of hurricane strength eventually force the water onto the shore. At first, the water level climbs slowly, but as the eye of the storm approaches, water rises rapidly. Storm surge can also cause extensive damage on the backside of a hurricane as storm surge waters are sucked back out to sea. The estimated depth and spatial extent of storm surge by storm category is shown in Figure 4-27 through Figure 4-31 above based on the SLOSH model. Note that actual storm surge levels can vary substantially from these estimates.

Impact: Critical

PAST OCCURRENCES

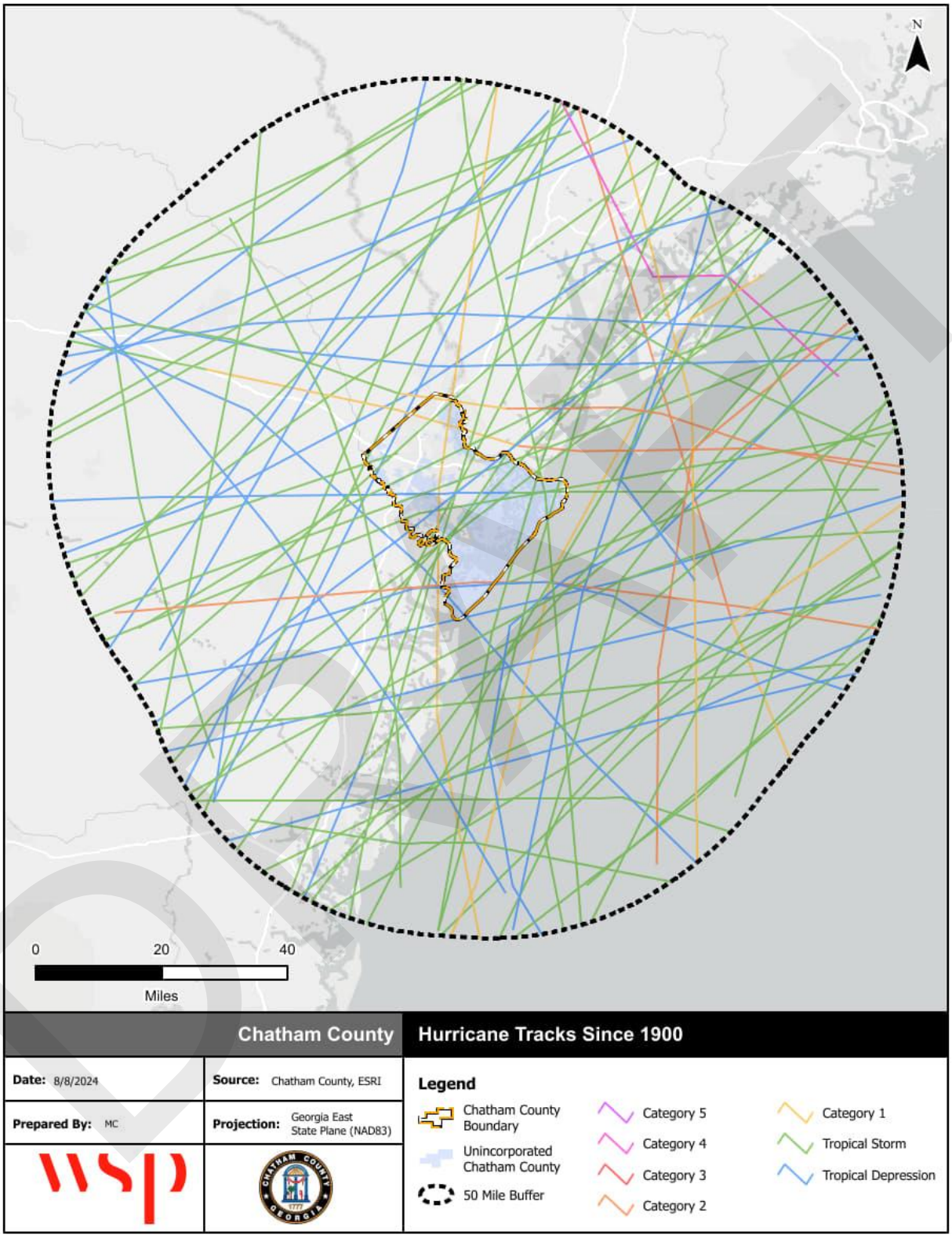
Chatham County is vulnerable to flood damage from hurricane rains and storm surge. Based on a search of the NOAA's National Hurricane Center Historical Hurricane Tracks for all hurricanes that have passed within 50 nautical miles of the County, the County has been exposed to 58 hurricanes and tropical storms including 17 tropical depressions since 1900. These storms are listed on the following pages in Table 4.28 and summarized by type and frequency in Table 4.27.

Table 4.27 – Hurricane Type & Frequency

Storm Intensity	Number of Occurrences	Rate of Occurrence
Tropical Storm/Depression	65	1 in 1.9 years
CAT I Hurricane	4	1 in 30.5 years
CAT II Hurricane	5	1 in 24.4 years
CAT III Hurricane	0	-
CAT IV Hurricane	1	1 in 122 years
CAT V Hurricane	0	-
TOTAL	**75**	**1 in 1.6 years**

Figure 4-32 on the following page illustrates past hurricane strike data for land falling major hurricanes over Chatham County as provided by the National Hurricane Center.

Figure 4-32 – Historical Hurricane Tracks (1900-2022)



Source: NOAA/National Hurricane Center (http://coast.noaa.gov/hurricanes/#)

Table 4.28 – Historical Hurricane Tracks Near Chatham County, GA

Storm Name	Category	Date
Unnamed 1900	Tropical Strom	10/12/1900
Unnamed 1904	Tropical Depression	11/04/1904
Unnamed 1906	Category 1	10/20/1906
Unnamed 1907	Tropical Strom	06/29/1907
Unnamed 1907	Tropical Strom	09/29/1907
Unnamed 1909	Tropical Depression	07/02/1909
Unnamed 1910	Tropical Strom	10/19/1910
Unnamed 1911	Tropical Depression	08/05/1911
Unnamed 1911	Category 2	08/28/1911
Unnamed 1912	Tropical Strom	07/15/1912
Unnamed 1912	Tropical Depression	09/06/1912
Unnamed 1916	Tropical Strom	05/16/1916
Unnamed 1916	Tropical Strom	10/04/1916
Unnamed 1919	Tropical Strom	09/30/1919
Unnamed 1923	Tropical Strom	06/27/1923
Unnamed 1924	Tropical Strom	09/16/1924
Unnamed 1924	Tropical Strom	09/30/1924
Unnamed 1927	Tropical Strom	10/03/1927
Unnamed 1928	Category 1	09/18/1928
Unnamed 1932	Tropical Strom	09/15/1932
Unnamed 1940	Category 2	08/11/1940
Unnamed 1941	Tropical Strom	10/08/1941
Unnamed 1944	Tropical Strom	10/19/1944
Unnamed 1945	Tropical Strom	09/17/1945
Unnamed 1946	Tropical Strom	10/08/1946
Unnamed 1947	Tropical Strom	09/24/1947
Unnamed 1947	Category 2	10/15/1947
Love 1950	Tropical Depression	10/22/1950
Able 1952	Category 2	08/30/1952
Unnamed 1953	Tropical Depression	09/01/1953
Florence 1953	Tropical Strom	09/27/1953
Unnamed 1954	Tropical Strom	07/10/1954
Flossy	Tropical Strom	09/25/1956
Unnamed 1957	Tropical Strom	06/09/1957
Gracie 1959	Category 4	09/29/1959
Brenda 1960	Tropical Strom	07/29/1960
Cleo 1964	Tropical Strom	08/29/1964
Dora 1964	Tropical Strom	09/13/1964
Alma 1966	Tropical Strom	06/10/1966
Abby 1968	Tropical Strom	06/07/1968
Alma 1970	Tropical Strom	05/25/1970
Unnamed 1971	Tropical Depression	09/11/1971
Dawn 1972	Tropical Depression	09/13/1972
Unnamed 1976	Tropical Strom	05/24/1976
Unnamed 1976	Tropical Strom	09/14/1976
David 1979	Category 1	09/04/1979
Unnamed 1981	Tropical Depression	07/03/1981
Dennis 1981	Tropical Strom	08/19/1981

Storm Name	Category	Date
Isidore 1984	Tropical Strom	09/29/1984
Bob 1985	Category 1	07/24/1985
Claudette 1985	Tropical Depression	08/09/1985
Isabel 1985	Tropical Depression	10/11/1985
Kate 1985	Tropical Strom	11/22/1985
Charley 1986	Tropical Depression	08/14/1986
Chris 1988	Tropical Strom	08/28/1988
Gordon 1994	Tropical Depression	11/21/1994
Allison 1995	Tropical Strom	06/06/1995
Josephine 1996	Tropical Strom	10/08/1996
Earl 1998	Tropical Strom	09/03/1998
Gordon 2000	Tropical Depression	09/18/2000
Kyle 2002	Tropical Strom	10/11/2002
Unnamed 2003	Tropical Depression	07/26/2003
Bonnie 2004	Tropical Depression	08/12/2004
Barry 2007	Tropical Strom	06/02/2007
Beryl 2012	Tropical Strom	05/29/2012
Andrea 2013	Tropical Strom	06/07/2013
Colin 2016	Tropical Strom	06/07/2016
Hermine 2016	Tropical Strom	09/02/2016
Julia 2016	Tropical Strom	09/14/2016
Matthew 2016	Category 2	10/08/2016
Unnamed 2017	Tropical Strom	08/28/2017
Eta 2020	Tropical Strom	11/12/2020
Danny 2021	Tropical Strom	06/28/2021
Mindy 2021	Tropical Depression	09/09/2021
Colin 2022	Tropical Strom	07/01/2022

Source: NOAA Historical Hurricane Tracks, 2024

The following is a description of past occurrences of hurricanes and tropical storms recorded by NCEI and the 2018 Flood Insurance Study (FIS) report:

August 21 - 29, 1881 – This storm reached hurricane intensity northeast of Puerto Rico on August 22. The lowest barometric pressure reading was 29.08 inches. The storm center entered the coast south of Savannah on August 27. Damage in Savannah was estimated at $1.5 million. Approximately 335 people were killed in and near the city. Nearly 100 vessels were wrecked along the Atlantic coast. Damage was very heavy on Tybee Island and other coastal islands near Savannah. The highest tide observed was estimated to reach an elevation of 15.6 feet NAVD at Savannah Beach, approximating a flood of at least 1-percent-annual-chance magnitude.

August 15 - September 2, 1893 – This major hurricane, which originated near the Cape Verde Islands, reached the Georgia coast on August 27. It was accompanied by a tremendous storm wave that submerged the islands along the Georgia and South Carolina coasts. Between 2,000 and 2,500 people lost their lives on the coastal islands and in the lowland between Tybee Island and Charleston. Property damage along the Atlantic coast was estimated at $10 million. Nearly every building on Tybee Island was damaged and the railroad to the island was wrecked. The highest tide known to have occurred in the county was estimated to have a range of 16.1 to 18.6 feet NAVD at Savannah Beach.

August 30 - September 1, 1898 – This hurricane entered the Georgia-South Carolina coast on August 30. Its center passed over Tybee Island. Winds on Tybee Island were estimated at 100 mph. The storm surges were not high enough to cause extensive damage; however, the hurricane was accompanied by very heavy

rain, and the countryside was flooded for 100 miles around Savannah. Most roads and railroads were impassable because of high water.

August 5 - 15, 1940 – This was the first hurricane to affect Georgia since August 1911. Its center entered the South Carolina coast to the north of Savannah on August 11. The wind at Savannah reached 73 mph, and damage in the Savannah area was estimated at $850,000. The highest tide observed at Beaufort, South Carolina, was estimated to be 11.5 feet NAVD. High tides of 6.5 and 5.5 feet NAVD were recorded at Fort Pulaski, Georgia, and at Fort Jackson, Savannah Harbor, Georgia, respectively.

September 20 - October 2, 1959 – Hurricane Gracie moved inland on September 29. Its center passed over the South Carolina coast near Beaufort. Wind gusts of hurricane force were felt in the Savannah

area, and damage was inflicted over the upper Georgia coastal area. The total damage inflicted by the storm was estimated at $14 million with damage in Georgia estimated at more than $500,000. Highwater marks, which were reported near Edisto Beach, South Carolina, ranged from 6.4 to 11.0 feet NAVD.

July 7, 1996 – Hurricane Watch for Bertha and later a Warning for the Georgia Coast caused about 20,000 people to evacuate, primarily Chatham County. Bertha was far enough offshore that it did not cause significant damage. Estimated loss revenue and down time for local plants and factories was $2,000,000.

October 10, 2005 – Tropical Storm Tammy moved ashore in northeast Florida but the strongest effects were felt well north of the actual center. Tropical Storm force wind gusts as high as 50 mph affected the Georgia coast for many hours. Numerous trees were blown down, a few of which fell on houses and cars. Coastal flooding and high surf also occurred due to Tammy. Significant beach erosion occurred at Tybee Island.

August 21, 2008 – Tropical Storm Fay moved eastward into northeast Florida, resulting in Tropical Storm force conditions across southeast Georgia. Law Enforcement reported power lines blown down near the intersection of Johnny Mercer and Pennwaller roads. Traffic lights were also reported down at the intersection of Dereene and Montgomery roads. Several roads were flooded, including portions of Abercorne Street, 40th Street, Bull Street and Montgomery Street.

May 27, 2012 – Beryl developed as a Subtropical Storm over the Atlantic Ocean well east of the North Coastal Georgia area. The cyclone eventually became a Tropical Storm and slowly moved to the southwest and finally made landfall along the northeast Florida coast. The system then weakened to a Tropical Depression and meandered about before slowly moving back to the northeast across coastal portions of Georgia and South Carolina. The system produced tropical storm force winds, rip currents, and areas of heavy rainfall across the region.

October 7, 2016 – Across southeast Georgia the main impacts from Matthew included heavy rain, wind damage in the form of scattered to widespread trees and power lines blown down and storm surge, specifically along coastal locations from Tybee Island, GA north to Edisto Beach, SC. Storm total rainfall amounts generally ranged from 4.5 to 7 inches across western areas of Southeast Georgia, highest in coastal counties of Southeast Georgia. A peak storm total rainfall of 17.49 inches was recorded at Hunter Army Airfield (HAAF) in Georgia. Daily record rainfall totals of were also set on October 7th and October 8th at the Savannah International Airport (KSAV), 4.36 inches and 3.84 inches, respectively. Heavy rains also led to several instances of flash flooding with damage to roads and homes. The most extensive damage came with storm surge during Matthew. The entire Southeast Georgia and Southeast South Carolina coast was impacted by storm surge generally ranging between 2 to 5 feet with some locations as high as 6 to 8 feet. A peak surge of 7.69 feet occurred at the Fort Pulaski tide gauge at 248 AM October 8th. Damage from surge was most notable on the northern ends of Tybee Island in Georgia.

September 11, 2017 – Hurricane Irm hit Georgia in September 2017 and caused significant impacts due to heavy rainfall, strong winds, tornadoes, and storm surge. Chatham County Emergency Management

reported numerous trees down across the county due to strong winds associated with Hurricane Irma. The NOS tide gauge at Fort Pulaski measured peak sustained winds of 48 mph and a peak wind gust of 70 mph. Feeder bands around Irma continuously moved onshore on September 11th and produced very heavy rainfall rates with rainfall totals generally ranging from 3 to 9 inches. While a peak surge of 5.63 feet occurred at the Fort Pulaski tide gauge at 5:42 am. Significant beach erosion occurred at area beaches with widespread damage to docks and piers all along the coast, as well as numerous reports of inundated roadways. According to data received from the Georgia Emergency Management Agency, total damages from Irma in southeast Georgia were $29,150,000. This includes $20,000,000 in Chatham County.

October 10, 2018 – Hurricane Michael maintained hurricane strength winds as it initially hit Chatham County. Across southeast Georgia the main impacts from Michael included wind damage in the form of isolated to scattered trees and power lines blown down, heavy rainfall and minor levels of storm surge. Emergency Management and broadcast media reported 12 trees and several power lines down across coastal areas of Chatham County, most notably around Savannah, White Bluff, Thunderbolt, Wilmington Island and Tybee Island. Two trees fell down on the roof of homes. A maximum sustained wind of 43 mph and gust of 57 mph occurred at the southern end of Tybee Island during the event. Peak surge of 2.29 ft occurred at the Fort Pulaski tide gauge.

September 4, 2019 – Dorian produced notable impacts across southeast Georgia as it passed by offshore. The strongest winds were limited to immediate coastal areas across southeast Georgia and southeast South Carolina. The peak measured wind gust in southeast Georgia was 60 mph by the Weatherflow site located on the north end of Tybee Island. Winds topped out in the Tropical Storm force range and produced numerous trees down across much of the area. The peak storm surge from Dorian was 3-4 ft, but this occurred at low tide which greatly reduced the threat of damaging and life threatening storm surge inundation.

June 28, 2021 – Tropical Storm Danny weakened to a tropical depression near the South Carolina/Georgia state line and following a path across central Georgia. The primary impacts from Danny included gusty winds and heavy rainfall. Across Chatham and Effingham counties, rainfall total amounts ranged approximately 3.25 to 5.50 inches. Winds peaked over the Atlantic coastal waters with a 41 knot wind gust measured at Buoy 41029. Otherwise, wind gusts generally ranged between 25 to 40 mph across Chatham County, producing isolated/minor wind damage.

September 29, 2022 – The primary impacts of Tropical Storm Elsa to southeast Georgia included heavy rainfall, a few tornadoes, and gusty winds. Rainfall amounts peaked in the 6-8 inch range across portions of Charleston, Chatham, Beaufort, and Colleton counties. The heavy rainfall did produce some street flooding. Peak winds occurred along the Chatham County coasts producing scattered wind damage. Chatham County Emergency Management Agency reported numerous trees and powerlines down across the county including one tree that fell on a vehicle on Turnberry Street. Other trees were reported down on Main Street at Rommel Avenue and the 1600 block of Pine Barren Road.

August 20, 2023 – Idalia continued to track north-northeast after landfall, eventually turning northeast and weakening to a strong tropical storm while traversing southeast Georgia and southeast South Carolina. Across southeast Georgia, the main impacts associated with Idalia included tropical storm force winds, heavy rain, storm surge and tornadoes. Tropical storm force winds gusts up to 40 to 69 mph (highest near coastal areas) aided with heavy rains led to numerous trees and power lines down. A Chatham County emergency manager and 911 call center reported 7 trees down across coastal areas due to tropical storm force wind gusts.

Table 4.29 shows hurricane, tropical storm, and storm surge data reported by NCEI since 1996 for Chatham County. Duplicate records have been condensed where possible into one line per event.

Table 4.29 – NCEI Hurricane/Tropical Storm Data for Chatham County

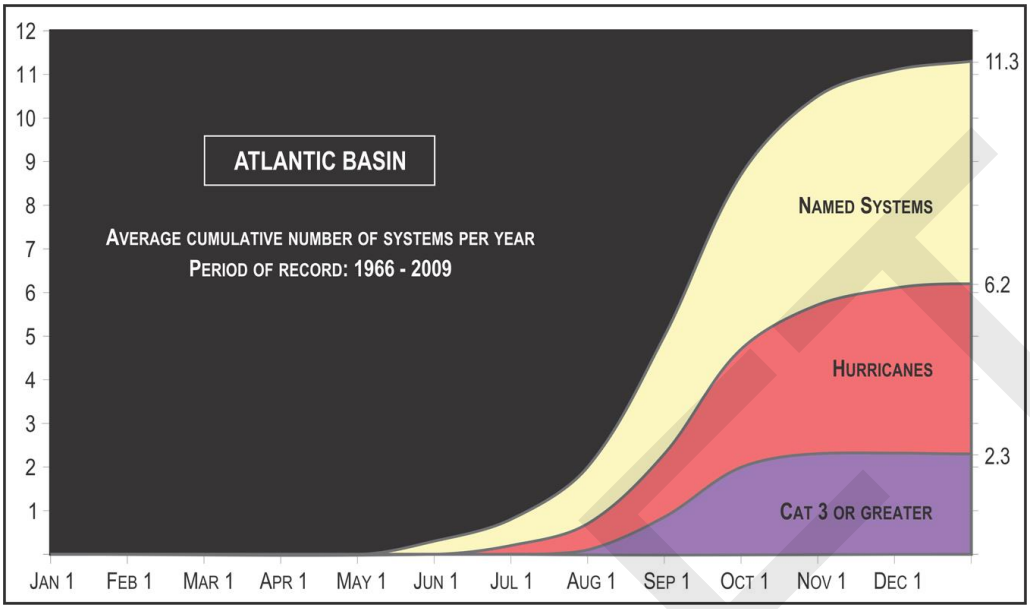
Date	Event Type	Deaths/ Injuries	Property Damage	Crop Damage
7/11/1996	Hurricane	0/0	$0	$0
9/15/1999	Hurricane	0/0	$0	$0
7/10/2005	Hurricane	0/0	$0	$0
8/29/2005	Hurricane	0/0	$0	$0
9/14/2002	Tropical Storm	0/0	$0	$0
7/1/2003	Tropical Storm	0/0	$0	$0
9/6/2004	Tropical Storm	0/0	$0	$0
9/16/2004	Tropical Storm	0/0	$0	$0
9/26/2004	Tropical Storm	0/0	$0	$0
9/27/2004	Tropical Storm	0/0	$0	$0
6/12/2005	Tropical Storm	0/0	$0	$0
7/6/2005	Tropical Storm	0/0	$0	$0
10/5/2005	Tropical Storm	0/0	$0	$0
6/12/2006	Tropical Storm	0/0	$0	$0
8/30/2006	Tropical Storm	0/0	$0	$0
8/21/2008	Tropical Storm	0/0	$3000	$0
8/22/2008	Tropical Storm	0/0	$1500	$0
11/10/2009	Tropical Storm	0/0	$0	$0
9/4/2011	Tropical Storm	0/0	$0	$0
5/27/2012	Tropical Storm	0/0	$2500	$0
6/6/2013	Tropical Storm	0/0	$7500	$0
9/2/2016	Tropical Storm	0/0	$0	$0
10/7/2016	Tropical Storm	0/0	$0	$0
9/11/2017	Tropical Storm	0/0	$10,000,000	$0
10/10/2018	Tropical Storm	0/0	$0	$0
9/4/2019	Tropical Storm	0/0	$0	$0
6/28/2021	Tropical Storm	0/0	$0	$0
7/7/2021	Tropical Storm	0/0	$0	$0
9/29/2022	Tropical Storm	0/0	$0	$0
8/30/2023	Tropical Storm	0/0	$0	$0
9/4/2019	Tropical Depression	0/0	$0	$0
7/7/2021	Tropical Depression	0/0	$0	$0
9/2/2016	Storm Surge/Tide	0/0	$0	$0
10/7/2016	Storm Surge/Tide	0/0	$0	$0
9/11/2017	Storm Surge/Tide	0/0	$10,000,000	$0
11/10/2022	Storm Surge/Tide	0/0	$0	$0
	Total	**0/0**	**$20,014,500**	**$0**

Source: NCEI, May 2024

PROBABILITY OF FUTURE OCCURRENCE

The Atlantic basin hurricane season runs from June 1st to November 30th. The Atlantic basin includes the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico. Figure 4.28 shows the progress of a typical hurricane season in terms of the total number of tropical systems and hurricanes produced throughout the year in the Atlantic basin. The curves represent the average cumulative production of all named tropical systems, all hurricanes, and those hurricanes which were Category 3 or stronger in those basins. Hurricanes are certain to continue occurring in the Atlantic Basin.

Figure 4-33 – Average Number of Tropical Storms per Year (Atlantic Basin)



Source: NOAA/National Hurricane Center

Given the 34 hurricane, tropical storm, and storm surge occurrences recorded by NCEI over a period of 20 years (2002-2022), and the 75 historical hurricane tracks recorded by NOAA and the National Hurricane Center, hurricane-related flooding in Chatham County is likely in the future. A hurricane or tropical storm affects Chatham County on average once every year. Therefore, hurricane or tropical storm related flooding in Chatham County is highly likely in the future.

Probability: Highly Likely

CLIMATE CHANGE AND FUTURE CONDITIONS

One of the primary factors contributing to the origin and growth of tropical storm and hurricanes systems is water temperature. Sea surface temperature may increase significantly in the main hurricane development region of the North Atlantic during the next century as well as in the Gulf of Mexico. NOAA models predict that while there may be less frequent, low-category storm events (Tropical Storms, Category 1 Hurricanes), there will be more, high-category storm events (Category 4 and 5 Hurricanes) in the future. This means that there may be fewer hurricanes overall in any given year, but when hurricanes do form, it is more likely that they will become large storms that can create massive damage. Per the Fourth National Climate Assessment, studies suggest that there will be an increase in the number of very intense tropical cyclones. The total number of storms may remain consistent, but very intense storms are expected to become more frequent and the amount of rainfall from these storms is projected to increase.

The heavy rains associated with tropical weather systems are not only responsible for major flooding in areas where the storm initially strikes, but can also affect areas hundreds of miles inland. Torrential rains from hurricanes and tropical storms can produce extensive urban and riverine flooding, especially if the storm systems are large and slow moving. Winds from these storms located offshore can drive ocean water up the mouth of a river or canal, compounding the severity of inland overbank flooding.

Hurricanes and other coastal storms may result in increased flooding, injuries, deaths, and extreme property loss. According to the US Government Accountability Office, national storm losses from changing frequency and intensity of storms is projected to increase anywhere from $4-6 billion soon.

Sea level change will be particularly important in influencing storm surge flooding in the Chatham County area, since the area is already subject to flooding from above normal tides, surge and rainfall events from hurricanes and less powerful tropical storms. As a result of sea-level rise, flooding from just high tide events is becoming more common.

VULNERABILITY ASSESSMENT

Vulnerability: High

PROPERTY

Table 4.30 through Table 4.34 provide a summary of assets at risk to hurricane surge based on each hurricane category. The buildings vulnerable to each hurricane category are mapped in Figure 4-34 through Figure 4-38 on the following pages. Buildings are shown as at risk to hurricane storm surge if they fall within any portion of the SLOSH model storm surge extent, regardless of flood depth. Therefore, some structures are more vulnerable than others depending on the actual depth of flooding that could occur at each location.

The estimate of assets at risk for each hurricane category is based on the total of improved and contents value. These values are not damage estimates, but rather reflect the total building and contents value for all structures that could be exposed to any depth of hurricane storm surge flooding for each category of storm based on NOAA SLOSH models.

Table 4.30 – Properties at Risk to Category 1 Storm Surge

Occupancy Type	Building Count	Total Building Value	Estimated Content Value	Total Value (Building and Contents)
Agricultural	16	$3,260,048	$3,260,048	$6,520,096
Commercial	129	$82,389,836	$82,389,836	$164,779,673
Education	1	$80,799	$80,799	$161,599
Government	74	$21,041,475	$21,041,475	$42,082,949
Industrial	128	$133,743,995	$200,615,993	$334,359,988
Religious	61	$30,903,306	$30,903,306	$61,806,611
Residential	5,131	$1,698,652,087	$850,010,805	$2,548,662,892
Total	**5,540**	**$1,970,071,545**	**$1,188,302,261**	**$3,158,373,807**

Source: Chatham County building data, NOAA SLOSH model

Table 4.31 – Properties at Risk to Category 2 Storm Surge

Occupancy Type	Building Count	Total Building Value	Estimated Content Value	Total Value (Building and Contents)
Agricultural	24	$4,295,450	$4,295,450	$8,590,899
Commercial	508	$261,059,701	$261,059,701	$522,119,402
Education	4	$2,671,700	$2,671,700	$5,343,400
Government	148	$86,009,343	$86,009,343	$172,018,685
Industrial	435	$314,921,310	$472,381,965	$787,303,274
Religious	130	$67,055,825	$67,055,825	$134,111,650
Residential	13,911	$4,185,938,226	$2,094,374,007	$6,280,312,233
Total	**15,177**	**$4,924,270,959**	**$2,989,127,959**	**$7,913,398,918**

Source: Chatham County building data, NOAA SLOSH model

Table 4.32 – Properties at Risk to Category 3 Storm Surge

Occupancy Type	Building Count	Total Building Value	Estimated Content Value	Total Value (Building and Contents)
Agricultural	36	$5,075,402	$5,075,402	$10,150,804
Commercial	1,202	$507,361,858	$507,361,858	$1,014,723,716

Education	4	$2,671,700	$2,671,700	$5,343,400
Government	224	$118,762,521	$118,762,521	$237,525,043
Industrial	901	$486,955,331	$730,432,996	$1,217,388,327
Religious	194	$89,921,194	$89,921,194	$179,842,389
Residential	20,722	$5,525,438,769	$2,765,296,732	$8,290,735,501
Total	**23,283**	**$6,736,186,776**	**$4,219,522,404**	**$10,955,709,180**

Source: Chatham County building data, NOAA SLOSH model

Table 4.33 – Properties at Risk to Category 4 Storm Surge

Occupancy Type	Building Count	Total Building Value	Estimated Content Value	Total Value (Building and Contents)
Agricultural	71	$7,537,557	$7,537,557	$15,075,113
Commercial	2,110	$1,019,817,482	$1,019,817,482	$2,039,634,964
Education	8	$4,973,538	$4,973,538	$9,947,076
Government	319	$359,906,298	$359,906,298	$719,812,597
Industrial	1,249	$703,327,809	$1,054,991,713	$1,758,319,521
Religious	256	$144,363,795	$144,363,795	$288,727,589
Residential	28,293	$6,748,286,086	$3,376,846,598	$10,125,132,685
Total	**32,306**	**$8,988,212,565**	**$5,968,436,981**	**$14,956,649,545**

Source: Chatham County building data, NOAA SLOSH model

Table 4.34 – Properties at Risk to Category 5 Storm Surge

Occupancy Type	Building Count	Total Building Value	Estimated Content Value	Total Value (Building and Contents)
Agricultural	106	$8,497,840	$8,497,840	$16,995,681
Commercial	2,364	$1,106,391,293	$1,106,391,293	$2,212,782,585
Education	15	$5,584,698	$5,584,698	$11,169,397
Government	356	$416,787,024	$416,787,024	$833,574,049
Industrial	1,311	$717,158,305	$1,075,737,457	$1,792,895,762
Religious	287	$152,962,892	$152,962,892	$305,925,784
Residential	31,559	$7,312,576,616	$3,659,037,277	$10,971,613,893
Total	**35,998**	**$9,719,958,668**	**$6,424,998,482**	**$16,144,957,150**

Source: Chatham County building data, NOAA SLOSH model

Figure 4-34 – Buildings Vulnerable to Modeled Category 1 Storm Surge

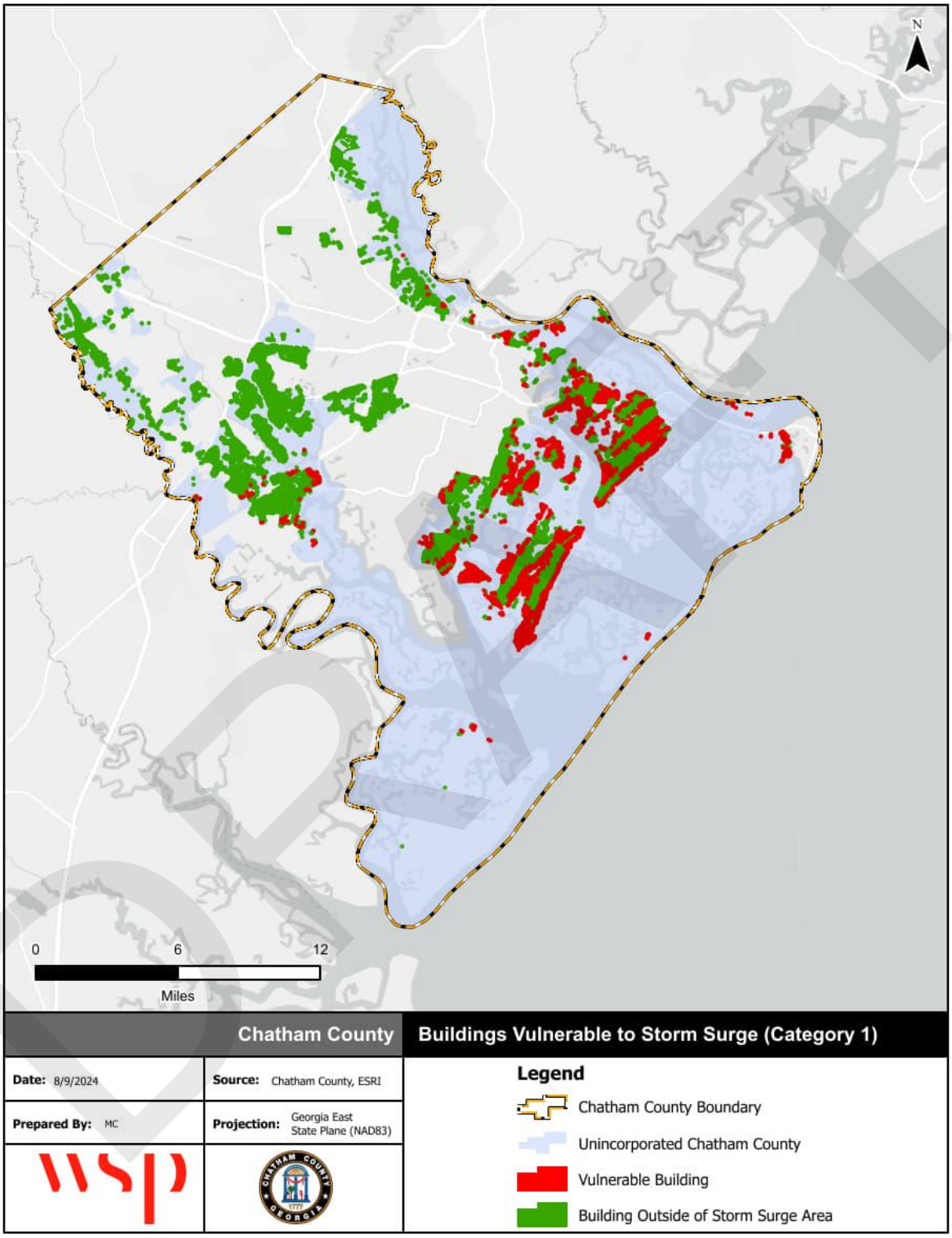


Figure 4-35 – Buildings Vulnerable to Modeled Category 2 Storm Surge

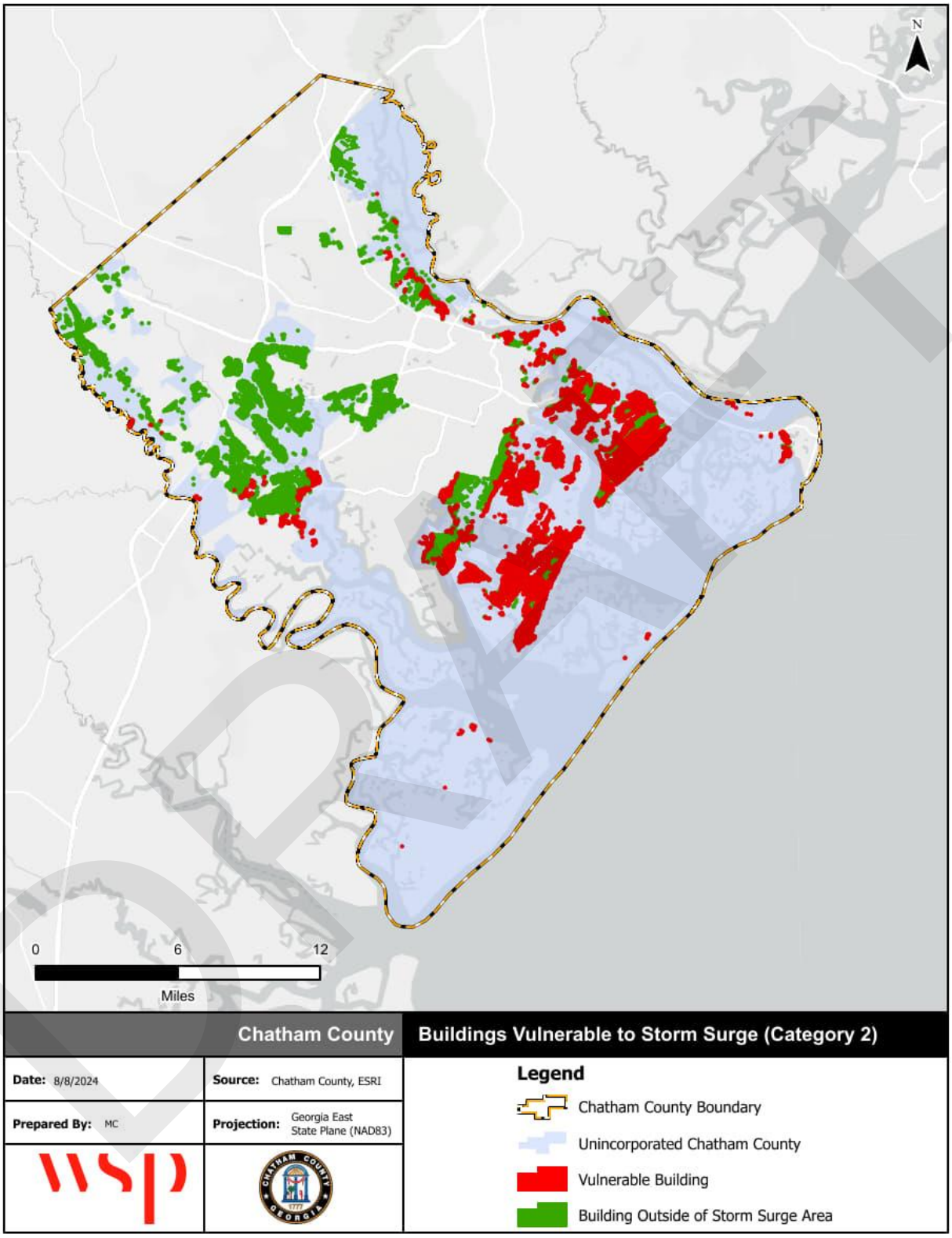


Figure 4-36 – Buildings Vulnerable to Modeled Category 3 Storm Surge

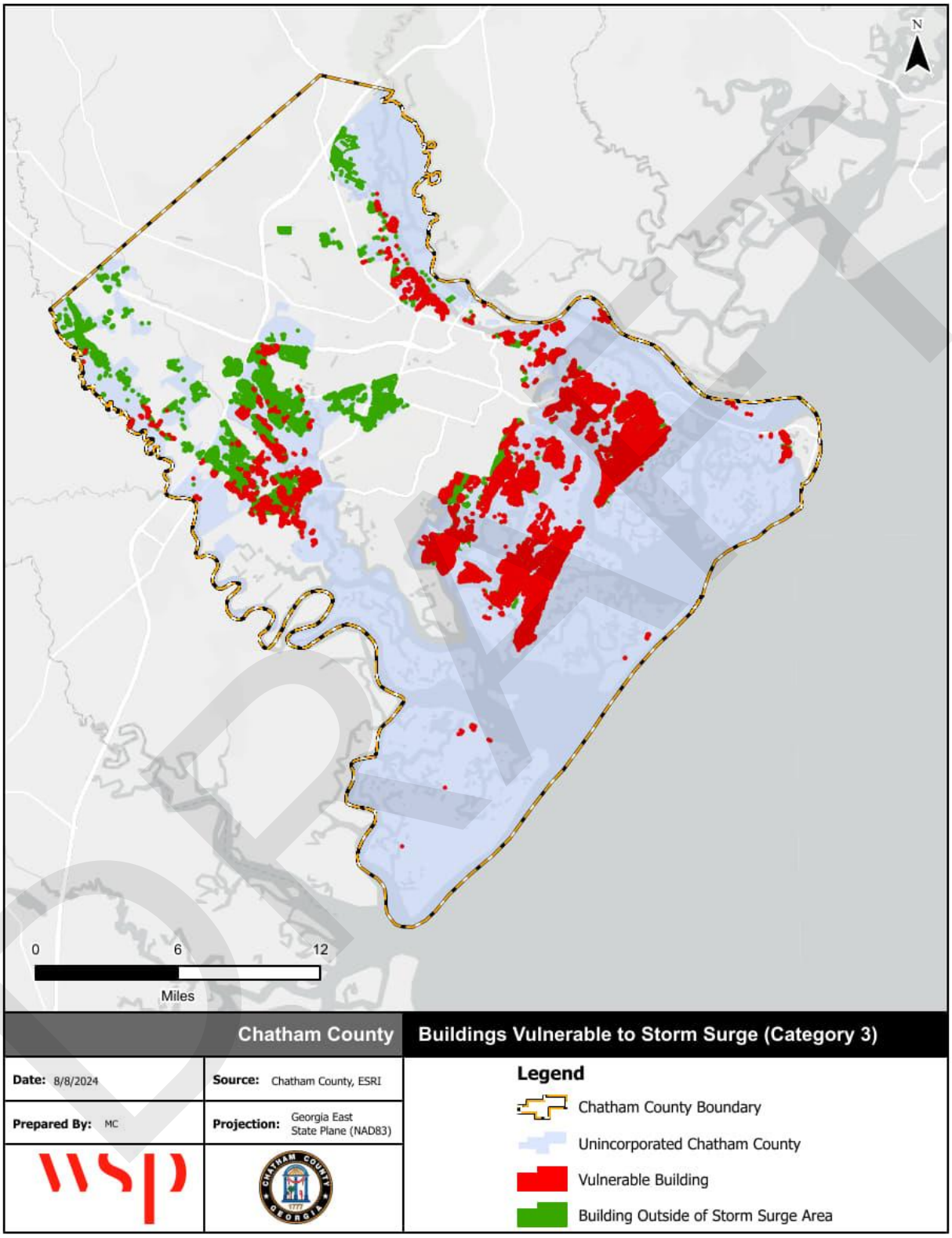


Figure 4-37 – Buildings Vulnerable to Modeled Category 4 Storm Surge

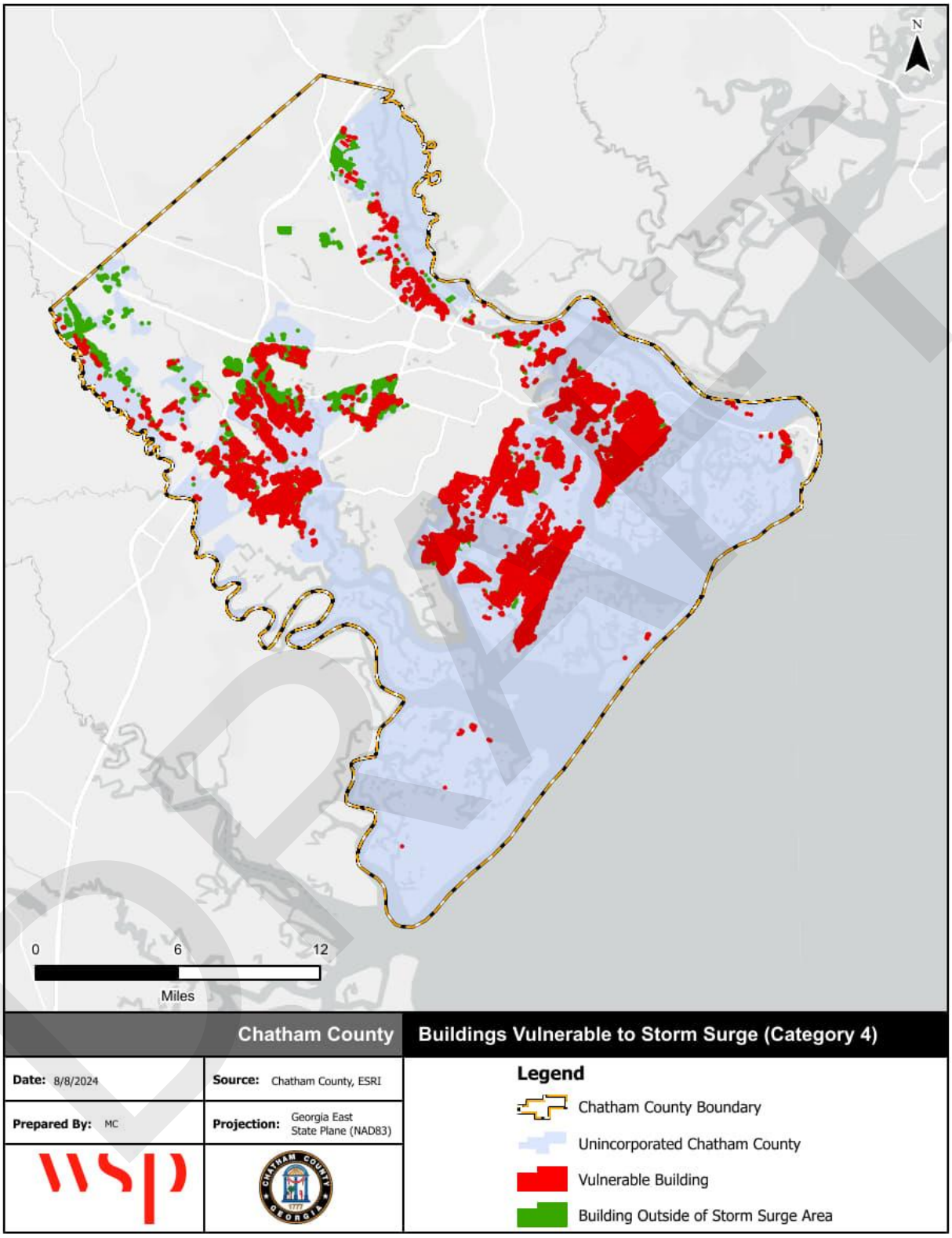
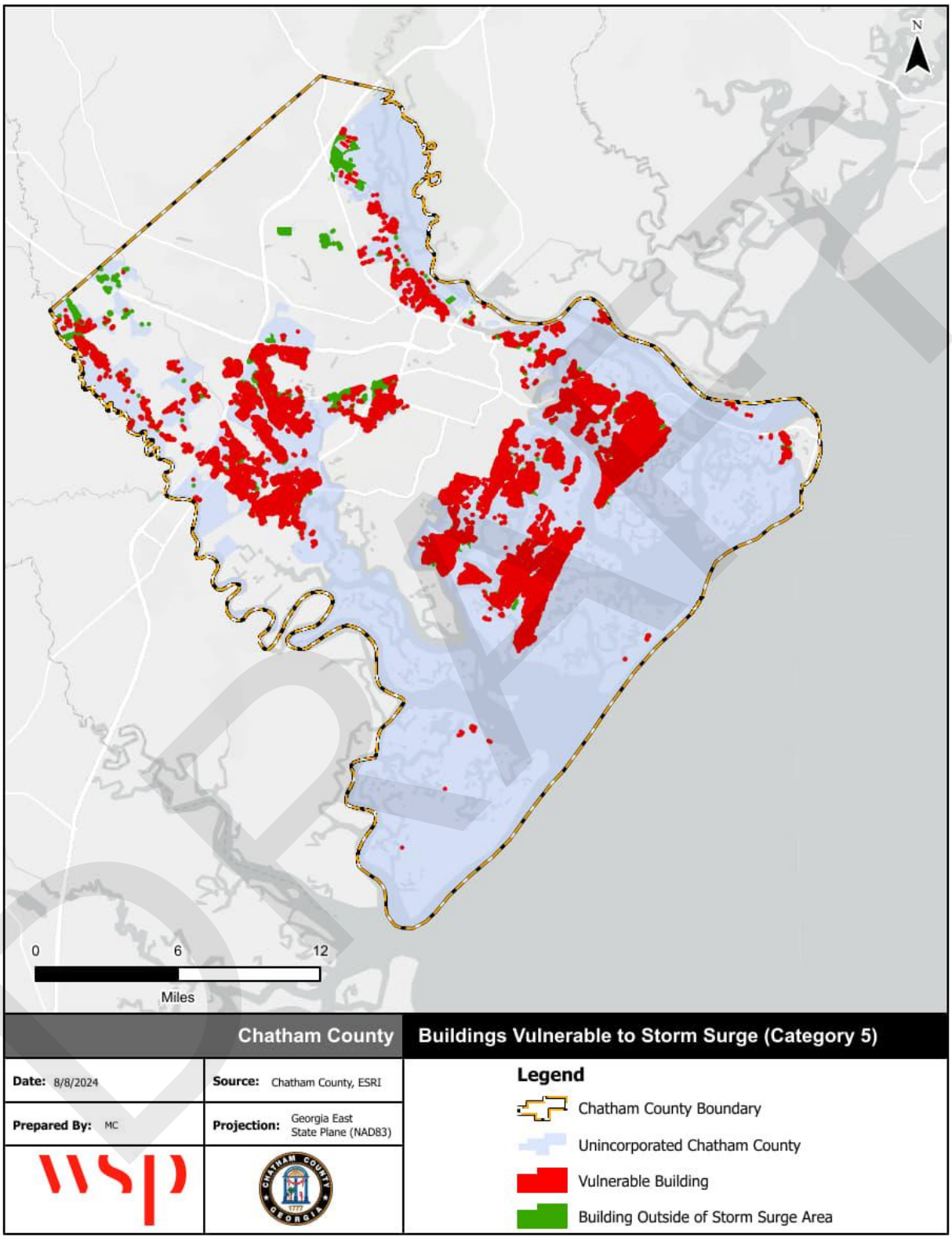


Figure 4-38 – Buildings Vulnerable to Modeled Category 5 Storm Surge



4.4.6 STORMWATER/LOCALIZED FLOODING

Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Stormwater/ Localized Flooding	Highly Likely	Limited	Small	6 to 12 hours	Less than 24 hours	2.7

HAZARD DESCRIPTION

Localized stormwater flooding can occur throughout Chatham County. Localized stormwater flooding occurs when heavy rainfall and an accumulation of runoff overburden the stormwater drainage system. The cause of localized stormwater flooding in Chatham County can be attributed to its generally flat topography, abundance of water features, and the large amount of developed and impervious land, which limits ground absorption and increases surface water runoff.

Localized flooding may be caused by the following issues:

Inadequate Capacity – An undersized/under capacity pipe system can cause water to back-up behind a structure which can lead to areas of ponded water and/or overtopping of banks.

Clogged Inlets – Debris covering the asphalt apron and the top of grate at catch basin inlets may contribute to an inadequate flow of stormwater into the system. Debris within the basin itself may also reduce the efficiency of the system by reducing the carrying capacity.

Blocked Drainage Outfalls – Debris blockage or structural damage at drainage outfalls may prevent the system from discharging runoff, which may lead to a back-up of stormwater within the system.

Improper Grade – Poorly graded asphalt around catch basin inlets may prevent stormwater from entering the catch basin as designed. Areas of settled asphalt may create low spots within the roadway that allow for areas of ponded water.

While localized flooding may not be as destructive as coastal flooding, it is a chronic problem. The repetitive damage caused by such flooding can add up. Sewers may back up, yards can be inundated, and homes, businesses and vehicles can be flooded. Drainage and sewer systems not designed to carry the capacity currently needed to handle increased storm runoff can cause water to back into basements and damage mechanical systems. These impacts, and other localized flooding impacts, can create public health and safety concerns.

Warning Time: 6 to 12 hours

Duration: Less than 24 hours

LOCATION

Spatial Extent: Small

A list of hot spot flooding locations is maintained by the Chatham County Public Works Department. These hot spots are divided into three areas: Westside, Eastside, and Islands. The identified locations are known to have issues during major rainfall events and are separate from sea level rise flooding.

The areas of localized flooding noted by the Chatham County Public Works Department are listed below in Table 4.35.

Table 4.35 – Areas of Localized Flooding

Area	Location	Street Name or Intersection
Eastside	1	Ferguson Avenue
Eastside	2	Garland Drive

Area	Location	Street Name or Intersection
Eastside	3	Hardee Drive
Eastside	4	Jacquelyn Drive
Eastside	5	Kings Way
Eastside	6	Leghorn Street
Eastside	7	Strachan Avenue
Islands	1	Ashely Road
Islands	2	Battery Circle
Islands	3	Montford Court
Islands	4	Oatland Island Road at Islands Expressway
Islands	5	Oemler Loop
Islands	6	Pelican Drive
Islands	7	Salisbury Road
Islands	8	Surrey Road
Islands	9	Talbot Roud
Islands	10	Wilmington Island Road
Georgetown	1	Crown Villa Apartments
Georgetown	2	Dovetail Crossing
Georgetown	3	Red Fox Drive
Georgetown	4	Sagebush Lane
Georgetown	5	White Hawthorne Drive
Westside	1	Bluegill Lane
Westside	2	Brandlewood Drive
Westside	3	Diggs Avenue
Westside	4	Gamble Rd Lake outfall (Going under Veteran's Parkway)
Westside	5	Gateway Boulevard
Westside	6	Gulfstream Road (near the canal)
Westside	7	Henderson Boulevard
Westside	8	Holiday Circle at Larchmont Drive
Westside	9	Lamarville Park Area
Westside	10	Mark Circle
Westside	11	Osteen Road
Westside	12	Quacco Rd (near Regency Trailer Park)
Westside	13	Westlake Apartment Area

Figure 4-39 on the following page depicts the areas of localized stormwater flooding identified by the FMPC.

Figure 4-40 through Figure 4-43 show localized flooding hot spots in greater detail, by area.

Figure 4-39 – Localized Flooding Locations Index Map

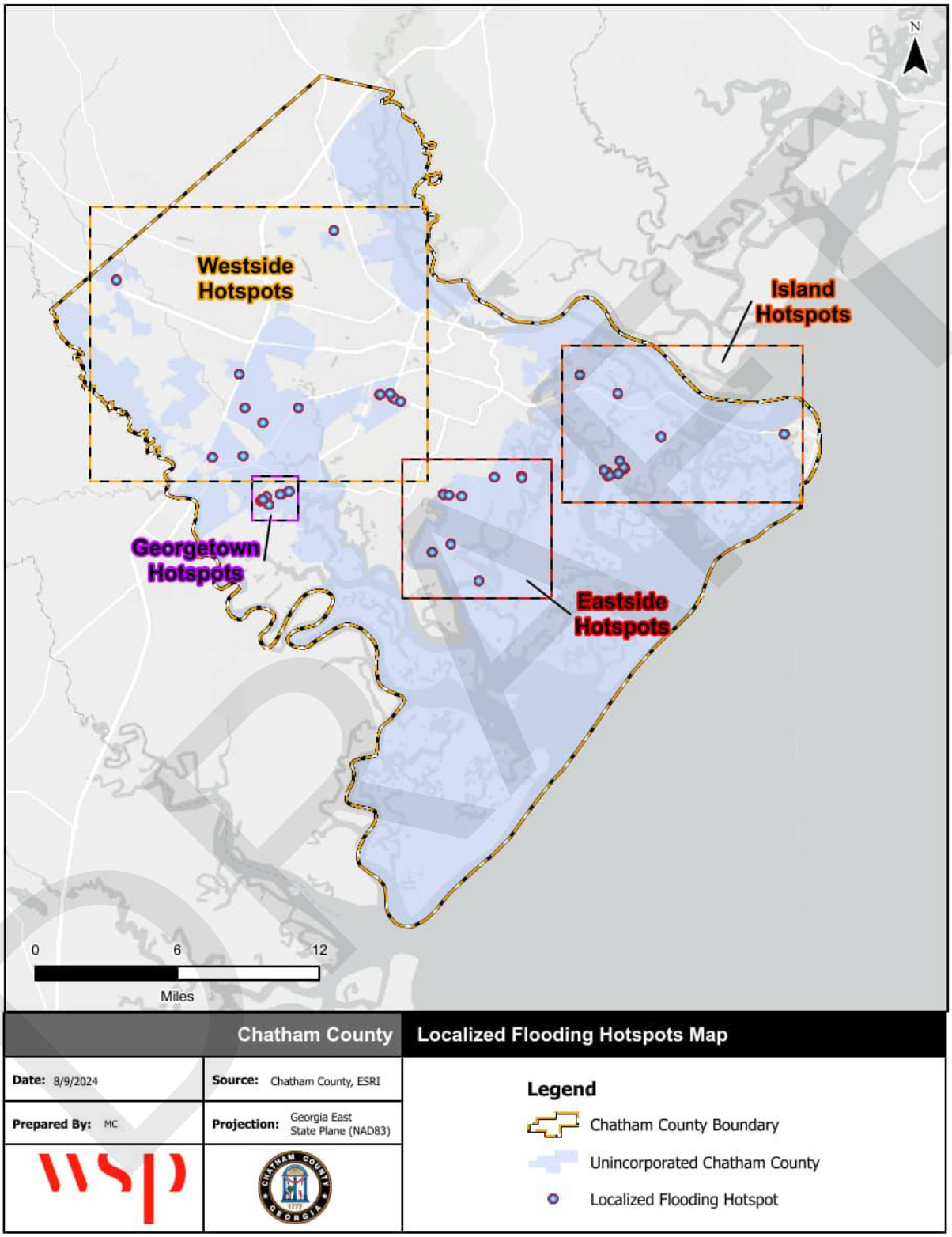


Figure 4-40 – Localized Flooding, Eastside Area

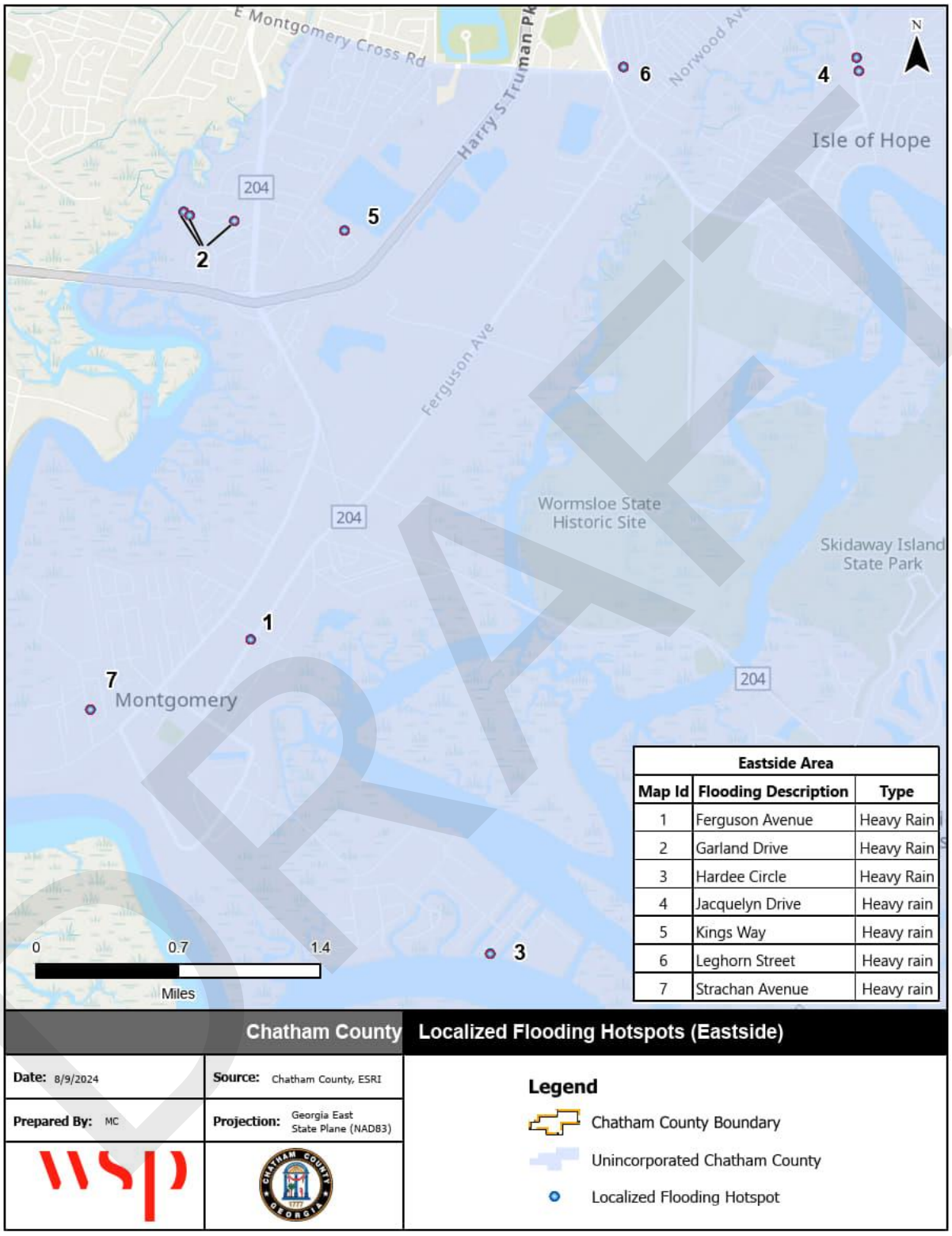


Figure 4-41 – Localized Flooding, Islands Area

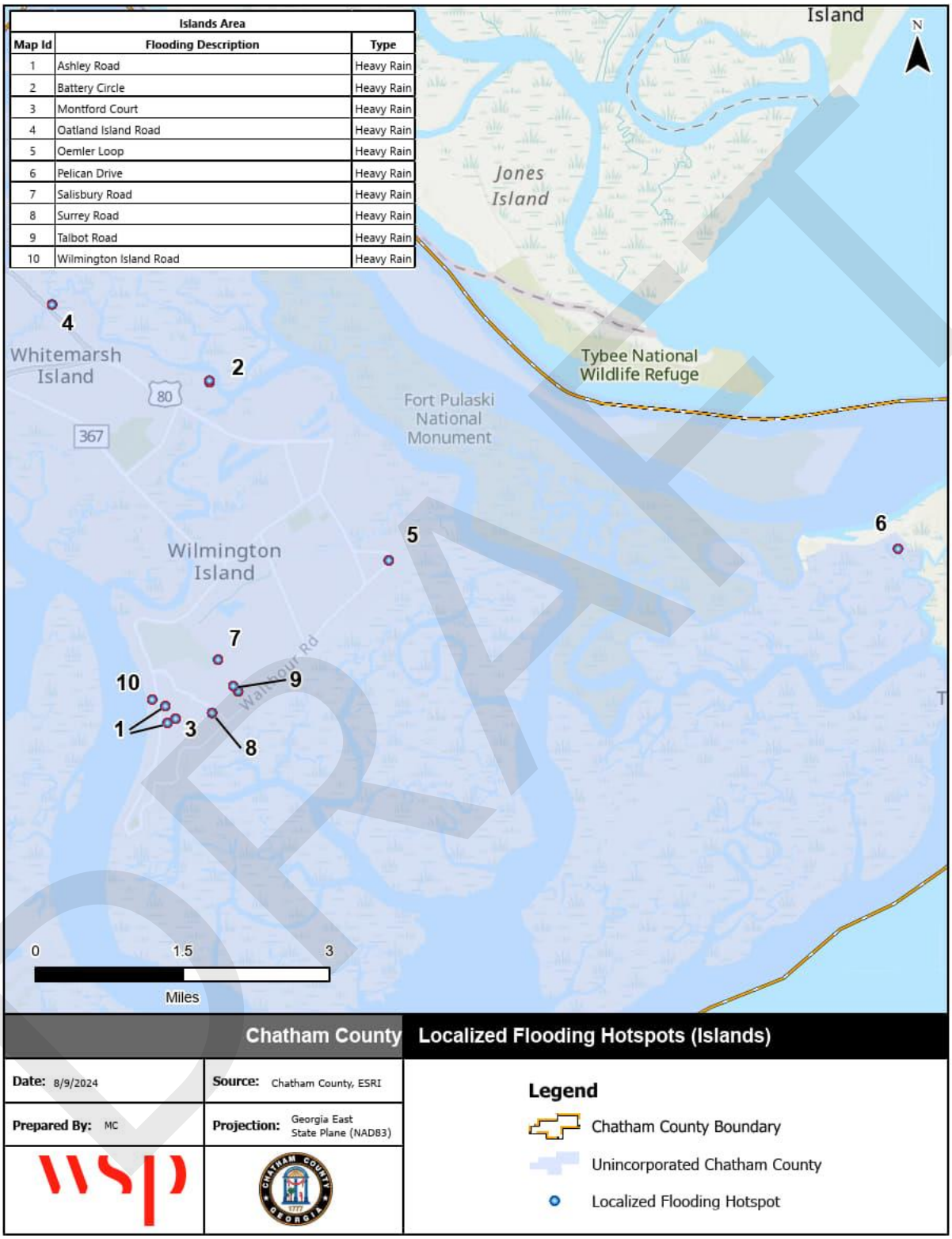


Figure 4-42 – Localized Flooding, Westside Area

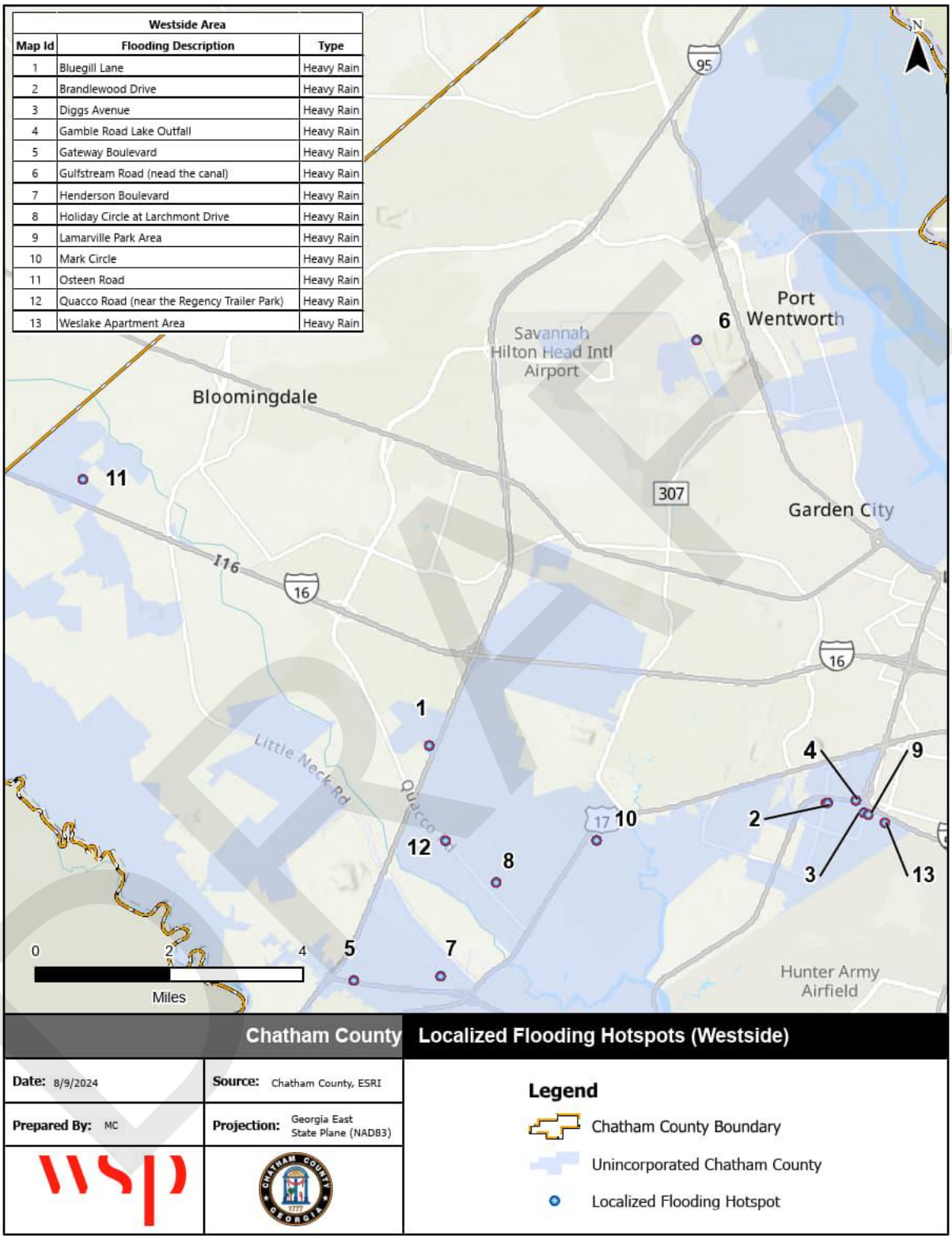
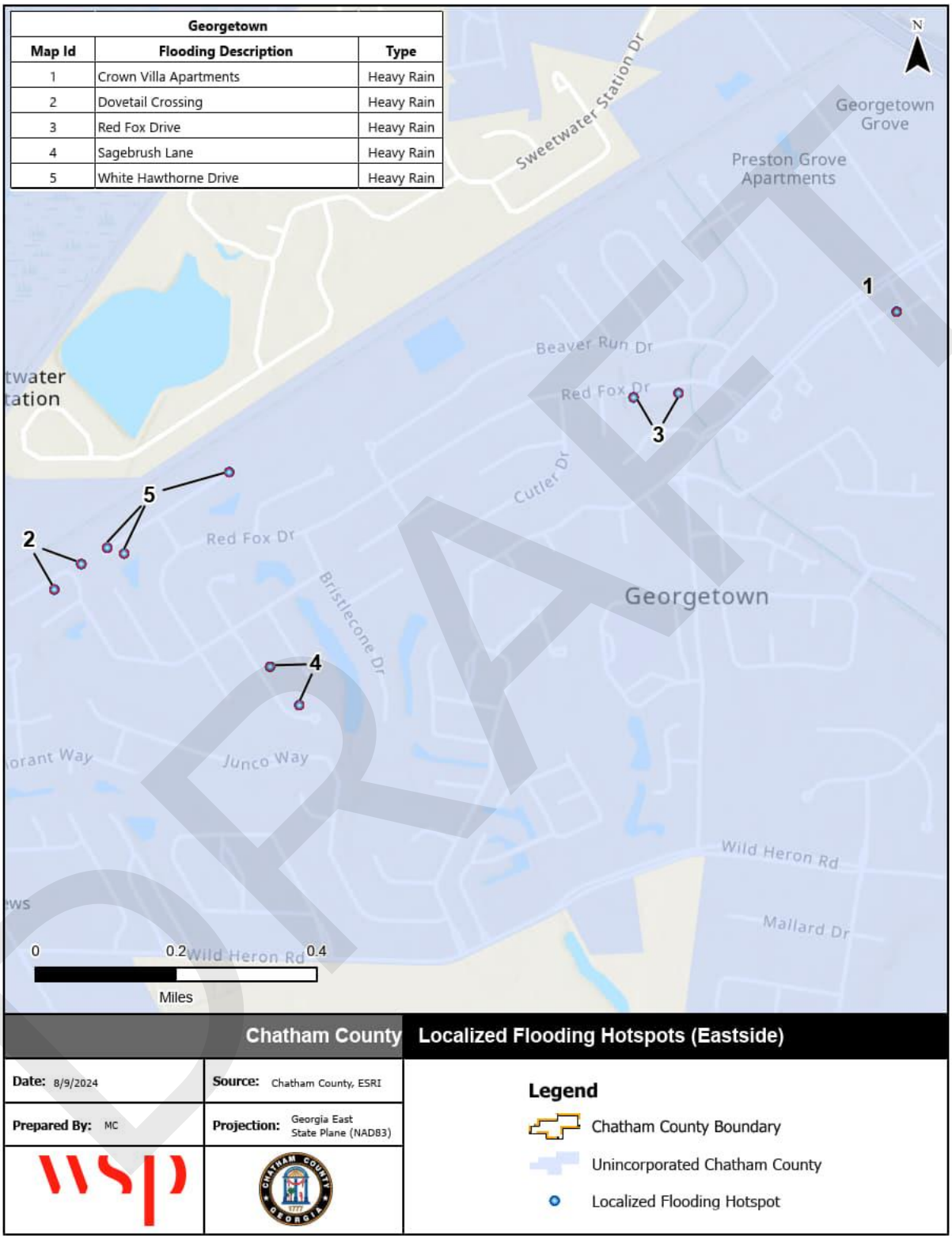


Figure 4-43 – Localized Flooding, Georgetown Area



EXTENT

The severity of flooding is generally linked to the flood depth, velocity, and how rapidly it occurs. However, unlike with the mapped floodplain, there is limited data on flood depths and recurrence intervals for localized flooding because it is highly variable based on stormwater system maintenance, development and runoff management, recent weather patterns, and each rain event. Localized flooding typically refers to smaller scale events that are less severe than riverine flooding but can present a nuisance and generate substantial losses over repeated occurrences.

Impact: Limited

PAST OCCURRENCES

NCEI contains records for 66 flash flood events that were reported as occurring in Chatham County since 1996. A review of the event narratives indicates that five of the flash flood events, which occurred on three separate days, involved large scale impacts associated with coastal and riverine flooding and are therefore reported in Section 4.4.2 Coastal and Inland Flooding. The remaining 61 flash flood events, occurring on 32 separate days, involved stormwater flooding throughout the county with localized impacts on streets, vehicles, and structures. These events are summarized by date in Table 4.36.

Table 4.36 – NCEI Reported Flash Flood Events in Chatham County (January 1996 to October 2023)

Location	Date	Injuries/Deaths	Property Damage	Crop Damage
SAVANNAH	8/7/1996	0/0	75,000	$0
EAST PORTION	1/23/1998	0/0	$0	$0
SAVANNAH	10/11/2002	0/0	$0	$0
SAVANNAH	4/7/2003	0/0	$0	$0
SAVANNAH	4/8/2003	0/0	$0	$0
SAVANNAH	4/8/2003	0/0	$0	$0
SAVANNAH	7/24/2003	0/0	$0	$0
SAVANNAH	8/12/2004	0/0	$0	$0
SAVANNAH	10/5/2005	0/0	$0	$0
SAVANNAH	7/6/2006	0/0	10,000	$0
SAVANNAH	7/30/2007	0/0	8,000	$0
SAVANNAH	9/1/2007	0/0	$0	$0
CENTRAL JCT	9/13/2007	0/0	$0	$0
CENTRAL JCT	9/21/2007	0/0	$0	$0
SAVANNAH	12/21/2007	0/0	$11,000	$0
CENTRAL JCT	7/27/2008	0/0	$0	$0
MEINHARD	10/24/2008	0/0	$0	$0
SAVANNAH	7/27/2009	0/0	10,000	$0
CENTRAL JCT	8/3/2009	0/0	5,000	$0
GARDEN CITY	8/3/2009	0/0	150,000	$0
SAVANNAH	8/12/2009	0/0	$0	$0
SAVANNAH	6/27/2010	0/0	$0	$0
VERNONBURG	8/20/2010	0/0	$0	$0
CENTRAL JCT	6/29/2011	0/0	$0	$0
THUNDERBOLT	7/14/2011	0/0	10,000	$0
SAVANNAH	8/6/2011	0/0	$0	$0
SAVANNAH	7/12/2013	0/0	11,000	$0
OLEARY	7/13/2013	0/0	$30,000	$0
SAVANNAH	7/31/2013	0/0	$30,000	$0
CENTRAL JCT	8/16/2013	0/0	20,000	$0

Location	Date	Injuries/Deaths	Property Damage	Crop Damage
BONA BELLA	6/23/2014	0/0	15,000	$0
CENTRAL JCT	8/10/2014	0/0	$0	$0
LIBERTY CITY	7/17/2016	0/0	$20,000	$0
WILLIAMS	10/7/2016	0/0	$0	$0
	Total	**0/0**	**$405,000**	**$0**

Source: NCEI, 2024

The following provides details on select flood events recorded in the NCEI database. These scenarios represent the types of flood events that can be expected in the future in the Chatham County.

August 7, 1996 – Four to eight inches of rain fell in two to four hours causing flash flooding of streets and small streams in Savannah.

June 29, 1999 – Slow moving showers and thunderstorms developed repeatedly across Chatham County and Effingham County during the day. Twenty-four-hour rainfall amounts ranged from about 7 inches to over 13 inches. As a result of the flooding, over 500 homes and businesses were damaged to varying degrees and almost 600 automobiles were damaged. Water was as deep as 6 ft in some places. Numerous roads were washed out and/or closed during the flooding. Estimated dollar damage for public property was 4.5 million dollars and at least another 2.5 million dollars for private property.

October 11, 2002 – Tropical Storm Kyle dumped 3 to 5 inches of rain in the Savannah area within a 12-hour period. This very heavy rainfall caused flooding of roads, low lying areas and places with poor drainage. Numerous cars stalled and roads were closed as the flooding began to endanger lives.

July 24, 2003 – Thunderstorms dumped an estimated 4 to 6 inches of rain around high tide causing flooding in downtown Savannah. Numerous streets and underpasses were closed due to flooding. Four people were rescued from their cars after driving into water that caused cars to stall.

July 30, 2007 – Numerous road closures were reported in Downtown Savannah as a result of heavy rain from showers and thunderstorms across the region. High water was reported entering some apartments. Cars were floating down the roadway at 65th and Abercorn Street.

August 3, 2009 – Showers and thunderstorms brought heavy rainfall to southeast Georgia. The Chatham County Emergency Management Agency reported flooding of the following roadways or intersections in Savannah, Georgia, East Broad and Gwinnett, the 500 Block of River, 37th Street and Burroughs, Gwinnett and West Boundary, Legrand and 33rd Street, Drayton and 35th-36th Streets, Abercorn and Duffy, East Broad and Anderson, the 700 Block of East Henry, Bay and East Broad, Randolph and General McIntosh, President and General McIntosh, Martin Luther King Jr. and Hall, the 800 Block of Anderson, and East Broad and Henry.

June 23, 2014 – A line of stationary thunderstorms produced between 4-10 inches of rain across Chatham County, which resulted in flash flooding. KSAV observed the wettest June day on record since observations began in 1871. A trained spotter measured 4.75 inches of rainfall in under two hours. The Savannah Airport ASOS measured 6.65 inches of rainfall for the day. Flood waters also washed out a section of the CSX rail line near Highway 307 and Gulf Stream Road. Total costs were generally estimated to be around 15 thousand dollars.

PROBABILITY OF FUTURE OCCURRENCE

Given the 32 days with flash flood events recorded in NCEI over the 28-year period, from 1996 to October 2023 there is a 100 percent chance of occurrence within any given year. Precipitation resulting from heavy rainstorms, including tropical storms and hurricanes, makes it highly likely that unmitigated properties will continue to experience localized flooding.

Probability: Highly Likely

CLIMATE CHANGE AND FUTURE CONDITIONS

Climate change and sea level rise have the potential to affect localized flooding. As discussed in Section 4.4.2, according to the Fourth National Climate Assessment, the frequency and intensity of rainfall events is expected to increase across the U.S., and total precipitation amounts are expected to increase in the Southeast. If these trends extend to the planning area, these changes may cause increases in localized flooding, as stormwater drainage systems designed for smaller flood volumes may become overwhelmed more frequently.

New development can also affect the occurrence of localized flooding. As greenfield areas are developed, impervious surface increases, putting additional strain on existing stormwater infrastructure. Incorporating low-impact development techniques and other on-site stormwater management, and designing those systems for greater stormwater volumes, can help to mitigate the impacts of new development.

Mitigating the root causes of localized flooding or choosing not to develop in areas that often are subject to localized flooding will reduce future risk of losses due to this hazard. Figure 4-44 shows localized stormwater flooding in relation to future land use for Chatham County and the City of Savannah.

An analysis of future land use along with current known flooding locations indicates that many localized flooding locations are in areas slated for low density residential development near tidal marshes. Additionally, an increase in future flooding can likely be expected in and around the Westside hotspots in West Chatham County. As most of the developable land in the Islands and Southeast Chatham is built out, development pressure has shifted to West Chatham County, reflected in the planned low and medium density residential land uses in areas currently under agricultural use.

Evaluated on a watershed level, impervious surface and thus stormwater-related flooding is likely to increase in the Ogeechee Coastal and Lower Ogeechee basins, especially around areas of rapid development. Based on the land use and development mapped for these areas, not only will more property be exposed due to new construction, but the associated increase in impervious surface and reduction in flood storage areas will increase the vulnerability of existing property within these watersheds, particularly in West Chatham County and downstream areas.

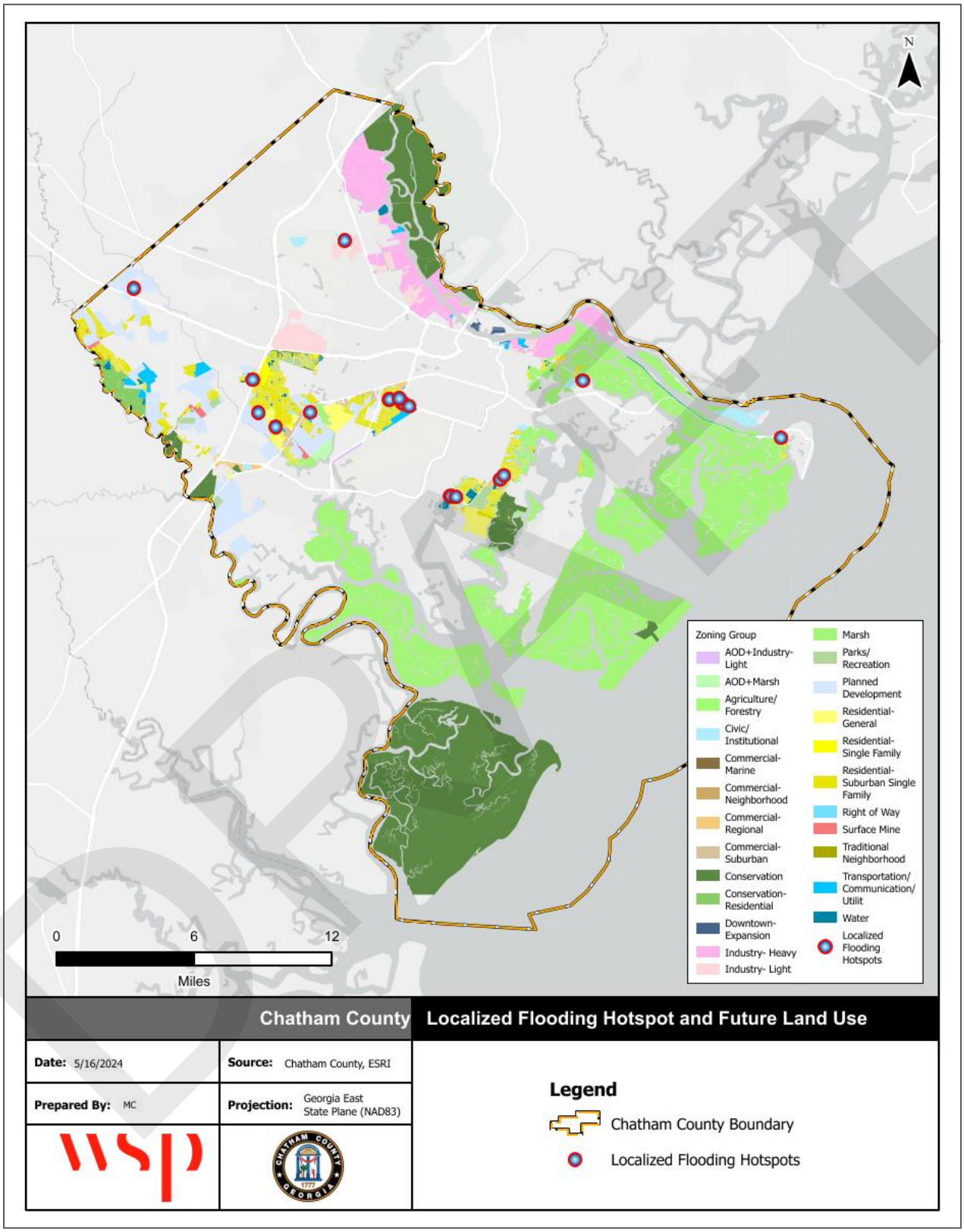
VULNERABILITY ASSESSMENT

PROPERTY

Localized flooding occurs at various times throughout the year with several areas of primary concern to the County. Localized flooding and ponding affect streets and property. Loss estimates for localized flooding cannot be created because the frequency and depth of localized flooding is unknown. However, all properties in an around the known localized flooding areas may be at risk of future flood damages.

Vulnerability: Moderate

Figure 4-44 – Localized Flooding Locations in Relation to Future Land Use



4.5 RISK AND VULNERABILITY CONCLUSIONS

4.5.1 FLOOD HAZARDS PROFILE SUMMARY

Table 4.37 summarizes the degree of risk assigned to each identified hazard using the PRI method. Table 4.38 summarizes the results of the hazard profile for Chatham County based on hazard identification data and input from the FMPC. For each hazard profiled within Section 4.4, this table includes the relative risk for the County according to the results of the Priority Risk Index (PRI).

Table 4.37 – Summary of PRI Results

Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Climate Change & Sea Level Rise	Highly Likely	Limited	Moderate	More than 24 hours	More than 1 week	2.9
Coastal & Inland Flooding	Highly Likely	Critical	Large	6 to 12 hours	Less than 1 week	3.5
Coastal & Stream Bank Erosion	Likely	Limited	Small	More than 24 hours	More than 1 week	2.4
Dam Failure	Unlikely	Minor	Negligible	Less than 6 hours	Less than 24 hours	1.4
Hurricane & Tropical Storm	Highly Likely	Critical	Large	More than 24 hours	Less than 1 week	3.3
Stormwater/ Localized Flooding	Highly Likely	Limited	Small	6 to 12 hours	Less than 24 hours	2.7

The results from the PRI have been classified into three categories based on the assigned risk value which are summarized in Table 4.38 below:

Low Risk – Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal. This is not a priority hazard.

Medium Risk – Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.

High Risk – Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread.

Table 4.38 – Summary of Hazard Risk Classification

High Risk (≥ 3.0)	Coastal & Inland Flooding Hurricane & Tropical Storm
Moderate Risk (2.0 – 2.9)	Climate Change & Sea Level Rise Coastal & Streambank Erosion Stormwater/Localized Flooding
Low Risk (< 2.0)	Dam Failure

4.5.2 ASSESSMENT OF AREAS LIKELY TO FLOOD

The following targeted areas are identified as areas likely to flood in the future.

IDENTIFIED AREA #1: SFHAS AND 0.2%-ANNUAL-CHANCE FLOODPLAINS

According to the Effective DFIRM, approximately 84% of Chatham County's unincorporated areas fall within the 1%-annual-chance floodplain in the effective FIRMs. The SFHA and the moderate-risk 0.2%-annual-chance floodplain are likely to continue flooding in the future. Changes in floodplain development and future development within the watershed in general as well as climate change-driven changes in rainfall probabilities and intensities may increase the size of the SFHAs in the future.

IDENTIFIED AREA #2: AREAS OF LOCALIZED STORMWATER FLOODING

Due to the planning area's low elevation and flat topography, and heavy precipitation resulting from thunderstorms, tropical storms, and hurricanes, with the potential for increasing intensity and frequency due to climate change, it is highly likely that underperforming drainage infrastructure and unmitigated properties will continue to experience localized flooding. Tidal and sea level rise impacts on stormwater systems and their capacity must also be considered. An increase in impervious area due to future development could exacerbate localizing flooding issues, particularly if growth expands into currently undeveloped areas, unless measures are taken to limit the volume of runoff allowed post-development. As noted in Section 4.4.6, increases in future flooding may occur in the drainage basins where localized flooding is already a noted problem. The future land use map indicates that more intense development could occur in the western portion of the unincorporated county in areas that were previously planned for agricultural use. Increases in density would also increase overall property exposure in these areas.

IDENTIFIED AREA #3 REPETITIVE LOSS AREAS

Repetitive loss properties have a greater need for flood protection. Repetitive loss can be attributed to development within the 100-year floodplain as well as localized stormwater flooding. As mentioned above, riverine flooding and localized stormwater flooding could increase in the future if measures are not taken to mitigate the effects of development, and coastal flooding is expected to impact as a result of sea level rise. Therefore, it is very likely that unmitigated repetitive loss properties will continue to flood in the future. Repetitive loss areas identified by the FMPC are shown in Figure 4-20.

IDENTIFIED AREA # 4: SEA LEVEL RISE RISK AREAS

Sea level rise will continue to affect low lying lands along the coast, in some cases permanently inundating areas along the coast. NOAA estimates that sea level will rise between 2.5 feet and 6.6 feet by 2100 depending on emissions scenarios. According to the National Climate Assessment, the frequency, extent, and depth of coastal flooding due to high water events will increase.

The flood impacts of sea level rise extend far beyond the lands at risk of immediate inundation from rising seas. As seas rise, coastal marshes and wetlands will inundate permanently, unable to migrate inland fast enough to keep up with rising seas. The loss of these protective features will allow heightened coastal erosion, decrease flood storage area, and make inland areas more vulnerable to tidal flooding, storm surge, and riverine flooding. Thus, as a result of sea level rise, future flood risk in all of the above-identified areas will be further increased.

4.5.3 IMPACT OF FUTURE FLOODING

Changes in floodplain development, development in the watersheds that encompass the County, and changes associated with climate change make future flood problems worse in the above identified areas that are likely to flood.

CHANGES IN FLOODPLAIN DEVELOPMENT

Development in the floodplain affects natural floodplain functions by removing needed flood storage capacity and forcing floodwaters elsewhere, also contributing to expansion of the floodplain and an increase in future flood risk. This process can have similar effects on the likelihood and magnitude of stormwater flooding. Stormwater drainage systems can manage limited capacities. As development occurs and increases stormwater runoff, stormwater system capacities can be exceeded more quickly, resulting in more frequent and/or more severe stormwater flooding.

Additionally, unregulated changes in the floodplain and development within the watershed may increase the base flood elevation in SFHAs. The 1%-annual-chance flood could become more severe as a result of increased development, and the floodplain of the 1%-annual-chance flood could expand. Consequently, existing development in those areas would become exposed to flood risk, meaning more people and property would be at risk.

Chatham County has grown significantly in population and property over the past decade and this trend is expected to continue. As discussed in Section 3.7, the County's population is projected to grow by 15.5% making it home to 335,211 residents by the year 2040. Additionally, per U.S. Census Building Permits Survey data summarized in Table 4.39, Chatham County has added 18, 970 residential units over the past 14 years. Residential building permit issuance rose from 2010 to 2014, with new permits leveling off until 2021 – there have been more annual permit approvals from 2021 – 2023. The majority of building permits issued in all years since 2010 have been for single family homes. Single family detached homes are also the most common housing type in the County, making up 63.6% of the housing supply as of 2022. Single family homes typically produce the most impervious surface per unit, which means the development trends in Chatham County have been greatly increasing impervious surface coverage.

Table 4.39 – Building Permits Issued in Chatham County since 2010

Year	1-unit		2-units		3-4 units			5+ units		
	Bldgs	Value	Bldgs	Value	Bldgs	Units	Value	Bldgs	Units	Value
2010	676	$87,335,207	1	$140,000	2	8	$258,888	21	271	$13,946,583
2011	655	$84,463,420	3	$437,850	5	20	$2,294,000	20	376	$22,141,746
2012	811	$122,205,698	1	$197,500	1	4	$175,000	13	198	$11,142,608
2013	901	$156,331,898	9	$1,803,902	1	4	$200,000	19	127	$6,486,958
2014	1,048	$205,885,088	3	$657,120	0	0	$ -	42	263	$45,184,142
2015	933	$200,307,059	1	$210,000	0	0	$ -	1	24	$2,000,000
2016	780	$194,149,166	4	$713,744	0	0	$ -	10	170	$12,915,000
2017	812	$182,019,357	4	$816,000	0	0	$ -	11	60	$ 3,300,000
2018	1,081	$223,544,604	2	$584,800	0	0	$ -	43	982	$ 170,186,479
2019	887	$208,119,293	0	$0	0	0	$ -	32	431	$ 37,544,044
2020	808	$178,153,721	0	$0	3	12	$1,760,000	76	934	$ 61,517,507
2021	1,441	$361,614,823	3	$1,340,112	6	21	$4,768,920	25	436	$ 37,900,000

2022	1,167	$314,918,138	55	$10,248,000	21	81	$10,658,250	50	704	$ 84,558,182
2023	1,597	$393,722,446	8	$2,632,770	0	0	$ -	3	59	$ 10,982,875
Total	**13,597**	**$2,912,769,918**	**94**	**$19,781,798**	**39**	**150**	**$20,115,058**	**366**	**5,035**	**$519,806,124**

Source: U.S. Census Building Permits Survey, Annual Totals, 2010-2023

To evaluate the potential for new development in the SFHA, unimproved parcels (those that are vacant, have no building footprint, or have no improved value) were compared with the SFHA and the County's future land use – shown in Table 4.40. There are approximately 1,589 parcels with 57,082 acres of unimproved area within SFHA in unincorporated Chatham County; 90% of that acreage is in Zone AE and 10% is in Zone VE. Within Zone AE, most of the unimproved acreage is planned to remain as marsh and conservation area. Around 18% of the assessed parcels are for land uses that would require development of the land. Within Zone VE, 82% of unimproved acreage is planned to remain as marsh.

It is important that the County continues to maintain its marsh and conservation land as these undeveloped areas help minimizes potential increases in flooding and associated impacts on existing development.

The County has several regulatory tools in place, including the updated comprehensive plan and the County's floodplain regulations, which help County staff minimize the potential for new development in the floodplain.

Table 4.40 – Future Land Use of Unimproved Parcels in SFHA

Future Land Use	Zone AE		Zone VE	
	Parcel Count	Total Acreage	Parcel Count	Total Acreage
Agriculture/Forestry	1	4.7	-	-
Civic/Institutional	10	3.3	-	-
Commercial Marine	4	6.3		
Commercial- Neighborhood	3	2.4	-	-
Commercial- Regional	5	9.1	-	-
Commercial- Suburban	34	187.5	-	-
Conservation	60	7,511.8	4	843.1
Conservation- Residential	13	343.7	-	-
Downtown- Expansion	2	115.9	-	-
Industry- Heavy	24	1,176.0	-	-
Industry- Light	19	1,374.6	-	-
Marsh	323	33,105.9	45	4,389.1
Parks/Recreation	17	261.3	-	-
Planned Development	68	5,054.4	-	-
Residential- General	55	95.5	-	-
Residential- Single Family	35	276.4	-	-
Residential- Suburban Single Family	790	1,528.1	7	5.3
Right of Way	1	0.2	-	-
Surface Mine	3	10.8	-	-
Transportation/Communication/Utilit	25	347.2	-	-
Water	39	283.3	2	145.8
Total	**1,531**	**51,698.5**	**58**	**5,383.3**

CHANGES IN THE WATERSHED

Chatham County is located within the Ogeechee Coastal Sub-basin, with additional areas in the Lower Savannah River Sub-basin and the Lower Ogeechee Sub-basin. Changes in the watersheds, particularly an increase in impervious area, could make these identified areas even more likely to flood in the future.

Additionally, as development in the watershed occurs, the amount of runoff sent to drainage features often increases. The County's current zoning reflects that over 104,615 acres (22% of the County) is zoned for planned development. Future land use designations in these areas include a range of land uses including rural designation, suburban neighborhoods, and main street uses. Lower densities may minimize the potential for increases in runoff.

Based on the County's future land use map, 449 unimproved parcels and 46,111 acres designated as parks and recreation, conservation, and marsh are within the SFHA. Open space and low-density parcels within these flood zones should remain as open space or land uses with minimal development like parks or agricultural uses.

According to U.S. Census Building Permits Survey data, single family homes are by far the most common type of new residential construction in the County. Compared to multi-unit structures, which typically have a smaller per-unit footprint and house more dwelling units per acre by building up rather than out, single family homes have a large per unit building footprint. Their space requirements also result in increased infrastructure needs such as roads and sidewalks. These large building footprints and infrastructure requirements create impervious surface which contributes to flood hazards by increasing stormwater runoff and reducing the potential for infiltration. Thus, the dominance of single-family home construction in the County and the projections for continued population growth suggests that future flood increases as a result of development in the watershed are likely.

Figure 4-45 shows unimproved parcels (parcels without development), which is dispersed across the watersheds that cover the County. The western portion of the unincorporated county will likely experience some new residential development in areas planned for future development.

The County's Flood Damage Prevention ordinance allows County staff to regulate development both in and out of the floodplain in an effort to protect the watersheds.

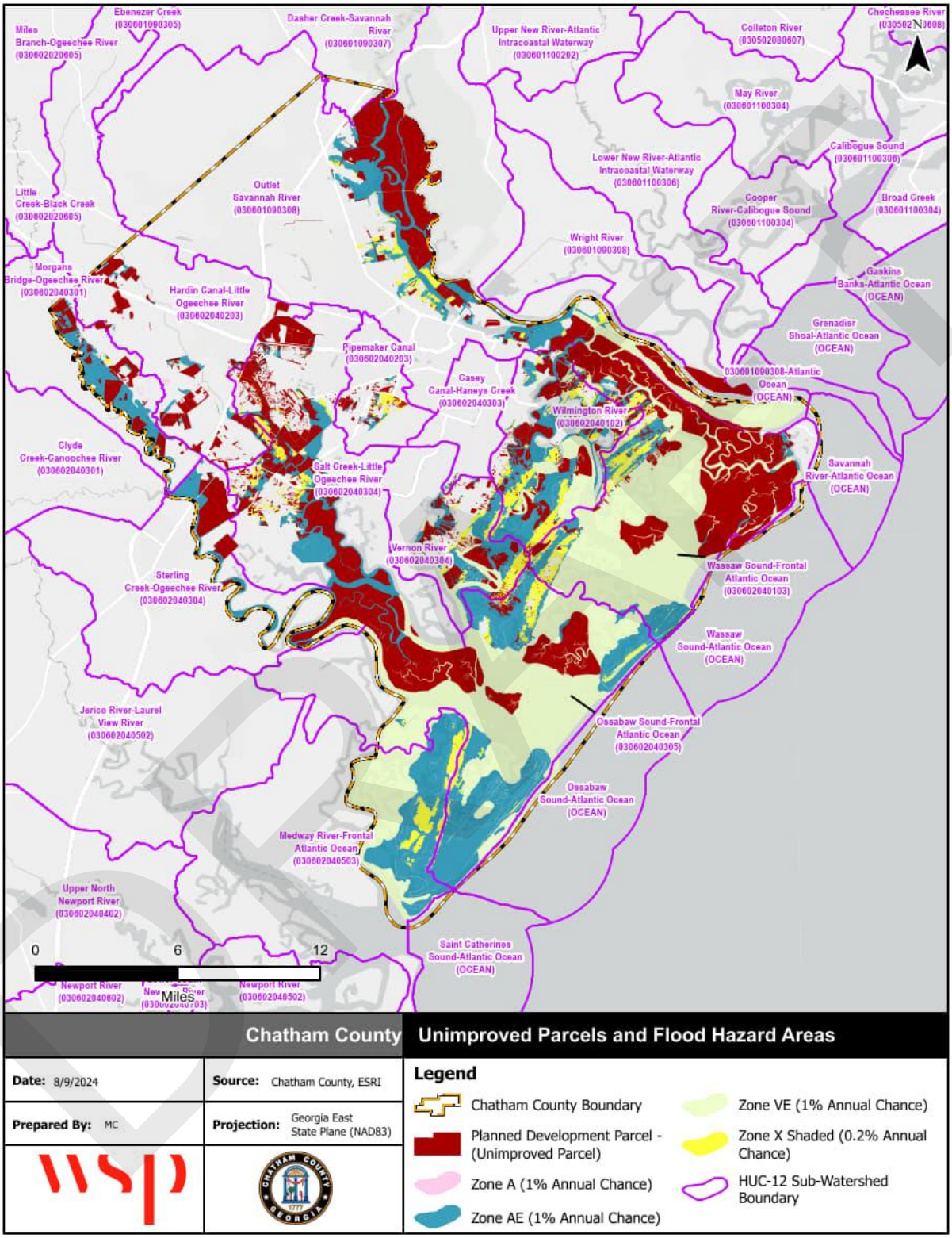
CLIMATE CHANGE

As discussed in Section 4.1.4, climate change is expected to cause an increase in frequency and intensity of heavy precipitation events and climate-driven events such as hurricanes and flooding are likely to increase in intensity, and possibly frequency, in the future. In general, the potential impacts of climate change include potential damage to critical infrastructure, and increasing public costs associated with flood insurance claims, infrastructure repair and maintenance, environmental impacts and increased costs associated with emergency management efforts.

In 2022 there were 28 weather and climate-related disaster events in the U.S. with losses exceeding $1 billion each. Seven of the top ten costliest disasters to affect Georgia have been hurricane and flood related. Some of the recent storms to have impacted the region include, Hurricane Ian (2022), Hurricane Ida (2021), Hurricane Michael (2018), and Hurricane Irma (2017). The cost of these storms exceeds $146 billion.

The trend of costly disasters is attributed to many factors. For one, there have been more disaster declarations in recent years as well as increased cost for disaster response and recovery, in part due to population growth and development in hazardous areas which has increased exposure. However, while as storms of similar magnitude increase in frequency the County must plan for mitigation because the costs of response and recovery are growing, and many events are predictable or repetitive.

Figure 4-45 – Unimproved Parcels and Flood Hazard Areas



4.5.4 HEALTH & SAFETY CONSEQUENCES ANALYSIS

Flooding poses a significant risk to life and safety, including the threat of injury or drowning during a flood event as well as numerous health risks during and after an event.

4.5.4.1 LIFE AND SAFETY

Flood waters may prevent access to areas in need of response or to the critical facilities themselves which may prolong response time. The public must understand that they should never drive through flooded streets. The Centers for Disease Control and Prevention report that over half of flood-related drownings occur when a vehicle is driven into flood water, and the next highest percentage of deaths is due to people walking into or near flood waters. The National Weather Service warns that just 6 inches of fast-moving flood water can knock down an adult, 12 inches can carry away a small car, and 2 feet can carry away most vehicles. When someone drives through floodwaters, they put their life and the lives of first responders at risk. First responders are at risk when attempting to rescue people from floodwaters. They are subject to the same health hazards as the public and are more likely to be exposed to these hazards during their response efforts.

Residential, commercial, and public buildings, as well as critical infrastructure such as transportation, water, energy, and communication systems may be damaged or destroyed by flood waters. Floods can severely disrupt normal operations, especially when there is a loss of power. This can affect the operations of critical facilities, which affects response times. Loss of power also puts the public at risk. Downed power lines pose a serious hazard and should always be treated as if they are still energized. When a building loses power during a flood, electricity should be turned off and not used until the wiring can be inspected, to avoid risk of electrocution or fire. Ocean water and salt spray can be particularly damaging to electrical equipment due to the corrosive and conductive nature of the salt water residue. Damage to electrical equipment can also result from exposure to flood waters contaminated with chemicals, sewage, oil, and other debris.

4.5.4.2 PUBLIC HEALTH

In addition to the threat to life safety that people face during flood events, certain health hazards are also common. While such problems are often not reported, the following general types of health hazards may arise during and after floods:

- Floodwaters carry anything that was on the ground that the upstream runoff picked up, including dirt; oil; human and livestock waste; household, medical, and industrial hazardous waste; coal ash waste that can contain carcinogenic compounds; or lawn, farm and industrial chemicals. Pastures and areas where farm animals are kept or their wastes are stored can contribute polluted waters to the receiving streams.
- Flood-borne debris, including lumber, vehicles, or smaller sharp objects such as glass or metal fragments, can cause injury and subsequent infection.
- Floodwaters saturate the ground, which leads to infiltration into sanitary sewer lines. When wastewater treatment plants are flooded, there is nowhere for the sewage to flow. Infiltration and lack of treatment can lead to overloaded sewer lines that can back up into low-lying areas and homes. Even when it is diluted by flood waters, raw sewage can be a breeding ground for bacteria such as e.coli and other disease causing agents.
- Stagnant pools can become breeding grounds for mosquitoes and other disease vectors.
- Floodwaters can also displace insects, rodents, snakes, and other animals, potentially bringing them into contact with people. Animals can spread disease and can bite people and pets. They may also cause asthma or allergic reactions in some people.

- Wet areas of a building that have not been properly cleaned breed mold and mildew. Mold and mildew can pose a severe a health hazard, especially for small children and the elderly.
- Building utilities can harbor health hazards if not properly cleaned. When a furnace or air conditioner is turned on after a flood, the sediments left in the ducts are circulated throughout the building and breathed in by the occupants. If the County water system loses pressure, a boil order may be issued to protect people and animals from contaminated water.
- Flooding can affect mental health due to trauma or stress. People can experience a long-term psychological impact of having been through a flood and seen their home damaged and personal belongings destroyed. The cost and labor needed to repair a flood-damaged home puts a severe strain on people, especially the unprepared and uninsured. There is also a long-term problem for those who know that their homes can be flooded again. The resulting stress on floodplain residents takes its toll in the form of aggravated physical and mental health problems.

4.5.4.3 *WARNING AND EVACUATION*

The risk to life and safety necessitates establishing warning and evacuation procedures to ensure that both residents and visitors are aware of flood events and able to move to safety.

Chatham County has multiple public warning systems established to ensure that residents are visitors are notified of flood events. These systems include the following:

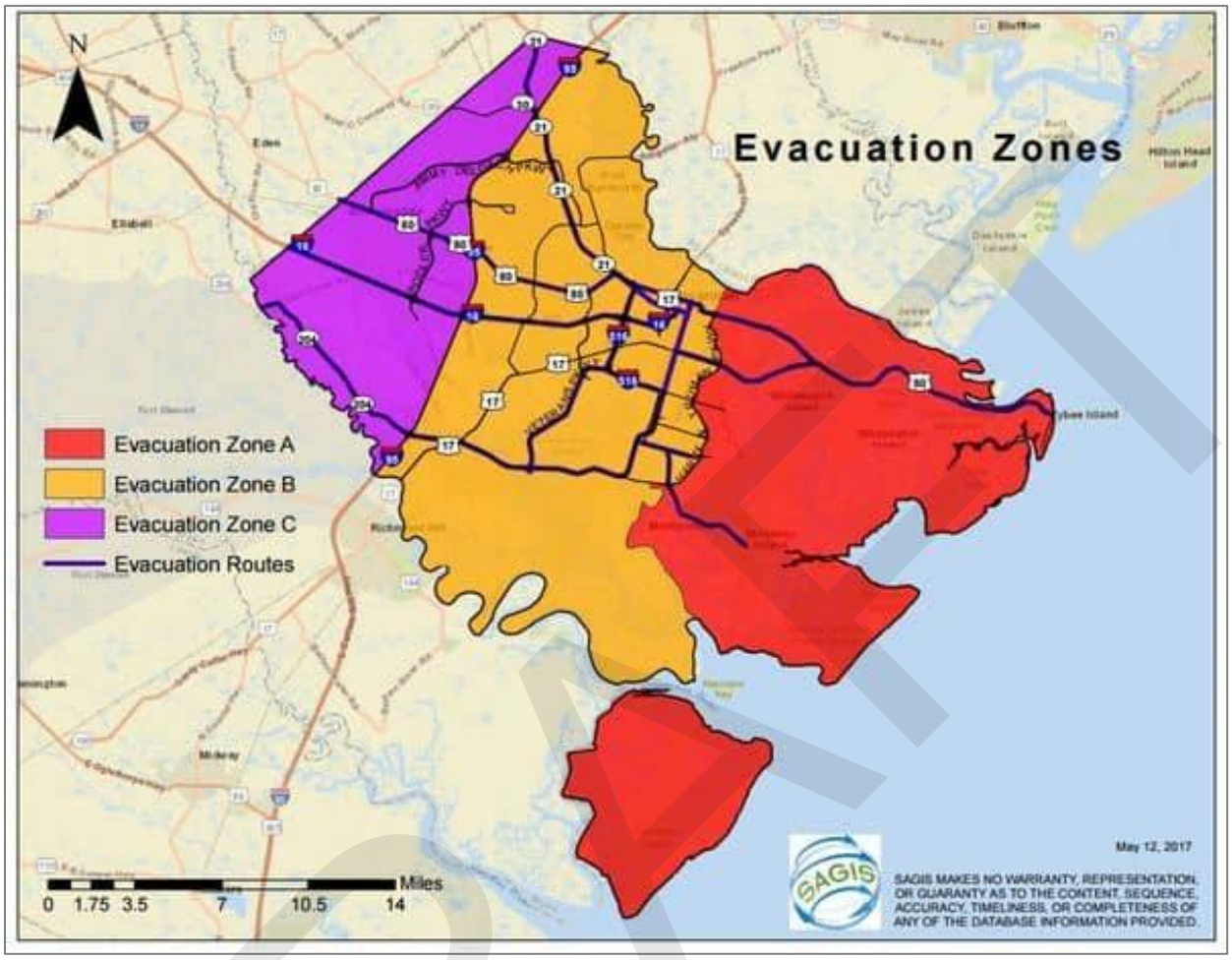
- NOAA Weather Radio
- Media Coordination
- Chatham County Government Website
- Chatham County EMA Smartphone App
- Emergency Alert System
- CEMA Alert System
- Smart 911
- Public TV (WTOC, WSAV, or WJCL)
- Facebook
- Twitter

The County's flood warning systems are coordinated by Chatham Emergency Management Agency (CEMA). Information shared on these systems includes emergency actions to be taken, shelter locations and status, evacuation zones, and evacuation routes.

Hurricane storm surge models, shown in Section 4.4.5 Hurricane/Tropical Storm indicate areas likely to experience flooding and require evacuation in the event of a hurricane. Based on these models, a category 1 or category 2 storm would require minimal evacuation. A category 3 storm or stronger is likely to require more substantial evacuation or sheltering of County residents and visitors due to storm surge flooding.

It should be noted that these models do not predict storm surge, and actual storm surge heights may exceed the estimates shown. Additionally, these storm surge models do not incorporate other hurricane impacts that may exacerbate flooding and necessitate evacuation, including hurricane strength winds and rain. Therefore, these models should be interpreted as a minimum impact scenario. Actual evacuation advisories are issued by emergency management in the event of a storm.

Figure 4-46 – Chatham County Evacuation Zones



Source: Chatham County Emergency Management, 2024

FLOOD WARNING PROCEDURES

Once CEMA receives a potentially dangerous warning, sirens will be activated. The sirens can give as little as fifteen minutes warning time. When you hear the sirens, information can be heard on the television (WTOC, WSAV, or WJCL) or on the radio at WCHY (94.1) on what to do. Information can be heard on the NOAA weather radio broadcast at frequency 162.40. Local evacuation routes can be found in the phone book. For additional information, contact CEMA at 201-4500. Additional information about potential flood conditions can also be obtained by visiting the USGS River Gage Website.

5 CAPABILITY ASSESSMENT

The findings of the capability assessment are summarized in this chapter to provide insight into the relevant capacity of Chatham County to implement flood hazard mitigation measures. All information is based upon the review of the existing Chatham County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan (December 2015), Chatham County's website, and input provided by local government officials. This section contains the following subsections:

- Regulatory Capability
- Administrative and Technical Mitigation Capabilities
- Fiscal Mitigation Capabilities
- Education and Outreach Capabilities

The purpose of conducting a capability assessment is to determine the community's ability to implement feasible mitigation actions based on an understanding of the capacity of those agencies or departments tasked with their implementation. The process of conducting a capability assessment includes developing an inventory of relevant plans, ordinances, or programs already in place and assessing the community's resources and ability to implement existing and/or new policies. Through the capability assessment, a community can identify any gaps or weaknesses in existing programs and policies as well as positive measures already in place which should be supported through additional mitigation efforts.

5.1 REGULATORY CAPABILITY

Table 5.1 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Chatham County. Additional details on key identified regulatory tools are provided below.

Table 5.1 – Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Y/N	Elements Related to Mitigation
Comprehensive Plan	Y	Natural Resources Element & Goals
Land Use Plan	Y	(element of Comprehensive Plan)
Zoning Ordinance	Y	
Subdivision Ordinance	Y	Recorded plats show flood zones, minimum BFE's, wetlands and natural habitats that protect against flood hazards.
Floodplain Ordinance	Y	
Erosion, Sedimentation and Pollution Control Ordinance	Y	E&S approved plans protect natural streams and marsh from sediment loads, prevent the accumulation of sediment in the public storm system that can create restrictions and blockages which increase the chances of flooding.
Other special purpose ordinance (stormwater, growth management, wildfire, etc.)	-	
Building Code	Y	Version: 2018 Edition, International Building Code
Fire department ISO rating	-	Rating:
BCEGS Rating	Y	Rating: 5 residential, 4 commercial
Stormwater Management Program	-	

Regulatory Tool (ordinances, codes, plans)	Y/N	Elements Related to Mitigation
Site Plan Review Requirements	Y	Requires compliance to the Zoning Ordinance; Structures are required to be set at a freeboard of 1' above BFE and structural fill has to be mitigated on-site for each project that is reviewed.
Capital Improvements Plan	Y	Includes improvements to increase capacity of channels and conduits to reduce flood levels. Request specifics from Engineering.
Local Emergency Operations Plan	Y	
Flood Insurance Study or Other Engineering Study for Streams	Y	Completed drainage studies for many basins which identify obstructions to flow and identify channels and conduits which can be improved to reduce flooding. Request specifics from Engineering.
Repetitive Loss Plan	-	Originally developed in 2018. Update underway.
Elevation Certificates	Y	

Below is a summary of key regulatory tools in place in Chatham County that already provide for flood risk reduction and/or could support the implementation of additional flood mitigation activities.

HAZARD MITIGATION PLAN

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

The Chatham County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan was updated and approved by FEMA in January 2021. This plan addresses flooding related to hurricanes, tropical storms, flood, storm surge, and sea level rise. Mitigation activities identified within this plan that address flooding hazards should be included within the Floodplain Management Plan as appropriate for unincorporated Chatham County.

DISASTER RECOVERY PLAN

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

CEMA developed a Disaster Recovery Plan in September of 2015. This plan address how CEMA, Chatham County, local municipalities and other relevant agencies will coordinate in the immediate aftermath of a disaster and during long-term recovery from a disaster, including disasters related to flooding. The pre-disaster goals of this plan include the following:

- Be prepared and proactive.
- Coordinate with local jurisdictions.
- Establish and maintain the County's leadership role.
- Leverage existing relationships with private and non-profit sectors.
- Promote legitimacy and credibility.
- Focus on fairness
- Build on existing deliberative plans and asset identification/ prioritization.

- Ensure sufficient financial reserves

Mitigation is also built into post-disaster procedures through the goal to "promote mitigation and foster resilient redevelopment and construction." This County envisions meeting this goal by using "education, incentives, and regulation to reduce community vulnerability to various hazards by fostering more resilient land use patterns and building practices" as well as by incorporating actions identified in other mitigation planning processes.

The general roles and responsibilities identified for local governments, including Chatham County, include:

- Lead local preparedness, pre-disaster and mitigation planning efforts.
- Pre-identify a structure for managing recovery.
- Establish agreements and mechanisms to address surge capabilities.
- Institute mechanisms for immediate post-disaster damage assessment.
- Ensure compliance with local, state, and federal civil rights obligations.

Redevelopment is addressed in the Community Development, Planning, and Housing Annex to the plan, which established a Long-Term Housing Reconstruction and Relocation Recovery group. The main focus of this group is to develop a long-term housing redevelopment and relocation strategy and to identify and address regulatory and statutory changes necessary to expedite rehabilitation and facilitate resilient reconstruction and new construction. This group is also tasked with implementing programs to facilitate long-term resilient reconstruction and promoting hazard mitigation and resilience strategies.

EMERGENCY OPERATIONS PLAN

An emergency operations plan outlines responsibility and the means by which resources are deployed during and following an emergency or disaster. CEMA maintains an emergency operations plan that addresses unincorporated Chatham County and was last updated in July 2020. This plan outlines local procedures for responding to disasters including those that involve flooding. It includes a detailed description of 19 Emergency Support Functions (ESF).

FLOOD RESPONSE PLAN

A flood response plan establishes procedures for responding to a flood emergency including coordinating and facilitating resources to minimize the impacts of flood. Chatham County has a Flood Incident Management (FIM) plan, dated 2021, in Incident Annex I of the County's Emergency Operations Plan. The FIM plan includes:

- Flood Threat Recognition System (FTR) which is the operation of a system to notify the community that a flood is on the way
- Emergency Warning Dissemination (EWD) which establishes how the flood warning will be disseminated to the community
- Flood Response Operations (FRO) plan which establishes which actions and resources will be necessary in response to floods
- Critical Facilities Planning (CFP) which is the coordination of the flood warning and response effort with critical facilities
- Criteria needed to accomplish certification as a StormReady community by the National Weather Service (NWS)

CONTINUITY OF OPERATIONS PLAN

A continuity of operations plan establishes a chain of command, line of succession, and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster event. CEMA adopted a Continuity of Operations Plan in March of 2020.

COMPREHENSIVE LAND USE PLAN

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

Chatham County adopted a joint Comprehensive Plan Update with the City of Savannah in 2020. The Plan 2040 Chatham County – Savannah Comprehensive Plan has integrated climate change into all of the elements of the plan and includes goals and strategies that consider the best ways to increase resiliency for the government and the public of Chatham County.

The following goals related to flooding and floodplain management were included in this Plan's Natural Resources section:

- Protect the public health, safety, and welfare of residents from flood hazards
- Improve public education and outreach efforts related to water, flooding, and hazards
- Proactively manage stormwater runoff

The following objectives were listed in this plan to address potential flooding hazards:

- Work at a regional level to address and mitigate impacts of flooding and sea level rise.
- Implement policies and standards to prevent future development and infrastructure in areas susceptible to flooding.
- Prioritize conservation of undeveloped lands and dedication of open space to reduce impervious surfaces in the region.
- Create a series of training programs to educate the public on water, flooding, and hazard related issues impacting the community.
- Develop partnerships with schools, churches, and other civic organizations to broaden public education and outreach efforts.
- Address stormwater runoff management efforts regionally.
- Evaluate existing policies, plans, and regulations to ensure that they encourage low impact development principles and are consistent with best management practices in regards to stormwater runoff.
- Review and amend policies and regulations as necessary to remove barriers to innovative and creative solutions to manage stormwater runoff.
- Identify funding sources and other mechanisms to conserve properties in open space as part of the community stormwater management system.

CAPITAL IMPROVEMENT PLAN

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

Chatham County has a CIP that is managed primarily through the Department of Engineering and was last updated in 2023. The CIP is capital funding that accounts for the acquisition of construction of major projects or facilities. Drainage projects have been funded through the CIP in the past with intent to improve drainage system conveyance and capacity to reduce flooding during storm events.

The CIP has traditionally been SPLOST funded, but this may not be adequate to complete all planned CIP. Additionally, SPLOST has many other funding priorities and must be passed every 5 to 6 years by a popular vote, and therefore is not a reliable funding source.

HISTORIC PRESERVATION PLAN

A historic preservation plan is intended to preserve historic structures or districts within a community. An often-overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards and the identification of ways to reduce future damages. This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of harm's way.

Chatham County has a Natural, Cultural, and Historic Properties Coordination plan that was last updated in 2013. This plan that includes general guidelines on pre-event planning, hurricane evacuation, damage assessment, recovery and salvage, and funding as well as a list of historic sites of significance.

ZONING ORDINANCE

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

Chatham County has adopted a Zoning Ordinance, and land use and development standards that address flooding through the following districts:

- The County's Zoning Ordinance establishes Environmental Overlay Districts (EO) which sustains a 35 foot riparian buffer within the jurisdictional marsh line and provides General Development Standards within these districts.
- The Zoning ordinance also establishes Marsh Conservation (C-M) Districts intended to protect marshlands which provide natural storage for flood waters.

SUBDIVISION ORDINANCE

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

Chatham County has adopted a Subdivision Ordinance that was last amended in 2010. The County's Subdivision Ordinance establishes the following standards:

- Ground level within the building area must be a minimum of 8 ft above mean sea level
- First floor elevation must be at least the level of the 100-yr flood
- Residential subdivision lots within floodplains are prohibited
- The location, elevation, and construction of public utilities must minimize or eliminate damage from flooding

BUILDING CODES, PERMITTING, AND INSPECTIONS

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

The Georgia Department of Community Affairs (DCA) states that local jurisdictions may adopt their own local codes; but in order to enforce them, the proposed amendment must have been submitted and approved by the DCA. Chatham County has adopted building codes and the Building and Inspections Department provides building inspection services for all unincorporated areas of the County.

The adoption and enforcement of building codes by local jurisdictions is routinely assessed through the Building Code Effectiveness Grading Schedule (BCEGS) program developed by the Insurance Services Office, Inc. (ISO). In Georgia, the Department of Community Affairs assesses the building codes and provides the minimum requirements. In conducting the assessment, ISO collects information related to personnel qualification and continuing education as well as the number of inspections performed per day. This type of information combined with local building codes is used to determine a grade for that jurisdiction. The grades range from 1 to 10 with a BCEGS grade of 1 representing exemplary commitment to building code enforcement and a grade of 10 indicating less than minimum recognized protection. Chatham County's current CBEGS rating for residential codes is 5 and for commercial codes is 4.

DISASTER REDEVELOPMENT PLAN

A disaster redevelopment plan is intended to provide a guiding action and decision making during long-term redevelopment periods after a disaster such as a hurricane and flooding. The Chatham County Emergency Management Agency (CEMA) developed a Disaster Redevelopment Plan (DRP) in 2016.

The DRP is the first of its kind in the State of Georgia and will serve as a model for other communities. The County's plan also is intended to ensure rebuilding that occurs following a disaster is done in sustainable manner consistent with other plans and incorporates hazard mitigation techniques. The plan was developed to cover the unincorporated areas of the County along with the jurisdictions of Bloomingdale, Garden City, Pooler, Port Wentworth, Savannah, Thunderbolt, Tybee Island, and Vernonburg. The DRP includes:

- Redevelopment goals
- Priority areas for redevelopment, determined with incorporation of resilience-oriented criteria, including that areas are not in a floodplain and are not vulnerable to storm surge
- Redevelopment policies for land use including growth management tools such as transfer of development rights, conservation easements, and deed restrictions
- Redevelopment policies for financial capacity, including pre-established recovery contracts
- Recommendations for building institutional capacity
- Inventory of vulnerable assets

FLOOD DAMAGE PREVENTION ORDINANCE

A flood damage prevention ordinance establishes minimum building standards in the floodplain with the intent to minimize public and private losses due to flood conditions. All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance.

Chatham County last adopted the Flood Damage Prevention (FDP) Ordinance in September of 2021. The FDP Ordinance establishes the following provisions:

- General standards for all areas in Areas of Special Flood Hazards
    - Requires new construction to be constructed to minimize flood damage, anchored, and utilizing materials resistant to flood damage
    - Requirements for elevated buildings with enclosed areas on the first floor to be designed to equalize hydrostatic forces
    - Water, sewer, HVAC equipment, and power must be designed and located to prevent flood damage

- Specific standards of flood hazard areas with estimated or established base flood elevations (BFE)
    - Minimum of 3-feet of freeboard should be provided above the BFE and the lowest floor or any wood framed foundation
    - Encroachments are prohibited in areas designated as floodways
- Standards for areas of shallow flooding (AO Zones)
- Requirements for Coastal High Hazard Areas (V-Zones and Coastal A)
- Standards for subdivisions
- Provisions for watercourse alterations

FLOODPLAIN MANAGEMENT PLAN

A floodplain management plan (FMP) provides a framework for action regarding corrective and preventative measures to reduce flood related impacts. Note that this document is a comprehensive update to the 2018 plan. The 2018 FMP was developed to satisfy the certification requirements of the NFIP Community Rating System. The FMP establishes four goals, reviews existing programs in place that help achieve each goal and provides a mitigation action plan designed to reduce flood risk. The 2018 FMP included 21 mitigation actions that cover the six FEMA mitigation categories. Status updates and additional actions are included in Section 6 of this plan.

GREENWAY IMPLEMENTATION PLAN

An open space management plan is designed to preserve, protect, and restore largely undeveloped lands in their natural state and to expand or connect areas in the public domain such as parks, greenways, and other outdoor recreation areas. In many instances, open space management practices are consistent with the goals of reducing hazard losses, such as the preservation of wetlands or other flood-prone areas in their natural state in perpetuity.

Chatham County developed and adopted a Greenway Implementation Study in March 2016 that recommends preservation of floodplains associated with drainage canals. The plan was developed after assessing stormwater drainage canals and retired rail corridors in the County to determine their viability as potential greenway trails. After potential greenways were evaluated, three corridors were selected. Additionally, the County developed a guide to properly maintain the trail systems and adjacent habitats.

STORMWATER MANAGEMENT PLAN / STORMWATER ORDINANCE

A stormwater management plan is designed to address flooding associated with stormwater runoff. The stormwater management plan is typically focused on design and construction measures that are intended to reduce the impact of more frequently occurring minor urban flooding.

Chatham County has adopted a stormwater management ordinance that is consistent with the Georgia Stormwater Management Manual and the Coastal Stormwater Supplement. This ordinance requires infiltration or treatment of the water quality volume (the first 1.2” of run off) through the use of green infrastructure and low impact development best management practices. This ordinance also requires developers to obtain Land Disturbing Activities Permit prior to the start of construction activities and includes guidelines to assist in designing a site plan that will manage post-construction runoff quality and quantity.

The County’s Stormwater Management Plan was updated in May 2019 and developed to meet the requirements of the National Pollution Discharge Elimination System (NPDES) Phase I Municipal Separate Storm Sewer System (MS4) Permit as required by the Georgia Water Quality Control Act and the Federal Clean Water Act.

STORMWATER SYSTEM SEA LEVEL RISE VULNERABILITY ASSESSMENT AND COASTAL WATERSHED MANAGEMENT PLAN

In 2020, Chatham County and City of Savannah developed a joint Stormwater System Sea Level Rise Vulnerability Assessment and Coastal Watershed Management Plan (CWMP) to assess the vulnerability of the region's stormwater management systems to sea level rise and other future hydrologic changes. The plan provides actionable information for Chatham County, the City of Savannah, and other jurisdictions that will be used in developing future plans and implementing capital improvement projects that can increase the resilience of the regional stormwater system. This plan also fulfils several CRS credits. Chatham County identified 16 stormwater drainage capital improvement projects some of which will be integrated into this plan.

5.2 ADMINISTRATIVE AND TECHNICAL MITIGATION CAPABILITIES

The ability of a local government to develop and implement mitigation projects, policies, and programs is directly tied to its ability to direct staff time and resources for that purpose. Administrative capability can be evaluated by determining how mitigation-related activities are assigned to local departments and if there are adequate personnel resources to complete these activities. The degree of intergovernmental coordination among departments will also affect administrative capability for the implementation and success of proposed mitigation activities.

Table 5.2 identifies personnel responsible for activities related to mitigation and loss prevention in Chatham County.

Table 5.2 – Administrative Capabilities

Personnel Resources	Y/N	Department/Position	Licensure/Certification
Planner with knowledge of land development and management practices	Y	Metropolitan Planning Commission	AICP
Building official trained in construction practices	Y	Department of Building Safety and Regulatory Services / Director	Certified Building Official, Certified Building Inspector
Engineer with an understanding of natural hazards	Y	Engineering / Drainage Engineer	GA Professional Engineer, GSWCC Level II Certified Design Professionals
Staff skilled in GIS	Y	Savannah Area GIS / GIS Analyst	ASPRS Certified Mapping Scientist (CMS), GISCI GISP (GIS "Professional)
Floodplain Manager	Y	Engineering	Certified Floodplain Manager
Emergency Manager	Y	Chatham County Emergency Management	GA Certified Emergency Manager, Certified Professional Emergency Manager
Grant Writer	-		
Public Information Officer	Y	Public Information Office	
Other personnel: Scientists familiar with	Y	UGA Marine Extension Service	

Personnel Resources	Y/N	Department/Position	Licensure/Certification
the hazards of the community			

Technical capability can be evaluated by assessing the level of knowledge and technical expertise of local government employees, such as personnel skilled in using Geographic Information Systems (GIS) to analyze and assess community hazard vulnerability. Available tools and resources are also important to consider in evaluating a community's technical capabilities.

Table 5.3 summarizes data and technical resources available to the County.

Table 5.3 – Technical Capabilities

Data Resources	Y/N	How often is it updated?	How is it used?	How/To whom is it accessible?
Warning Systems	Y	Yearly	Tornado Warning Sirens	CEMA – County
Real time flood gauge data	Y	Has to be driven and downloaded	One on Pipemakers Canal	Department of Engineering
GIS data: flood zones / hazard areas	Y	As needed – based on lidar	For flood determinations	Everyone within Chatham County and outside
GIS data: critical facilities	Y	Yearly	Used for Emergency Management Planning	CEMA – Coordinated with CEMA
GIS data: current/future land use	Y	MPC Updates	Used to determine current and proposed land use plan.	MPC – SAGIS Open Data Portal
GIS data: building footprints	Y	As permits come in	To determine if new construction is in a flood zone	Chatham County Engineering
GIS data: tax assessor's data	Y	Yearly	For tax digest purpose	SAGIS Open Data Portal
GIS data: parcels	Y	Yearly	For tax digest purpose	SAGIS Open Data Portal
GIS data: shelter locations	Y	As-needed	Used for potential shelter locations. Not meant for all situations	CEMA
Elevation certificates	Y			Department of Engineering

This section summarizes all local government entities (departments, agencies, etc.) involved with flood hazard mitigation and/or hazard control.

The Chatham County Administrative office is located at 124 Bull Street in Savannah, GA. Chatham County operates under the commission-manager plan of local government. The Chatham County Board of Commissioners sets policy, adopts laws, sets budget limits, sets tax rates, and decides zoning issues. The Board appoints a county manager who acts as the chief administrative officer responsible for implementing policies and managing the day-to-day operations of the County offices. Summarized below are the County offices and departments responsible for hazard control and hazard mitigation responsibilities.

Table 5.4 – Chatham County Department and Agency Review

Department	Contact Information
Planning and Development	

Department	Contact Information
Planning and development within Chatham County (and the City of Savannah) is the responsibility of the Metropolitan Planning Commission (MPC). The MPC is sub-divided into the following departments: Comprehensive Planning Department – Long-term planning including establishing a desirable built environment, promoting economic development, protecting natural resources. This department works with all jurisdictions within the County on stormwater management, sea level rise, and other natural resource issues that cross municipal boundaries. Development Services – Focuses on current planning maters including the review of site plans, subdivision plats, zoning amendments to the zoning ordinance. Historic Preservation and Urban Planning – Reviews projects and makes recommendations to the Historic District Board of Review, Chatham County Historic Preservation Commission, Historic Site and Monument Commission, Chatham County Resource Protection Commission and the Metropolitan Planning Commission on historic preservation matters.	Metropolitan Planning Commission (MPC) (912) 651-1440
Building Codes and Inspections	
Chatham County Building Safety & Regulatory Services issues permits, performs building inspections, and administers county laws and ordinances.	Chatham County Building Safety & Regulatory Services (912) 201-4300
Zoning	
Chatham County Building Safety and Regulatory Services issues / states the "official" zoning of a property in unincorporated portions of the County. The County Zoning Board of Appeals (ZBA) reviews variances, special uses, appeals of decisions and extensions of nonconforming uses for the County.	Chatham County Building Safety and Regulatory Services Department (912) 201-4300 Metropolitan Planning Commission (912) 651-1440
Engineering	
The Chatham County Department of Engineering (DOE) protects public interest in the County by administering the County Engineering Policy, Land Disturbing Activities Ordinance, and Storm Water Management Ordinance. The DOE manages and administers the road and drainage capital improvement programs including design, environmental permitting, and construction management. The DOE coordinates projects with local municipalities, state agencies, federal agencies, and provides contract management for other County construction projects. The DOE reviews residential and commercial development plans, approves and issues development permits, and enforces compliance with County ordinances and state and federal statutes.	Chatham County Engineering (912) 652-7800
Water and Sewer	
The County does not provide water and sewer services to its residents. Most customers are served by Water Utility Management which is located at 621 Stephenson Avenue. A small percentage of customers within the County who live on Hopeton Court, Zipperer Drive and Little Neck Road is serviced by Coastal Water & Sewerage.	Water Utility Management (912) 352-9339 Coastal Water & Sewerage (912) 233-3254

Department	Contact Information
Stormwater Management / Drainage Maintenance	
The County Public Works Department provides stormwater maintenance including canal and ditch maintenance, herbicide, storm drain maintenance, and storm line blockage inspections.	Chatham County Public Works (912) 652-6840
Emergency Management	
Chatham Emergency Management Agency (CEMA) is responsible for providing a county-wide emergency management program to provide for the safety and welfare of county residents before, during, and after a major emergency or disaster.	Chatham County Emergency Management (912) 201-4500
Law Enforcement	
Law enforcement is provided by the Chatham County Police Department.	Chatham County Police Headquarters (912) 652-6920
Fire	
Unincorporated Chatham County does not have a government funded fire service. Chatham Emergency Services is a not for profit combination service that provides fire protection for areas not covered by a city or township jurisdiction. Chatham Emergency Services currently maintains 13 Fire/EMS Stations and 1 Headquarters complex within Chatham County. There are 15 Fire Departments in Chatham County – Chatham Emergency Services manages the following five (5) departments: Southside FD, Islands FD, Skidaway Island FD, Montgomery FD, 7th District FD.	Chatham Emergency Services (912) 354-1011
Electricity	
Electric service throughout Chatham County is provided by Georgia Power.	Georgia Power (912) 238-2960
Roads / Streets	
Road maintenance and repairs are performed by the Chatham County Public Works Department. Responsibilities includes litter/debris pick-up, roadside maintenance, pothole repair, street sweeping, sign installation and repair, and road closures.	Chatham County Public Works (912) 652-6840
Parks, Greenways, Open Space	
The Chatham County Parks & Recreation Department manages parks and recreational facilities including: parks, boat ramps and fishing piers, nature preserves, multipurpose trails, community centers, sports facilities, and swimming pools.	Chatham County Parks & Recreation (912) 652-6780
Healthcare	
The Chatham County Board of Health is part of the Coastal Health District of the Georgia Department of Public Health. The intent of the County Board and Coastal Health District is to improve the health of residents by preventing illness and injury, promoting healthy behaviors, and protecting from harm. The Health District helps prepare and respond to disasters as well as coordinate disaster response with other agencies and organizations in the eight county-district.	Chatham County Health Department (912) 644-5200
Shelters	
The Savannah Chapter of the American Red Cross has primary responsibility for providing public shelters.	Savannah Office Southeast & Coastal Georgia American Red Cross (912) 651-5300

In 2022, Chatham County established a new Resilience Program that will work with all of the County's departments to reduce vulnerability of facilities and its residents to climate change. Additionally, The Smart Sea Level Sensors Project was started through a partnership of Chatham County, the City of Savannah, and a team of scientists and engineers at Georgia Tech to install a network of internet-enabled water level sensors across flood-vulnerable areas of Chatham County.

5.3 FISCAL MITIGATION CAPABILITIES

The ability of a local government to implement mitigation projects is often closely associated with the funding available to do so. This may take the form of outside grant funding awards or locally-based revenue and financing. The costs associated with mitigation policy and project implementation vary widely. In some cases, policies are tied primarily to staff time or administrative costs associated with the creation and monitoring of a given program. In other cases, direct expenses are linked to an actual project, such as the acquisition of flood-prone homes, which can require a substantial commitment from local, state, and federal funding sources.

Table 5.5 identifies financial tools or resources that the County could potentially use to fund mitigation activities.

Table 5.5 – Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to use Y/N	Comments
Community Development Block Grants	Y	
Capital improvements project funding	Y	
Authority to levy taxes for specific services	Y	Special Purpose Local Option Sales Tax (SPLOST), has been used for Improvement projects to lower water surface elevations
Gas or electric utility fees	N	
Water or sewer fees	N	
Stormwater utility fees	N	
Impact fees for new development	N	
Incur debt through general obligation bonds	-	
Incur debt through special tax bonds	-	
Incur debt through private activities	-	
Withhold spending in hazard prone areas	-	
Other: Special Service District Taxes, Local Option Sales Tax (LOST), partnering arrangements or intergovernmental agreements, HMGP, PDM, FMA, SBA	Y	

5.4 EDUCATION AND OUTREACH CAPABILITIES

This section summarizes the County's flood-related outreach activities. In 2022, Chatham County formally established a new Resilience Program that is designed to work with all County departments and its residents to build a greater resilience to climate change impacts. The Resilience Program focuses on creating a proactive community within Chatham County that will be strong enough to bounce back when flooding, heavy rainfall, or other climate driven events occur.

Highlighted on the Chatham County's website is a video series titled "Faces of Resiliency." The series was developed by the University of Georgia's Marine Extension and Georgia Sea Grant, which contain interviews with coastal residents and researchers who share stories of adapting to coastal hazards through community engagement and collaboration with scientist, nonprofits, and government agencies. Each video highlights how communities in Georgia are increasing their resilience to sea level rise, storm surge, and flooding and serves as educational opportunities for the residents of Chatham County.

As part of Chatham County's public outreach efforts to the public, the Department of Engineering has created a page of flood facts for unincorporated Chatham County Residents located within their main website. This page contains frequently asked flood related questions with related topics towards property protection, flood insurance, or how to be safe in the event of a flood. This website also provides Chatham County residents contact information on who to contact in different scenarios and provides education on local flood hazards.

6 MITIGATION STRATEGY

Requirement §201.6(c)(3): [The plan shall include] a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section describes the mitigation strategy process and mitigation action plan for the Chatham County Floodplain Management Plan. It describes how the County met the following requirements from the 10-step planning process:

- Planning Step 6: Set Goals
- Planning Step 7: Review Possible Activities
- Planning Step 8: Draft an Action Plan

6.1 MITIGATION STRATEGY OVERVIEW

After organizing and collecting data and assessing risks, vulnerabilities, and capabilities, the FMPC used the reported findings to develop a mitigation strategy. The mitigation strategy is designed to be comprehensive, strategic, and functional, in that it includes a thorough review of all possible mitigation alternatives, achieves multiple local objectives, is consistent with other long-term planning goals, and facilitates implementation of the identified actions. The FMPC considered the following approaches to mitigation planning when preparing this mitigation strategy:

- Communicate the hazard information collected and analyzed through this planning process as well as mitigation success stories so that the community better understands what can happen where and what they themselves can do to be better prepared.
- Use existing rules, regulations, policies, and procedures to support new mitigation efforts.
- Consider multi-objective management opportunities so that funding may be shared and packaged and broader constituent support may be garnered.

The first step in designing the mitigation strategy is the identification of mitigation goals, which are presented in Section 6.2. Goals represent broad statements of intent and are realized through the implementation of specific mitigation actions.

The second step involves the identification and analysis of available mitigation alternatives that could achieve the identified goals. Alternatives must then be prioritized for implementation. An alternatives analysis was conducted by the FMPC in the development of this plan, but continuous evaluation and consideration of alternatives is a process to be sustained through the plan's implementation and maintenance. Alternative mitigation measures will continue to be considered as future capabilities change and opportunities arise. Section 6.3 describes the analysis of mitigation action alternatives and the criteria for action prioritization.

The third and final step of the mitigation strategy is the selection of mitigation actions to pursue within the planning timeframe. Selected actions are detailed in the Mitigation Action Plan in Section 6.4. Section 6.5 provides additional details for each mitigation action.

6.1.1 CONTINUED COMPLIANCE WITH THE NFIP

Given the flood hazards in the planning area, an emphasis will be placed on continued compliance with the NFIP and participation in the CRS. The County meets or exceeds the following minimum requirements as set by the NFIP:

- Issuing or denying floodplain development/building permits
- Inspecting all development to assure compliance with the local ordinance
- Maintaining records of floodplain development
- Assisting in the preparation and revision of floodplain maps
- Helping residents obtain information on flood hazards, floodplain map data, flood insurance and proper construction measures

The Chatham County Engineering Department is responsible for the review and approval of all development applications to the County. Once a development begins construction, there are multiple, periodic on-site inspections performed by trained inspection staff to ensure compliance before construction can proceed toward completion. The Planning and Inspections Department also maintains the record of all map revisions and changes received from FEMA. As a part of the services offered to the public, the Department provides FEMA floodplain mapping information, flood insurance program information, flooding hazards, and proper construction methods within the special flood hazard area.

The CRS was created in 1990. It is designed to recognize floodplain management activities that are above and beyond the NFIP's minimum requirements. Chatham County is currently classified as a Class 5 community, which gives a 25% premium discount to individuals in the Special Flood Hazard Area, and a 10% discount to policyholders outside the Special Flood Hazard Area. The following is a summary of the CRS Activities for which Chatham County currently receives credit based on the 2019 verification report:

Activity 310 – Elevation Certificates: The Department of Building Safety and Regulatory Services maintains elevation certificates for new and substantially improved buildings. Copies of elevation certificates are made available upon request.

Activity 320 – Map Information Service: Credit is provided for furnishing inquirers with basic flood zone information from the community's latest FIRM. Credit is also provided for the community furnishing additional FIRM information, information about problems not shown on the FIRM, flood depth data, special flood related hazards, historical flood information, and natural floodplain functions. The service is publicized annually and records are maintained.

Activity 330 – Outreach Projects: Credit is provided for informational outreach projects that include brochures placed at public building locations, general outreach projects that include publications in local newspapers, and expos at fairs, and targeted outreach projects that include mailings to residents in repetitive loss areas and those in the Special Flood Hazard Area. These projects are disseminated annually. Credit is also provided for having a pre-flood plan for public information.

Activity 340 – Hazard Disclosure: Credit is provided for state and community regulations requiring disclosure of flood hazards. Real estate agents provide a brochure advising prospective buyers about insurance and checking property flood hazards.

Activity 350 – Flood Protection Information: Documents relating to floodplain management are available in the reference section of the Chatham County Regional Library. Credit is also provided for floodplain information displayed on the community's website.

Activity 360 – Flood Protection Assistance: Credit is provided for offering one-on-one advice regarding property protection and making site visits before providing advice. Credit is also provided for giving advice on financial assistance programs and advisor training at appropriate EMI courses.

Activity 370 – Flood Insurance Promotion: Credit is provided for advising people who have questions about flood insurance. The community can provide technical assistance and encourage people to purchase, maintain, and improve insurance coverage.

Activity 420 – Open Space Preservation: Credit is provided for preserving approximately 70% of the SFHA as open space, protecting open space land with deed restrictions, and preserving open space land in a natural state. Credit is also provided for regulations and incentives that minimize development in the SFHA and protect natural shorelines and channels.

Activity 430 – Higher Regulatory Standards: Credit is provided for enforcing regulations that require development limitations, freeboard for new and substantial improvement construction, cumulative substantial improvement, protection of critical facilities and enclosure limits. Credit is also provided for the enforcement of building codes, BCEGS Classification of 5/4, state mandated regulatory standards, and regulations administration.

Activity 440 – Flood Data Maintenance: Credit is provided for maintaining and using digitized maps, overlay maps and parcel records in the day to day management of the floodplain. Credit is also provided for establishing and maintaining a system of benchmarks.

Activity 450 – Stormwater Management: The community enforces regulations for stormwater management and soil and erosion control.

Activity 510 – Floodplain Management Planning: Credit is provided for the adoption and implementation of the Chatham County Floodplain Mitigation Plan, adopted in 2018. A progress report must be submitted on an annual basis.

Activity 520 – Acquisition and Relocation: Credit is provided for acquiring and relocating buildings from the community's regulatory floodplain.

Activity 540 – Drainage System Maintenance: A portion of the community's drainage system is inspected regularly throughout the year and maintenance is performed as needed. Credit is also provided for listing problem sites that are inspected more frequently, and for implementing an ongoing Capital Improvements Program. The community enforces a regulation prohibiting dumping in the drainage system, and annually publicizes the regulation or has appropriate signs posted.

Activity 610 – Flood Warning Program: Credit is provided for a program that provides timely identification of impending flood threats, disseminates warnings to appropriate floodplain residents, and coordinates flood response activities. Credit is also provided for the designation as a Storm Ready Community by the National Weather Service.

6.1.2 POST DISASTER RECOVERY AND MITIGATION

Chatham County maintains an Emergency Operations Plan which outlines local procedures for disaster response, including floods. It includes a detailed description of 19 Emergency Support Functions that are integral to disaster response and recovery. The County also has a Disaster Recovery Plan, prepared in 2015, which addresses how the County will work with neighboring jurisdictions and other entities involved in disaster recovery to plan for long-term recovery. The plan is intended to encourage disaster redevelopment policies that break the cycle of repetitive disaster losses by inserting effective mitigation into the rebuilding process. Additionally, in 2016 the County developed a Disaster Redevelopment Plan to proactively identify procedures and policies that will ensure post-disaster redevelopment incorporates hazard mitigation techniques. More details of these plans are discussed in Section 5 Capability Assessment.

As noted in the Capability Assessment, Chatham County aims to incorporate mitigation during response and recovery phases and has policies and procedures in place that determine post-disaster activities for hazard mitigation. Incorporating flood mitigation and prevention into post-disaster recovery includes measures such as public information activities to educate residents about property protection that can be incorporated into reconstruction, evaluating damaged public buildings and infrastructure for retrofit

options, acquiring substantially damaged or repetitive loss structures from willing sellers, and providing education on and enforcement of floodplain management regulations.

Chatham County's disaster recovery plan breaks its operations down by three time-frames: short-term, intermediate-term, and long-term. The plan's recovery procedures include the following actions:

Short-term Recovery Operations involve managing and containing immediate impacts of an event on community systems, thereby creating an environment where recovery activities can begin. Stabilization includes such activities as:

- *Initial debris management;*
- *Providing essential health and safety services;*
- *Congregate sheltering or other temporary sheltering solutions. Transitioning individuals and households from congregate sheltering solutions to temporary housing solutions;*
- *Return of medical patients to appropriate facilities in the area;*
- *Family and pet reunification;*
- *Damage assessments;*
- *Restoration of essential infrastructure.*

Intermediate-Term Recovery Operations involve returning individuals and families, critical infrastructure, and essential government and commercial services back to a functional state, not necessarily a pre-disaster condition. Intermediate-Term Recovery Operations occur following Short-Term Recovery Operations. Activities include:

- *Standing up disaster recovery centers (DRCs);*
- *Providing individual, family-centered, and culturally appropriate case management;*
- *Providing accessible interim housing and planning on long-term housing solutions;*
- *Returning displaced populations, pets, and restoring business operations; and,*
- *Completing assessments of natural and cultural resources and developing plans for long-term environmental and cultural resource recovery.*

Long-term Recovery Operations follows Intermediate-Term Recovery Operations and may continue for months or up to several years. The goal underlying long-term recovery operations is the impacted community moving toward self-sufficiency, sustainability, and resiliency. Long-term recovery operations involve returning individuals and families, critical infrastructure, and essential government or commercial services back to a functional self-sufficient state, not necessarily a pre-disaster condition. Activities may include:

- *Providing individual, family centered, and culturally appropriate case management.*
- *Transitioning individuals and households to long-term, permanent housing solutions.*
- *Returning displaced populations and businesses to the community.*
- *Providing job training and workforce assistance to populations in the county*

Post-disaster redevelopment and mitigation procedures can also tie to emergency services actions, including measures such as providing safe drinking water, monitoring for diseases, vaccinating residents for tetanus and other diseases, clearing streets and drainage infrastructure, and cleaning up debris.

Chatham County's redevelopment plan provides Chatham County with a reference for guiding action and decision making during the long-term disaster redevelopment period. The plan outlines actions that can be taken to speed the recovery and redevelopment process and ensure rebuilding occurs in a manner consistent with the County's other relevant hazard mitigation goals. The plan includes the following relevant actions:

Land Use:

- *LU-4: Develop build-back standards, regulations that govern reconstruction following disasters, prior to a disaster, facilitating expeditious rebuilding post-disaster*
- *LU-6: Implement local Coastal Stormwater Supplement (CSS) low impact development (LID) building and land use incentives (often referred to as Green Infrastructure) using or mimicking natural processes that result in the infiltration, evapotranspiration or use of stormwater in order to protect water quality and associated aquatic habitat (e.g. green roofs, rain gardens, rainwater harvesting)*
- *LU-7: Enact land use modifications that consider Smart Growth principles during reconstruction, including stormwater management considerations to reduce downstream flooding and/or water quality issues*

Housing:

- *H-4: Establish guidelines / initiatives for future mitigation in repair / rebuilding processes*

Economic Redevelopment:

- *E-1: Establish plan to set up "Disaster Recovery Centers" (DRC's) at locations throughout the county for citizens and homeowners to meet with representatives of the Federal Emergency Management Agency (FEMA), the American Red Cross (ARC), Small Business Association (SBA), and insurance companies, etc*
- *E-2: Develop plan for communication with and possible relocation of most vulnerable industries /employers and recovery prioritization*
- *E-5: Identify and advocate for marginalized or isolated groups (location and demographic characteristics) of populations in the County that may need additional assistance and support before, during, and after disaster*

Infrastructure and Public Facilities:

- *IFP-1: Communicate with infrastructure and public facilities to develop a plan for expansion efforts that ensure facilities are not within high hazard zones*
- *IFP-2: Develop guidelines for protection of key infrastructure sites from hazards in their current locations (e.g., lift stations, access roads, etc.)*

Health and Social Services:

- *HSS-3: Consider movement of vulnerable public safety facilities*
- *HSS-4: Engage community leaders to communicate directly with marginalized groups to ensure that redevelopment plans meet their needs*

Environmental:

- *E-3: Create ordinances for prevention of erosion to and restoration of beaches and dunes.*
- *E-4: Create ordinances for wetland restoration*
- *E-7: Strengthen the planting and tree replacement ordinance to increase green space county-wide, fostering Smart Growth and LID principles to provide open space, natural beauty, and critical environmental areas*
- *E-8: Update the Open Space Management Plan to aid in the selection of property redevelopment areas (PRAs) and management of open space within the County*
- *E-12: Ensure County-wide Sea Level Rise mapping is completed and overlaid with critical facilities (water treatment, schools, hospitals, nursing homes, etc.) for possible relocation or mitigation.*

Historic Property Preservation:

- *HP-3: Create guidelines for pre-disaster mitigation of threats to historic structure*

Finance:

- *FR-1: Incorporate financial strategies into fiscal reporting mechanisms so that post-disaster financial requirements remain a consideration in planning for Chatham County's future*

The FMPC has considered options for post-disaster mitigation in identifying mitigation action alternatives related to flood prevention, property protection, and emergency services. Following a flood event, the County will evaluate damages and recommend appropriate mitigation options from this plan.

6.1.3 PLANNING FOR CRITICAL FACILITY PROTECTION

Critical facility and infrastructure protection was also emphasized during goal setting and while reviewing mitigation action alternatives. Chatham County has several options to consider in planning to reduce the vulnerability of critical facilities and infrastructure. Per FEMA guidance, of primary concern is the protection of essential systems and equipment to maintain the function of these critical facilities and their ability to serve the community during and after hazard events. One way to protect critical facilities is to ensure that electrical systems, mechanical systems, and other essential equipment are sufficiently elevated above the base flood elevation. Another option is to install dry floodproofing to protect these critical components from floodwaters, flood forces, and leakage. Among the components that should be considered for protection are electrical service and distribution systems; data systems; heating, ventilation, and air conditioning systems; water and wastewater systems; emergency power systems, and elevators. Providing backup power systems will also help to ensure these facilities continue operating during power outages.

Alternatively, Chatham County can consider relocating vulnerable critical facilities to new locations outside the floodplain. However, additional protection may still be required because areas outside the 1%-annual-chance and 0.2%-annual-chance floodplain are still at risk of flooding. According to FEMA, properties outside of high-risk flood areas account for over 20 percent of NFIP claims and one-third of disaster assistance for flooding.

The Chatham County FMPC considered these concerns in developing their mitigation strategies. In the future, the FMPC will consider grant opportunities for modifications to these facilities.

6.2 MITIGATION GOALS AND OBJECTIVES

Requirement §201.6(c)(3)(i): [The mitigation strategy section shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Section 4 documents the flood hazards, associated risks that threaten Chatham County, and the vulnerability of structures, infrastructure, and critical facilities. Section 5 evaluates the capacity of the County to reduce the impact of those hazards. The intent of goal setting is to identify areas where improvements to existing capabilities (policies and programs) can be made so that community vulnerability is reduced. Goals are also necessary to guide the review of possible mitigation measures. This Plan needs to make sure that recommended actions are consistent with what is appropriate for the County. Mitigation goals need to reflect community priorities and should be consistent with other plans in the County.

- **Goals** are general guidelines that explain what is to be achieved. They are usually broad-based policy type statements, long term and represent global visions. Goals help define the benefits that the plan is trying to achieve.
- **Objectives** are short term aims, when combined, form a strategy or course of action to meet a goal. Unlike goals, objectives are specific and measurable.

6.2.1 COORDINATION WITH OTHER PLANNING EFFORTS

The goals of this plan need to be consistent with and complement the goals of other planning efforts, primarily the Plan 2040 Chatham County-Savannah Comprehensive Plan. Comprehensive plans are important as they are developed and designed to guide future growth within the community. Therefore, to effectively pursue preventative flood mitigation for future development, this floodplain management plan should be consistent with the overall goals of the comprehensive plan. Likewise, the goals of the Chatham County Hazard Mitigation Plan play an important role as it also focuses on flood hazards and mitigation projects. Goals from both of these plans were reviewed to develop the goals of this plan.

6.2.2 GOAL SETTING EXERCISE

At the second FMPC meeting, the committee members participated in an exercise to review and recommend amendments or updates to the existing goals for this Floodplain Management Plan. The first part of the exercise involved reviewing the existing goals from the 2018 FMP. The committee determined that the existing goals were comprehensive and continue to upload the County's mitigation efforts. It should be noted that these goals were coordinated with the Chatham County Hazard Mitigation Plan. Some small edits and revisions were made to improve the goals and objective to better reflect the County's desire to address vulnerability and resilience.

6.2.3 RESULTING GOALS AND OBJECTIVES

At the end of the exercises, the FMPC agreed upon four general goals for this planning effort. The FMPC also included objectives in support of the goals. The refined goals and objectives are as follows:

Goal 1 – Reduce vulnerability of people, property, critical facilities and infrastructure to flood hazards to protect the health, safety and welfare of residents and visitors.

Objective 1.1: Advise the community of the safety and health precautions to implement before, during, and after a flood.
Objective 1.2: Educate residents and businesses on the benefits of improved water quality and the positive impacts on associated habitat.
Objective 1.3: Identify the location of vulnerable populations to aid in emergency evacuations.
Objective 1.4: Conduct site investigations, research exposure and hazard data, and evaluate proposed modifications to repair and mitigate stormwater management problems.
Objective 1.5: Implement flood mitigation measures or strategies, as necessary, to protect critical facilities.

Goal 2 – Reduce damage to development through flood resilient strategies and measures.

Objective 2.1: Prioritize capital improvements to address areas where poor drainage causes flooding.
Objective 2.2: Promote development only in areas outside the special flood hazard area (1%-annual-chance flood).
Objective 2.3: Use a variety of mitigation techniques to protect buildings from flood damage, including elevation, acquisition, and other retrofitting techniques where appropriate.
Objective 2.4: Encourage property owners to assume an appropriate level of responsibility for their own protection, including the purchase of flood insurance.
Objective 2.5: Integrate the County's relevant resilience strategies to support mitigation and prevention efforts that reduce future flood risk and increase the ability to respond and recover from future hazards.

Goal 3 – Protect natural resources by employing watershed-based approaches that balance environmental, economic and engineering considerations.

Objective 3.1: Maintain and enforce regulations to protect and restore wetlands and ecological functions for long-term environmental, economic and recreational values.
Objective 3.2: Pursue water management approaches and techniques that improve water quality and protect public health.
Objective 3.3: Preserve and maintain open space in flood prone areas to reduce flood damage to buildings and to provide recreational benefits.
Objective 3.4: Continue to protect wetlands and environmentally sensitive areas from encroachment of development by requiring buffers and other setback mechanisms.

Goal 4 – Encourage property owners, through education and outreach measures, to protect their homes and businesses from flood damage.

Objective 4.1: Educate property owners, including repetitive loss properties, on FEMA grant programs and other methods to mitigate possible flood damage.
Objective 4.2: Provide current flood-proofing and retrofitting information to property owners.
Objective 4.3: Effectively communicate flood risk to residents, businesses, contractors, realtors, prospective property buyers, and all vulnerable populations.

6.3 IDENTIFICATION AND ANALYSIS OF MITIGATION ACTIVITIES

Requirement §201.6(c)(3)(ii): [The mitigation strategy section shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. All plans approved by FEMA after October 1, 2008, must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.

To identify and select mitigation projects that support the mitigation goals and achieve the greatest risk reduction, the FMPC considered the Priority Risk Index ratings determined for each hazard in Section 4. While mitigation alternatives were considered to address risks associated with all identified hazards, an emphasis was placed on high and moderate priority flood-related hazards.

The FMPC analyzed viable mitigation options that supported the identified goals and objectives and addressed the risks and vulnerabilities associated with each hazard. The FMPC was provided with the following list of mitigation categories which are utilized as part of the CRS planning process:

- Prevention
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information and Outreach

A facilitated discussion took place to review the status of existing mitigation actions and examine and analyze the options for new actions. The FMPC was provided with examples of potential mitigation actions for each of the above categories and consider opportunities to alter, avert, adapt to, or avoid the flood hazard. Additionally, The FMPC was instructed to consider both future and existing buildings in evaluating possible mitigation actions.

Appendix B, Mitigation Strategy, provides a detailed discussion organized by CRS mitigation category of possible mitigation alternatives to assist the County in the review and identification of possible mitigation activities. This comprehensive review of possible mitigation activities details why some were appropriate for implementation and why others were not. As promoted by CRS, mitigation alternatives across all categories were discussed and considered for the flood risk reduction. This discussion was followed by a brainstorming session that generated a list of preferred mitigation actions.

Actions from the previous FMP that were completed or not carried forward in this plan are summarized in Table 6.1.

Table 6.1 – Completed and Deleted Actions from the 2018 FMP

2018 Action #	Action Description	Status
1	Update County website incorporating new technology to create interactive data and mapping system that will provide online technical assistance to homeowners, real estate agents and insurance agents. Include access to elevation certificates, flood zones, general flood history, repetitive loss areas, and mitigated properties, etc.	Completed. Most aspects have been completed based on current website updates; have been implemented over the past 9 months.

4	Continue to enforce Flood Damage Prevention requirements through on-site floodplain inspections.	Delete. On-going regulations that is well established
11	Promote low-impact development projects where applicable to improve water quality and reduce runoff.	Delete. Covered in previous Action 6 (now Action 4). Efforts to improve water quality will be added to Action 6.
13	Develop a Natural Floodplain Functions Plan to protect and or restore endangered species and habitat.	Completed. Plan will be completed in 2024.
14	Integrate the FMP into the Emergency Operations Plan, Pre-Disaster Hazard Mitigation Plan, Comprehensive Plan, and Capital Improvement Program.	Completed. Integration into the EOP and HMP has been done. FMP is integrated into the most recent 2024 comprehensive plan update. Capital Improvement Plan integration is ongoing.
15	Implement an outreach campaign to educate residents on flood risks, maps, mitigation activities, stormwater, water quality, environmental protection, and the benefits of natural floodplains.	Completed. There is an existing County program that addresses this action and implements this outreach. The program is established and will continue.
16	Develop web-based outreach efforts, including social media.	Completed. Throughout the year CEMA does various outreach campaigns for a variety of topics: dangers of riverine flooding, coastal flooding, excessive rainfall, hurricanes, etc. This outreach has been done with a variety of web-based efforts such as podcasts, videos, social media, etc.
18	Use Flood Protection Questionnaire results to identify target areas for outreach and flood protection.	Completed. Specific outreach is ongoing. Also captured in the County's RLAA.

6.3.1 PRIORITIZATION PROCESS

Once the mitigation actions were identified, the FMPC used FEMA's recommended prioritization criteria, STAPLEE, to assist in deciding why one recommended action might be more important, more effective, or more likely to be implemented than another. STAPLEE criteria were used to generate preliminary prioritization scores, by rating projects as positive (+1), neutral (0), or negative (-1) against each of the criteria. STAPLEE stands for the following:

- **Social:** Will the measure have equitable outcomes? Does it benefit vulnerable populations?
- **Technical:** Will it work? Does it solve the problem? Is it feasible?
- **Administrative:** Does the community have the capacity to implement and manage the project?
- **Political:** Is there public and stakeholder support? Is political leadership willing to support?
- **Legal:** Does the community have the authority to implement it? Are there liability implications?
- **Economic:** Is it cost-beneficial? Is there funding? Does it contribute to the local economy or economic development?
- **Environmental:** Does the action comply with environmental regulations? Does it benefit or protect existing natural resources?

In accordance with the DMA requirements, an emphasis was placed on the importance of a benefit-cost analysis in determining action priority. The four criteria, reflected in the prioritization criteria above, reflect the consideration of benefit-cost analysis for each action:

- Contribution of the action to save life or property
- Availability of funding and perceived cost-effectiveness
- Available technical and administrative resources for implementation
- Ability of the action to address the problem

The consideration of these criteria helped to prioritize and refine mitigation actions but did not constitute a full benefit-cost analysis. The cost-effectiveness of any mitigation alternative will be considered in greater detail through performing benefit-cost project analyses when seeking FEMA mitigation grant funding for eligible actions associated with this plan.

The FMPC members were also asked to determine an implementation timeline for each project. The priority time frames for project implementation were determined to be as follows:

Short Range = Project can be completed in less than one year from plan adoption

Medium Range = Project can be implemented in more than two years but less than five years

Long Range = Project will likely require more than five years to implement

This timeline distinguishes projects that can be completed within the five-year lifetime of the plan (short and medium range projects) from those that will likely not be completed prior to the required plan update.

6.4 MITIGATION ACTION PLAN

Requirement §201.6(c)(3)(iii): [The mitigation strategy section shall include an] action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

This action plan was developed to present the recommendations developed by the FMPC for how Chatham County can reduce the risk and vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses. Emphasis was placed on both future and existing development. The action plan summarizes who is responsible for implementing each of the prioritized actions as well as when and how the actions will be implemented. Each action's priority is also noted based on the criteria in Section 6.3.1as well as the benefit-cost review conducted to meet the regulatory requirements of the Disaster Mitigation Act. Table 6.2 identifies the mitigation actions.

The FMPC also realizes that new needs and priorities may arise as a result of a disaster or other circumstances and reserves the right to support new actions, as necessary, as long as they conform to the overall goals of this plan.

Moreover, the actions included in this mitigation strategy are subject to further review and refinement; alternatives analyses; and reprioritization due to funding availability and/or other criteria. The County is not obligated by this document to implement any or all of these projects. Rather, this mitigation strategy represents the County's overall intentions to mitigate flood risks and vulnerabilities from identified hazards. The actual selection, prioritization, and implementation of these actions will also be further evaluated in accordance with the CRS mitigation categories and criteria contained in Appendix B.

The following fields are included in the mitigation action plan summary table:

- **Action Item:** Provides an ID number for each action. Actions carried forward from the previous FMP may be renumbered, where appropriate, in this updated mitigation action plan.
- **Project:** Describes the mitigation activity.
- **Hazards Addressed:** Lists the hazards mitigated against. Abbreviated as follows: Climate Change & Sea Level Rise (CC/SLR), Coastal and Inland Flooding (CIF), Coastal and Stream Bank Erosion (CE), Dam Failure (DF), Hurricane and Tropical Storm (H), Stormwater/Localized Flooding (SF). See Section 4.
- **Goals Addressed:** Lists the mitigation goals the action supports. See Section 6.2.
- **Priority:** Lists the action's overall priority rating of high, medium, or low. See Section 6.3.
- **Funding Source:** Lists potential sources of funding.
- **Timeframe:** Lists the estimated timeframe for the action to be completed.
- **Responsible Department:** Lists the department(s) that will lead implementation and report on progress at plan evaluation meetings.
- **Status:** Provides an update on the progress towards implementation for carried forward actions and indicates new actions, where appropriate.

Table 6.2 – Summary of Chatham County Mitigation Actions

Action Item	Project	Goals Addressed	Hazards Addressed	Mitigation Category	Responsible Department/ Agency/Person	Funding Source	Priority	Timeline	Status
1	Acquire and demolish high-risk flood-prone buildings and repetitive loss structures and preserve land as open space.	2, 3	SF, CC/SLR, CIF, H, CE	Property Protection	Chatham County Department of Engineering	FEMA HMGP	Low	Long	Carry forward. On-going action. County continues to pursue opportunities.
2	Consider higher regulatory standards to better protect existing and future development.	1, 2	CC/SLR, CIF, SF, H	Prevention	Chatham County Department of Engineering	Operating Budget	High	Medium	Carry forward. Action revised to remove building code enforcement as it's an already established practice.
3	Update stormwater conveyance systems to alleviate flooding for existing and new development.	1, 2	SF	Structural Projects	Chatham County Department of Engineering, Public Works	Operating Budget	Medium	Medium	Carry forward. County continues to make progress.
4	Improve stormwater management regulations to include higher standards for design storm, size of development regulated, low-impact development, and public maintenance of detention and retention facilities to improve water quality.	1, 2	SF, CC/SLR, CIF, H, CE	Prevention, Natural Resource Protection	Chatham County Department of Engineering	Operating Budget	High	Medium	Carry forward. Combined with previous Action 11 to include improvements to water quality.
5	Relocate, elevate, or retrofit substantially damaged and/or pre-FIRM properties.	1, 2	CIF, CC/SLR, SF, H	Property Protection	Chatham County Department of Engineering	FEMA HMGP, FMA	Low	Long	Carry forward. County continues to pursue relevant opportunities.
6	Encourage the purchase of flood insurance and educate public on Increased Cost of Compliance (ICC) coverage through the County's CRS Flood Insurance Advocate. The advocate will facilitate face-to-face meetings, outreach events, and presentations to HOAs, and maintain a record of events attended and the number of people reached.	2, 4	CIF, SF, H	Property Protection, Public Information & Outreach	Chatham County Department of Engineering	Operating Budget	Medium	Short	Carry forward. Action revised to reflect new efforts of the CRS Insurance Advocate. Outreach materials and online resources have been established and were removed from original action.
7	Display signs along roads and canals at entrances to high, moderate, and low food risk areas.	4	CIF, SF	Public Information & Outreach	Chatham County Department of Engineering, Public Works	Operating Budget	High	Short	Carry forward. County continues to place signs in known problem areas.
8	Enact deed restrictions and other growth management tools to preserve wetland and natural resource areas and conserve their natural and ecological functions.	3	CIF, SF, CE	Prevention, Natural Resource Protection	MPC	Operating Budget	Medium	Medium	Carry forward. County continues to explore options for implementation.
9	Improve recurring local funding for Public Works maintenance and flood management activities implemented through the Capital Improvements Program.	1, 2	SF	Structural Projects	Chatham County Department of Engineering, Public Works, Finance Department	Operating Budget	Medium	Medium	Carry forward. Funding options to be explored.
10	Elevate lift stations and electrical components above the base flood elevation (BFE).	1	CC/SLR, CIF, H, SF	Property Protection	Chatham County Department of Engineering, Public Works	FEMA HMGP, FMA	Low	Medium	Carry forward. County continues to pursue this action.
11	Partner with Georgia Tech to install additional tidal and riverine flood gauges at various locations throughout the County to help provide real-time flood data on the County website.	1, 4	CC/SLR, CIF, H	Emergency Services, Public Information & Outreach	CEMA, Georgia Tech University	Operating Budget	Medium	Medium	Carry forward. Some sensors have been deployed to support real-time monitoring and future flood forecasting. Chatham County Engineering is still adding new stations.
12	Develop a long-range regional plan for sea level rise and compounding hazards like subsidence which evaluates multiple adaptation methods, including updated codes and ordinances that protect property based on the report findings.	2, 3	SF, CC/SLR, CIF, H, CE	Prevention	Chatham County Department of Engineering	Operating Budget	High	Medium	Carry forward. Action revised to include additional hazards like subsidence and the implementation of ordinance level changes to address risk. SLR has been incorporated into other County plans.
13	Evaluate sanitary sewer basins for possible transition from septic to public sewer.	1, 2	SF, CIF, H, CC/SLR	Structural Projects	Chatham County Department of Engineering, Public Works	Operating Budget	High	Medium	New Action
14	Strengthen policies and ordinances limiting allowable impervious coverage for new development.	1	SF, CIF	Prevention	Chatham County Department of Engineering	Operating Budget	Medium	Medium	New Action
15	Develop Watershed Master Plan	1, 3	SF, CIF, CC/SLR, H. CE	Prevention	Chatham County Department of Engineering	Operating Budget	High	Medium	New Action
16	Publish the locations (roads and intersections) that often flood after heavy rain events, major storms, or tidal flooding.	1, 4	CIF, SF	Public Information & Outreach	Chatham County Department of Engineering	Operating Budget	Medium	Short	New Action

6.5 DETAILED MITIGATION ACTIONS

6.5.1 PREVENTION

2. Consider higher regulatory standards to better protect existing and future development.	
Issue/Background:	Chatham County can limit the vulnerability of new development to flooding by updating regulations to require higher standards, such as an increased freeboard or elevation of electrical equipment, and by enforcing these codes throughout the development process to ensure compliance.
Hazards Addressed:	Climate Change & Sea Level Rise; Coastal & Inland Flooding; Stormwater/Localized Flooding; Hurricane/Tropical Storm
Alternatives Considered:	Encourage developers to build to higher standards voluntarily
Existing Planning Mechanism(s) to Support Implementation:	Existing Flood Damage Prevention Ordinance will be updated; current enforcement protocols could be expanded
Responsible Department/Agency:	The Chatham County Department of Engineering
Priority:	High
Cost Estimate:	Staff time
Benefits (Losses Avoided):	New development will be less vulnerable to flooding.
Timeframe for Completion:	Ongoing implementation. Updates can occur over next two years.
Potential Funding Source:	The cost will be paid for by Chatham County's operating budget.
Additional Notes:	Previous action was revised to remove building code enforcement as it's an already established practice.

4. Improve stormwater management regulations to include higher standards for design storm, size of development regulated, low-impact development, and public maintenance of detention and retention facilities to improve water quality.	
Issue/Background:	Stormwater flooding is a problem throughout the County.
Hazards Addressed:	Climate Change & Sea Level Rise; Coastal & Inland Flooding; Stormwater/Localized Flooding; Hurricane/Tropical Storm; Coastal/Streambank Erosion.
Alternatives Considered:	No action
Existing Planning Mechanism(s) to Support Implementation:	Improvement will be made to the existing stormwater management regulations.
Responsible Department/Agency:	The Chatham County Department of Engineering
Priority:	High
Cost Estimate:	Staff time
Benefits (Losses Avoided):	Incorporating higher standards into stormwater management regulations will help to minimize the stormwater runoff generated by new development and can potentially provide for on-site stormwater management to mitigate existing problems.
Timeframe for Completion:	Ongoing implementation. Updates can occur over next two years.
Potential Funding Source:	The cost will be paid for by Chatham County's operating budget.

Additional Notes:	Combined with previous Action 11 to include improvements to water quality.

12. Develop a long-range regional plan for sea level rise and compounding hazards like subsidence which evaluates multiple adaptation methods, including updated codes and ordinances that protect property based on the report findings.	
Issue/Background:	Chatham County's geography makes it extremely vulnerable to sea level rise. Current projections indicated that parts of the County will be permanently inundated within the next few decades. Analyzing exactly which areas and properties are at risk and then planning and implementing adaptation strategies accordingly can protect the County from suffering the full impact of sea level rise.
Hazards Addressed:	Climate Change & Sea Level Rise; Coastal & Inland Flooding; Stormwater/Localized Flooding; Hurricane/Tropical Storm; Coastal/Streambank Erosion.
Alternatives Considered:	No action
Existing Planning Mechanism(s) to Support Implementation:	Build off of existing plans like this FMP, the HMP, and the Stormwater System Sea Level Rise Vulnerability Assessment. Existing Flood Damage Prevention Ordinance will be updated; current enforcement protocols could be expanded.
Responsible Department/Agency:	The Chatham County Department of Engineering
Priority:	High
Cost Estimate:	TBD
Benefits (Losses Avoided):	The County will be able to plan for and mitigate the impacts of sea level rise before it can cause property and infrastructure damages.
Timeframe for Completion:	County is actively seeking opportunities to develop a plan. Developments can occur over next two years.
Potential Funding Source:	The cost will be paid for by Chatham County's operating budget.
Additional Notes:	Action was revised to include additional hazards like subsidence and the implementation of ordinance level changes to address risk. SLR has been incorporated into other County plans.

14. Strengthen policies and ordinances limiting allowable impervious coverage for new development.	
Issue/Background:	Excessive Impervious surfaces coverage can alter the natural hydrology cycle, increase stormwater runoff and reduce groundwater recharge. This can result in more frequent flooding, higher flood peak flow, lower base flow in streams, and lower water table levels.
Hazards Addressed:	Coastal & Inland Flooding; Stormwater/Localized Flooding
Alternatives Considered:	No action
Existing Planning Mechanism(s) to Support Implementation:	Build off of existing plans like Existing Flood Damage Prevention Ordinance and comprehensive plan. The County's ordinance will be updated; current enforcement protocols could be expanded.
Responsible Department/Agency:	The Chatham County Department of Engineering
Priority:	Medium
Cost Estimate:	Staff time

Benefits (Losses Avoided):	Reduced impervious surface coverage can protect water quality, preserve ecosystem services of watershed, protect habitats, and reduce runoff.
Timeframe for Completion:	Once pursed this action could be completed in the short-term. Within a year.
Potential Funding Source:	The cost will be paid for by Chatham County's operating budget.
Additional Notes:	Action is also listed a priority in the County's comprehensive plan updated in 2024.

15. Develop Watershed Master Plan	
Issue/Background:	Political boundaries usually do not coincide with the natural drainage boundaries of a watershed, however changes and development within the watershed can greatly impact flood and water quality.
Hazards Addressed:	Climate Change & Sea Level Rise; Coastal & Inland Flooding; Stormwater/Localized Flooding; Hurricane/Tropical Storm; Coastal/Streambank Erosion.
Alternatives Considered:	No action
Existing Planning Mechanism(s) to Support Implementation:	Build off of existing planning efforts and CRS capabilities.
Responsible Department/Agency:	The Chatham County Department of Engineering
Priority:	High
Cost Estimate:	TBD
Benefits (Losses Avoided):	Comprehensive approach to understanding and addressing current and future flood challenges. Can lead to the protection and restoration of natural resources and improve water quality. County will receive CRS credit for the plan, which helps support discounted insurance premiums.
Timeframe for Completion:	County is actively seeking opportunities to develop a plan. Developments can occur over next two years.
Potential Funding Source:	The cost will be paid for by Chatham County's operating budget.
Additional Notes:	New action.

6.5.2 PROPERTY PROTECTION

1. Acquire and demolish high-risk flood-prone buildings and repetitive loss structures and preserve land as open space.	
Issue/Background:	Repetitive loss structures are known to be vulnerable to flooding and are likely to continue to flood without mitigation. Demolition ensures that future risk is eliminated and allows the land as open space to better manage floodwaters.
Hazards Addressed:	Climate Change & Sea Level Rise; Coastal & Inland Flooding; Stormwater/Localized Flooding; Hurricane/Tropical Storm; Coastal/Streambank Erosion.
Alternatives Considered:	Elevation, barriers, and drainage improvements are alternatives to acquisition, but none of these other options can ensure that risk on a repetitive loss property is completely mitigated.

Existing Planning Mechanism(s) to Support Implementation:	This effort could be coordinated with existing land preservation efforts and supported through integration with the County's land use planning and zoning.
Responsible Department/Agency:	The Chatham County Department of Engineering
Priority:	Low
Cost Estimate:	Cost must be determined on a case-by-case basis
Benefits (Losses Avoided):	Acquisition and demolition of repetitive loss structures completely removes the flood problem and eliminates vulnerability while also expanding open space and enhancing the land's natural and beneficial flood management functions.
Timeframe for Completion:	Long-term. County pursues as opportunities arise.
Potential Funding Source:	The cost will be paid for by FEMA Hazard Mitigation Grant Program (HMGP) funds.
Additional Notes:	On-going action. County as acquired properties in the past and continues to pursue opportunities.

5. Relocate, elevate, or retrofit substantially damaged and/or pre-FIRM properties.	
Issue/Background:	Pre-FIRM properties were not required to incorporate flood damage prevention building requirements when built, therefore these properties may be at risk of flooding and may be likely to continue incurring flood damages if not properly mitigated. Similarly, substantially damaged properties are likely to be vulnerable to continued flooding. However, substantially damaged properties must be brought up to current standards when repaired, whereas non-substantial improvements to pre-FIRM structures are not required to be elevated above the existing finished floor elevation. Pre-FIRM properties vulnerable to major flooding should be mitigated to prevent substantial damages. In both of these cases, relocation, additional elevation, or retrofits to be encouraged as mitigation options for property owners.
Hazards Addressed:	Climate Change & Sea Level Rise; Coastal & Inland Flooding; Stormwater/Localized Flooding; Hurricane/Tropical Storm
Alternatives Considered:	No action
Existing Planning Mechanism(s) to Support Implementation:	None
Responsible Department/Agency:	The Chatham County Department of Engineering
Priority:	Low
Cost Estimate:	Cost must be determined on a case-by-case basis
Benefits (Losses Avoided):	Relocating, elevating, or retrofitting substantially damaged and/or pre-FIRM properties will greatly reduce exposure and/or vulnerability to flooding.
Timeframe for Completion:	Long-term. County pursues as opportunities arise.
Potential Funding Source:	The cost will be paid for by FEMA Hazard Mitigation Grant Program (HMGP) funds.
Additional Notes:	On-going action. County continues to pursue relevant opportunities.

10. Elevate lift stations and electrical components above the base flood elevation (BFE).	
Issue/Background:	Lift stations are an important component of flood protection, moving water from low-lying areas that would not normally drain on their own. Lift stations and other electrical equipment are not able to operate once they are flooded. Elevating this equipment to above the BFE ensures that lift stations are operable in the event of at least a 1% annual-chance event or lesser flood.
Hazards Addressed:	Climate Change & Sea Level Rise; Coastal & Inland Flooding; Stormwater/Localized Flooding; Hurricane/Tropical Storm;
Alternatives Considered:	No action
Existing Planning Mechanism(s) to Support Implementation:	These improvements can be planned for through the Capital Improvements Program once additional funding is established.
Responsible Department/Agency:	The Chatham County Department of Engineering
Priority:	Medium
Cost Estimate:	TBD
Benefits (Losses Avoided):	Lift stations provide flood protection for low-lying areas. Elevating this and other electrical equipment ensures operation during flood events, which limits flood damages.
Timeframe for Completion:	County can assess infrastructure and replace within the next 5 years.
Potential Funding Source:	The cost will be paid for by FEMA Hazard Mitigation Grant Program (HMGP) funds.
Additional Notes:	County continues to pursue this action.

6.5.3 NATURAL RESOURCE PROTECTION

8. Enact deed restrictions and other growth management tools to preserve wetland and natural resource areas and conserve their natural and ecological functions.	
Issue/Background:	Wetlands provide important natural functions, including improving water quality through filtration and natural pollution treatment and managing flooding by containing and slowing floodwaters. Existing wetlands and natural resource areas must be protected to preserve these beneficial ecological functions.
Hazards Addressed:	Climate Change & Sea Level Rise; Coastal & Inland Flooding; Stormwater/Localized Flooding; Hurricane/Tropical Storm; Coastal/Streambank Erosion.
Alternatives Considered:	Discourage development of these areas through site development regulations
Existing Planning Mechanism(s) to Support Implementation:	Growth management techniques can be incorporated into future planning efforts and formally supported through ordinance updates.
Responsible Department/Agency:	MPC
Priority:	Medium
Cost Estimate:	Staff time
Benefits (Losses Avoided):	Preserving wetlands and natural resource areas will protect these important areas for future flood protection and continued water quality improvement.

Timeframe for Completion:	Ongoing implementation. Progress can occur over next two years.
Potential Funding Source:	The cost will be paid for by Chatham County's operating budget.
Additional Notes:	County continues to explore options for implementation.

6.5.4 EMERGENCY SERVICES

11. Partner with Georgia Tech to install additional tidal and riverine flood gauges at various locations throughout the County to help provide real-time flood data on the County website.	
Issue/Background:	Tidal and riverine gauges provide data on water levels and enable more accurate monitoring of flood conditions, allowing for more timely warnings, when necessary.
Hazards Addressed:	Climate Change & Sea Level Rise; Coastal & Inland Flooding; Stormwater/Localized Flooding; Hurricane/Tropical Storm
Alternatives Considered:	No action
Existing Planning Mechanism(s) to Support Implementation:	County has begun to install sensors. Will use same partnership to implement sensors in new locations.
Responsible Department/Agency:	CEMA, Georgia Tech University
Priority:	Medium
Cost Estimate:	Approximately $25,000 to install and $16,000/year to operate per gauge
Benefits (Losses Avoided):	The County will have better data on flooding and be able to recognize flood threats and issue more timely, accurate warnings. With this data available on the County website, the public can be better informed of flood hazards and risk data.
Timeframe for Completion:	Ongoing implementation. Progress can occur over next two years.
Potential Funding Source:	TBD
Additional Notes:	Some sensors have been deployed to support real-time monitoring and future flood forecasting. Department of Engineering is still seeking multiple locations for new sensors.

6.5.5 STRUCTURAL PROJECTS

3. Update stormwater conveyance systems to alleviate flooding for existing and new development.	
Issue/Background:	Inadequate stormwater drainage causes flooding issues across the County.
Hazards Addressed:	Climate Change & Sea Level Rise; Coastal & Inland Flooding; Stormwater/Localized Flooding; Hurricane/Tropical Storm
Alternatives Considered:	No action
Existing Planning Mechanism(s) to Support Implementation:	The Department of Engineering maintains the County's stormwater management system and can make improvements to the drainage system through the Capital Improvements Program.
Responsible Department/Agency:	The Chatham County Department of Engineering, Public Works
Priority:	Medium
Cost Estimate:	TBD
Benefits (Losses Avoided):	Improving stormwater conveyance systems in areas where drainage is currently inadequate will reduce stormwater flooding and prevent losses.

Timeframe for Completion:	Ongoing implementation. Progress can occur over next two years.
Potential Funding Source:	Operating Budget
Additional Notes:	County continues to make progress.

9. Improve recurring local funding for Public Works maintenance and flood management activities implemented through the Capital Improvements Program.	
Issue/Background:	A Capital Improvements Program (CIP) is a forward-looking plan for infrastructure improvements that considers needs and available funding. By looking ahead at future maintenance needs for the stormwater management system, the County can ensure funds are set aside to pay for those improvements. Currently, the County is limited in this effort by a lack of steady funding.
Hazards Addressed:	Climate Change & Sea Level Rise; Coastal & Inland Flooding; Stormwater/Localized Flooding; Hurricane/Tropical Storm; Coastal/Stream Bank Erosion
Alternatives Considered:	No action
Existing Planning Mechanism(s) to Support Implementation:	The Department of Engineering maintains a Capital Improvements Program and is funded by the County's operating budget.
Responsible Department/Agency:	Chatham County Department of Engineering, Public Works, Finance Department
Priority:	Medium
Cost Estimate:	Staff time
Benefits (Losses Avoided):	identifying additional funding sources for a capital improvement program will enable better advanced planning of Improvements to the stormwater system and more assurance that funding will be available for the needed maintenance.
Timeframe for Completion:	Ongoing implementation. Progress can occur over next two years.
Potential Funding Source:	The cost will be paid for by Chatham County's operating budget.
Additional Notes:	Funding options to be explored.

13. Evaluate sanitary sewer basins for possible transition from septic to public sewer.	
Issue/Background:	Some of the issues facing County properties include transitioning low-lying coastal areas from septic systems; serving existing communities with limited undeveloped land; rising groundwater tables; properties in VE and LimWA Special Flood Hazard Areas that restrict fill.
Hazards Addressed:	Climate Change & Sea Level Rise; Coastal & Inland Flooding; Stormwater/Localized Flooding; Hurricane/Tropical Storm
Alternatives Considered:	No action
Existing Planning Mechanism(s) to Support Implementation:	Chatham County Department of Engineering has started to explore this issue with the community and is actively working toward making the necessary transitions.
Responsible Department/Agency:	Chatham County Department of Engineering, Public Works
Priority:	High
Cost Estimate:	Staff time
Benefits (Losses Avoided):	This step would help the County to eventually implement and construct the recommended projects to improve sanitary sewer conditions for both the residents and the impacted waterways.

Timeframe for Completion:	Ongoing implementation. Progress can occur over next two years.
Potential Funding Source:	The cost will be paid for by Chatham County's operating budget.
Additional Notes:	New action

6.5.6 PUBLIC INFORMATION

6. Encourage the purchase of flood insurance and educate public on Increased Cost of Compliance (ICC) coverage through the County's CRS Flood Insurance Advocate. The advocate will facilitate face-to-face meetings, outreach events, and presentations to HOAs, and maintain a record of events attended and the number of people reached.	
Issue/Background:	ICC coverage pays up to $30,000 to bring a building into compliance with state or local flood damage prevention ordinance regulations if it is declared to be substantially damaged or if it is a repetitive loss property.
Hazards Addressed:	Coastal & Inland Flooding; Stormwater/Localized Flooding; Hurricane/Tropical Storm
Alternatives Considered:	No action
Existing Planning Mechanism(s) to Support Implementation:	The County has established outreach materials and an existing CRS Flood Insurance Advocate that works with neighboring jurisdictions.
Responsible Department/Agency:	Chatham County Department of Engineering
Priority:	Medium
Cost Estimate:	Staff time
Benefits (Losses Avoided):	Educating the public on ICC coverage and encouraging the purchase of flood insurance will help protect property owners in the event of a major flood by ensuring that they are aware of the resources available to them to help cover the cost of necessary mitigation.
Timeframe for Completion:	Ongoing implementation. Progress can occur over the next year.
Potential Funding Source:	The cost will be paid for by Chatham County's operating budget.
Additional Notes:	Action revised to reflect new efforts of the CRS Insurance Advocate. Outreach materials and online resources have been established and were removed from original action.

7. Display signs along roads and canals at entrances to high, moderate, and low food risk areas.	
Issue/Background:	Displaying signs at entrances to high, moderate, and low flood risk areas will help increase public awareness of flood risk throughout the County.
Hazards Addressed:	Coastal & Inland Flooding; Stormwater/Localized Flooding
Alternatives Considered:	No action
Existing Planning Mechanism(s) to Support Implementation:	Some signage has been placed around the County. New signs should be placed in known flood hazard areas.
Responsible Department/Agency:	Chatham County Department of Engineering, Public Works
Priority:	High
Cost Estimate:	TBD
Benefits (Losses Avoided):	Posting signage around high, moderate, and low flood risk areas will reduce vulnerability to flooding by increasing awareness and therefore

	encouraging residents and visitors to avoid high and moderate flood risk areas during or leading up to a flood event.
Timeframe for Completion:	Ongoing implementation. Progress can occur over the next year.
Potential Funding Source:	The cost will be paid for by Chatham County's operating budget.
Additional Notes:	County continues to place signs in known problem areas.

16. Publish the locations (roads and intersections) that often flood after heavy rain events, major storms, or tidal flooding.	
Issue/Background:	Public feedback indicates that residents would are interested in flood awareness and often report common localized flooding locations in the community.
Hazards Addressed:	Coastal & Inland Flooding; Stormwater/Localized Flooding
Alternatives Considered:	No action
Existing Planning Mechanism(s) to Support Implementation:	The County maintains known localized flooding locations. Engineering department could streamline and formalize the list of locations.
Responsible Department/Agency:	Chatham County Department of Engineering
Priority:	Medium
Cost Estimate:	Staff time
Benefits (Losses Avoided):	An ongoing and up to date list of known flooding locations will help increase public awareness of flood risk throughout the County and help the County track areas that should be addressed.
Timeframe for Completion:	Ongoing implementation. Progress can occur over the next year.
Potential Funding Source:	The cost will be paid for by Chatham County's operating budget.
Additional Notes:	New action. Previously objective 1.2.

7 PLAN ADOPTION

Requirement §201.6(c)(5): [The plan shall include] documentation that the plan has been formally approved by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council).

The purpose of formally adopting this plan is to secure buy-in from Chatham County, raise awareness of the plan, and formalize the plan's implementation. The adoption of this plan completes Planning Step 9 of the 10-step planning process: Adopt the Plan, in accordance with the requirements of DMA 2000. The Chatham County Board of Commissioners will adopt the Floodplain Management Plan by passing a resolution.

8 PLAN IMPLEMENTATION AND MAINTENANCE

Requirement §201.6(c)(4): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Implementation and maintenance of the plan is critical to achieve the intended outcomes of this floodplain management plan. This is Planning Step 10 of the 10-step planning process. This section provides an overview of the overall strategy for plan implementation and maintenance and outlines the method and schedule for monitoring, updating, and evaluating the plan. The section also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

8.1 ROLE OF FMPC IN IMPLEMENTATION, MONITORING, AND MAINTENANCE

With adoption of this plan, the County will be responsible for the plan implementation and maintenance. The FMPC identified in Section 2 will reconvene quarterly each year to ensure that mitigation strategies are being implemented and that the County continues to maintain compliance with the NFIP. As such, the County agrees to continue its relationship with the FMPC and:

- Act as a forum for flood mitigation issues;
- Disseminate flood mitigation ideas and activities to all participants;
- Pursue the implementation of high-priority, low/no-cost recommended actions;
- Ensure flood mitigation remains a consideration for community decision makers;
- Maintain a vigilant monitoring of multi-objective cost-share opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update of this plan;
- Report on plan progress and recommended revisions to the County Board of Commissioners; and
- Inform and solicit input from the public.

The FMPC's primary duty moving forward is to see the plan successfully carried out and report to the County Board of Commissioners, GEMA/HS, FEMA, and the public on the status of plan implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, considering stakeholder concerns about flood mitigation, passing concerns on to appropriate entities, and posting relevant information on the County's website (and others as appropriate).

8.2 IMPLEMENTATION

Once adopted, the plan must be implemented to be effective in mitigation flood risk. While this plan contains many worthwhile actions, Chatham County will need to decide which action(s) to undertake first. The priority assigned the actions in the planning process and funding availability will affect that decision. Low or no-cost actions most easily demonstrate progress toward successful plan implementation while the County works to secure funding for more costly high-priority actions.

An important implementation mechanism that is highly effective and low-cost is incorporation of the Floodplain Management Plan recommendations and their underlying principles into other plans and mechanisms, such as the Comprehensive Plan. The County already implements policies and programs to

reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms.

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government. Implementation will be accomplished by adhering to the schedules identified for each action and through constant, pervasive, and energetic efforts to network and highlight the multi-objective, win-win benefits to each program and the community. This effort is achieved through the routine actions of monitoring agendas, attending meetings, and promoting a safe, sustainable community. Additional mitigation strategies could include consistent and ongoing enforcement of existing policies and vigilant review of programs for coordination and multi-objective opportunities.

Constant monitoring of funding opportunities that can be leveraged to implement some of the costlier recommended actions will also be necessary. This includes creating and maintaining a bank of ideas on how to meet local match or participation requirements. With this preparation, when funding does become available, the County will be positioned to capitalize on the opportunity. Funding opportunities to be monitored include special pre- and post-disaster funds, state and federal earmarked funds, benefit assessments, and other grant programs, including those that can serve or support multi-objective applications.

8.2.1 RESPONSIBILITY FOR IMPLEMENTATION OF GOALS AND ACTIVITIES

Elected officials, officials appointed to head community departments and community staff are charged with implementation of various activities in the plan. During the quarterly reviews as described later in this section, an assessment of progress on each of the goals and activities in the plan will be determined and noted. At that time, recommendations will be made to modify timeframes for completion of activities, funding resources, and responsible entities. On a quarterly basis, the priority standing of various activities may also be changed. Some activities that are found not to be doable may be deleted from the plan entirely and activities addressing problems unforeseen during plan development may be added.

8.2.2 INCORPORATION INTO EXISTING PLANNING MECHANISMS

An important implementation mechanism that is highly effective and low-cost is incorporation of the Floodplain Management Plan recommendations and their underlying principles into other plans and mechanisms. Where possible, plan participants will use existing plans and/or programs to implement flood mitigation actions. As previously stated, mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. As described in this plan's capability assessment, Chatham County already implements policies and programs to reduce losses to life and property from flood hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms. These existing mechanisms include:

- Comprehensive Plan
- Capital Improvement Plan
- Hazard Mitigation Plans
- Land Use Plans and Code of Ordinances
- Emergency Management Plans
- Ordinances
- Other plans, regulations, and practices with a mitigation focus

Those involved in these other planning mechanisms will be responsible for integrating the findings and recommendations of this plan with these other plans, programs, etc., as appropriate. Integration into existing planning mechanisms will be done through the routine actions of:

- Monitoring other planning/program agendas;
- Attending other planning/program meetings;
- Participating in other planning processes; and
- Monitoring community budget meetings for other community program opportunities.

The successful implementation of this mitigation strategy will require constant and vigilant review of existing plans and programs for coordination and multi-objective opportunities that promote a safe, sustainable community.

Efforts should continuously be made to monitor the progress of mitigation actions implemented through other planning mechanisms and, where appropriate, their priority actions should be incorporated into updates of this Floodplain Management Plan.

8.3 MAINTENANCE

Plan maintenance implies an ongoing effort to monitor and evaluate plan implementation and to update the plan as progress, roadblocks, or changing circumstances are recognized. Maintenance will occur on an establish schedule according to the process discussed below.

8.3.1 MAINTENANCE SCHEDULE

Chatham County's Department of Engineering is responsible for initiating plan reviews. In order to monitor progress and update the mitigation strategies identified in the action plan, the County will revisit this plan quarterly and following a hazard event. Quarterly reviews will be documented with meeting minutes and a status report that will be shared with the County Board of Commissioners and the public. The County will submit a five-year written update to GEMA/HS and FEMA Region IV, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule. With this plan update anticipated to be fully approved and adopted in 2024, the next plan update for Chatham County will occur in 2029.

8.3.2 MAINTENANCE EVALUATION PROCESS

Regular review and maintenance of this plan will seek to facilitate implementation, track progress towards achieving goals, and monitor changes that should be incorporated into the next plan update. Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the plan. Changes in vulnerability can be identified by noting:

- Decreased vulnerability as a result of implementing recommended actions;
- Increased vulnerability as a result of failed or ineffective mitigation actions; and/or
- Increased vulnerability as a result of new development (and/or further annexation).

Updates to this plan will:

- Consider changes in vulnerability due to action implementation;
- Document success stories where mitigation efforts have proven effective;
- Document areas where mitigation actions were not effective;
- Document any new hazards that may arise or were previously overlooked;
- Incorporate new data or studies on hazards and risks;

- Incorporate new capabilities or changes in capabilities;
- Incorporate growth and development-related changes to infrastructure inventories; and
- Incorporate new action recommendations or changes in action prioritization.

Changes will be made to the plan during the update process to accommodate for actions that have failed or are not considered feasible after a review of their consistency with established criteria, time frame, community priorities, and/or funding resources. Actions that were not ranked high but were identified as potential mitigation activities will be reviewed as well during the monitoring and update of this plan to determine feasibility of future implementation. Updating of the plan will be by written changes and submissions, as is appropriate and necessary, and as approved by the County Board of Commissioners. In keeping with the five-year update process, the FMPC or similar committee will convene public meetings to solicit public input on the plan and its routine maintenance and the final product will be adopted by the County Board of Commissioners.

To inform the plan update process and to maintain and implement the plan during the interim five-year period, the FMPC will conduct plan reviews quarterly and following a hazard event. Specifically, the County will adhere to the following process for the next update of this FMP:

QUARTERLY PLAN REVIEW PROCESS

For the quarterly plan review process, the Chatham County Department of Engineering will be responsible for facilitating, coordinating, and scheduling reviews and maintenance of the plan. The quarterly review of the Floodplain Management Plan will be conducted as follows:

- The County's Department of Engineering will reconvene the FMPC or similar committee to meet and review the progress toward implementation of the plan's mitigation action plan. This review will evaluate the progress made on implementation of each mitigation action listed in Section 8.4 Mitigation Action Plan.
- Meetings of the FMPC shall be published in accordance with local rules regarding public notice.
- Prior to the review, department heads and others tasked with implementation of the various activities will be queried concerning progress on each activity in their area of responsibility and asked to present a report at the review meeting.
- After each quarterly meeting, minutes of the meeting and a status report will be prepared by the County's Department of Engineering.
- The results of each quarterly FMPC meeting will be made available to the local news media and the County Board of Commissioners for informational purposes.
- The County's Department of Engineering will maintain copies of minutes and status reports to provide to ISO/FEMA as part of the community's annual recertification to the CRS program.

CRITERIA FOR QUARTERLY REVIEWS IN PREPARATION FOR 5-YEAR UPDATE

The criteria recommended in 44 CFR 201 and 206 will be utilized in reviewing and updating the plan. More specifically, quarterly reviews will monitor changes to the following information:

- Community growth or change in the past quarter.
- The number of substantially damaged or substantially improved structures by flood zone.
- The renovations to public infrastructure including water, sewer, drainage, roads, bridges, gas lines, and buildings.
- Natural hazard occurrences that required activation of the Emergency Operations Center (EOC) and whether the event resulted in a presidential disaster declaration.
- Natural hazard occurrences that were not of a magnitude to warrant activation of the EOC or a federal disaster declaration but were severe enough to cause damage in the community or closure of businesses, schools, or public services.
- The dates of hazard events descriptions.

- Documented damages due to the event.
- Closures of places of employment or schools and the number of days closed.
- Road or bridge closures due to the hazard and the length of time closed.
- Assessment of the number of private and public buildings damaged and whether the damage was minor, substantial, major, or if buildings were destroyed. The assessment will include residences, mobile homes, commercial structures, industrial structures, and public buildings, such as schools and public safety buildings.
- Review of any changes in federal, state, and local policies to determine the impact of these policies on the community and how and if the policy changes can or should be incorporated into the Floodplain Management Plan. Review of the status of implementation of projects (mitigation strategies) including projects completed will be noted. Projects behind schedule will include a reason for delay of implementation.

8.3.3 CONTINUED PUBLIC INVOLVEMENT

Continued public involvement is imperative to the overall success of the plan's implementation. The update process provides an opportunity to solicit participation from new and existing stakeholders and to publicize success stories from the plan implementation and seek additional public comment. The plan maintenance and update process will include continued public and stakeholder involvement and input through attendance at designated committee meetings, web postings, press releases to local media, and through public hearings.

PUBLIC INVOLVEMENT PROCESS FOR QUARTERLY REVIEWS

The public will be noticed by placing an advertisement on the County's website specifying the date and time for the review and inviting public participation.

PUBLIC INVOLVEMENT FOR FIVE-YEAR UPDATE

When the FMPC reconvenes for the five-year update, they will coordinate with all stakeholders participating in the planning process—including those that joined the committee since the planning process began—to update and revise the plan. In reconvening, the FMPC will be responsible for coordinating the activities necessary to involve the greater public, including disseminating information through a variety of media channels detailing the plan update process. As part of this effort, public meetings will be held and public comments will be solicited on the plan update draft. The FMPC will also coordinate this public outreach process with the program for public information established pursuant to the most current guidelines from the CRS.

APPENDIX A PLANNING PROCESS DOCUMENTATION

FMPC MEETING DATES, TOPICS, AND LOCATIONS

Table A.1: FMPC Meeting Dates

Note: All FMPC Meetings were open to the public.

Meeting Type	Meeting Topic	Meeting Date	Meeting Location
FMPC #1 (Kick-off)	1) Introduction to DMA, CRS and the planning process 3) Organize resources: the role of the FMPC, planning for public involvement, and coordinating with other agencies and stakeholders	November 21, 2023 11:00 a.m.	Chatham County Metropolitan Planning Commission 110 E. State St.
FMPC #2	1) Review Flood Protection Questionnaire and other public involvement strategies 5) Discuss/develop mitigation goals for the FMP	February 21, 2024 3:30 p.m.	Virtual/Microsoft Teams
FMPC #3	1) Hazard Identification and Risk Assessment Review 2) Review/discussion of Vulnerability Assessment (Assess the Problem) 3) Mitigation Action Review	May 14, 2024 11:00 a.m.	Virtual/Microsoft Teams
FMPC #4	1) Review "Draft" Floodplain Management Plan 2) Solicit comments and feedback from the FMPC 3) 3) Review and finalize Mitigation Action Plan	July 16, 2024 1:30 – 3:30 p.m.	124 Bull St. & Zoom

FMPC MEETING AGENDAS, MINUTES, AND SIGN-IN SHEETS

FMPC Meeting 1: November 21, 2023

Chatham County, GA Floodplain Management Plan (FMP)
Floodplain Management Planning Committee Meeting #1
Tuesday, November 21, 2023, 11:00 a.m.
Chatham County Metropolitan Planning Commission Mendonsa Hearing Room & Microsoft Teams

David Stroud from WSP, the County's consultants, was in attendance to facilitate the meeting according to the following agenda:

- Introductions
- Community Rating System (CRS) Overview
- Why Plan?
- Project Overview
  - Disaster Mitigation Act (DMA) Requirements
  - CRS Activity 510 Requirements
- FMP Planning Process
  - Stakeholder Coordination
  - Public Outreach
  - Risk Assessment Update
- Project Schedule
- Next Steps

There were four people in attendance:

- Michael Blakely, CRS Program Management
- Anna McQuarrie, Planner, Chatham County Metropolitan Planning Commission
- Jeffery Brady, Rountree Brady Insurance
- Don Sullens, Resident

CRS Program Overview

The CRS Program, in which Chatham County participates, is a voluntary, point-based program that provides a 5% premium discount to flood insurance policyholders for every 500 points that the County earns. Currently, the County is a Class 5, which provides a 25% discount to policyholders in the SFHA. The annual savings to all policyholders in the community is $1.7M, with an average annual per policy discount of $224 in the SFHA. If the County has enough credit points through this Activity 510 Floodplain Management Plan and additional CRS activities of credit, the County could lower its classification to 4 and 30% reduction in flood insurance premiums. This would raise the average discount for policies in the SFHA to $269.

Trends in Disasters

David discussed that there have been more disaster declarations in recent years as well as increased cost for disaster response and recovery, in part due to population growth and development in hazardous areas which has increased exposure. So far, in 2023 there have been 25 disaster events with losses exceeding $1 billion. One of the costliest disasters across the US was a severe storm that impacted portions of Georgia.

David explained that we must plan for mitigation because the costs of response and recovery are growing, many events are predictable or repetitive, loss reduction works, and there are funds available to help. The average benefit-cost ratio for a federally funded mitigation project is 6:1.

DMA Planning Requirements

1 Chatham County, GA FMP | FMPC Meeting 1

David reviewed the intent of DMA planning and explained the basis of DMA planning requirements in the Code of Federal Regulations, which establish the four-phase planning process. This process dovetails with the CRS Program's 10-Step planning process. The completed plan will meet all the requirements of both programs.

CRS Requirements

Activity 510 FMP 10-Step Process

The purpose of a floodplain management plan is to reduce potential losses from future disasters. David reviewed the FMP planning process noting that the planning requirements of the DMA outline four ordered phases: 1) organize resources, 2) risk assessment, 3) develop a mitigation plan, and 4) adoption and implementation. These phases outline a ten-step planning process reflected in both DMA and CRS planning requirements. David reviewed the 10-Step planning process, which is as follows:

1. Organize to Prepare the Plan
2. Involve the Public
3. Coordinate
4. Assess the Hazard
5. Assess the Problem
6. Set Goals
7. Review Possible Activities
8. Draft an Action Plan
9. Adopt the Plan
10. Implement, Evaluate, and Revise the Plan

Phase 1: Organize Resources

Step 1 – Organize to Prepare the Plan

In this step the County convened the FMPC which includes local staff, citizens, and stakeholders. Additionally, the County can organize existing resources and inventory what tools, data, and services are available to create the plan.

Step 2 – Plan for Public Involvement

Prepare and develop ways to engage the public in the planning process. This could include integrating the public on the planning team, posting information on websites, developing press releases, and implementing surveys and questionnaires. The County can receive 5 points for every additional public information activity implemented (up to 30 points).

The WSP planning team has developed a public survey that will help the Committee better understand the community's experiences and concerns with flooding. The survey can be accessed at the link **HERE**.

It was asked if there is a threshold of participants that need to be engaged in the planning process. David explained that there is no required number, but that the County should use several methods to engage and reach as many people as possible.

Step 3 – Coordinate with Other Departments and Agencies

The FMPC should seek the support of other departments for assistance with plan development. These agencies can help connect with the public, provide critical information and data, and provide important insight that enriches the FMP. Please see the presentation for a list of potential departments and agencies.

Phase 2: Risk Assessment

Step 4 – Identify the Hazards

Hazard identification explores what types of events may occur within the County. Hazards are profiled based on their extent, past occurrences, seasonal patterns, magnitude, and other factors.

David reviewed the hazards included in the exiting FMP: Riverine Flooding, Stormwater Flooding, Dam Failure, Erosion, Sea Level Rise, and Climate Change. These hazards will likely be assessed in the updated plan.

2

Step 5 – Assess the Problem
The risk assessment considers what assets will be affected as well as the location a hazard can occur, previous occurrences, potential impacts, probability, and extent of the evaluated hazards. This step also considers the County's existing local capability to implement mitigation projects.

David briefly discussed the range of data and tools used to evaluate assets and assess risk including building footprint and parcel data, and FEMA's Hazus loss estimation tool.

Phase 3: Develop a Mitigation Plan

Step 6 – Set Planning Goals
The FMPC will evaluate the goals from the current plan and decide if any changes need to be made or if additional goals need to be added. These goals will guide the creation and implementation of the Plan's mitigation strategy.

Step 7 – Review Possible Activities
The FMPC will review and choose mitigation activities that reflect the goals and capability of the County.

Step 8 – Draft Action Plan
The FMPC along with County staff will identify and prioritize actions and determine which department is responsible for particular mitigation actions, when the actions will be completed, and how they will be financed.

David reviewed the six FEMA mitigation categories: prevention, property protection, structural projects, emergency services, natural resource protection, and public education. The mitigation action plan will have at least one project that falls within each category. David asked the FMPC to discuss which category they would prioritize. Several committee members noted that public outreach was a top priority as these efforts ensure that people in the County understand their flood risks. Others discussed the importance of prevention as such projects are more action based. It was also noted that nature-based solutions should be considered.

Phase 4: Adoption and Implementation

Step 9 – Adopt the Plan
At this step, the plan will be adopted by County Council. The public will have the opportunity to review and provide input that will be incorporated into the plan before adoption.

Step 10 – Implement, Evaluate and Revise the Plan
Plan implementation requires several steps including assigning an overall project manager and integrating actions into staff work plans. Overtime, the FMPC should monitor changes in vulnerability, report on progress, publicize successes, and revise the plan as necessary. The DMA and CRS program require updates every 5 years. After the plan is adopted the FMPC can maximize CRS credit by meeting quarterly to review plan progress.

Project Schedule

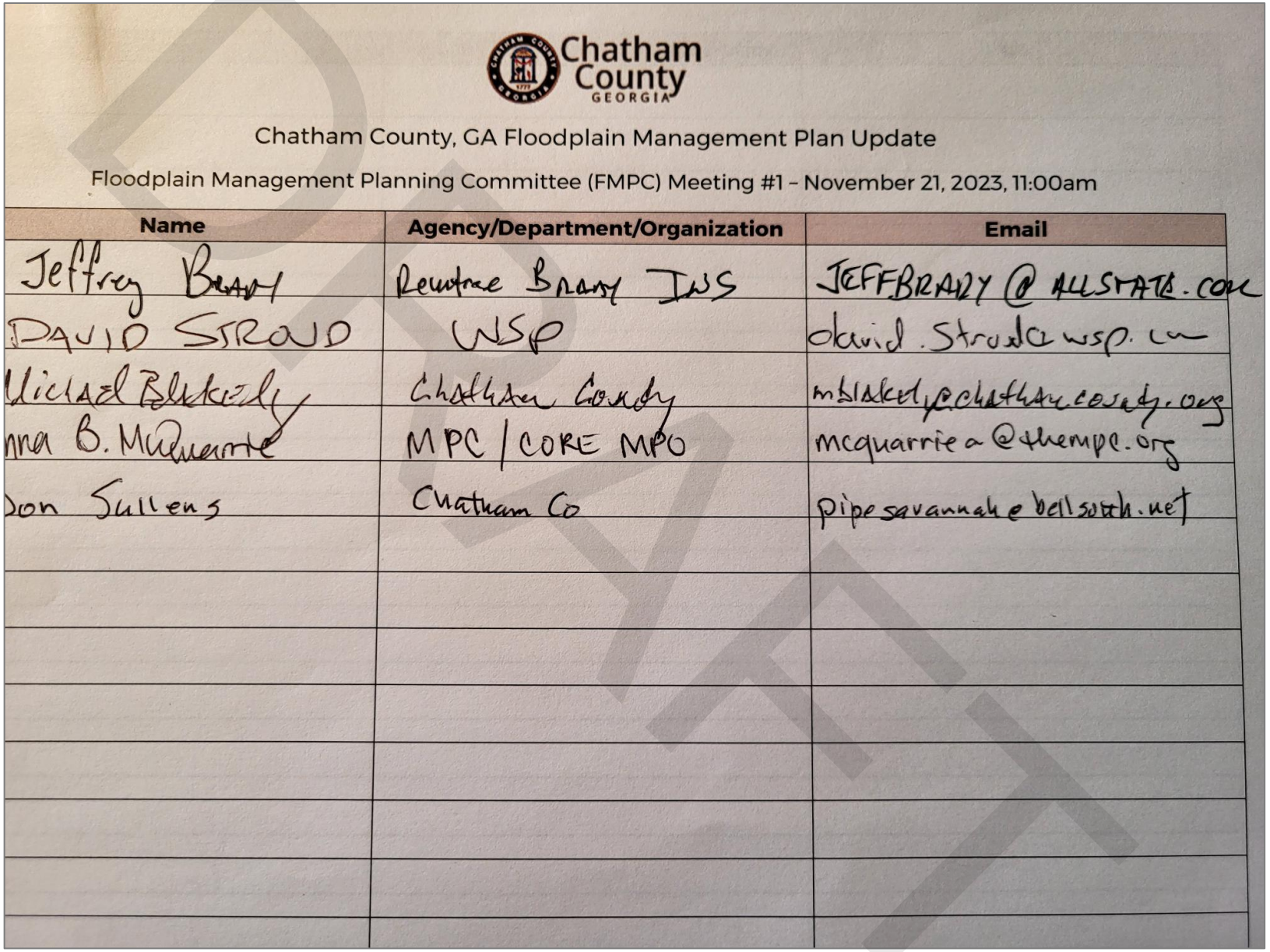
David briefly reviewed the project schedule which aims for project completion and adoption by June. This schedule can be adjusted as needed.

Discussion

Anna mentioned two resources that can be incorporated into the planning process, the Coastal Region (CORE) MPO Flood Modeling Tools and the Georgia Department of Natural Resources Enhancing Coastal Resilience with Green Infrastructure report. She will share these resources with WSP to review.

Next Steps

David reviewed ways for the public to be involved in the planning process including a public meeting at 5:00 PM. He asked the County to continue publicizing the public survey on the website and social media platforms. The next FMPC meeting will focus on mitigation action updates and initial assessment review. The minutes of the meeting along with the PowerPoint presentation will be sent to the FMPC.



Chatham County
GEORGIA

Chatham County, GA Floodplain Management Plan Update

Floodplain Management Planning Committee (FMPC) Meeting #1 – November 21, 2023, 11:00am

Name	Agency/Department/Organization	Email
Jeffrey Brady	Rewtrae Brady IWS	JEFFBRADY@ALLSTATE.COM
DAVID STROUD	WSP	david.stroud@wsp.com
Michael Blakely	Chatham County	mblakely@chathamcounty.org
nna B. McQuarrie	MPC / CORE MPO	mcquarriea@thempc.org
Don Sullens	Chatham Co	pipesavannah@bellsouth.net

FMPC Meeting 2: February 21, 2024

Chatham County, GA Floodplain Management Plan (FMP)
Floodplain Management Planning Committee Meeting #2
Wednesday, February 21, 2024, 3:30 p.m.
Microsoft Teams

David Stroud, Abby Moore, and Ranger Ruffins from WSP, the County's consultants, were in attendance to facilitate the meeting according to the following agenda:

- Introductions
- Planning Process Update
- Discuss Public Feedback
  - Public Meeting
  - Survey Update
- Review and Update Goals and Objectives
- Discuss Capability
- Review Mitigation Actions
- Next Steps

There were seven people in attendance:

- Angela Bliss, Department of Engineering
- Anna McQuarrie, Planner, Chatham County Metropolitan Planning Commission
- David Anderson, Chatham County GIS
- Edward Marrow, Metropolitan Planning Commission
- Jackie Jackson, Chatham Resilience Program Administrator
- Jeffery Brady, Rountree Brady Insurance
- Tom McDonald, City of Savannah Development Services, CRS Coordinator

Planning Process

Where we are in the Planning Process

Abby reviewed where we are in the planning process noting that WSP continues to work on steps 4 and 5 – assess the hazard and assess the problem and will present the risk assessment findings at the next committee meeting. The focus of this FMPC meeting covers steps 6 and 7 where the committee will review and set plan goals and review existing mitigation strategies and discuss what to carry forward.

Abby also reviewed the project schedule explain that the next FMPC meeting will be held in March with the final Committee meeting and final public meeting held in April and plan adoption in May. The final FMPC meeting public meeting will likely be held in person.

Public Feedback

Abby presented the public survey results gathered so far. There have been 56 responses so far. Around 57% of respondents have experienced high water or flooding challenges primarily from localized flooding issues or residential flooding in backyards and driveways. Most respondents have not taken actions to protect their home and around half do not know who to contact regarding flood risks. This points to opportunities for further flood risk education and awareness. When asked for suggested steps for the County to take, respondents emphasized stormwater maintenance and improvements, and more education on ways to protect property from flood damage.

Goals and Objectives

Abby reviewed the existing 2018 FMP goals noting that they are comprehensive and continue to uphold the County's mitigation efforts. She also noted that these goals were coordinated with the Chatham County Hazard Mitigation Plan (HMP) which helps integrate the efforts of both plans. The existing goals are as follows:

- **Goal 1:** Reduce vulnerability of people, property, critical facilities and infrastructure to flood hazards to protect the health, safety and welfare of residents and visitors
- **Goal 2:** Reduce damage to development through flood resilient strategies and measures
- **Goal 3:** Protect natural resources by employing watershed-based approaches that balance environmental, economic, and engineering considerations
- **Goal 4:** Encourage property owners, through education and outreach measures, to protect their homes and businesses from flood damage

The corresponding objectives were also reviewed for each goal, see slides 11 – 14. The FMPC and WSP team discussed several potential changes. Jackie and Anna noted the need to address vulnerable populations beyond the identification of such groups to include actions that address potential challenges. David suggested developing specific actions to address vulnerable populations particularly education and emergency outreach. It was also decided to revise objective 4.3 to include vulnerable populations.

Tom suggested adding an objective focused on watershed master planning. David responded noting that this would be a great action rather than a broad objective. Tom also asked about the need to cover future flooding like sea level rise. David noted that sea level rise is analyzed in the hazard risk and vulnerability assessment and the Committee will have the opportunity to develop mitigation actions to address future flooding.

Angela asked about objectives addressing education on ICC coverage funding and substantial damage regulations. David explained that both of these topics would be better suited for specific mitigation action items.

David suggested adding an objective that addresses resilience, as the County continues its resilience planning efforts. The committee agreed. WSP will provide a suggestion for review.

The following changes were recommended and will be incorporated into the plan update:

- Remove objective 1.2: make this objective a new mitigation action
  - Revise to state "Publish the locations (roads and intersections) which often flood after heavy rain event, major storms, or tidal flooding."
- Revise objective 1.3 to be more specific: "Educate residents and businesses on the benefits of improved water quality and associated habitat."
- Revise objective 2.2: "Promote development outside the special flood hazard area (1%-annual-chance flood)."
- Revise objective 2.3: "Use a variety of mitigation techniques to protect buildings from flood damage, including elevation, acquisition, and other retrofitting techniques where appropriate."
- Add objective 2.5 to focus on resilience. Suggestion: "Integrate the County's relevant resilience strategies to support mitigation efforts that reduce future flood risk and increase the ability to respond and recovery from future hazards."
  - Committee review and edit

2

- Revise objective 4.3: "Effectively communicate flood risk to residents, businesses, contractors, realtors and prospective buyers, and vulnerable populations."

Discuss Capability

New Updates

Abby reviewed the various capability categories: regulatory, administrative and technical, and fiscal. She asked for any relevant changes over the past five years since the last plan, including new plans, policies, programs, staff, services, trainings, etc.

Updates include a new comprehensive plan that have been developed since the last FMP. Jackie's Resilience Department has been created and the Flood Damage Prevention Ordinance is currently being revised. David asked if the ordinance will include any new higher standards. Angela noted that she is unsure of any new higher standards but the ordinance has been overhauled and reformatted for clarity and to better match the model ordinance.

David Anderson noted a new Westside Drainage Study that has been developed and will share more information with the WSP team.

Additional updates include new sea level rise censors used for modeling and monitoring and 3D modeling of bridges to understand what design elevation they can be lifted to. This helps provide baseline data and future estimates and supplements work that is typically done by the DOT.

Review Mitigation Actions

David reviewed the six CRS mitigation categories and the existing number of strategies within each category. He also noted that to maximize CRS points the plan should include mitigation actions for at least five of the six categories. A summary of the categories and action count are in the table below.

Category *(example projects)*	**Existing Action Count**
Prevention: *stormwater management regulations, growth management tools*	7
Property Protection: *floodproofing, acquire RL structures, elevate pre-FIRM structures, elevate lift stations*	3
Natural Resource Protection: *promote LID, develop natural floodplain functions plan*	2
Emergency Services: *Install tidal gauges for real-time data*	1
Structural Projects: *stormwater system improvements, improve local funding for CIP*	2
Public Information: *mailings, website & social media outreach, flood risk signage*	6

Existing Mitigation Actions

David explained that the FMPC will need to provide a status update for each of the existing actions (shown on slides 21 – 24) noting weather the project is completed, if it should be removed or carried forward. The committee should also note any progress that has been made or what may be limiting progress.

The WSP team and FMPC reviewed the first six actions and provided the following status updates:

- Action 1: **Completed.** Most aspects have been completed based on current website updates have been implemented over the past 9 months
- Action 2: **Carry forward/Ongoing action**
  - County has acquired additional buildings, 17 in total
- Action 3: **Revise**. Will revise to include onsite inspections (will capture existing action 4)
- Action 4: **Remove.** Will be covered in updated action 3.

- Action 5: **Revise.** Change language to "Update stormwater conveyance systems to alleviate flooding for existing development." Split up action to cover existing development and add a new mitigation action to cover new development. WSP will suggest a potential action for Committee review.
- Action 6: **Carry forward/Ongoing action**. Design storm and associated regulations have not been updated.

Based on the discussions held throughout the presentation potential new strategies could focus on the following topics:

- Create an action from existing objective 2.3
- Address the need for a new/updated watershed master plan
- Address county's resilience efforts
- Create specific actions that address vulnerable populations (beyond identification – action focused)
- Include mitigation actions that address future flood challenges like sea level rise
- Create an action focused on education about ICC funding and substantial damage regulations

David asked the committee to review the remaining mitigation actions and provide the WSP team with status updates by **March 13th**. He also asked the committee to begin brainstorming potential new actions.

Next Steps

WSP Team Acton Items:

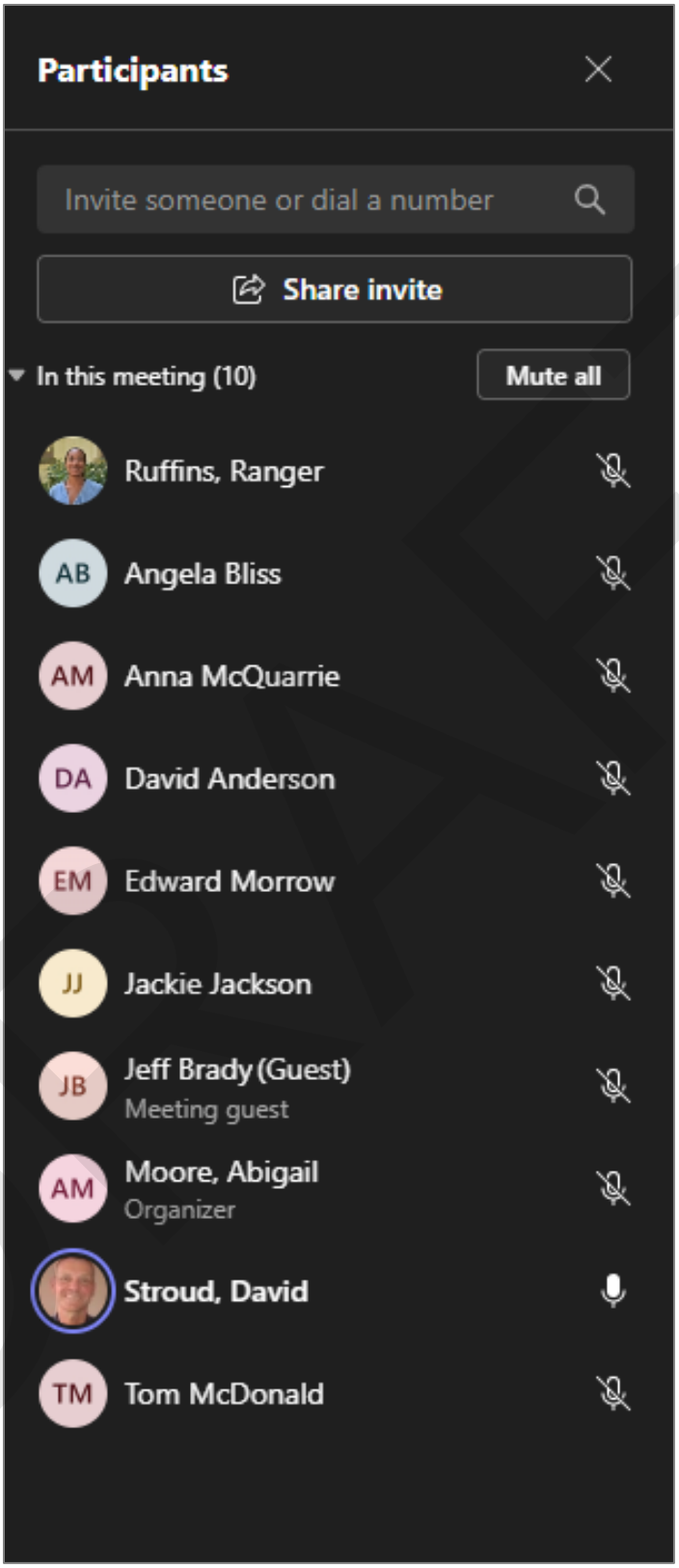
- Send excel sheet with list of existing mitigation action items
- WSP team to finish risk and vulnerability assessment

Chatham County Action Items:

- Promote the survey via website and social media

Requests for FMPC Input:

- Provide comments on goals and objectives by **March 6th**
- Provide status on all mitigation actions by **March 13th**
- Begin to brainstorm potential new actions


Participants
Invite someone or dial a number
Share invite
In this meeting (10)
Mute all
Ruffins, Ranger
AB
Angela Bliss
AM
Anna McQuarrie
DA
David Anderson
EM
Edward Morrow
JJ
Jackie Jackson
JB
Jeff Brady (Guest)
Meeting guest
AM
Moore, Abigail
Organizer
Stroud, David
TM
Tom McDonald

FMPC Meeting 3: May 14, 2024

Chatham County, GA Floodplain Management Plan (FMP)
Floodplain Management Planning Committee Meeting #3
Tuesday, May 14, 2024, 11:00 a.m.
Microsoft Teams

David Stroud and Ranger Ruffins from WSP, the County's consultants, were in attendance to facilitate the meeting according to the following agenda:

- Introductions
- Planning Process Update
- Hazard Identification and Risk Assessment Review
  - Hazard Identification Risk Assessment (HIRA) Process and Organization in the Plan
  - Hazard Identification
  - Asset Inventory
  - Hazard Profiles: Risk and Vulnerability Assessment
- Update Mitigation Goals
- Mitigation Action Plan
  - Mitigation Strategy Updates
  - Brainstorm New Possible Activities
- Next Steps

There were seven people in attendance:

- Angela Bliss, Department of Engineering
- Anna McQuarrie, Planner, Chatham County Metropolitan Planning Commission
- Jackie Jackson, Chatham Resilience Program Administrator
- Jeffery Brady, Rountree Brady Insurance
- Tom McDonald, City of Savannah Development Services, CRS Coordinator
- Randall Mathews, Chatham County Emergency Management
- Amy Growe, Resident

Planning Process Update

Where we are in the Planning Process

David reviewed where we are in the planning process noting that WSP has completed steps 4 and 5 – assess the hazard and assess the problem. The focus of this FMPC meeting covers the results of the hazard risk assessment and a review of the updated plan goals and objectives.

David also reviewed the project schedule and explained that the final FMPC and public meeting will be held in June and plan adoption in July. The final FMPC meeting public meeting will likely be held in person.

Hazard Identification and Risk Assessment Review

HIRA Organization

The four components of the HIRA are the hazard identification, hazard profiles, asset inventory, and loss estimates. The HIRA is found in Section 4 of the plan and contains the hazard identification, hazard profiles, and the findings of the Vulnerability Assessment.

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Hazard Identification
Hazards were identified for initial review based on the list of hazards included in the 2018 FMP, the 2019 State Hazard Mitigation Plan (HMP), the 2020 Chatham County HMP, major disaster declarations for the county, and FMPC input from the previous meeting. The full list of identified hazards for this plan are: Climate Change and Sea Level Rise, Coastal and Inland Flooding, Coastal and Streambank Erosion, Dam Failure, Hurricane and Tropical Storm, and Stormwater and Localized Flooding. All hazards from the previous plan were included in this plan update.

Asset Inventory
David reviewed updates to the property inventory, which is based on current building footprints and parcel data and summarized by property occupancy type. The asset inventory also includes an update to the inventory of critical facilities and infrastructure categorized by FEMA Lifelines. There are 18 critical facilities and infrastructure captured in this assessment. The assets assessed in this plan only include those that fall within the unincorporated county boundary.

Hazard Profiles
Ranger briefly described the methodology and steps taken to assess each hazard. Each of these steps corresponds to a subheading in each hazard profile – hazard description, location, extent (potential severity), past occurrences, probability of future occurrences, climate change and future conditions, vulnerability assessment (people, property, and environment).

Priority Risk Index (PRI) Results Summary
All of the hazards were evaluated using the Priority Risk Index (PRI) to rank their relative importance. With the PRI, hazards are rated on their probability, impact, spatial extent, warning time, and duration to produce an overall score and associated priority level. Ranger encouraged the FMPC to review the assigned ratings and provide feedback if they think any ratings should be adjusted.

David suggested increasing the probability rating for costal and inland flooding from likely to highly likely based on the known flood events that the County has experienced. Several members of the committee agreed with this change. There was discussion about adjusting the probably rating for hurricane and tropical storm to likely, however, comments from the FMPC indicate that the rating of highly likely is accurate. The FMPC will review the HIRA and note any further adjustments.

The green boxes indicate ratings that have increased since the previous FMP.

Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Climate Change & Sea Level Rise	Highly Likely	Limited	Moderate	More than 24 hours	More than 1 week	2.9
Coastal & Inland Flooding	Likely	Critical	Moderate	6 to 12 hours	Less than 1 week	3.2
Coastal & Stream Bank Erosion	Likely	Limited	Small	More than 24 hours	More than 1 week	2.4
Dam Failure	Unlikely	Minor	Negligible	Less than 6 hours	Less than 6 hours	1.3
Hurricane & Tropical Storm	Highly Likely	Critical	Large	More than 24 hours	Less than 1 week	3.3
Stormwater & Localized Flooding	Highly Likely	Limited	Small	6 to 12 hours	Less than 24 hours	2.7

Ranger provided a summary of the hazard risk and vulnerability assessment findings for each of the identified hazards:

Climate Change and Sea Level Rise
By 2040, sea level in the region is projected to rise about 12 inches above the 2005 mean sea level, with increases to 24 inches by 2060 and 63 inches by 2100. Around 147 buildings are exposed to 1-foot of sea level rise; 278 buildings are exposed to 2-feet of sea level rise; 438 buildings are exposed to 3-feet of sea level rise.

Coastal and Inland Flooding
An overview of the acreage in FEMA flood hazard areas was presented. Over 84% of the flood zone acreage in unincorporated Chatham County is within the SFHA. A loss estimate was also presented to show potential loss from the 1%-annual-chance flood event. There are an estimated 2,466 buildings with loss – the majority (1,539) of which are residential buildings. Total estimated losses are over $116M. This equates to a loss estimate of 3%, meaning 3% of the property exposure would be damaged. FEMA considers a loss estimate of 10% to be an indicator that a community will have difficulty in recovery, therefore, in general, Chatham County may not have extreme difficulty in recovery from a 1% annual chance flood event.

Coastal and Streambank Erosion

In Chatham County erosion rates and potential impacts tend to be highly localized and overall vulnerability is considered low. However, given Chatham County's coastal setting, soils, topography, and likelihood of hurricanes and storm surge that worsen erosion, it is likely erosion will continue to occur. Ranger presented a map that shows several erosion hot spots reported in the Georgia Coastal Hazards Portal.

David asked the FMPC to note any additional locations of erosion if they are aware of any that have not been captured in the plan.

Dam Failure

There are seven dams in Chatham County and one dam in Effingham County within 1 mile of the Chatham County boundary. All eight are low hazard dams. Seven of the dams have been inspected in the past eight years and most are rated satisfactory. Two dams (Pond 24 and Pond 29) received an unsatisfactory rating, however, because they are low hazard dams this is less of a concern. WSP was unable to obtain inundation data to evaluate exposure, but the low hazard ratings indicate that damage to the dams would result in minimal impacts to the surrounding area.

Hurricanes and Tropical Storm

There have been 75 hurricane and tropical storm tracks that have passed within 50 miles of Chatham County from 1900-2023. NCEI records report over $20M in property damage from hurricanes and tropical storms since 2002 which is likely low due to under reporting. Additionally, nearly all Disaster Declarations are hurricanes and tropical storms. Increased frequency and intensity of these storms will impact flood hazards in Chatham County.

Ranger also reviewed storm surge mapping that displays results from SLOSH modeling. Storm surge exposure was estimated using SLOSH data. Approximately 729 buildings and $1.8 billion in property value is exposed to the modeled Category 1 storm surge in the unincorporated county. Approximately 11,645 buildings and $7.4 billion in property value is exposed to the modeled Category 4 storm surge.

It was asked which basin was for the SLOSH storm surge modeling – the Charleston basin or the North Florida basin. The WSP GIS team used the most recent SLOSH model version available – Version 3. The SLOSH model is subdivided into basins however, the model aggregates the data to best depict the geographic location of interest. Chatham County falls within the North Florida Basin, however, one single basin cannot be chosen to evaluate storm surge in Chatham County.

Stormwater and Localized Flooding

Localized flooding hotspots were provided by the Public Works Department and incorporated into the previous FMP. Ranger reviewed these locations which are organized by location – Westside, Eastside, and Islands. Public works indicated that heavy rain event trigger flooding in these locations, however, some additional causes likely include clogged inlets, blocked drainage outfalls, and improper grade. The County is working on providing updated localized flooding data to WSP to map and evaluate in the plan.

Goals and Objectives

Ranger reviewed the updated goals and objectives that include revisions discussed at the previous FMPC meeting. The final goals and objectives can be reviewed on slides 34 – 37 of the presentation.

Mitigation Action Review

David reviewed the six CRS mitigation categories and the existing number of strategies within each category. He also noted that to maximize CRS points the plan should include mitigation actions for at least five of the six categories. A summary of the categories and action count are on slide 39 in the presentation.

He also reviewed some of the initial topics and suggestions for new mitigation actions discussed at the previous FMPC meeting these include following highlights:

- Make the previous objective 1.2 into a mitigation action: *Publish the locations (roads and intersections) which often flood after heavy rain events, major storms, or tidal flooding*
- New/updated watershed master plan
- Address and incorporate resilience efforts
- Create specific actions that address vulnerable populations
- Include mitigation actions that address future flood challenges like sea level rise
- Create an action focused on education about ICC funding and substantial damage regulations

The FMPC was asked to submit potential mitigation actions to WSP by **May 28th**. Actions can be submitted using the Chatham County FMP Strategy Submission Form, or emailed to any of the WSP or County staff.

David also asked County staff to please review the existing mitigation actions and provide status updates by **May 28th**.

Next Steps

WSP Team Acton Items:

- WSP team to finish work on the draft plan
- Send HIRA to FMPC for review

Chatham County Action Items:

- Provide status updates for remaining mitigation action by **May 28th**
- Work with WSP to select a date for the final FMPC and public meeting

Requests for FMPC Input:

- Review the HIRA by **June 4th**
- Provide new mitigation actions by **May 28th**

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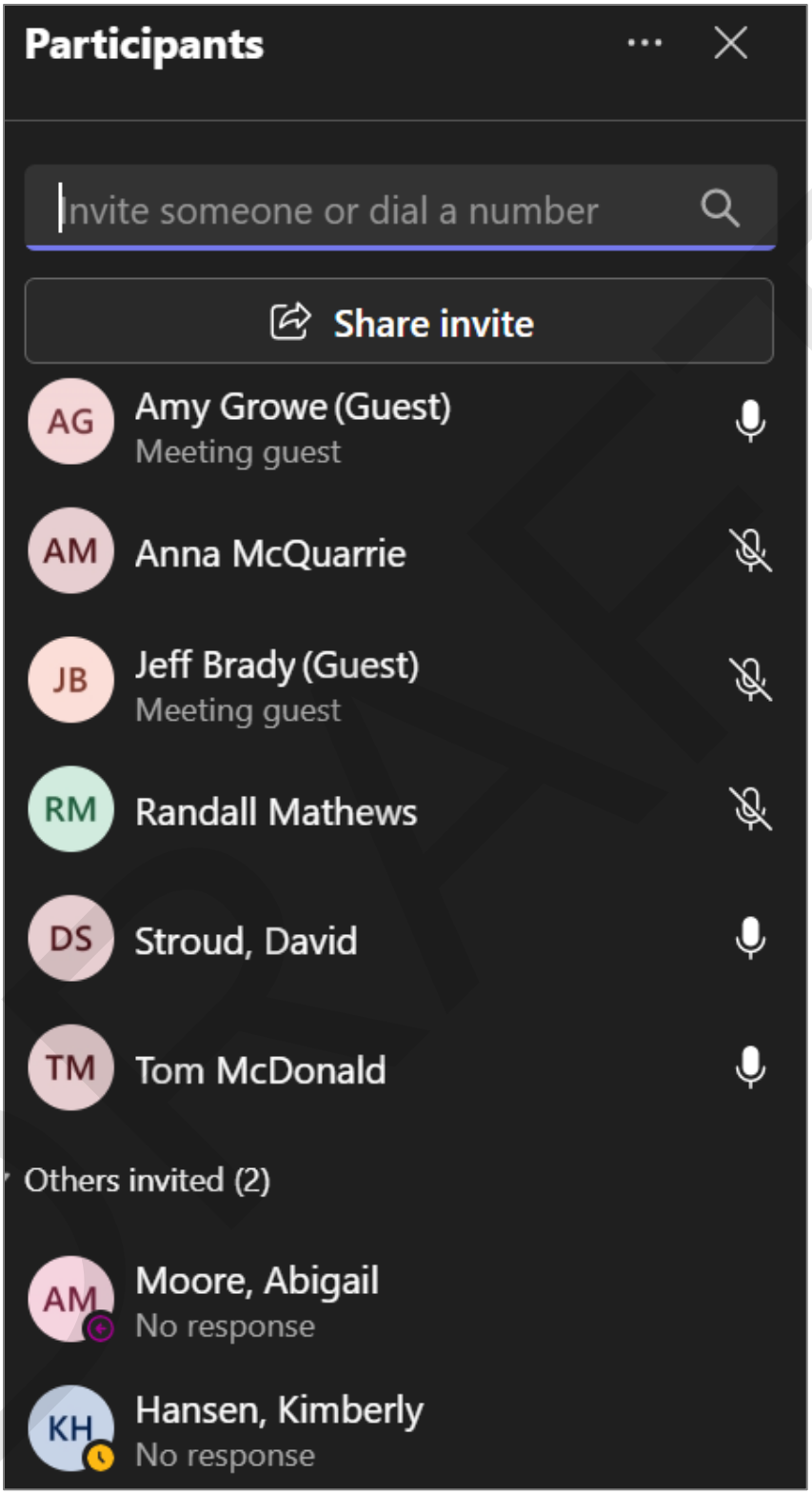
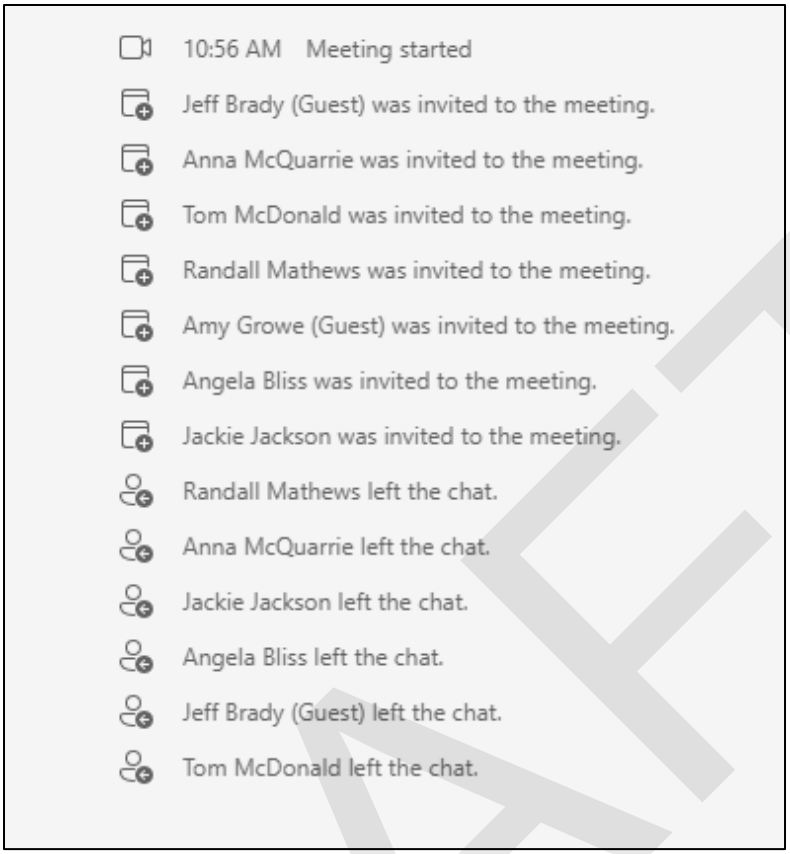

Participants
Invite someone or dial a number
Share invite
AG
Amy Growe (Guest)
Meeting guest
AM
Anna McQuarrie
JB
Jeff Brady (Guest)
Meeting guest
RM
Randall Mathews
DS
Stroud, David
TM
Tom McDonald
Others invited (2)
AM
Moore, Abigail
No response
KH
Hansen, Kimberly
No response


10:56 AM Meeting started
Jeff Brady (Guest) was invited to the meeting.
Anna McQuarrie was invited to the meeting.
Tom McDonald was invited to the meeting.
Randall Mathews was invited to the meeting.
Amy Growe (Guest) was invited to the meeting.
Angela Bliss was invited to the meeting.
Jackie Jackson was invited to the meeting.
Randall Mathews left the chat.
Anna McQuarrie left the chat.
Jackie Jackson left the chat.
Angela Bliss left the chat.
Jeff Brady (Guest) left the chat.
Tom McDonald left the chat.

FMPC Meeting 4: July 16, 2024

Chatham County, GA Floodplain Management Plan (FMP)
Floodplain Management Planning Committee Meeting #4
Tuesday, July 16, 2024, 3:00 p.m.
124 Bull Street Savannah, GA 31401 & Zoom

David Stroud, Abby Moore, Ranger Ruffins, and Kimmy Hansen from WSP, the County's consultants, were in attendance to facilitate the meeting according to the following agenda:

- Introductions
- Planning Process Update
- Review of Draft Plan
  - Organization of the Plan
- Mitigation Action Plan
  - Mitigation Strategy Updates
  - Brainstorm New Possible Activities
- Next Steps

There were seven people in attendance:

- Angela Bliss, Department of Engineering
- Jackie Jackson, Chatham Resilience Program Administrator
- Jeffery Brady, Rountree Brady Insurance
- Tom McDonald, City of Savannah Development Services, CRS Coordinator
- David Anderson, Chatham County GIS Analyst
- Edward Morrow, Chatham County Metropolitan Planning Commission
- Greg Harris, Resident

Planning Process Update
Where we are in the Planning Process

David reviewed where we are in the planning process noting that WSP is currently focused on steps 7 and 8 – review possible activities and draft an action plan. The focus of this FMPC meeting is to review the organization of the draft plan and review the status of all mitigation actions.

David mentioned that plan adoption is intended to occur in early September of this year.

Review the Draft FMP
Organization of the Plan

The eight components of the draft FMP are as follows:

1. Introduction
   a. Provides context and justification for the plan, including regulatory framework, and FEMA and CRS guidance documents
2. Planning Process
   a. Explains the steps followed to prepare the plan

1 Chatham County, GA FMP | FMPC Meeting 4

b. Documents the process, including FMPC participation, public outreach, and stakeholder coordination

David updated the attendees on the public survey results which showed a total of 65 responses from the community. A summary of the survey results is shown on slide 10 of the presentation. Additionally, suggested steps for the County to take based on the survey results were discussed.

- More robust drainage program
- Clear debris (drainage and waterways)
- Update infrastructure
- More efficient communication between the County and the public to advise homeowners on preventative measures

3. Community Profile
    a. Provides an overview of current conditions in the County

Jackie mentioned a document that contains population projects for the Economic Development Authority and will share with WSP for the community profile to be updated accordingly.

4. Flood Risk Assessment
    a. Identifies the hazards, summarizes risk, estimates exposure and vulnerability, and prioritizes the hazards for mitigation
5. Capability Assessment
    a. Details existing tools, resources, and staff that can support mitigation project implementation
6. Mitigation Strategy
    a. Summarizes activities for continued compliance with the NFIP; reviews goal setting and resulting goals; describes the mitigation action identification and prioritization process; and presents the mitigation action plan
7. Plan Adoption
    a. Documents plan adoption
    b. Plan must be formally adopted by the Board of Commissioners
8. Plan Implementation and Maintenance
    a. Summarizes the process for monitoring and evaluating the plan, including the FMPC's responsibilities once the plan is adopted
    b. Quarterly review meetings are recommended

Appendix A. Planning Process Documentation

- Documents the planning process, including meeting minutes, attendance records, public outreach efforts, and stakeholder coordination

Appendix B. Mitigation Strategy

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- Reviews mitigation action alternatives within each FEMA mitigation category

Appendix C. References

- Lists data sources and other references

Mitigation Action Plan

David noted that there were 21 actions in the previous FMP.

Based on FMPC feedback:

- Completed: 5
- Deleted: 1
- Carry Forward: 12 (2 revised)

As David reviewed the Mitigation Action Plan with the group, substantial discussion took place in order to revise or approve of the 2024 status of individual projects. The following sections note the status updates that were determined in the meeting by the FMPC.

Existing Actions

Action Item	Project	2024 Status	Status Explanation
1	Update County website incorporating new technology to create interactive data and mapping system that will provide online technical assistance to homeowners, real estate agents and insurance agents. Include access to elevation certificates, flood zones, general flood history, repetitive loss areas, and mitigated properties, etc.	Complete	Most aspects have been completed based on current website updates have been implemented over the past 9 months
13	Develop a Natural Floodplain Functions Plan to protect and or restore endangered species and habitat.	Complete	Plan will be completed in 2024
14	Integrate the FMP into the Emergency Operations Plan, Pre-Disaster Hazard Mitigation Plan, Comprehensive Plan, and Capital Improvement Program.	Complete	Integration into the EOP and HMP has been done. FMP is integrated into the 2024 Comprehensive plan. Capital Improvement Plan integration is ongoing.
15	Implement an outreach campaign to educate residents on flood risks, maps, mitigation activities, stormwater, water quality, environmental protection, and the benefits of natural floodplains.	Complete	There is an existing County Program that addresses this project, that will continue.
16	Develop web-based outreach efforts, including social media.	Complete*	Every year, CEMA does outreach campaigns: dangers of flooding, excessive rainfall, hurricanes, etc. Been done with a variety of web-based efforts such as podcasts, videos, social media, etc.

*Was marked as "Carry Forward" but based on feedback can be considered complete

- Action 2: Carry Forward
- Action 3: Enforce building code is set practice – remove from action
  - **Revise: just include higher regulatory standards language**
- Action 4: Ongoing action that is regularly enforced
- Action 5: Carry Forward
- Action 6: Carry Forward/Revise to capture what's in action 11
- Action 7: FMPC not sure if there is enough natural drainage to consider carrying this forward. FMPC will follow-up.
- Action 8: Carry Forward

- Action 9: Flood insurance is covered on County website – **Carry Forward/Revise**. Leveraging Jeff Brady as promotion of flood insurance at local level – CRS flood insurance advocate
    - Jeff to record number of people he speaks to at each outreach event – County can track how many people he's reached
    - **Revise action: CRS flood insurance advocate to pursue outreach about flood insurance**
- Action 10: Carry forward
- Action 11: Combine with action 6 and add improved water quality
- Action 18: Complete
- Action 21: Carry Forward/Revise
    - Want to evaluate SLR outside of just CIP
    - Evaluate and develop codes and ordinances based on SLR study. Consider other resilience strategies.
    - May include something about subsidence related to documents shared by Ed Morrow.

Potential New Mitigation Actions

David suggested opportunity for increased CRS credit: change substantial damage threshold from 50% to 49%. FMPC is not sure if they are ready to make this change.

Potential New Actions:

- Evaluate Sanitary sewer basins for possible transition to public sewer
- Limit allowable impervious coverage
- Create watershed master plan

Next Steps

WSP Team Acton Items:

- WSP will share draft plan

Chatham County Action Items:

- Post draft plan for public review

Requests for FMPC Input:

- Review draft plan and provide feedback by July 31st

Plan Adoption

The FMP will be adopted by Board of Commissioners. The FMP, RLAA and NFP should be adopted at same time.

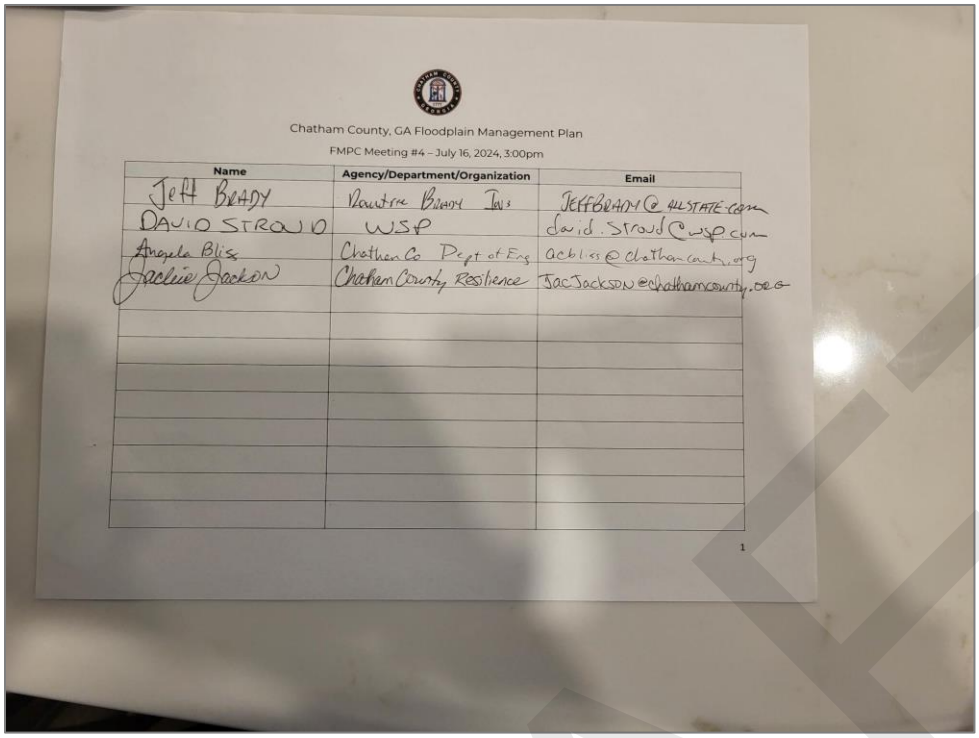
Plan Implementation and Maintenance

FMPC Responsibilities:

- Report quarterly on the status of the plan's implementation and any recommended revisions
- Pursue implementation of mitigation actions
- Monitor funding opportunities
- Ensure continued public involvement
- Integrate the FMP with other planning efforts

The FMP will continue to be updated every five years

4 Chatham County, GA FMP | FMPC Meeting 4



Chatham County, GA Floodplain Management Plan

FMPC Meeting #4 – July 16, 2024, 3:00pm

Name	Agency/Department/Organization	Email
Jeff Brady	Dawtrie Brady Inc	JEFFBRADY@ALLSTATE.COM
DAVID STROUD	WSP	david.stroud@wsp.com
Angela Bliss	Chatham Co Dept of Eng	acbliss@chathamcounty.org
Jaclie Jackson	Chatham County Resilience	JacJackson@chathamcounty.org

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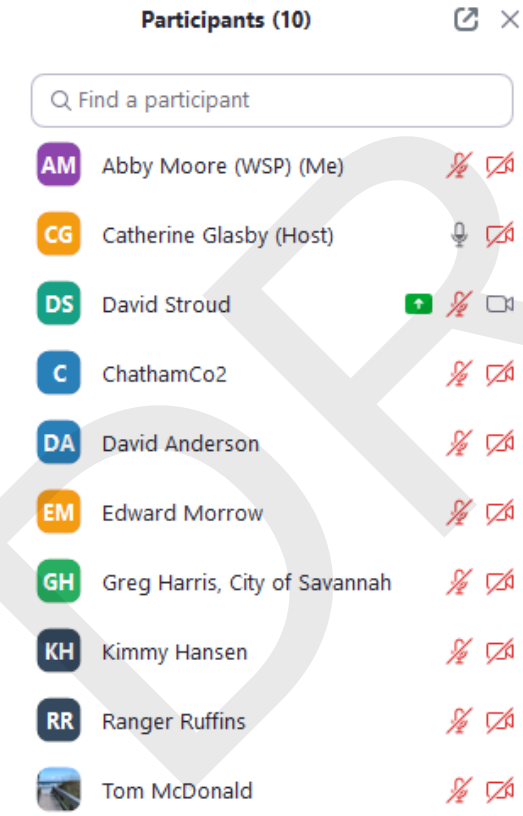

Planning Step 2: Involve the Public

Table A.2: Public Meeting Dates

Meeting Type	Meeting Topic	Meeting Date	Meeting Locations
Public Meeting #1	3) Introduction to DMA, CRS and the planning process 4) Introduction to hazard identification	November 21, 2023 5:00 p.m.	Chatham County Metropolitan Planning Commission 110 E. State St.
Public Meeting #2	3) Review "Draft" Floodplain Management Plan 4) Solicit comments and feedback from the public	July 16, 2024 5:30 – 6:30 p.m.	124 Bull St. & Zoom

PUBLIC MEETING AGENDAS, MINUTES, SIGN-IN SHEETS, AND ADVERTISEMENTS

Public Meeting 1: November 21, 2023

Chatham County GEORGIA

Chatham County, GA Floodplain Management Plan (FMP)
Public Meeting #1
Tuesday, November 21, 2023, 5:00 p.m.
Chatham County Metropolitan Planning Commission Mendonsa Hearing Room

David Stroud from WSP, the County's consultants, was in attendance to facilitate the meeting according to the following agenda:

- Introductions
- Community Rating System (CRS) Overview
- Why Plan?
- Project Overview
  - Disaster Mitigation Act (DMA) Requirements
  - CRS Activity 510 Requirements
- FMP Planning Process
  - Stakeholder Coordination
  - Public Outreach
  - Risk Assessment Update
- Project Schedule
- Next Steps

CRS Program Overview

The CRS Program, in which Chatham County participates, is a voluntary, point-based program that provides a 5% premium discount to flood insurance policyholders for every 500 points that the County earns. Currently, the County is a Class 5, which provides a 25% discount to policyholders in the SFHA. The annual savings to all policyholders in the community is $1.7M, with an average annual per policy discount of $224 in the SFHA. If the County has enough credit points through this Activity 510 Floodplain Management Plan and additional CRS activities of credit, the County could lower its classification to 4 and 30% reduction in flood insurance premiums. This would raise the average discount for policies in the SFHA to $269.

Trends in Disasters

David discussed that there have been more disaster declarations in recent years as well as increased cost for disaster response and recovery, in part due to population growth and development in hazardous areas which has increased exposure. So far, in 2023 there have been 25 disaster events with losses exceeding $1 billion. One of the costliest disasters across the US was a severe storm that impacted portions of Georgia.

David explained that we must plan for mitigation because the costs of response and recovery are growing, many events are predictable or repetitive, loss reduction works, and there are funds available to help. The average benefit-cost ratio for a federally funded mitigation project is 6:1.

DMA Planning Requirements

David reviewed the intent of DMA planning and explained the basis of DMA planning requirements in the Code of Federal Regulations, which establish the four-phase planning process. This process dovetails with the CRS Program's 10-Step planning process. The completed plan will meet all the requirements of both programs.

CRS Requirements

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wsp

Activity 510 FMP 10-Step Process

The purpose of a floodplain management plan is to reduce potential losses from future disasters. David reviewed the FMP planning process noting that the planning requirements of the DMA outline four ordered phases: 1) organize resources, 2) risk assessment, 3) develop a mitigation plan, and 4) adoption and implementation. These phases outline a ten-step planning process reflected in both DMA and CRS planning requirements. David reviewed the 10-Step planning process, which is as follows:

1. Organize to Prepare the Plan
2. Involve the Public
3. Coordinate
4. Assess the Hazard
5. Assess the Problem
6. Set Goals
7. Review Possible Activities
8. Draft an Action Plan
9. Adopt the Plan
10. Implement, Evaluate, and Revise the Plan

Phase 1: Organize Resources

Step 1 – Organize to Prepare the Plan

In this step the County convened the Floodplain Management Plan Committee (FMPC) which includes local staff, citizens, and stakeholders. Additionally, the County can organize existing resources and inventory what tools, data, and services are available to create the plan.

Step 2 – Plan for Public Involvement

Prepare and develop ways to engage the public in the planning process. This could include integrating the public on the planning team, posting information on websites, developing press releases, and implementing surveys and questionnaires. The County can receive 5 points for every additional public information activity implemented (up to 30 points).

The WSP planning team has developed a public survey that will help to better understand the community's experiences and concerns with flooding. The survey can be accessed at the link **HERE**.

Step 3 – Coordinate with Other Departments and Agencies

The FMPC should seek the support of other departments for assistance with plan development. These agencies can help connect with the public, provide critical information and data, and provide important insight that enriches the FMP. Please see the presentation for a list of potential departments and agencies.

Phase 2: Risk Assessment

Step 4 – Identify the Hazards

Hazard identification explores what types of events may occur within the County. Hazards are profiled based on their extent, past occurrences, seasonal patterns, magnitude, and other factors.

David reviewed the hazards included in the exiting FMP: Riverine Flooding, Stormwater Flooding, Dam Failure, Erosion, Sea Level Rise, and Climate Change. These hazards will likely be assessed in the updated plan.

Step 5 – Assess the Problem

The risk assessment considers what assets will be affected as well as the location a hazard can occur, previous occurrences, potential impacts, probability, and extent of the evaluated hazards. This step also considers the County's existing local capability to implement mitigation projects.

David briefly discussed the range of data and tools used to evaluate assets and assess risk including building footprint and parcel data, and FEMA's Hazus loss estimation tool.

Phase 3: Develop a Mitigation Plan

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Step 6 – Set Planning Goals
The goals from the current plan will be evaluated and the FMPC will work with the public to determine if any changes need to be made or if additional goals need to be added. These goals will guide the creation and implementation of the Plan's mitigation strategy.

Step 7 – Review Possible Activities
The existing mitigation actions will be reviewed and new mitigation activities that reflect the goals and capability of the County will be added.

Step 8 – Draft Action Plan
With public input, the FMPC along with County staff will identify and prioritize actions and determine which department is responsible for particular mitigation actions, when the actions will be completed, and how they will be financed.

Phase 4: Adoption and Implementation

Step 9 – Adopt the Plan
At this step, the plan will be adopted by County Council. The public will have the opportunity to review and provide input that will be incorporated into the plan before adoption.

Step 10 – Implement, Evaluate and Revise the Plan
Plan implementation requires several steps including assigning an overall project manager and integrating actions into staff work plans. Overtime, the FMPC should monitor changes in vulnerability, report on progress, publicize successes, and revise the plan as necessary. The DMA and CRS program require updates every 5 years. After the plan is adopted the FMPC can maximize CRS credit by meeting quarterly to review plan progress.

Project Schedule
David briefly reviewed the project schedule which aims for project completion and adoption by June. He also noted that this schedule can be adjusted as needed.

Next Steps
David described the various ways that the public can be involved in the planning process.

Chatham County

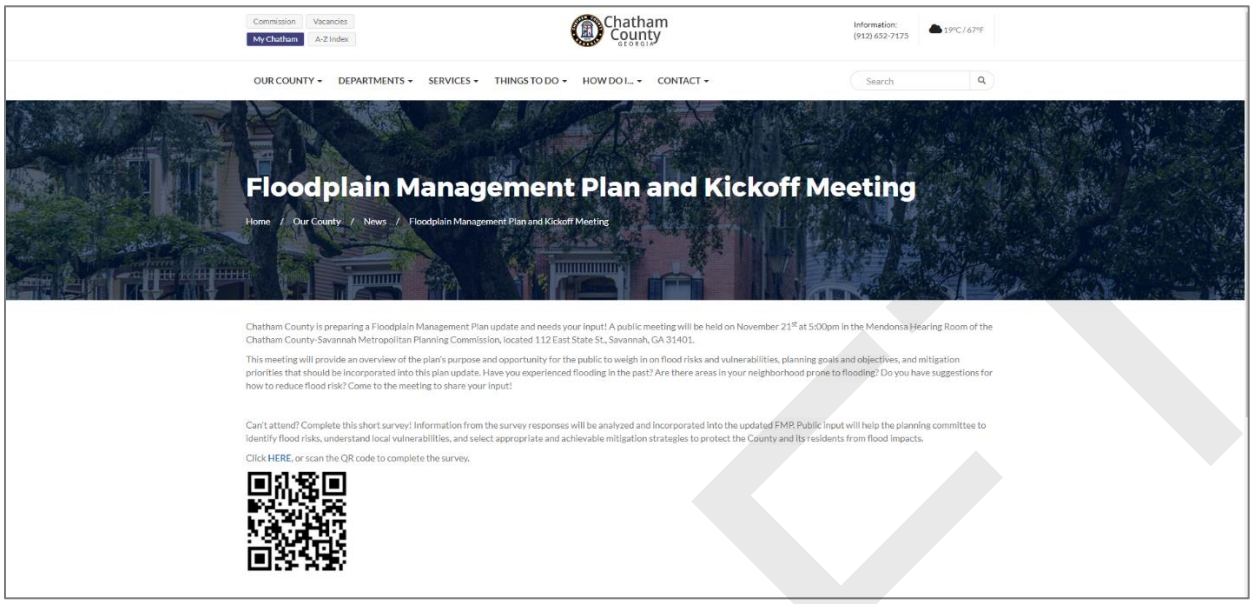
GEORGIA

Chatham County, GA Floodplain Management Plan Update

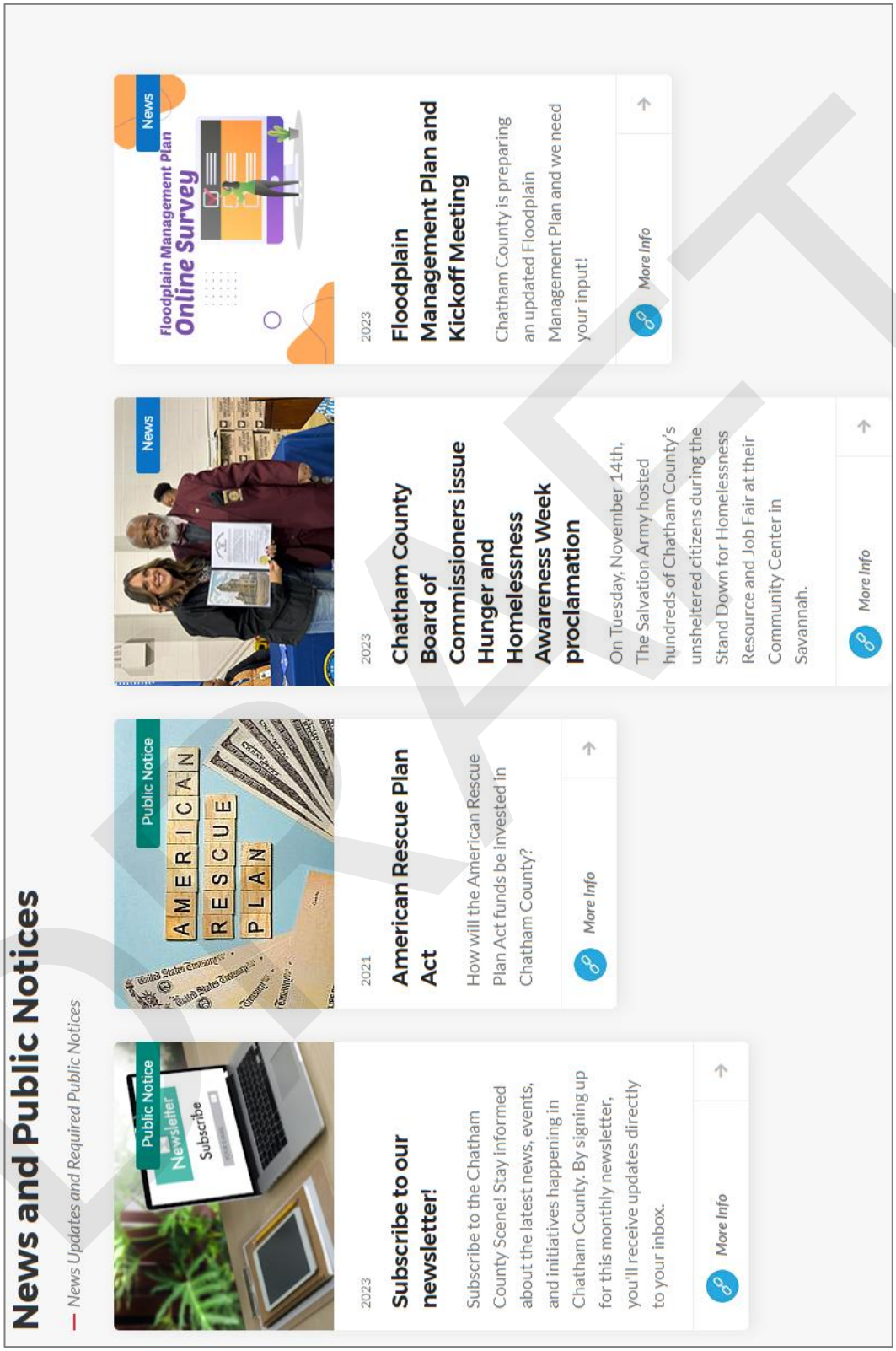
Floodplain Management Planning Public Meeting #1 – November 21, 2023, 5:00pm

Name	Agency/Department/Organization	Email
DAVID STREND	WSP	david.strend@wsp.com
Dellie Bennett	Citizen	mburdsall@comcast.net
Sharon Black	CITIZEN	SBLACK1503@VERIZON.NET
Michael Blakely	Chatham County	mblakely@chathamcounty.org
Chastity Kelly	Chatham County MPC	
Edward Morrow		morrowe@thempc.org
Anna B. Mcquarrie	MPC / CORE MPO	mcquarrie a@thempc.org

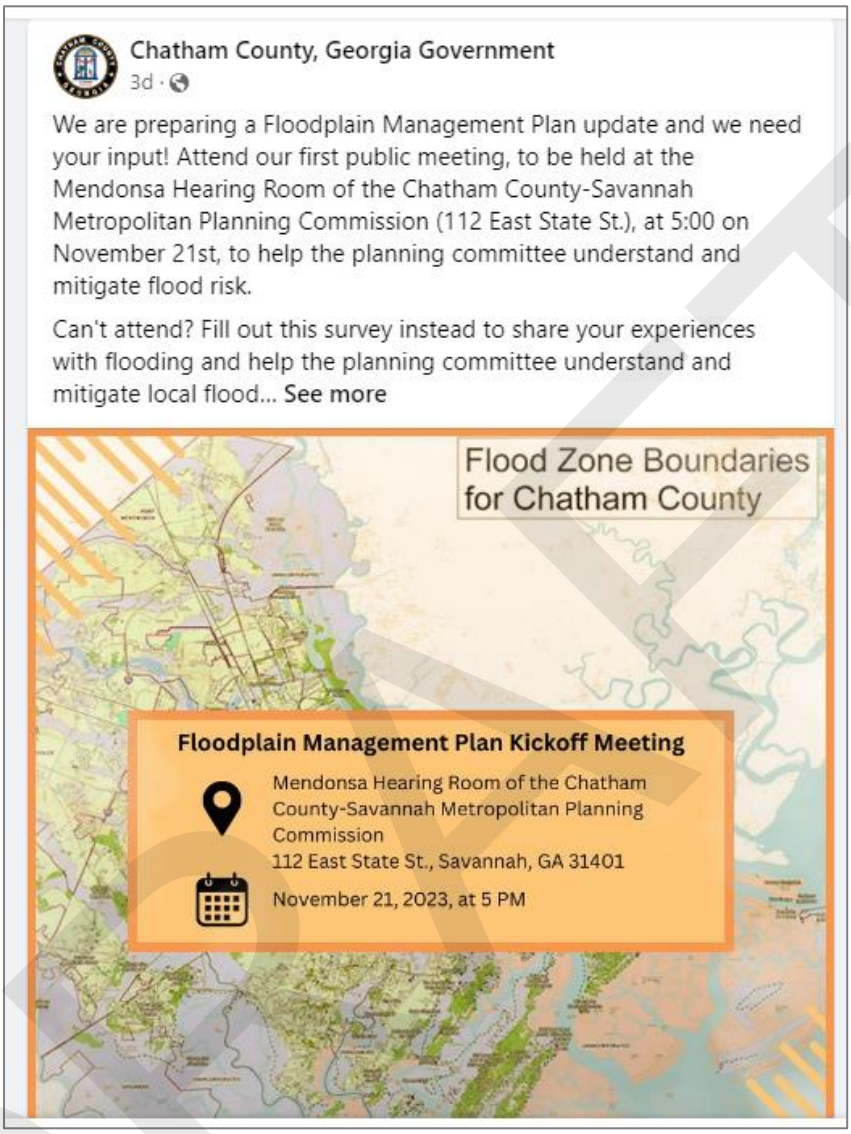
Public Meeting 1 Announcement on Chatham County Website



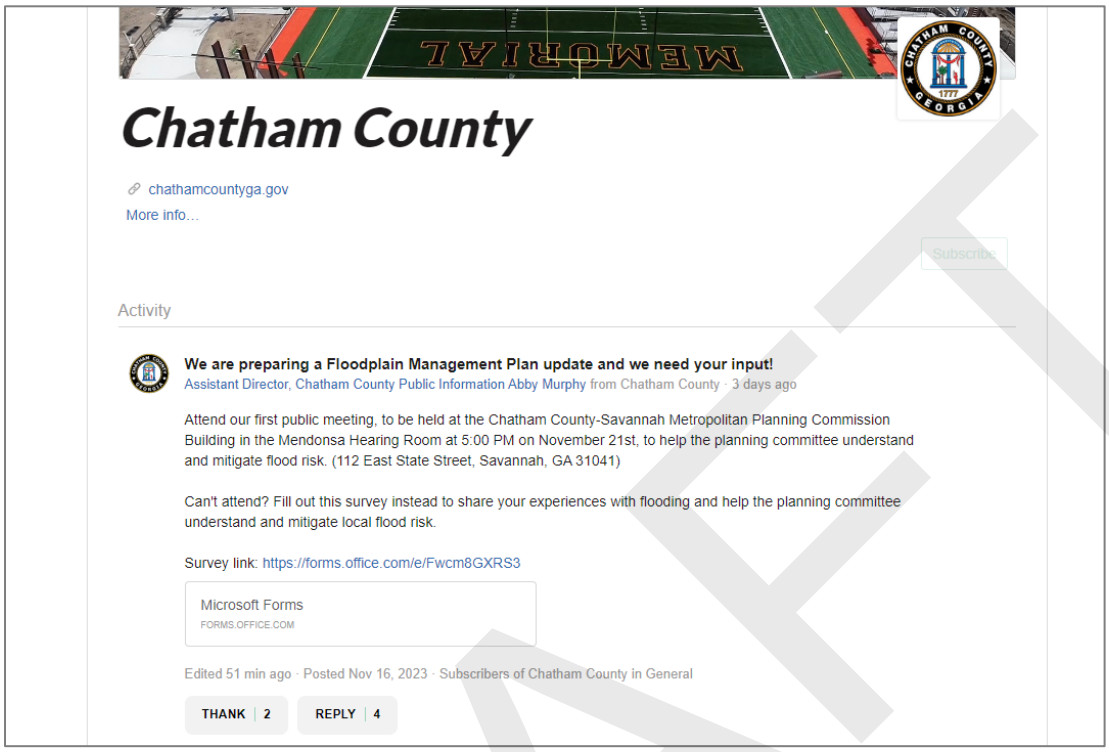
Public Meeting 1 Announcement on County Website



Public Meeting 1 Announcement on Facebook



Public Meeting 1 Announcement in Nextdoor



Public Meeting 2: July 16, 2024

Chatham County, GA Floodplain Management Plan (FMP)
Public Meeting #2
Tuesday, July 16, 2024, 5:30 p.m.
124 Bull Street Savannah, GA 31401 & Zoom

David Stroud, Ranger Ruffins, and Kimmy Hansen from WSP, the County's consultants, were in attendance to facilitate the meeting according to the following agenda:

- Introductions
- Planning Process Update
- Review the Draft FMP
  - Organization of the Plan
- Key Plan Components
- Next Steps
  - Draft Plan Comments
  - Plan Adoption
  - Implementation & Maintenance

Planning Process Update

Where we are in the Planning Process

At the start of the presentation, David and Angela clarified that this FMP is specifically for unincorporated Chatham County.

David reviewed where we are in the planning process noting that WSP is currently on step 8 – draft an action plan. The focus of this public meeting is to review the organization of the draft plan and the status of all mitigation actions that were revised earlier by the FMPC.

Review the Draft FMP

Organization of the Plan

The eight components of the draft FMP are as follows:

1. Introduction
   a. Provides context and justification for the plan, including regulatory framework, and FEMA and CRS guidance documents
2. Planning Process
   a. Explains the steps followed to prepare the plan
   b. Documents the process, including FMPC participation, public outreach, and stakeholder coordination
3. Community Profile
   a. Provides an overview of current conditions in the County
4. Flood Risk Assessment
   a. Identifies the hazards, summarizes risk, estimates exposure and vulnerability, and prioritizes the hazards for mitigation

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5. Capability Assessment
    a. Details existing tools, resources, and staff that can support mitigation project implementation
6. Mitigation Strategy
    a. Summarizes activities for continued compliance with the NFIP; reviews goal setting and resulting goals; describes the mitigation action identification and prioritization process; and presents the mitigation action plan
7. Plan Adoption
    a. Documents plan adoption
    b. Plan must be formally adopted by the Board of Commissioners
8. Plan Implementation and Maintenance
    a. Summarizes the process for monitoring and evaluating the plan, including the FMPC's responsibilities once the plan is adopted
    b. Quarterly review meetings are recommended

Appendix A. Planning Process Documentation

- Documents the planning process, including meeting minutes, attendance records, public outreach efforts, and stakeholder coordination

Appendix B. Mitigation Strategy

- Reviews mitigation action alternatives within each FEMA mitigation category

Appendix C. References

- Lists data sources and other references

Key Plan Components

FMPC Meetings & Public Meetings

There were four FMPC meetings starting in November of 2023 and ending on July 16, 2024. Additionally, there have been two public meetings, one on November 21, 2023, and this one occurred on July 16, 2024.

Public Survey

David reviewed the results of the public survey that was open from November 2023 to May 2024. A total of 65 responses were collected during that time from the community.

Survey Results:

- Around 58% of respondents have experienced flooding
- Over 90% are concerned about flooding
- Around 17% of respondents don't know if they're in the floodplain
- Over 76% of respondents have flood insurance even though less than half reported that they're in the floodplain
- Almost half of the respondents without insurance, indicated that their homes were otherwise protected or that insurance is too expensive
- Over 60% have not taken actions to protect their home

2 Chatham County, GA FMP | Public Meeting 2

David suggested steps for the County to take based on the public survey results such as establishing a more robust drainage program, clear debris from drains and waterways, update infrastructure, and create better communication between the County and the public to advise homeowners on preventative measures.

Priority Risk Index Results

David briefly reviewed the methodology and Priority Risk Index results for each hazard that was listed in the Risk Assessment section of the FMP. It was noted that Hurricane & Tropical Storm and Coastal & Inland flooding have the highest scores.

High	Moderate	Low
≥3.0	2.0-2.9	<2.0

Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Climate Change & Sea Level Rise	Highly Likely	Limited	Moderate	More than 24 hours	More than 1 week	2.9
Coastal & Inland Flooding	Likely	Critical	Large	6 to 12 hours	Less than 1 week	3.2
Coastal & Streambank Erosion	Likely	Limited	Small	More than 24 hours	More than 1 week	2.4
Dam Failure	Unlikely	Minor	Negligible	Less than 6 hours	Less than 24 hours	1.4
Hurricane & Tropical Storm	Highly Likely	Critical	Large	More than 24 hours	Less than 1 week	3.3
Stormwater & Localized Flooding	Highly Likely	Limited	Small	6 to 12 hours	Less than 24 hours	2.7

Plan Goals

The four goals for the updated plan were reviewed. David noted that changes to the plan's goals reflected responses provided in the community survey, feedback from the FMPC, and tie well with the developed mitigation strategy.

- **Goal 1:** Reduce vulnerability of people, property, critical facilities and infrastructure to flood hazards to protect the health, safety and welfare of residents and visitors.
- **Goal 2:** Reduce damage to development through flood resilient strategies and measures.
- **Goal 3:** Protect natural resources by employing watershed-based approaches that balance environmental, economic, and engineering considerations.
- **Goal 4:** Encourage property owners, through education and outreach measures, to protect their homes and businesses from flood damage.

Mitigation Action Plan

There were a total of 21 actions in the previous FMP. David reviewed the 12 mitigation projects that are being carried forward to the next FMP update. The actions cover all six FEMA mitigation categories and address all identified flood hazards.

Discussion and Next Steps

Draft Plan Comments

The public can review and provide feedback on the draft plan. Comments should be submitted to David Stroud at david.stroud@wsp.com and Angela Bliss at acbliss@chathamcounty.org by July 31st.

Plan Adoption

Plan will be adopted by County Commission with a target date of early September 2024.

3 Chatham County, GA FMP | Public Meeting 2

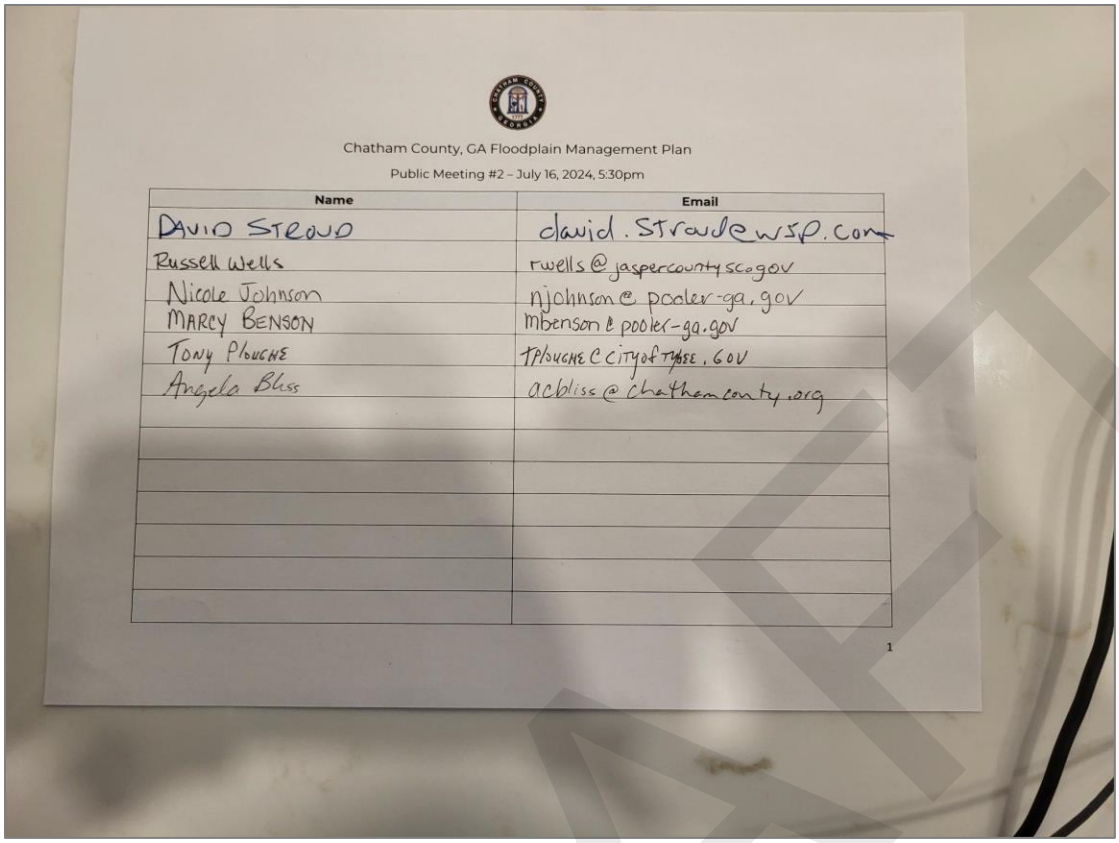
Plan Implementation & Maintenance

David briefly discussed that the FMPC will convene quarterly to review the status of the plan's implementation and make any revisions, pursue the implementation of mitigation actions, monitor funding opportunities, ensure continued public involvement, and integrate the FMP with any additional planning effort. The plan will be updated every five years.

Discussion

One resident expressed concern with new townhomes potentially being built on wetlands near Gerard Avenue. This situation has occurred in the past causing the resident to notice extensive drainage issues in the neighborhood forcing many of the existing homeowners to purchase flood insurance.

Thomas Beason asked if there were any plans being developed to help understand the elevation of major primary and secondary drainage canals as there are other communities currently working on this. David responded saying that this would be a beneficial project but would be costly. David mentioned using LiDAR to look at depth elevation, but Thomas noted that LiDAR only works for areas with clear water which is not adequate for Chatham County.



Chatham County, GA Floodplain Management Plan

Public Meeting #2 – July 16, 2024, 5:30pm

Name	Email
DAVID STROUD	david.Straudewsp.com
Russell Wells	rwells@jaspercountysc.gov
Nicole Johnson	njohnson@pooler-ga.gov
MARCY BENSON	mbenson@pooler-ga.gov
Tony Plouche	TPlouche@cityofthsse.gov
Angela Bliss	acbliss@chathamcounty.org

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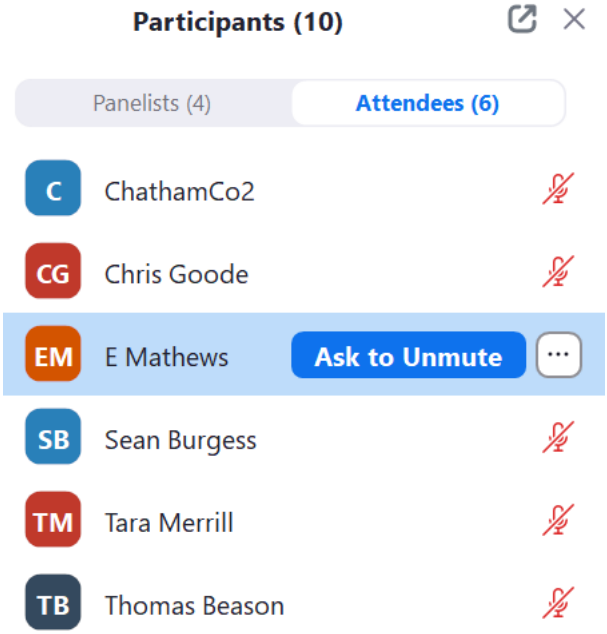
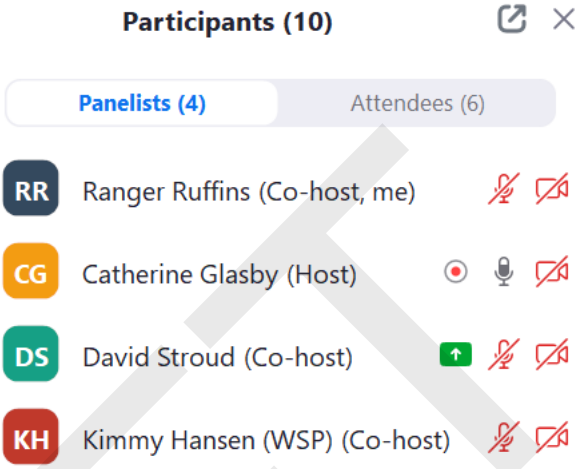
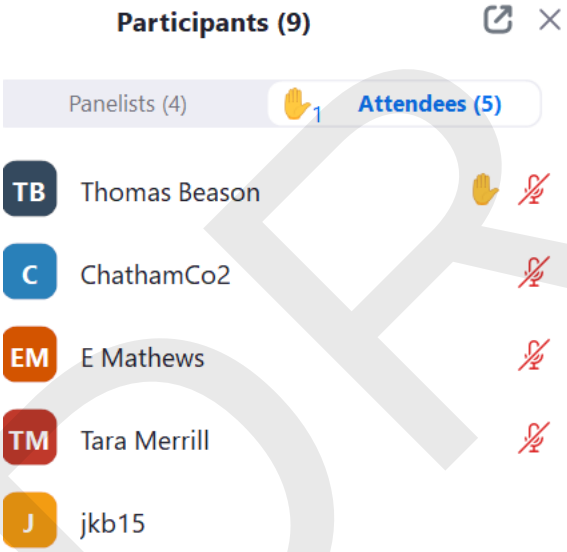
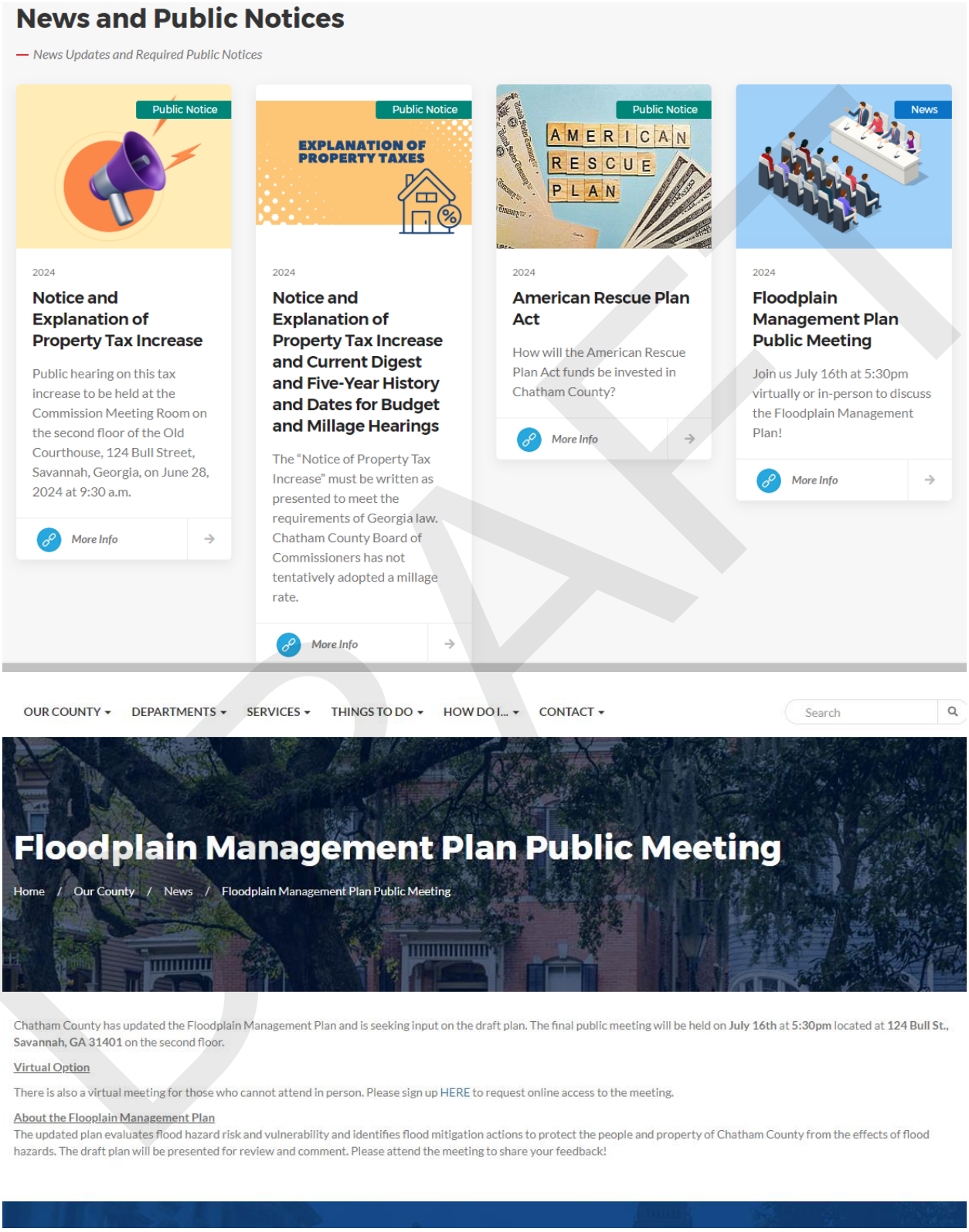

Participants (10)
Panelists (4)
Attendees (6)
C ChathamCo2
CG Chris Goode
EM E Mathews
Ask to Unmute
SB Sean Burgess
TM Tara Merrill
TB Thomas Beason


Participants (10)
Panelists (4)
Attendees (6)
RR Ranger Ruffins (Co-host, me)
CG Catherine Glasby (Host)
DS David Stroud (Co-host)
KH Kimmy Hansen (WSP) (Co-host)


Participants (9)
Panelists (4)
Attendees (5)
TB Thomas Beason
C ChathamCo2
EM E Mathews
TM Tara Merrill
J jkb15

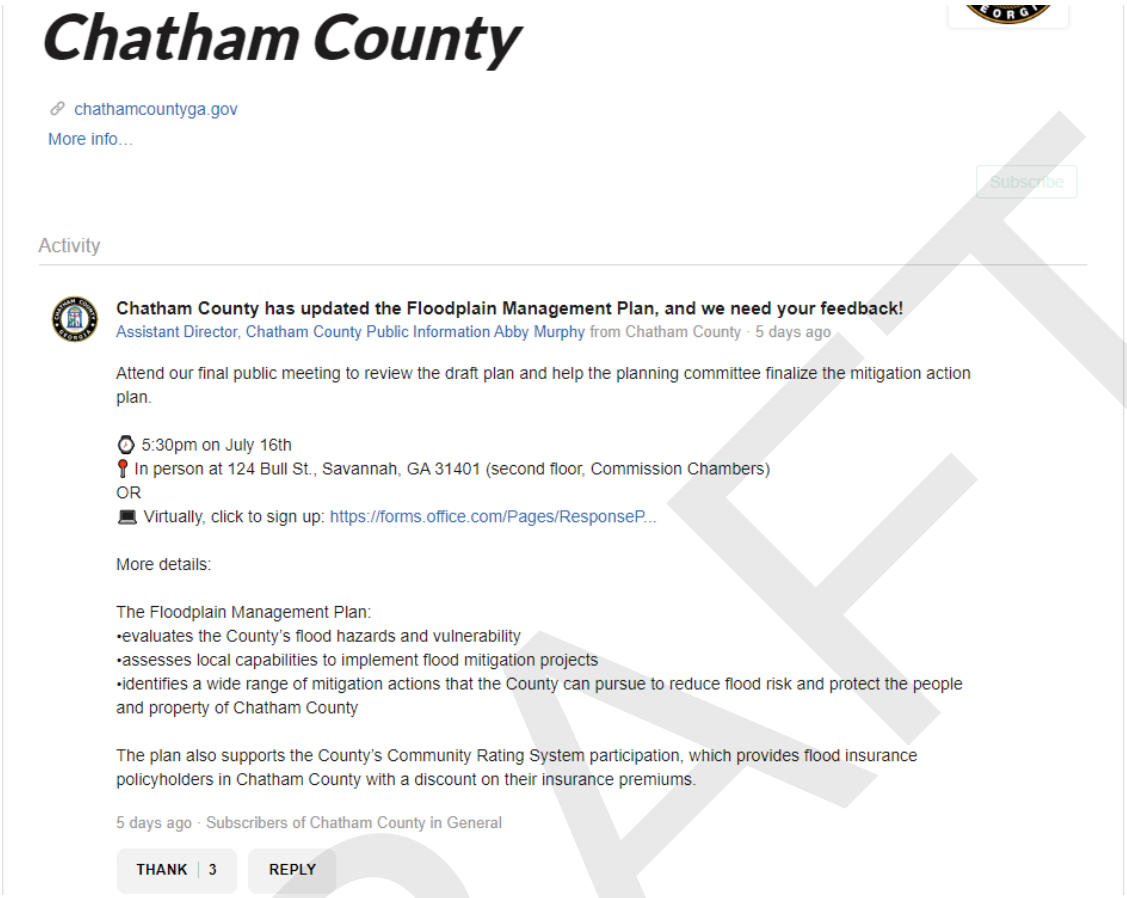
Public Meeting 2 Announcement on County website



Public Meeting 2 Announcement on County Facebook Page

Public Meeting 2 Announcement on County Instagram

Public Meeting 2 Announcement on County Nextdoor



Chatham County

chathamcountyga.gov

More info...

Subscribe

Activity

Chatham County has updated the Floodplain Management Plan, and we need your feedback!

Assistant Director, Chatham County Public Information Abby Murphy from Chatham County · 5 days ago

Attend our final public meeting to review the draft plan and help the planning committee finalize the mitigation action plan.

5:30pm on July 16th
In person at 124 Bull St., Savannah, GA 31401 (second floor, Commission Chambers)
OR
Virtually, click to sign up: https://forms.office.com/Pages/ResponseP...

More details:

The Floodplain Management Plan:
•evaluates the County's flood hazards and vulnerability
•assesses local capabilities to implement flood mitigation projects
•identifies a wide range of mitigation actions that the County can pursue to reduce flood risk and protect the people and property of Chatham County

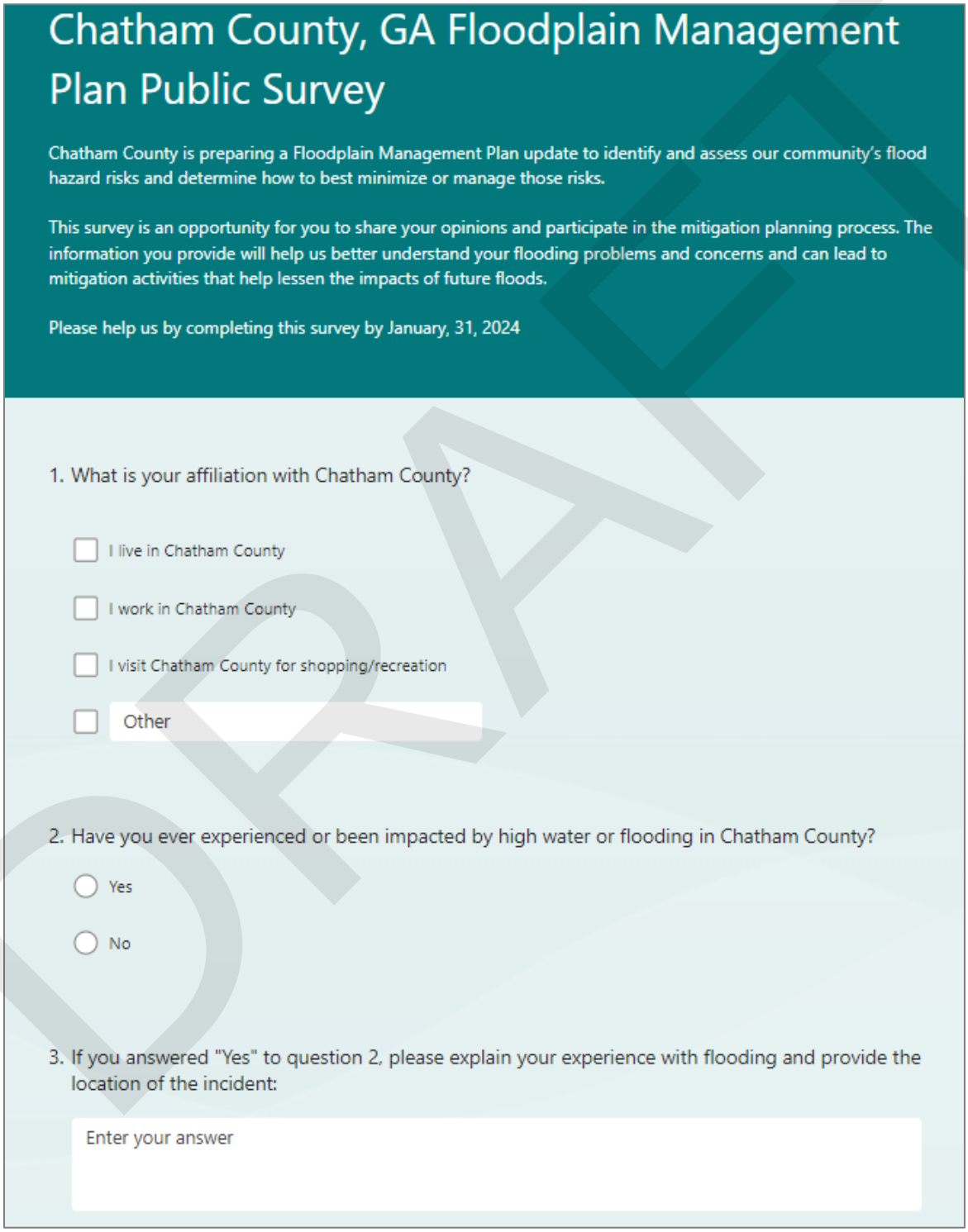
The plan also supports the County's Community Rating System participation, which provides flood insurance policyholders in Chatham County with a discount on their insurance premiums.

5 days ago · Subscribers of Chatham County in General

THANK | 3 REPLY

PUBLIC SURVEY

Chatham County distributed a public survey that requested public input into the Floodplain Management Plan planning process and the identification of mitigation activities that could lessen the risk and impact of future flood hazard events. The survey was provided on the County's website and distributed at the first public meeting.



Chatham County, GA Floodplain Management Plan Public Survey

Chatham County is preparing a Floodplain Management Plan update to identify and assess our community's flood hazard risks and determine how to best minimize or manage those risks.

This survey is an opportunity for you to share your opinions and participate in the mitigation planning process. The information you provide will help us better understand your flooding problems and concerns and can lead to mitigation activities that help lessen the impacts of future floods.

Please help us by completing this survey by January, 31, 2024

1. What is your affiliation with Chatham County?

- [ ] I live in Chatham County
- [ ] I work in Chatham County
- [ ] I visit Chatham County for shopping/recreation
- [ ] Other

2. Have you ever experienced or been impacted by high water or flooding in Chatham County?

- ( ) Yes
- ( ) No

3. If you answered "Yes" to question 2, please explain your experience with flooding and provide the location of the incident:

Enter your answer

4. How concerned are you about the possibility of your community being impacted by flooding?

- ○ Very concerned
- ○ Somewhat concerned
- ○ Not concerned

5. Is your home located in a Federal Emergency Management Agency (FEMA) mapped floodplain?

- ○ Yes
- ○ No
- ○ I don't know

6. Do you have flood insurance for your home and/or personal property?

- ○ Yes
- ○ No
- ○ I don't know

7. If you do NOT have flood insurance, what is the reason?

- ○ It's too expensive
- ○ I never really considered it
- ○ I don't need it because my home is elevated or otherwise protected
- ○ Other

8. Have you taken any actions to protect your home from flood damage?

- ◯ Yes
- ◯ No

9. If you answered "Yes" to question 8, what actions have you implemented?

Enter your answer

10. Do you know what government agency/office to contact regarding the risks associated with flooding?

- ◯ Yes
- ◯ No

11. What is the best way for you to receive information about how to make your home or neighborhood more resistant to flood damage? Please check all that apply.

- [ ] Newspaper
- [ ] TV Ads/Programming
- [ ] Radio Ads/Programming
- [ ] Public library
- [ ] Public workshop/meetings
- [ ] School meetings
- [ ] Mail
- [ ] Email
- [ ] Text message
- [ ] County website
- [ ] County social media
- [ ] Other

12. What are some steps the County could take to reduce the risk of flooding in your neighborhood?

Enter your answer

13. Please provide your email below in case Chatham County staff have further questions to understand your flood concerns (optional)

Enter your answer

There 65 responses to the survey, the results of which are summarized below.

Q1. What is your affiliation with Chatham County?

Answer Choices	Number Responding
I live in Chatham County	63
I work in Chatham County	14
I visit Chatham County for shopping/recreation	3
Other	0
Total	**80**

Q2: Have you ever experienced or been impacted by high water or flooding in Chatham County?

Answer Choices	Number Responding
Yes	38
No	27
Total	**65**

Q3: If you answered "Yes" to question 2, please explain your experience with flooding and provide the location of the incident:

- There were 38 responses. Respondents noted experiences with Hurricane Irma and Matthew. Others mentioned flooding that occurred in parts of downtown, localized flooding streets, and around peoples homes and neighborhoods after heavy rain.

Q4: How concerned are you about the possibility of your community being impacted by flooding?

Answer Choices	Number Responding
Very concerned	29
Somewhat concerned	30
No concerned	6
Total	**65**

Q5: Is your home located in a Federal Emergency Management Agency (FEMA) mapped floodplain?

Answer Choices	Number Responding
Yes	31
No	23
I don't know	11
Total	**65**

Q6: Do you have flood insurance for your home and/or personal property?

Answer Choices	Number Responding
Yes	50
No	11
I don't know	4
Total	**65**

Q7: If you do NOT have flood insurance, what is the reason?

Answer Choices	Number Responding
It's too expensive	3
I never really considered it	1
I don't need it because my home elevated or otherwise protected	5

Other	7
Total	**16**

Q8: Have you taken any action to protect your home from flood damage?

Answer Choices	Number Responding
Yes	22
No	41
Total	**63**

Q9: If you answered "Yes" to question 8, what actions have you implemented?
There were 23 responses. Some of the common responses included sump pumps, clean gutters, sand bags, flood vents, French drains.

Q10: Do you know what government agency/office to contact regarding the risks associated with flooding?

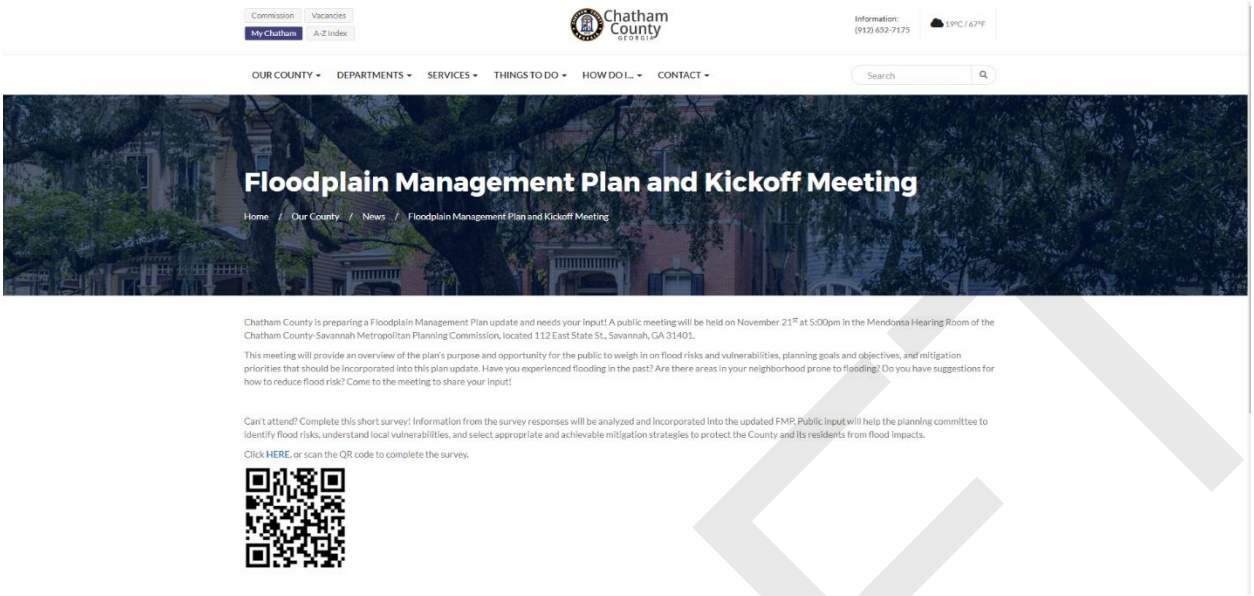
Answer Choices	Number Responding
Yes	33
No	31
Total	**64**

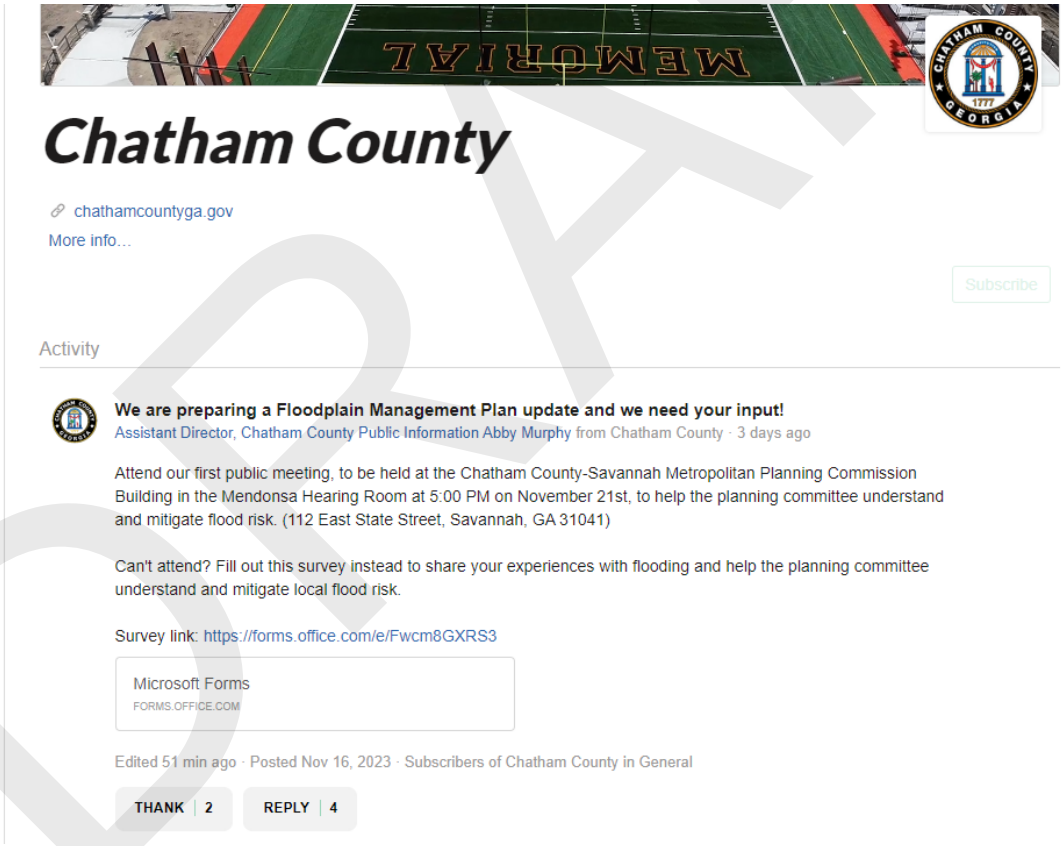
Q11: What is the best way for you to receive information about how to make your home or neighborhood more resistant to flood damage? Please check all that apply.

Answer Choices	Number Responding
Newspaper	10
TV Ads/Programming	15
Radio Ads/Programming	7
Public library	3
Public workshop/meetings	22
School meetings	0
Mail	34
Email	45
Text message	26
County website	26
County social media	21
Other	4
Total	**213**

Q12: What are some steps the County could take to reduce the risk of flooding in your neighborhood?
There 44 responses. Some common responses include more robust drainage program, clear debris (drainage and waterways), update infrastructure, and more efficient communication between the County and the public to advise homeowners on preventative measures

Public Survey posted on County's website and Nextdoor





Planning Step 3: Coordinate

This planning step credits the incorporation of other plans and other agencies' efforts into the development of the Floodplain Management Plan. Other agencies and organizations must be contacted to determine if they have studies, plans and information pertinent to the Floodplain Management Plan, to determine if their programs or initiatives may affect the community's program, and to see if they could support the community's efforts. A sample coordination letter is provided below. A copy of all coordination letters can be provided upon request by the Chatham County Department of Engineering.

CHATHAM COUNTY DEPARTMENT OF ENGINEERING

124 Bull Street, Room 430
P.O. Box 8161
Savannah, Georgia 31412-8161
FAX 912-652-7818
912-652-7800

Suzanne V. Cooler, P.E.
County Engineer

Nathaniel Panther, P.E.
Assistant County Engineer

July 8, 2024

RE: Chatham County Floodplain Management Plan (FMP) Update

Dear Stakeholder,

Chatham County is updating the 2018 Floodplain Management Plan (FMP), and we are seeking your input in the planning process. The purpose of the FMP is to address flood hazard risks and vulnerabilities and identify achievable mitigation actions to make our community safer and more resilient to flooding. This planning process incorporates the four phases of the Disaster Mitigation Act (DMA) of 2000 as well as the 10 steps of Activity 510 Floodplain Management Planning of the National Flood Insurance Program's (NFIP) Community Rating System (CRS) Program. Participation in the NFIP's CRS Program reduces the cost of flood insurance premiums for residents and businesses in Chatham County.

Your assistance is needed to coordinate additional information regarding flood risks and vulnerability issues within the Chatham County. Information, studies, etc. that may supplement the work of the established Floodplain Management Planning Committee (FMPC) would be welcomed. Additionally, we invite your input on the draft Hazard Identification & Risk Assessment (HIRA), which can be found at the link **HERE**. The full plan will be available for review and comment on the County's website once it is completed.

We encourage you to attend the final hybrid (in person and virtual option) public meeting for the FMP planning process on **Tuesday, July 16th at 5:30 PM**. This meeting will provide an overview of the planning process and the draft FMP plan. The meeting will be held at **124 Bull St., Savannah, GA 31401 (second floor)** or sign up **HERE** to request online access.

If you have any questions, would like to submit data or information for the FMPC's consideration, or would like to receive a notice about opportunities to attend future planning meetings or review the draft plan, please contact the County's planning consultant for this project, David Stroud with WSP, at david.stroud@wsp.com.

We thank you for your support of this important FMP planning process.

Regards,

Dr. Angela C. Bliss, CFM
Floodplain Administrator / CRS Program Manager
Chatham County Department of Engineering
124 Bull Street, Room 430
Savannah, Georgia 31401
Office: (912) 652-7833

Table A.3: FMPC Documentation Request List

First Name		Last Name	Organization/Position	Email
CHATHAM COUNTY, GA FLOODPLAIN MANAGMENT PLAN LIST OF STAKEHOLDERS				
Educational Institutions				
1	Paula	Wallace	Savannah College of Art & Design	communications@scad.edu
2	Kenneth	Sajwan	Savannah State University	sajwank@savannahstate.edu
3	Wei	Tu	Georgia Southern University	wtu@georgiasouthern.edu
4	Tellsha	Beatty	Armstrong State University	tbeatty@georgiasouthern.edu
Neighboring Communities				
5	Clint	Hodges	Effingham County, Emergency Management	CHodges@EffinghamCounty.org
6	Freddy	Howell	Bryan County, Emergency Services	fhowell@bryan-county.org
7	Robert	Dodd	Liberty County, Emergency Management Agency Director	robert.dodd@libertycountyga.com
8	Lt. Col. Neil	Baxley	Beaufort County, SC Emergency Management	neilb@bcgov.net
9	Denise	Sullivan	City of Bloomingdale, GA CRS Coordinator	dsullivan@bloomingdale-ga.gov
10	Nicole	Johnson	City of Pooler, GA Director of Planning and Development	njohnson@pooler-ga.gov
11	Jason	Stewart	City of Port Wentworth, GA Director of Development	jstewart@portwentworthga.gov
12	Lisa	Schaaf	City of Tybee Planning and Zoning Manager	lschaaf@cityoftybee.org
13	Russell	Wells	Jasper County, SC Emergency Services Director	emergencymanagement@jaspercountysc.gov
Federal Government				
14	Susan	Wilson	FEMA Region IV, Chief, Floodplain Management & Insurance Branch	susan.wilson@fema.dhs.gov
15	Janice	Mitchell	FEMA Region IV, Mitigation Division	janice.mitchell@fema.dhs.gov
16	Sue	Hopfensperger	ISO/CRS Specialist	shopfensperger@iso.com

	First Name	Last Name	Organization/Position	Email
17	Vic	Engel	USGS SAWSC Center Director	vengel@usgs.gov
18	Brian	Haines	NOAA - National Weather Service	nws.charlestonsc@noaa.gov
19	Tom	Charles	U.S. Army Corps of Engineers Savannah District, Regulatory Division	cesas-rd@usace.army.mil
			State Government	
20	Kristen	Higgs	GEMA/HS Area Eight Coordinator	kristen.higgs@gema.ga.gov
21	Shelby	Meyers	GEMA Hazard Mitigation Specialist	shelby.meyers@gema.ga.gov
22	Stephen	Clark	State Hazard Mitigation Officer	stephen.clark@gema.ga.gov
23	Jennifer	Kline	GA DNR Coastal Resources Division	jennifer.kline@dnr.ga.gov
			Business Community & Non-Profits Organizations	
24	Katie	Baratone Zwerk	American Red Cross	Katie.Zwerk@redcross.org
25	Marsha	Fogarty	WTOC News	marsha.fogarty@wtoc.com
26	Laura	Walker	Savannah Water Supply - I & D WATER	lwalker@savannahga.gov
27	Tina	Tyus-Shaw	WSAV 3: Anchor/Reporter	ttyus@wsav.com
28	Katherine	Moore	The GA Conservancy – Sustainable Growth Program Manager	kmoore@gaconservancy.org
29	Zoe	Rinker	Savannah Tree Foundation, Executive Director	info@savannahtree.org
30	Karen	Grainey	Sierra Club – Coastal Group	karengrainey@bellsouth.net

APPENDIX B MITIGATION STRATEGY

B.1 ALTERNATIVE MITIGATION MEASURES

As part of the process of developing the mitigation action plan found in Section 6.4, the FMPC reviewed and considered a comprehensive range of mitigation options before selecting the 16 actions identified for implementation. This section summarizes the full range of mitigation measures evaluated and considered by the FMPC, including a review of the categories of mitigation measures outlined in the 2017 CRS Coordinator's Manual, a discussion of current local implementation and CRS credits earned for those measures, and a list of the specific mitigation projects considered and recommended for implementation.

Mitigation alternatives considered for implementation by the Chatham County FMPC were evaluated and prioritized using the criteria discussed in Section 6.3.1 Prioritization Process.

Once it was determined which flood hazards warranted the development of specific mitigation actions, the FMPC analyzed viable mitigation options that supported the identified goals and objectives. The FMPC was provided with the following list of mitigation categories which are utilized as part of the CRS planning process.

- Prevention
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information and Outreach

B.1.1 PREVENTATIVE AND REGULATORY MEASURES

Preventative measures are designed to keep a problem - such as flooding - from occurring or from getting worse. The objective of preventative measures is to ensure that future development is not exposed to damage and does not cause an increase in damages to other properties. Building, zoning, planning and code enforcement offices usually administer preventative measures. Some examples of types of preventative measures include:

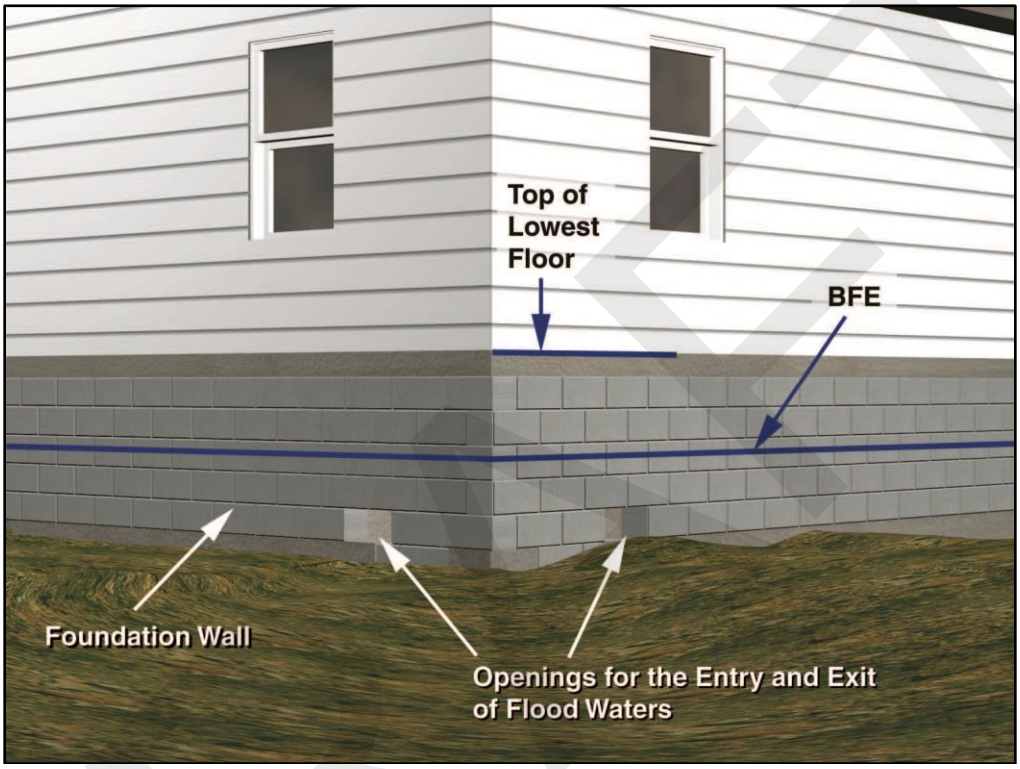
- Building codes
- Zoning ordinance
- Comprehensive or land use plan
- Open space preservation
- Floodplain regulations
- Subdivision regulations
- Stormwater management regulations

BUILDING CODES

Building codes provide one of the best methods for addressing natural hazards. When properly designed and constructed according to code, the average building can withstand many of the impacts of natural hazards. Hazard protection standards for all new and improved or repaired buildings can be incorporated into the local building code. Building codes can ensure that the first floors of new buildings are

constructed to be higher than the elevation of the 100-year flood (the flood that is expected to have a one percent chance of occurring in any given year). This is shown in Figure B.1.

Just as important as having code standards is the enforcement of the code. Adequate inspections are needed during the course of construction to ensure that the builder understands the requirements and is following them. Making sure a structure is properly elevated and anchored requires site inspections at each step.



Source: FEMA Publication: *Above the Flood: Elevating Your Floodprone House, 2000*

Figure B.1 – Building Codes and Flood

As of February 26, 2016, Chatham County has adopted the current edition of the International Building Code. In accordance with the IBC, the ground immediately adjacent to the foundation shall be sloped away from the building at a slope of not less than one unit vertical in 20 units horizontal (5-percent slope) for a minimum distance of 10 feet measured perpendicular to the face of the wall. If physical obstructions or lot lines prohibit 10 feet of horizontal distance, a 5-percent slope shall be provided to an *approved* alternative method of diverting water away from the foundation. Swales used for this purpose shall be sloped a minimum of 2 percent where located within 10 feet of the building foundation. Impervious surfaces within 10 feet of the building foundation shall be sloped a minimum of 2-percent away from the building.

ASCE 24 is a referenced standard in the International Building Code. Any building or structure that falls within the scope of the IBC that is proposed in a flood hazard area is to be designed in accordance with ASCE 24. Freeboard is required as a function of the nature of occupancy and the flood zone. Dwellings and most other buildings have 1-foot of freeboard; certain essential facilities have 2-3 feet; only agricultural facilities, temporary facilities and minor storage facilities are allowed to have their lowest floors at the BFE. In accordance with Chatham County's Flood Damage Prevention Ordinance (effective

January 1, 2017), in all special flood hazard areas where BFE data has been provided, the elevation to which all structures and other development located within the special flood hazard areas must be elevated, or floodproofed if non-residential, shall be the BFE plus one foot of freeboard. Additionally, unincorporated Chatham County officially adopted the Flood Damage Prevention Ordinance on September 24, 2021. The ordinance states that all new construction projects located within the SFHA are required to have the lowest floor, including the basement, be elevated no lower than three feet above the BFE.

The Chatham County Department of Engineering is responsible for ensuring the public safety through the enforcement of federal, state, and local codes governing construction. County staff review plans, issue building permits, and perform inspections to ensure Code compliance related to aspects of life-safety, structural integrity, energy conversation, accessible design and electrical, plumbing, fuel gas, heating and air conditioning systems.

COMPREHENSIVE OR LAND USE PLAN

Building codes provide guidance on how to build in hazardous areas. Planning and zoning activities direct development away from these areas, particularly floodplains and wetlands. They do this by designating land uses that are compatible with the natural conditions of land that is prone to flooding, such as open space or recreation. Planning and zoning activities can also provide benefits by simply allowing developers more flexibility in arranging improvements on a parcel of land through the planned development approach.

The Plan 2040 Chatham County – Savannah Comprehensive Plan was updated in 2020 and adopted in October 2021 by the Savannah City Council and Chatham County Commission. This plan was prepared by the Metropolitan Planning Commission, which is a joint planning commission that provides land use, transportation, natural resource, and related planning services to the Chatham County and Savannah, GA area. The 2020 update to the Comprehensive Plan examines existing conditions in the region, while also considering the future conditions that could impact the County by the year 2040 such as housing, population characteristics and economic conditions. The Comprehensive Plan is intended to ensure that the region grows in ways that enhance the community's vitality and overall quality of life through both short- and long-term growth, redevelopment, and preservation. The plan focuses on quality of life, housing, land use, natural resources, transportation, and economic development. It also addresses land preservation, the development of parks and recreation facilities, as well as the protection of natural resources and environmental quality.

OPEN SPACE PRESERVATION

Keeping the floodplain and other hazardous areas open and free from development is the best approach to preventing damage to new developments. Open space can be maintained in agricultural use or can serve as parks, greenway corridors and golf courses.

Comprehensive and capital improvement plans should identify areas to be preserved by acquisition and other means, such as purchasing an easement. With an easement, the owner is free to develop and use private property, but property taxes are reduced or a payment is made to the owner if the owner agrees to not build on the part set aside in the easement.

Although there are some federal programs that can help acquire or reserve open lands, open space lands and easements do not always have to be purchased. Developers can be encouraged to dedicate park land and required to dedicate easements for drainage and maintenance purposes.

Chatham County has many parks and other public lands designated as open space, including approximately 70 percent of the SFHA. Along some water features such as marsh lands, certain portions of lots have restrictive regulations which prohibit any development including placement of fill (buffer requirements).

ZONING ORDINANCE

Chatham County zoning regulations consist of both a zoning map and a written ordinance that divides the jurisdictions into zoning districts, including various residential, commercial, mixed-use and industrial districts. The zoning regulations describe what type of land use and specific activities are permitted in each district, and how to regulate how buildings, signs, parking, and other construction may be placed on a lot. The zoning regulations also provide procedures for rezoning and other planning applications. The zoning map and zoning regulations provide properties in Chatham County's planning and zoning jurisdiction with certain rights to development.

FLOODPLAIN REGULATIONS

Chatham County's Floodplain Management Ordinance requires that all new residential construction or substantial improvement shall have the lowest floor, including the basement, elevated to no lower than one foot above the base flood elevation (BFE). In VE Zones, structures must have their lowest horizontal member elevated to one foot above the BFE. Additionally, the Chatham County Zoning Ordinance requires that build permits be obtained from the County Department of Building Safety & Regulatory Services. The Stormwater Ordinance restricts the placement of fill in SFHAs. The County Land Disturbing Activities requires permits for certain activities and requires soil erosion control best management practices. Together, these ordinances protect development in the floodplain from flood damage.

Chatham County enforces reconstruction regulations to ensure that mitigation is integrated into recovery. Requiring permits for building repairs and conducting inspections are vital activities to ensure that damaged structures are safe for people to re-enter and repair. There is a special requirement to do this in floodplains, regardless of the type of disaster or the cause of damage. The NFIP requires that local officials enforce the substantial damage regulations. These rules require that if the cost to repair a building in the mapped floodplain equals or exceeds 50% of the building's market value, the building must be retrofitted to meet the standards of a new building in the floodplain. In Chatham County, this means that a substantially damaged building must be elevated above the base flood elevation.

STORMWATER MANAGEMENT REGULATIONS

Stormwater runoff is increased when natural ground cover is replaced by urban development. Development in the watershed that drains to a river can aggravate downstream flooding, overload the community's drainage system, cause erosion, and impair water quality. There are three ways to prevent flooding problems caused by stormwater runoff:

1) Regulating development in the floodplain to ensure that it will be protected from flooding and that it won't divert floodwaters onto other properties;
2) Regulating all development to ensure that the post-development peak runoff will not be greater than it was under pre-development conditions; and
3) Set construction standards so buildings are protected from shallow water.

Chatham County's Stormwater Management Ordinance requires that a stormwater management plan (SWMP) be developed for all projects required to have a permit for land disturbing activities. These SWMPs must include better site design practices for stormwater management, treat stormwater runoff quality, provide stream channel protection, and provide downstream overbank flood protection. The SWMPs must also provide extreme flood protection such that there is no increase in flood elevations upstream or downstream from the 100-year flood.

LOCAL IMPLEMENTATION AND CRS CREDIT

Zoning and comprehensive planning can work together to reduce future flood losses by directing development away from hazard prone areas. Creating or maintaining open space is the primary way to

reduce future flood losses. Chatham County has many open space and natural parcels which serve to reduce future flood losses by remaining open. These parks and natural preserved areas create opportunities for the public to benefit from education and recreation while eliminating potential for future flooding. The Chatham County-Savannah Future Land Use Map designates preservation, conservation, and conservation-residential lands to maintain open space throughout the County.

Planning for open space must also be supplemented with development regulations to ensure that stormwater runoff is managed and that development is protected from flooding. Future flood losses in Chatham County will be reduced through the implementation of the 2015 International Building Code, the County's 2017 Flood Damage Prevention Ordinance, and Stormwater Management Ordinance. Enforcement of the flood protection elevation requirement will provide an extra level of protection for buildings constructed in the County.

Stormwater management and the requirement that post-development runoff cannot exceed pre-development conditions is one way to prevent future flood losses. Retention and detention requirements also help to reduce future flood losses.

The CRS encourages strong building codes. It provides credit in two ways: points are awarded based on the community's Building Code Effectiveness Grading Schedule (BCEGS) classification and points are awarded for adopting the International Code series. Chatham County's BCEGS rating is a 5/4 for residential and commercial, respectively. The FMPC did not recommend any projects related to the building code since the County is already implementing the most current version of the International Building Code.

CRS credits are available for regulations that encourage developers to preserve floodplains or other hazardous areas away from development. There is no credit for a plan, only for the enforceable regulations that are adopted pursuant to a plan. Chatham County currently receives credit for Activity 430 – Higher Regulatory Standards. Additionally, Chatham County currently receives credit for Activity 420 – Open Space Preservation for preserving 70 percent of the SFHA as open space. Preserving flood prone areas as open space is one of the highest priorities of the Community Rating System. The credits in the 2017 manual have doubled for OSP (Open Space Preservation). Chatham County also currently receives credit for Activity 450 – Stormwater Management for enforcing regulations for stormwater management and soil and erosion control. The FMPC did not recommend any changes to the County's Comprehensive Plan, Zoning Ordinance, or Subdivision Ordinance, but did agree that higher standards should be considered for the Flood Damage Prevention Ordinance.

CONCLUSIONS

MITIGATION ALTERNATIVES EVALUATED

Table B.1 – Prevention Mitigation Options and Recommended Projects

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
Prevention Measures Considered by FMPC and Not Recommended			
-	Encourage voluntary compliance with floodplain development regulations.	Could save money on enforcement but would not guarantee compliance with standards.	n/a
-	Manage growth and development in the County through a constantly updated Master Plan.	Limited staff resources to support constant updates to a Master Plan.	n/a
-	Regulate development within Chatham County's coastal barrier areas	Development of a sea level rise adaptation plan instead would enable better-informed regulation of these and other at-risk areas.	n/a

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
Prevention Measures and Funding Recommended for Implementation			
2	Consider higher regulatory standards to better protect existing and future development.	By updating these regulations to require higher standards, such as an increased freeboard or elevation of electrical equipment, and by enforcing these codes throughout the development process to ensure compliance, Chatham County can limit the vulnerability of new development to flooding.	Operating Budget
4	Improve stormwater management regulations to include higher standards for design storm, size of development regulated, low-impact development, and public maintenance of detention and retention facilities to improve water quality.	Incorporating higher standards into stormwater management regulations will help to minimize the stormwater runoff generated by new development and can potentially provide for on-site stormwater management to mitigate existing problems.	Operating Budget
12	Develop a long-range regional plan for sea level rise and compounding hazards like subsidence which evaluates multiple adaptation methods, including updated codes and ordinances that protect property based on the report findings.	Analyzing exactly which areas and properties are at risk and then planning and implementing adaptation strategies accordingly can protect the County from suffering the full impact of sea level rise.	Operating Budget
14	Strengthen policies and ordinances limiting allowable impervious coverage for new development.	Reduced impervious surface coverage can protect water quality, preserve ecosystem services of watershed, protect habitats, and reduce runoff.	Operating Budget
15	Develop Watershed Master Plan	Comprehensive approach to understanding and addressing current and future flood challenges. Can lead to the protection and restoration of natural resources and improve water quality. County will receive CRS credit for the plan, which helps support discounted insurance premiums.	Operating Budget

B.1.2 PROPERTY PROTECTION MEASURES

Property protection measures are used to modify buildings or property subject to damage. Property protection measures fall under three approaches:

- Modify the site to keep the hazard from reaching the building;
- Modify the building (retrofit) so it can withstand the impacts of the hazard; and
- Insure the property to provide financial relief after the damage occurs.

Property protection measures are normally implemented by the property owner, although in many cases technical and financial assistance can be provided by a government agency.

KEEPING THE HAZARD AWAY

Generally, natural hazards do not damage vacant areas. As noted earlier, the major impact of hazards is to people and improved property. In some cases, properties can be modified so the hazard does not reach the damage-prone improvements. For example, a berm can be built to prevent floodwaters from reaching a house.

This low floodwall has landscaping to minimize the adverse impact on the property's appearance.

FLOODING

There are five common methods to keep a flood from reaching and damaging a building:

- Erect a barrier between the building and the source of the flooding.
- Move the building out of the flood-prone area.
- Elevate the building above the flood level.
- Demolish the building.
- Replace the building with a new one that is elevated above the flood level.

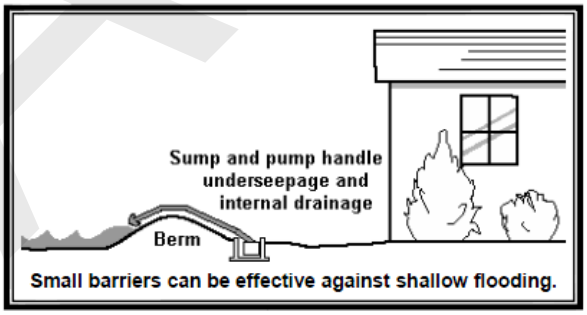
The latter three approaches are the most effective types to consider in Chatham County.

Small, wood frame buildings are the easiest to relocate

Source: Kennedy House Movers, Huntsville, AL

BARRIERS

A flood protection barrier can be built of dirt or soil (a "berm") or concrete or steel (a "floodwall"). Careful design is needed so as not to create flooding or drainage problems on neighboring properties. Depending on how porous the ground is, if floodwaters will stay up for more than an hour or two, the design needs to account for leaks, seepage of water underneath, and rainwater that will fall inside the perimeter. This is usually done with a sump or drain to collect the internal groundwater and surface water and a pump and pipe to pump the internal drainage over the barrier. Barriers can only be built so high. They can be overtopped by a flood higher than expected. Barriers made of earth are susceptible to erosion from rain and floodwaters if not properly sloped, covered with grass, and properly maintained.



Small barriers can be effective against shallow flooding.

RELOCATION

Moving a building to higher ground is the surest and safest way to protect it from flooding. While almost any building can be moved, the cost increases for heavier structures, such as those with exterior brick and stone walls, and for large or irregularly shaped buildings. Relocation is also preferred for large lots that include buildable areas outside the floodplain or where the owner has a new flood-free lot (or portion of the existing lot) available.

BUILDING ELEVATION

Raising a building above the flood level can be almost as effective as moving it out of the floodplain. Water flows under the building, causing little or no damage to the structure or its contents. Raising a building above the flood level is cheaper than moving it and can be less disruptive to a neighborhood. Elevation has proven to be an acceptable and reasonable means of complying with floodplain regulations

that require new, substantially improved, and substantially damaged buildings to be elevated above the base flood elevation.

DEMOLITION

Some buildings, especially heavily damaged or repetitively flooded ones, are not worth the expense to protect them from future damages. It is cheaper to demolish them and either replace them with new, flood protected structures, or relocate the occupants to a safer site. Demolition is also appropriate for buildings that are difficult to move – such as larger, slab foundation or masonry structures – and for dilapidated structures that are not cost-beneficial to protect.

Demolishing a repetitively flooded home

PILOT RECONSTRUCTION

If a building is not in good shape, elevating it may not be worthwhile or it may even be dangerous. An alternative is to demolish the structure and build a new one on the site that meets or exceeds all flood protection codes. FEMA funding programs refer to this approach as "pilot reconstruction." It is still a pilot program, and not a regularly funded option. Certain rules must be followed to qualify for federal funds for pilot reconstruction.

RETROFITTING

An alternative to keeping the hazard away from a building is to modify or retrofit the site or building to minimize or prevent damage. There are a variety of techniques to do this, as described below.

- ***Dry Floodproofing***
  Dry floodproofing means making all areas below the flood protection level watertight. Walls are coated with waterproofing compounds or plastic sheeting. Openings, such as doors, windows and vents, are closed, either permanently, with removable shields, or with sandbags. Dry floodproofing of new and existing nonresidential buildings in the regulatory floodplain is permitted under state, FEMA and local regulations. Dry floodproofing of existing residential buildings in the floodplain is also permitted as long as the building is not substantially damaged or being substantially improved. Owners of buildings located outside the regulatory floodplain can always use dry floodproofing techniques.

  Dry floodproofing is only effective for shallow flooding, such as repetitive drainage problems. It does not protect from the deep flooding along lakes and larger rivers caused by hurricanes or other storms.

- ***Wet Floodproofing***
  The alternative to dry floodproofing is wet floodproofing: water is let in and everything that could be damaged by a flood is removed or elevated above the flood level. Structural components below the flood level are replaced with materials that are not subject to water damage. For example, concrete block walls are used instead of wooden studs and gypsum wallboard. The furnace, water heater and laundry facilities are permanently relocated to a higher floor. Where the flooding is not deep, these appliances can be raised on blocks or platforms.

INSURANCE

Technically, insurance does not mitigate damage caused by a natural hazard. However, it does help the owner repair, rebuild, and hopefully afford to incorporate some of the other property protection measures in the process. Insurance offers the advantage of protecting the property, so long as the policy is in force, without requiring human intervention for the measure to work.

- ***Private Property***
  Although most homeowner's insurance policies do not cover a property for flood damage, an owner can insure a building for damage by surface flooding through the NFIP. Flood insurance coverage is provided for buildings and their contents damaged by a "general condition of surface flooding" in the area. Most people purchase flood insurance because it is required by the bank when they get a mortgage or home improvement loan. Usually these policies just cover the building's structure and not the contents. Contents coverage can be purchased separately. Renters can buy contents coverage, even if the owner does not buy structural coverage on the building. Most people don't realize that there is a 30-day waiting period to purchase a flood insurance policy and there are limits on coverage.

- ***Public Property***

  Governments can purchase commercial insurance policies. Larger local governments often self-insure and absorb the cost of damage to one facility, but if many properties are exposed to damage, self-insurance can drain the government's budget. Communities cannot expect federal disaster assistance to make up the difference after a flood.

LOCAL IMPLEMENTATION AND CRS CREDIT

The CRS provides the most credit points for acquisition and relocation under Activity 520, because this measure permanently removes insurable buildings from the floodplain. Chatham County does currently receive credit for Activity 520 – Acquisition and Relocation, for having acquired and relocated 36 buildings from the SFHA. The FMPC recommended that the County continue the purchase of repetitive loss buildings and other buildings which are subject to flood damage in order to return this land to open space.

The CRS also credits barriers and elevating existing buildings under Activity 530. The credit for Activity 530 is based on the combination of flood protection techniques used and the level of flood protection provided. Points are calculated for each protected building. Bonus points are provided for the protection of repetitive loss buildings and critical facilities. Chatham County does not currently receive credit for Activity 530 – Flood Protection, but the County does receive credit for Activity 360 – Flood Protection Assistance. The County staff has the technical expertise to provide advice and assistance to homeowners who may want to flood proof their home or business. Advice is provided both on property protection techniques and on financial assistance programs to help fund mitigation. Though it was not selected as a mitigation action due because it is already established and ongoing, the FMPC agreed that the County should continue to publicize technical assistance for Activity 360 Flood Protection Assistance.

Flood insurance information for the County is provided in Section 4.4.2. Chatham County publicizes the requirement for flood insurance to those requesting FIRM information through the Mandatory Purchase Requirement and through outreach brochures to residents of the SFHA and repetitive loss areas.

There is no credit for purchasing flood insurance, but the CRS does provide credit for local public information programs that, among other topics, explain flood insurance to property owners. The CRS also reduces the premiums for those people who do buy NFIP coverage. Chatham County currently receives credit for Activity 330 – Outreach Projects. The FMPC would like to focus outreach to property owners on the availability of Increased Cost of Compliance (ICC) coverage, which provides additional funds to repetitive loss properties and substantially damaged properties to offset the cost of improvements needed to bring these properties up to code.

CONCLUSIONS

MITIGATION ALTERNATIVES EVALUATED

Table B.2 – Property Protection Mitigation Options and Recommended Projects

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
Prevention Measures Considered by FMPC and Not Recommended			
-	Continue to publicize technical assistance for Activity 360 Flood Protection Assistance.	This service is already well-established and no additional effort is required for ongoing implementation to continue.	n/a
Prevention Measures and Funding Recommended for Implementation			
1	Acquire and demolish high-risk flood-prone buildings and repetitive loss structures and preserve land as open space.	Acquisition and demolition of repetitive loss structures completely removes the flood problem and eliminates vulnerability while also expanding open space and enhancing the land's natural and beneficial flood management functions.	HMGP
5	Relocate, elevate, or retrofit substantially damaged and/or pre-FIRM properties.	Pre-FIRM properties vulnerable to major flooding should be mitigated to prevent substantial damages, and substantially damaged properties already face high costs to be brought up to code and may benefit from alternative mitigation such as relocation.	HMGP, FMA
6	Encourage the purchase of flood insurance and educate public on Increased Cost of Compliance (ICC) coverage through the County's CRS Flood Insurance Advocate. The advocate will facilitate face-to-face meetings, outreach events, and presentations to HOAs, and maintain a record of events attended and the number of people reached.	Educating the public on ICC coverage and encouraging the purchase of flood insurance will help protect property owners in the event of a major flood by ensuring that they are aware of the resources available to them to help cover the cost of necessary mitigation.	Operating Budget
10	Elevate lift stations and electrical components above the base flood elevation (BFE).	Lift stations provide flood protection for low-lying areas. Elevating this and other electrical equipment ensures operation during flood events, which limits flood damages.	HMGP

B.1.3 NATURAL RESOURCE PROTECTION

Resource protection activities are generally aimed at preserving (or in some cases restoring) natural areas. These activities enable the naturally beneficial functions of fields, floodplains, wetlands, and other natural lands to operate more effectively. Natural and beneficial functions of watersheds, floodplains and wetlands include:

- Reduction in runoff from rainwater and stormwater in pervious areas
- Infiltration that absorbs overland flood flow

- Removal and filtering of excess nutrients, pollutants and sediments
- Storage of floodwaters
- Absorption of flood energy and reduction in flood scour
- Water quality improvement
- Groundwater recharge
- Habitat for flora and fauna
- Recreational and aesthetic opportunities

As development occurs, many of the above benefits can be achieved through regulatory steps for protecting natural areas or natural functions. This section covers the resource protection programs and standards that can help mitigate the impact of natural hazards, while they improve the overall environment. Six areas were reviewed:

- Wetland protection
- Erosion and sedimentation control
- Stream/River restoration
- Best management practices
- Dumping regulations
- Farmland protection

WETLAND PROTECTION

Wetlands are often found in floodplains and topographically depressed areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flows. They also serve as a natural filter, which helps to improve water quality, and they provide habitat for many species of fish, wildlife and plants. Chatham County contains 85,666 acres of tidal marshes, primarily in the Ogeechee Coastal and Lower Savannah River Basins.

EROSION AND SEDIMENTATION CONTROL

Farmlands and construction sites typically contain large areas of bare exposed soil. Surface water runoff can erode soil from these sites, sending sediment into downstream waterways. Erosion also occurs along stream banks and shorelines as the volume and velocity of flow or wave action destabilize and wash away the soil. Sediment suspended in the water tends to settle out where flowing water slows down. This can clog storm drains, drain tiles, culverts and ditches and reduce the water transport and storage capacity of river and stream channels, lakes and wetlands.

There are two principal strategies to address these problems: minimize erosion and control sedimentation. Techniques to minimize erosion include phased construction, minimal land clearing, and stabilizing bare ground as soon as possible with vegetation and other soil stabilizing practices. Chatham County has adopted a soil and erosion control ordinance.

STREAM/RIVER RESTORATION

There is a growing movement that has several names, such as "stream conservation," "bioengineering," or "riparian corridor restoration." The objective of these approaches is to return streams, stream banks and adjacent land to a more natural condition, including the natural meanders. Another term is "ecological restoration," which restores native indigenous plants and animals to an area.

A key component of these efforts is to use appropriate native plantings along the banks that resist erosion. This may involve retrofitting the shoreline with willow cuttings, wetland plants, or rolls of landscape material covered with a natural fabric that decomposes after the banks are stabilized with plant roots.

In all, restoring the right vegetation to a stream has the following advantages:

- Reduces the amount of sediment and pollutants entering the water
- Enhances aquatic habitat by cooling water temperature
- Provides food and shelter for both aquatic and terrestrial wildlife
- Can reduce flood damage by slowing the velocity of water
- Increases the beauty of the land and its property value
- Prevents property loss due to erosion
- Provides recreational opportunities, such as hunting, fishing and bird watching
- Reduces long-term maintenance costs

As required by state and federal regulations, Chatham County works with municipal governments to monitor its storm water drainage outfalls and control storm water runoff.

BEST MANAGEMENT PRACTICES

Point source pollutants come from pipes such as the outfall of a municipal wastewater treatment plant. They are regulated by the US EPA. Nonpoint source pollutants come from non-specific locations and harder to regulate. Examples of nonpoint source pollutants are lawn fertilizers, pesticides, other chemicals, animal wastes, oils from street surfaces and industrial areas, and sediment from agriculture, construction, mining and forestry. These pollutants are washed off the ground's surface by stormwater and flushed into receiving storm sewers, ditches and streams.

The term "best management practices" (BMPs) refers to design, construction and maintenance practices and criteria that minimize the impact of stormwater runoff rates and volumes, prevent erosion, protect natural resources and capture nonpoint source pollutants (including sediment). They can prevent increases in downstream flooding by attenuating runoff and enhancing infiltration of stormwater. They also minimize water quality degradation, preserve beneficial natural features onsite, maintain natural base flows, minimize habitat loss, and provide multiple usages of drainage and storage facilities.

Chatham County's Stormwater Management Ordinance contains regulations for stormwater BMPs. Because of Chatham County's unique geologic and hydrologic conditions (i.e., poorly drained soils and a shallow water table), the types of appropriate BMPs that can be effectively utilized in the County are limited.

DUMPING REGULATIONS

BMPs usually address pollutants that are liquids or are suspended in water that are washed into a lake or stream. Dumping regulations address solid matter, such as shopping carts, appliances and landscape waste that can be accidentally or intentionally thrown into channels or wetlands. Such materials may not pollute the water, but they can obstruct even low flows and reduce the channels' and wetlands' abilities to convey or clean stormwater.

Many cities have nuisance ordinances that prohibit dumping garbage or other "objectionable waste" on public or private property. Waterway dumping regulations need to also apply to "non-objectionable" materials, such as grass clippings or tree branches, which can kill ground cover or cause obstructions in channels. Regular inspections to catch violations should be scheduled.

Many people do not realize the consequences of their actions. They may, for example, fill in the ditch in their front yard without realizing that is needed to drain street runoff. They may not understand how regarding their yard, filling a wetland, or discarding leaves or branches in a watercourse can cause a problem to themselves and others. Therefore, a dumping enforcement program should include public information materials that explain the reasons for the rules as well as the penalties.

FARMLAND PROTECTION

Farmland protection is an important piece of comprehensive planning and zoning throughout the United States. The purpose of farmland protection is to provide mechanisms for prime, unique, or important agricultural land to remain as such, and to be protected from conversion to non-agricultural uses.

Frequently, farm owners sell their land to residential or commercial developers and the property is converted to non-agricultural land uses. With development comes more buildings, roads and other infrastructure. Urban sprawl occurs, which can lead to additional stormwater runoff and emergency management difficulties.

Farms on the edge of cities are often appraised based on the price they could be sold for to urban developers. This may drive farmers to sell to developers because their marginal farm operations cannot afford to be taxed as urban land. The Farmland Protection Program in the United States Department of Agriculture's 2002 Farm Bill (Part 519) allows for funds to go to state, tribal, and local governments as well as nonprofit organizations to help purchase easements on agricultural land to protect against the development of the land.

The FMPC did not recommend any projects related to farmland protection.

LOCAL IMPLEMENTATION AND CRS CREDIT

There is credit for preserving open space in its natural condition or restored to a state approximating its natural condition. The credit is based on the percentage of the floodplain that can be documented as wetlands protected from development by ownership or local regulations. Chatham County currently receives credit for Activity 420 – Open Space Preservation for preserving 70 percent of the SFHA as open space. The is in the process of updating it's Natural Floodplain Functions plan, to incorporate strategies for the protection of wetlands.

Chatham County currently receives credit for Activity 540 – Drainage System Maintenance. A portion of the County's drainage system is inspected regularly throughout the year and maintenance is performed as needed. Credit is also provided for listing problem sites that are inspected more frequently, and for implementing an ongoing Capital Improvements Program. The County enforces a regulation prohibiting dumping in the drainage system, and annually publicizes the regulation or has appropriate signs posted.

Credit is available for the Erosion and Sediment Control (ESC) element under Activity 450 for regulating activities throughout the watershed to minimize erosion on construction sites that could result in sedimentation and water pollution. Chatham County currently receives credit for soil and erosion control regulations under Activity 450 – Stormwater Management. The FMPC propose protecting wetland and conservation areas along with promoting LID techniques to protect these natural floodplain functions.

CONCLUSIONS

MITIGATION ALTERNATIVES EVALUATED

Table B.3 – Natural Resource Protection Mitigation Options and Recommended Projects

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
Natural Resource Protection Measures Considered by FMPC and Not Recommended			
-	Develop a natural area restoration plan	Developing a Natural Floodplain Functions plan instead, which addresses restoration among other issues and can earn CRS credit.	n/a
-	Develop a Natural Floodplain Functions Plan to protect and or	Developing this plan will identify mitigation actions to further protect	-

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
	restore endangered species and habitat.	natural floodplain resources and will provide credit in the Community Rating System toward lowering flood insurance premiums.	
Natural Resource Protection Measures and Funding Recommended for Implementation			
4	Improve stormwater management regulations to include higher standards for design storm, size of development regulated, low-impact development, and public maintenance of detention and retention facilities to improve water quality.	Incorporating higher standards into stormwater management regulations will help to minimize the stormwater runoff generated by new development and can potentially provide for on-site stormwater management to mitigate existing problems.	Operating Budget
8	Enact deed restrictions and other growth management tools to preserve wetland and natural resource areas and conserve their natural and ecological functions.	Preserving wetlands and natural resource areas will protect these important areas for future flood protection and continued water quality improvement.	Operating budget

B.1.4 EMERGENCY SERVICES MEASURES

Emergency services measures protect people during and after a disaster. A good emergency management program addresses all hazards, and it involves all local government departments. This section reviews emergency services measures following a chronological order of responding to an emergency. It starts with identifying an impending problem (threat recognition) and continues through post-disaster activities.

THREAT RECOGNITION

The first step in responding to a flood is to know when weather conditions are such that an event could occur. With a proper and timely threat recognition system, adequate warnings can be disseminated.

The National Weather Service (NWS) is the prime agency for detecting meteorological threats. Severe weather warnings are transmitted through NOAA's Weather Radio System. Local emergency managers can then provide more site-specific and timely recognition after the Weather Service issues a watch or a warning. A flood threat recognition system predicts the time and height of a flood crest. This can be done by measuring rainfall, soil moisture, and stream flows upstream of the community and calculating the subsequent flood levels.

On smaller rivers and streams, locally established rainfall and river gauges are needed to establish a flood threat recognition system. The NWS may issue a "flash flood watch." This is issued to indicate current or developing hydrologic conditions that are favorable for flash flooding in and close to the watch area, but the occurrence is neither certain nor imminent. These events are so localized and so rapid that a "flash flood warning" may not be issued, especially if no remote threat recognition equipment is available. In the absence of a gauging system on small streams, the best threat recognition system is to have local personnel monitor rainfall and stream conditions. While specific flood crests and times will not be predicted, this approach will provide advance notice of potential local or flash flooding.

WARNING

The next step in emergency response following threat recognition is to notify the public and staff of other agencies and critical facilities. More people can implement protection measures if warnings are early and include specific detail.

The NWS issues notices to the public using two levels of notification:

- Watch: conditions are right for flooding, thunderstorms, tornadoes or winter storms.
- Warning: a flood, tornado, etc., has started or been observed.

A more specific warning may be disseminated by the community in a variety of ways. The following are the more common methods:

- CodeRED countywide mass telephone emergency communication system
- Commercial or public radio or TV stations
- The Weather Channel
- Cable TV emergency news inserts
- Telephone trees/mass telephone notification
- NOAA Weather Radio
- Tone activated receivers in key facilities
- Outdoor warning sirens
- Sirens on public safety vehicles
- Door-to-door contact
- Mobile public address systems
- Email notifications

Just as important as issuing a warning is telling people what to do in case of an emergency. A warning program should include a public information component.

STORMREADY

The National Weather Service (NWS) established the StormReady program to help local governments improve the timeliness and effectiveness of hazardous weather related warnings for the public. To be officially StormReady, a community must:

- Establish a 24-hour warning point and emergency operations center
- Have more than one way to receive severe weather warnings and forecasts and to alert the public
- Create a system that monitors weather conditions locally
- Promote the importance of public readiness through community seminars
- Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises

Being designated a NWS StormReady community is a good measure of a community's emergency warning program for weather hazards. Chatham County is credited by NOAA as a StormReady community.

RESPONSE

The protection of life and property is the most important task of emergency responders. Concurrent with threat recognition and issuing warnings, a community should respond with actions that can prevent or reduce damage and injuries. Typical actions and responding parties include the following:

- Activating the emergency operations center (emergency preparedness)
- Closing streets or bridges (police or public works)
- Shutting off power to threatened areas (utility company)

- Passing out sand and sandbags (public works)
- Holding children at school or releasing children from school (school superintendent)
- Opening evacuation shelters (the American Red Cross)
- Monitoring water levels (public works)
- Establishing security and other protection measures (police)

An emergency action plan ensures that all bases are covered and that the response activities are appropriate for the expected threat. These plans are developed in coordination with the agencies or offices that are given various responsibilities.

Emergency response plans should be updated annually to keep contact names and telephone numbers current and to ensure that supplies and equipment that will be needed are still available. They should be critiqued and revised after disasters and exercises to take advantage of the lessons learned and of changing conditions. The end result is a coordinated effort implemented by people who have experience working together so that available resources will be used in the most efficient manner possible.

EVACUATION AND SHELTER

There are six key components to a successful evacuation:

- Adequate warning
- Adequate routes
- Proper timing to ensure the routes are clear
- Traffic control
- Knowledgeable travelers
- Care for special populations (e.g., disabled persons, prisoners, hospital patients, schoolchildren)

Those who cannot get out of harm's way need shelter. Typically, the American Red Cross will staff a shelter and ensure that there is adequate food, bedding, and wash facilities. Shelter management is a specialized skill. Managers must deal with problems like scared children, families that want to bring in their pets, and the potential for an overcrowded facility.

POST DISASTER RECOVERY AND MITIGATION

After a disaster, communities should undertake activities to protect public health and safety and facilitate recovery. Appropriate measures include:

- Patrolling evacuated areas to prevent looting
- Providing safe drinking water
- Monitoring for diseases
- Vaccinating residents for tetanus and other diseases
- Clearing streets
- Cleaning up debris and garbage

Following a disaster there should be an effort to help prepare people and property for the next disaster. Such an effort would include:

- Public information activities to advise residents about mitigation measures they can incorporate into their reconstruction work.
- Evaluating damaged public facilities to identify mitigation measures that can be included during repairs.
- Identifying other mitigation measures that can lessen the impact of the next disaster.
- Acquiring substantially or repeatedly damaged properties from willing sellers.
- Planning for long-term mitigation activities.
- Applying for post-disaster mitigation funds.

REGULATING RECONSTRUCTION

Requiring permits for building repairs and conducting inspections are vital activities to ensure that damaged structures are safe for people to re-enter and repair. There is a special requirement to do this in floodplains regardless of the type of disaster or the cause of damage. The NFIP requires that local officials enforce the substantial damage regulations. These rules require that if the cost to repair a building in the mapped floodplain equals or exceeds 50% of the building's market value, the building must be retrofitted to meet the standards of a new building in the floodplain. In most cases, this means that a substantially damaged building must be elevated above the base flood elevation.

LOCAL IMPLEMENTATION AND CRS CREDIT

Flash flood warnings are issued by National Weather Service Offices, which have the local and county warning responsibility. Flood warnings are forecasts of coming floods, and are distributed to the public by the NOAA Weather Radio, commercial radio and television, and through local emergency agencies. The warning message tells the expected degree of flooding, the affected river, when and where flooding will begin, and the expected maximum river level at specific forecast points during flood crest. The County has a Flood Incident Management (FIM) plan, as part of the Emergency Operations Plan. The FIM plan includes flood threat recognition, emergency warning dissemination, flood response operations, and critical facilities planning. The FMPC recommended the installation of additional flood gauges, in partnership with University of Georgia, to improve threat detection and, as a result, warning capabilities.

Chatham County currently receives credit for Activity 610 – Flood Warning Program for maintaining a program that provides timely identification of impending flood threats, disseminates warnings to appropriate floodplain residents, and coordinates flood response activities. Community Rating System credits are based on the number and types of warning media that can reach the community's flood prone population. Depending on the location, communities can receive credit for the telephone calling system and more credits if there are additional measures, like telephone trees. Being designated as a StormReady community also provides additional credits.

CONCLUSIONS

MITIGATION ALTERNATIVES EVALUATED

Table B.4 – Emergency Services Mitigation Options and Recommended Projects

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
Emergency Services Measures Considered by FMPC and Not Recommended			
-	Develop post-disaster mitigation procedures that assign responsibilities for public information, code enforcement, planning, and other efforts that encourage loss reduction.	To avoid redundancy, these responsibilities are identified in the County's Emergency Operations Plan, and the other mitigation projects identified in this FMP can be used as a guide for flood loss reduction in post-disaster mitigation.	n/a
Emergency Services Measures and Funding Recommended for Implementation			
11	Partner with Georgia Tech to install additional tidal and riverine flood gauges at various locations throughout the County to help provide real-time flood data on the County website.	The County will have better data on flooding and be able to recognize flood threats and issue more timely, accurate warnings.	-

B.1.5 STRUCTURAL PROJECTS

Four general types of flood control projects are reviewed here: levees, reservoirs, diversions, and dredging. These projects have three advantages not provided by other mitigation measures:

- They can stop most flooding, protecting streets and landscaping in addition to buildings.
- Many projects can be built without disrupting citizens' homes and businesses.
- They are constructed and maintained by a government agency, a more dependable long-term management arrangement than depending on many individual private property owners.

However, as shown below, structural measures also have shortcomings. The appropriateness of using flood control depends on individual project area circumstances.

- Advantages
  - They may provide the greatest amount of protection for land area used
  - Because of land limitations, they may be the only practical solution in some circumstances
  - They can incorporate other benefits into structural project design, such as water supply and recreational uses
  - Regional detention may be more cost-efficient and effective than requiring numerous small detention basins
- Disadvantages
  - They can disturb the land and disrupt the natural water flows, often destroying wildlife habitat
  - They require regular maintenance
  - They are built to a certain flood protection level that can be exceeded by larger floods
  - They can create a false sense of security
  - They promote more intensive land use and development in the floodplain

LEVEES AND FLOODWALLS

Probably the best known flood control measure is a barrier of earth (levee) or concrete (floodwall) erected between the watercourse and the property to be protected. Levees and floodwalls confine water to the stream channel by raising its banks. They must be well designed to account for large floods, underground seepage, pumping of internal drainage, and erosion and scour.

RESERVOIRS AND DETENTION

Reservoirs reduce flooding by temporarily storing flood waters behind dams or in storage or detention basins. Reservoirs lower flood heights by holding back, or detaining, runoff before it can flow downstream. Flood waters are detained until the flood has subsided, and then the water in the reservoir or detention basin is released or pumped out slowly at a rate that the river can accommodate downstream.

Reservoirs can be dry and remain idle until a large rain event occurs. Or they may be designed so that a lake or pond is created. The lake may provide recreational benefits or water supply (which could also help mitigate a drought).

Retention pond

Flood control reservoirs are most commonly built for one of two purposes. Large reservoirs are constructed to protect property from existing flood problems. Smaller reservoirs, or detention basins, are built to protect property from the stormwater runoff impacts of new development.

DIVERSION

A diversion is a new channel that sends floodwaters to a different location, thereby reducing flooding along an existing watercourse. Diversions can be surface channels, overflow weirs, or tunnels. During normal flows, the water stays in the old channel. During floods, the floodwaters spill over to the diversion channel or tunnel, which carries the excess water to a receiving lake or river.

LOCAL IMPLEMENTATION AND CRS CREDIT

Chatham County does not currently receive credit for Activity 530 – Flood Protection. Structural flood control projects that provide 100-year flood protection and that result in revisions to the Flood Insurance Rate Map are not credited by the CRS so as not to duplicate the larger premium reduction provided by removing properties from the mapped floodplain.

CONCLUSIONS

MITIGATION ALTERNATIVES EVALUATED

Table B.5 – Structural Projects Mitigation Options and Recommended Projects

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
Structural Project Measures Considered by FMPC and Not Recommended			
-	Dredge and increase size of all open channels to increase flow and carrying capacity	No funding to complete project; flow reduction strategies pursued instead	n/a
Structural Project Measures and Funding Recommended for Implementation			
3	Update stormwater conveyance systems to alleviate flooding for existing and new development.	Improving stormwater conveyance systems in areas where drainage is currently inadequate will reduce stormwater flooding and prevent losses.	Operating budget
9	Improve recurring local funding for Public Works maintenance and flood management activities implemented through the Capital Improvements Program.	Identifying additional funding sources for a capital improvement program will enable better advanced planning of Improvements to the stormwater system and more assurance that funding will be available for the needed maintenance.	Operating budget
15	Evaluate sanitary sewer basins for possible transition from septic to public sewer.	This step would help the County to eventually implement and construct the recommended projects to improve sanitary sewer conditions for both the residents and the impacted waterways.	Operating budget

B.2.6 PUBLIC INFORMATION

OUTREACH PROJECTS

Outreach projects are the first step in the process of orienting property owners to the hazards they face and to the concept of property protection. They are designed to encourage people to seek out more information in order to take steps to protect themselves and their properties.

Awareness of the hazard is not enough; people need to be told what they can do about the hazard. Thus, projects should include information on safety, health and property protection measures. Research has shown that a properly run local information program is more effective than national advertising or publicity campaigns. Therefore, outreach projects should be locally designed and tailored to meet local conditions.

Community newsletters/direct mailings: The most effective types of outreach projects are mailed or distributed to everyone in the community. In the case of floods, they can be sent only to floodplain property owners.

News media: Local newspapers can be strong allies in efforts to inform the public. Local radio stations and cable TV channels can also help. These media offer interview formats and cable TV may be willing to broadcast videos on the hazards.

LIBRARIES AND WEBSITES

The two previous activities tell people that they are exposed to a hazard. The next step is to provide information to those who want to know more. The community library and local websites are obvious places for residents to seek information on hazards, hazard protection, and protecting natural resources.

Books and pamphlets on hazard mitigation can be given to libraries, and many of these can be obtained for free from state and federal agencies. Libraries also have their own public information campaigns with displays, lectures and other projects, which can augment the activities of the local government. Today, websites are commonly used as research tools. They provide fast access to a wealth of public and private sites for information. Through links to other websites, there is almost no limit to the amount of up to date information that can be accessed on the Internet.

In addition to online floodplain maps, websites can link to information for homeowners on how to retrofit for floods or a website about floods for children.

TECHNICAL ASSISTANCE

HAZARD INFORMATION

Residents and business owners that are aware of the potential hazards can take steps to avoid problems or reduce their exposure to flooding. Communities can easily provide map information from FEMA's FIRMs and Flood Insurance Studies. They may also assist residents in submitting requests for map amendments and revisions when they are needed to show that a building is located outside the mapped floodplain.

Some communities supplement what is shown on the FIRM with information on additional hazards, flooding outside mapped areas and zoning. When the map information is provided, community staff can explain insurance, property protection measures and mitigation options that are available to property owners. They should also remind inquirers that being outside the mapped floodplain is no guarantee that a property will never flood.

PROPERTY PROTECTION ASSISTANCE

While general information provided by outreach projects or the library is beneficial, most property owners do not feel ready to retrofit their buildings without more specific guidance. Local building department staffs are experts in construction. They can provide free advice, not necessarily to design a protection measure, but to steer the owner onto the right track. Building or public works department staffs can provide the following types of assistance:

- Visit properties and offer protection suggestions
- Recommend or identify qualified or licensed contractors
- Inspect homes for anchoring of roofing and the home to the foundation
- Explain when building permits are needed for home improvements.

PUBLIC INFORMATION PROGRAM

A Program for Public Information (PPI) is a document that receives CRS credit. It is a review of local conditions, local public information needs, and a recommended plan of activities. A PPI consists of the following parts, which are incorporated into this plan:

- The local flood hazard
- The property protection measures appropriate for the flood hazard
- Flood safety measures appropriate for the local situation
- The public information activities currently being implemented within the community, including those being carried out by non-government agencies
- Goals for the community's public information program
- The outreach projects that will be done each year to reach the goals
- The process that will be followed to monitor and evaluate the projects

LOCAL IMPLEMENTATION AND CRS CREDIT

Chatham County currently receives credit under Activity 330 – Outreach Projects as well as Activity 350 – Flood Protection Information. A community brochure is mailed to all properties in the SFHA and all properties in repetitive loss areas on an annual basis. An outreach brochure is also placed at public building locations. Credit is also provided for general outreach projects including publications in local newspapers and expos at fairs. Documents relating to floodplain management are available in the reference section of the Chatham County Regional Library. Credit is also provided for floodplain information displayed on the County's website.

CONCLUSIONS

MITIGATION ALTERNATIVES EVALUATED

Table B.6 – Public Information and Outreach Mitigation Options and Recommended Projects

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
Public Information and Outreach Measures Considered by FMPC and Not Recommended			
-	Provide grants information, planning tools, training, and technical assistance to increase the number of private sector mitigation projects.	This service is already provided under Activity 360 Flood Protection Assistance.	n/a
-	Update County website incorporating new technology to create interactive data and mapping system that will provide	Providing information on flood risk and mitigation options to the public can reduce vulnerability through better awareness and encourage private action	n/a

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
	online technical assistance to homeowners, real estate agents and insurance agents. Include access to elevation certificates, flood zones, general flood history, repetitive loss areas, and mitigated properties, etc.	to reduce risk. County as completed this action already.	
-	Implement an outreach campaign to educate residents on flood risks, maps, mitigation activities, stormwater, water quality, environmental protection, and the benefits of natural floodplains.	Educating the public on flooding and the hazard area will make people more aware of their risk. Expanding this outreach campaign to include mitigation activities and ecological functions will make people more likely to implement mitigation actions and understand the importance of mitigation actions taken by the County. County has established this as a regular practice.	n/a
-	Develop web-based outreach efforts, including social media.	Social media is an increasingly essential way to communicate with the public. Chatham County has already developed web-based outreach efforts that reach a larger audience, especially with younger residents.	n/a
-	Use Flood Protection Questionnaire results to identify target areas for outreach and flood protection.	The survey may reveal areas with stormwater flooding problems not yet known to the County. County has implemented similar outreach efforts through existing CRS programs	n/a
Public Information and Outreach Measures and Funding Recommended for Implementation			
6	Encourage the purchase of flood insurance and educate public on Increased Cost of Compliance (ICC) coverage through the County's CRS Flood Insurance Advocate. The advocate will facilitate face-to-face meetings, outreach events, and presentations to HOAs, and maintain a record of events attended and the number of people reached.	Educating the public on ICC coverage and encouraging the purchase of flood insurance will help protect property owners in the event of a major flood by ensuring that they are aware of the resources available to them to help cover the cost of necessary mitigation.	Operating budget
7	Display signs along roads and canals at entrances to high, moderate, and low flood risk areas.	Posting signage around high, moderate, and low flood risk areas will reduce vulnerability to flooding by increasing awareness and therefore encouraging residents and visitors to avoid high and moderate flood risk areas during or leading up to a flood event.	Operating budget

Action #	Mitigation Action	Reason for Pursuing / Not Pursuing	Funding
11	Partner with Georgia Tech to install additional tidal and riverine flood gauges at various locations throughout the County to help provide real-time flood data on the County website.	The County will have better data on flooding and be able to recognize flood threats and issue more timely, accurate warnings.	-
16	Publish the locations (roads and intersections) that often flood after heavy rain events, major storms, or tidal flooding.	An ongoing and up to date list of known flooding locations will help increase public awareness of flood risk throughout the County and help the County track areas that should be addressed.	Operating budget

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