

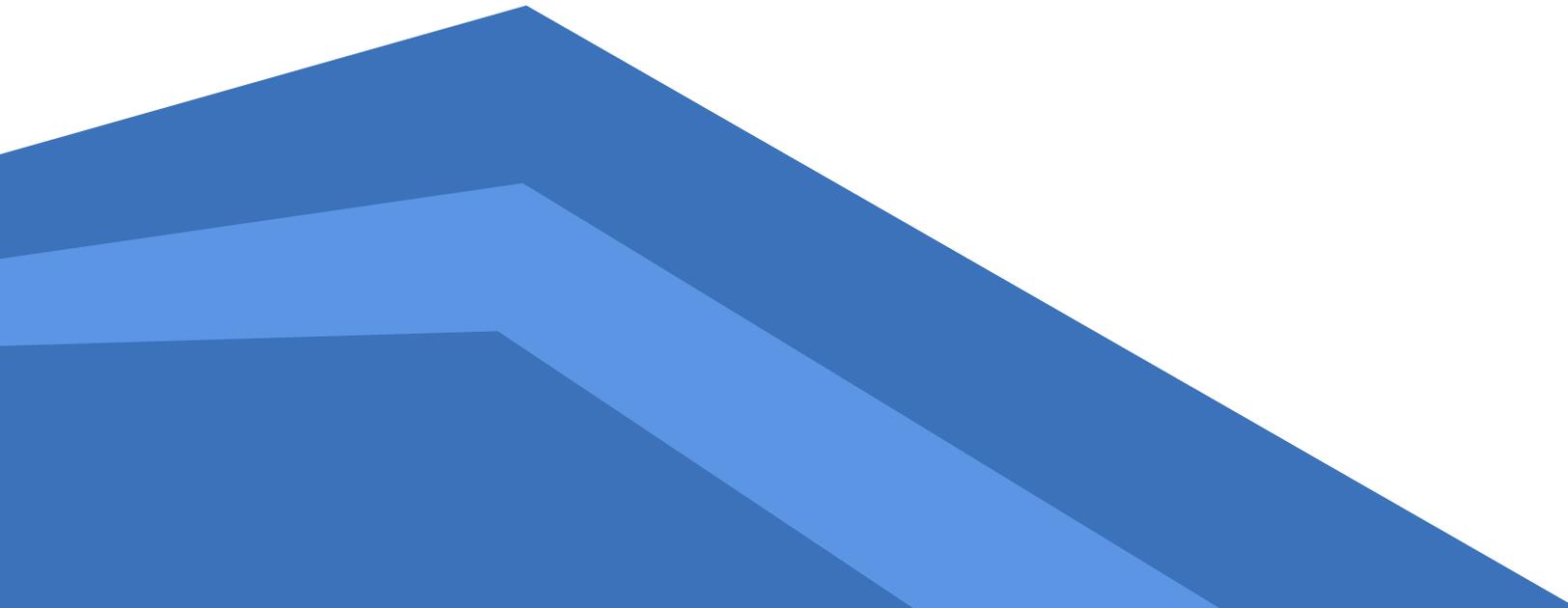


CHATHAM COUNTY-SAVANNAH DISASTER PREPAREDNESS PLAN FOR HISTORIC AND CULTURAL RESOURCES



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INTRODUCTION

The City of Savannah (City) and Chatham County (County) showcase centuries of growth and change, treasured parks, squares, valued and varied culture, and historic architecture. Together, the City and County have twenty-two districts and thirty-one properties that are on the National Register of Historic Places. Of those nationally registered districts, there are nine locally registered Historic and Conservation Districts, which contain thousands of historic buildings and properties. Beyond what is officially recognized, the City and the County are home to hundreds of culturally and historically important properties and landscapes, many of which are situated along the coast.

These historic and cultural resources are not only a source of pride and legacy for the City and the County, but are relied upon for cultural and heritage tourism, which supports the economy and provides employment and business opportunities.

It is widely recognized that shifts in large scale weather patterns – climate change – are already impacting coastal communities such as Chatham County. Negative impacts of climate change experienced locally include extreme heat, changes in the amount of annual rainfall, warmer ocean waters that feed and strengthen hurricanes, beach erosion, infrastructure damage, and inundation due to sea level rise. With regards to sea level rise, there is a lot of projection data available. For instance, the Georgia Institute of Technology conducted a 2012 study of the effects of sea level rise on Chatham, Liberty, and McIntosh Counties and found that by the year 2110, 9.5% of Chatham County’s buildings could be inundated, as well as multiple coastal historic sites and resources.[1]

In 2020, the Chatham Emergency Management Agency (CEMA) created the Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan, which identifies, assesses, and mitigates hazard risk within the County. While this document is comprehensive, it does not provide strategies specific to the County’s historic and cultural resources. Additionally, even if specific strategies were outlined, many City and County ordinances are not created to allow for adaptation and response measures for historic buildings. Previous disasters have highlighted the need for pre-disaster planning and post-disaster recovery strategies for these resources and for providing disaster planning information for historic and cultural property owners.

The Disaster Preparedness Plan for Historic and Cultural Resources will serve as a partner document to the Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan. This document will include information, goals, and strategies to aid local law and policy makers in making changes to current ordinances and guidelines, in order to provide pathways for owners and managers of historic/cultural buildings and sites to respond to natural disasters and the impacts of climate change with care and intention.

[1] Keating, Larry, and Dana Habeeb. "Tracking the Effects of Sea Level Rise in Georgia's Coastal Communities." Georgia Institute of Technology, hdl.handle.net/1853/48711.

PUBLIC AND STAKEHOLDER ENGAGEMENT

Overview

In 2022, community members and stakeholders were involved through a presentation and engagement session and a survey regarding flooding and flood insurance for both residence and business locations. The presentation and engagement session was held at the Metropolitan Planning Commission's (MPC) office on August 11, 2022. Organizations included CEMA, Savannah Historic District Board of Review, Chatham County Resiliency Office, City of Savannah, and Savannah Development Services Department. The project team presented the reasoning for the creation of the Plan and held open discussion on items which needed to be addressed and how to best engage the community.

Survey Method

On August 21, 2022, MPC sent a survey via email to over sixty (60) identified stakeholders and Neighborhood Association presidents to gather information from the public on properties which experience flooding and natural/human-made disasters. The initial questions were as follows:

1. What is the address of your residence?
2. Does your residence experience significant flooding?
Yes
No
Sometimes
3. Do you have flood insurance for your residence?
Yes, I am required to have flood insurance
Yes, but I'm not required to
No, my residence does not flood
No, but I'm interested in flood insurance
I'm not sure
4. What other damage has your residence suffered from natural disasters, human-made disasters, and weather events, if any?

Subsequent questions shifted to business owners and residents working within Chatham County.

5. What is the address of the local business?
6. Does the local business experience significant flooding?
Yes
No
Sometimes
7. Does the local business have flood insurance?
Yes, I am required to have flood insurance
Yes, but I'm not required to
No, my residence does not flood
No, but I'm interested in flood insurance
I'm not sure
8. What other damage has the local business suffered from natural disasters, human-made disasters, and weather events, if any?
9. What other information or resources can local government agencies provide to best help you as a property owner or resident?

Results

The survey collected 128 responses over five (5) weeks from August 21-September 29, 2022. After the first two (2) weeks of survey distribution, the geography of response rates within the City and the County were evaluated. Neighborhood association presidents were contacted to distribute physical survey copies to residents for broader response rates. Savannah neighborhood associations contacted were Brickyard, Historic Carver Village, Cloverdale, Eastside, Live Oak, Gordonston, Twickenham, Edgemere/ Sackville, Pine Gardens, and Hudson Hill/ Bayview.

Question two (2) shows (Figure 1) most respondents do not experience significant flooding at their residence.

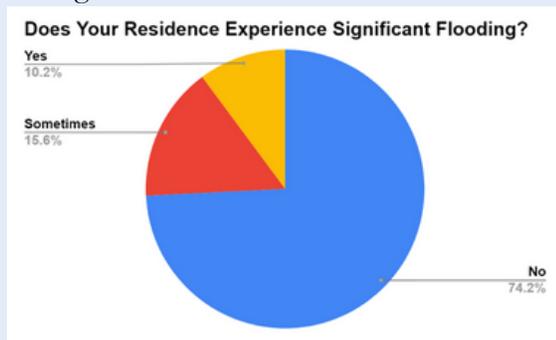


Figure 1, Question two (2) responses of MPC Survey.

Question three (3) shows (Figure 2) most respondents do not have flood insurance on their residence or are unsure.

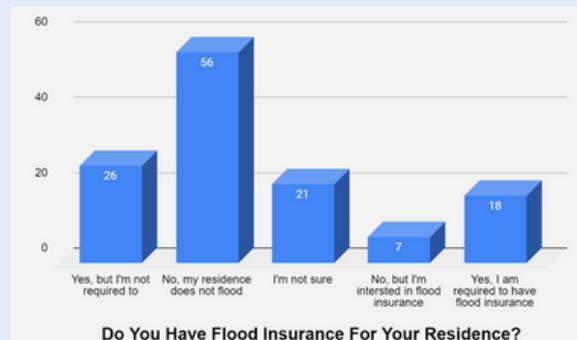


Figure 2, Question three (3) responses of MPC Survey.

Question four (4) featured a write-in response, asking participants if their residence has suffered damage from natural disasters, human-made disasters, and weather-related events.

Respondents who owned or were employed by a local business in Chatham County were asked to continue the survey. Others were asked to proceed to the last question.

Question six (6) shows (Figure 3) over 35% of respondents reporting their local business does or sometimes floods, indicating flooding at businesses is a significant issue.

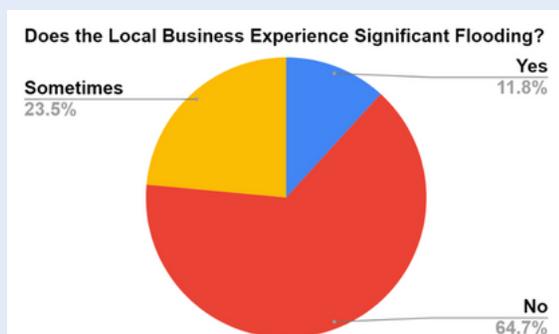


Figure 3, Question six (6) responses of MPC Survey

Question seven (7) shows (Figure 4) most respondents are not sure if their local business has flood insurance.

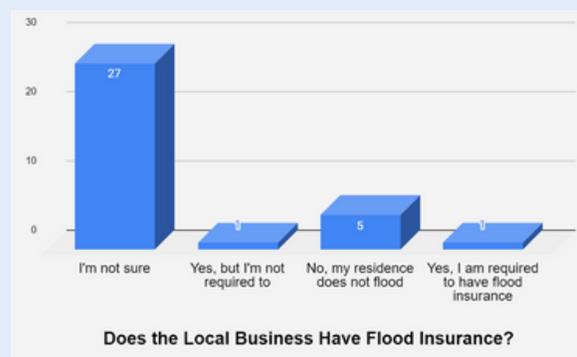


Figure 4, Question seven (7) responses of MPC Survey

OVERVIEW OF HISTORIC PRESERVATION AND EMERGENCY PLANNING IN CHATHAM COUNTY-SAVANNAH

The Cultural and Economic Significance of Historic Preservation

The value of historic preservation to a community can take many different forms, such as pride, beauty, or tourism. Economic and cultural benefits will be focused on here.

Heritage tourism is perhaps the largest driver of historic preservation's economic impact. Historic places and landmarks draw visitors to the City and County, with historic places making up thirty-two (32) percent of visitors' activities of special interest in 2019. The rich history of the area provides a varied and engaging experience for visitors and is essential to the economic development and wellbeing of the region. Between 2016 and 2019, visitors to the City contributed a total of \$11.7 billion to the local economy, with visitors listing shopping and historic/cultural sites as the top two priorities.^[2] In addition to heritage tourism, historic preservation enhances real estate and fosters success for local businesses.^[3] In addition to its economic impact, historic preservation has a deep cultural impact. It is intrinsically linked with the stories and peoples that resources such as buildings and monuments represent. Preserving the stories and the heart of Chatham County-Savannah is achieved through the preservation of these significant resources. Additionally, inclusive preservation practices protect the stories of particular communities in Savannah, such as Native Americans and Gullah/Geechee people.

National and Local Historic Protections

Historic resources are protected in the City and the County through local and national historic registration for districts and properties. National Register historic districts and properties are overseen by the National Park Service and qualify property owners for tax incentives and other potential funding. However, national registration provides little protection against inappropriate modification or demolition of a resource. Locally registered historic and conservation districts and properties in Savannah/Chatham are established and regulated by ordinances. Through a required review process, these standards ensure that rehabilitation, proposed demolition, and new development is consistent with the historic character and goals of the district. There are three Boards which serve the City (Historic Preservation Commission, Historic District Board of Review, and Historic Site and Monument Commission), and one board which serves the County (Chatham County Historic Preservation Commission).



[2] "2016 - 2019 Longwoods Travel USA Study." Visit Savannah, Longwoods International, www.visitsavannah.com/press/press-release/2019-longwoods-usa-study-reports-45-percent-increase-visitor-spending-over-1.

[3] "National Park Service Historic Preservation Economic Impact." Historic Preservation, National Park Service, www.nps.gov/subjects/historicpreservation/economic-impacts.htm.

There are a total of sixteen (16) nationally registered historic districts in the City, six (6) historic districts in the County, and numerous registered individual properties. Their names and years of establishment are listed below.

City of Savannah

- Savannah National Historic Landmark District, 1966 (**Local Historic District**)
- Victorian, 1974/82 (**Local Historic District**)
- Thomas Square/Streetcar, 1997 (**Local Historic District**)
- Cuyler-Brownville, 1998 (**Local Historic District**)
- Ardsley Park/Chatham Crescent, 1985 (**Local Conservation District**)
- Daffin Park/Parkside, 1999 (**Local Conservation District**) (pictured)
- Ardmore, 2018 (**Local Conservation District**)
- Carver Village, 2019 (**Local Conservation District**)
- Central Georgia Railroad Shops & Terminal Facility, 1976/78
- Laurel Grove South Cemetery, 1978
- Laurel Grove North Cemetery, 1983
- Gordonston, 2001
- Bonaventure Cemetery, 2001
- Eastside, 2002
- Fairway Oaks/Greenview, 2009
- Kensington Park/Groveland, 2014
- Pine Gardens, 2014

Unincorporated Chatham County

- Fort Pulaski, 1966
- Wormsloe Plantation, 1973 (pictured)
- Bethesda Home for Boys, 1973
- Isle of Hope Historic District, 1984
- Ossabaw Island, 1996
- Savannah and Ogeechee Canal, 1997
- Pin Point, 2007 (**Local Historic District**)
- Pennyworth Island, 2011 (**Local Historic District**)
- New Ogeechee Missionary Baptist Church, 2007 (**Local Historic Individual Property**)
- Maridon (Eureka Club/Farr's Point), 2007 (**Local Historic Individual Property**)
- Isle of Hope Missionary Baptist Church, 2019 (**Local Historic Individual Property**)



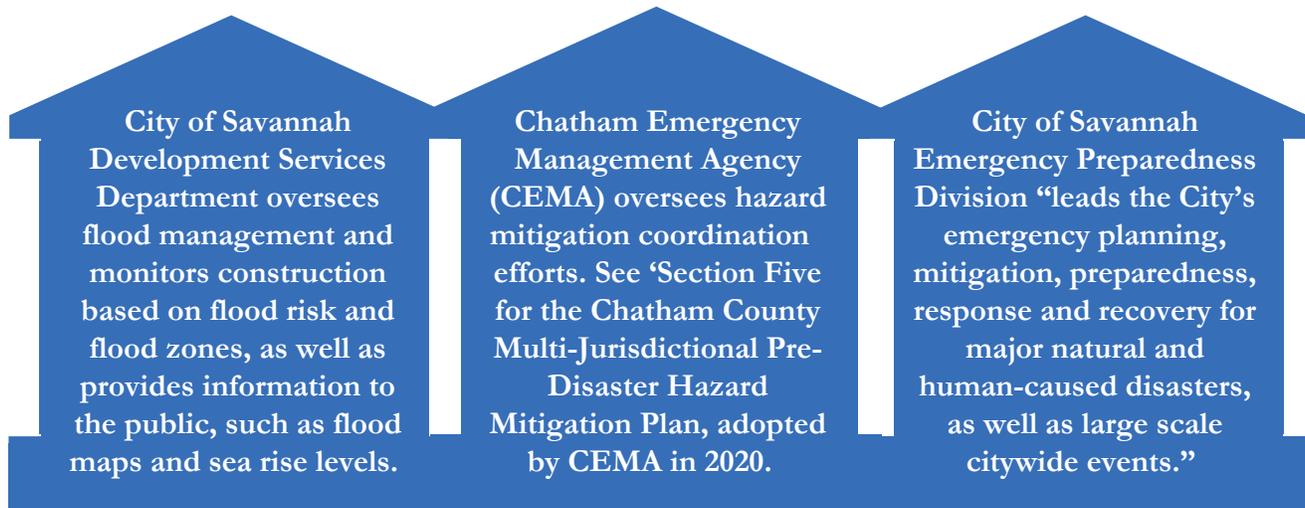
Daffin Park/Parkside, Savannah, GA



Wormsloe, Savannah, GA

Local Disaster Planning Efforts

Largely, disaster response and hazard mitigation in the City and the County is coordinated through several City departments and the Chatham Emergency Management Agency (CEMA). Collectively, these departments coordinate large-scale response to climate and disaster (flooding, fires, storms) events by providing intervention, aid, and information.



The Current Disconnect Between Disaster Planning and Historic Preservation

While many of the historic districts and properties in Savannah/Chatham County are protected from inappropriate rehabilitation and demolition, there are gaps in these protections when it comes to climate change and natural disasters.

Gap 1: A minimal number of historic resources surveys [4] have been completed in Savannah and Chatham County which catalog resources specifically based on risk due to climate change and its varied effects, leaving many historic resources un-identified, and therefore, unprotected.

Gap 2: Current ordinances do not support sensitive adaptation and mitigation techniques for historic buildings. There are many simple and cost-effective ways in which historic property owners can either integrate mitigation techniques before climate damage or to repair damage, without harming the resource. For instance, removable flood gates can be a critical way to protect water from entering a building in the event of heavy rains or a flood. While not prohibited within the current ordinance, it is not expressly encouraged, which can cause many people to not pursue the method of protection. Additionally, guidelines for installing anchors for temporary attachment of flood gates in a visually compatible manner are not available. Installation of these, and other adaptation measures, are often determined solely by visual compatibility, rather than directed by a particular portion of the ordinance.

[4] The Coastal Historic Survey, completed in July 2022, inventoried all historic resources over 50 years of age east of I-95 in Unincorporated Chatham and other coastal counties in Georgia to determine eligibility to the National Register of Historic Places, degree of damage from Hurricane Irma in 2017, and provide preparedness for future disasters. See 'Literature Review' and 'Appendix' for more information and a list of all resources surveyed in Chatham County through this project.

GEOGRAPHY, CLIMATE, AND PREVIOUS DISASTERS

This section provides historical context to climate information about the area, geography of the Georgia coastline, and past recorded weather events and disasters. This section also explores some of the future issues that may arise in Coastal Georgia based on previous events and global, national, and local weather pattern changes. Chatham County is home to more than half of Coastal Georgia’s historic resources, and it is therefore imperative that special attention be paid to Savannah and the surrounding areas.

71 Total locations that qualify on the National Park Service’s National Register of Historic Places in Chatham County

68 Total locations that qualify on the National Park Service’s National Register of Historic Places in Bryan, Liberty, McIntosh, Glynn, and Camden Counties

Geography of Coastal Georgia

Six (6) counties make up the coast of Georgia: Chatham, Bryan, Liberty, McIntosh, Glynn, and Camden. Georgia coastal counties tend to experience similar climate events to those of Northern Florida and the Lowcountry of South Carolina. While the Coastal Plain Physiographic Province is composed of many states bordering the Atlantic Ocean and the Gulf of Mexico, the focus is on weather and climate patterns affecting the Lower Coastal Plain of Georgia, especially areas denoted by the South Atlantic Water Science Center in their 2016 study as The Outer Coastal Plain. Chatham County is located fully within the Outer Coastal Plain. [1]

The Lower Coastal Plain contains the state’s “lowest elevations and its highest percentage of wetlands—including tidal salt and brackish marshes, bottomland hardwood swamps, coastal barrier islands, and the Okefenokee swamp.”[2] The topography extends about 65 miles inland from the water and is generally low and swampy. Towards the Inner Coastal Plain, more hills appear with low but notable grading.

The mainland rivers that flow through the area feed from the Blue Ridge Mountains, the Piedmont Plateau, and the Atlantic Coastal Plain (Fig. 5). These rivers influence the topography and distribution of water throughout the state.

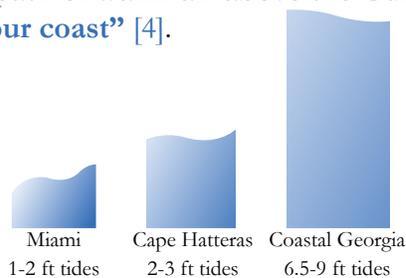
It is important to note that Georgia’s barrier islands dot the coast around 4 to 6 miles offshore near the coast of Chatham County.



Figure 5, The Atlantic Coastal Plain along the Atlantic Coast of North and South Carolina and parts of northern Florida, Georgia, Virginia, and Maryland

The islands, and the coastal mainland, have been visited and occupied since prehistoric times. Native Americans used the islands for hunting, fishing, and agriculture. Europeans later grew crops such as artichokes, citrus, figs, olives, onions, and peaches. [3]

Hurricane activity is irregular and largely dependent on how storm systems impact Florida. Hurricanes tend to affect the southeast coast in late summer and fall due to a weather phenomenon known as the Bermuda High, a large high-pressure system which keeps storms offshore during the summer months. The Bermuda High disintegrates in late summer, **“allowing the coast to again receive rain from large frontal storm systems which move across the continental United States. In the fall tropical storms can bring the heaviest rainfall. Intermittent northeasters, which may last for several days at a time, supply most of the rain in the late fall, winter, and spring.”** Hurricanes **“tend to follow the path of warm air above the Gulf Stream near the edge of the continental shelf, about 80 miles off our coast”** [4].



Tides range from 2 to 2.7 m (6.5 to 9 ft). Comparatively, Cape Hatteras, North Carolina has 2-to-3- ft tides, and Miami has 1-to-2-ft tides. Despite the concern over global sea level rise, **“the growth and erosion of our barrier beaches are more influenced by shifting shoals, storm episodes, and seasonal winds and tides”** [4].

Climate and Culture

The history of what is now known as Savannah begins with Native American tribes such as the Guale, Lower Creek, and Choctaw, with settlements south of the Savannah River, and the Yemasee tribe north of the Savannah River. The earliest recorded history notes the Guale tribe’s encounter with Spanish Missionaries in the 1500s, which included bringing disease and devastation to tribe’s population.

By the time General James Oglethorpe and other English colonizers arrived in 1733, they met members of the Yamacraw nation, a later tribe formed from an alliance between members of both the Yemasee and Creek tribes. The leader of the Yamacraw was Tomochichi, who forged a friendship with Oglethorpe. They worked together with the aid of a translator and negotiator, Coosaponakeesa (Mary Musgrove), the daughter of a Native American woman and an English tradesman.

On May 21, 1733, delegates from eight principal towns of the Lower Creeks met with Oglethorpe and signed the Treaty of Savannah, which included terms of commerce and land division. The Lower Creeks ceded all lands between the Savannah and Altamaha Rivers, extending west to the tidewater and included all islands on the coast from Tybee to St. Simon’s. The Creek were left with the islands of Ossabaw, Sapelo, and St. Catherine’s, as well as a tract of land between Pipemaker’s Bluff and Yamacraw Bluff. Over several decades, boundaries continued to change but the descendants of early Georgia tribes live throughout the Southeast.

Climate change has been shown to be irrevocably linked to cultural and historical preservation, as evidenced in the small settlement of Pin Point, located just south of Savannah.



Current view of Pinpoint Heritage Museum, site of former A. S. Varn and Son Oyster and Crab Factory

In 1896, Pin Point was founded by freed slaves from the surrounding Islands, centered around a church called Hinder Me Not. The Moon River runs through the heart of the village, with large oak trees and marshes dotting the landscape of this Gullah/Geechee town. Pin Point became known for their hardworking and dedicated residents, and industry naturally followed; by the 1920s, it was a mecca of shrimping, crabbing, and oyster harvesting for the southeast.

This village was a sanctuary for many Black Americans in the 1900s, a place where Jim Crow laws would not interfere with education, community, and a good honest day's work. By the late 1980s, the oyster population began to diminish, and crabs and shrimp were harder to come by. A combination of tidal temperature changes due to gradual warming and overfishing by the citizens of Pin Point had drained or relocated the natural resources from the community. While there used to be thousands of native Gullah speakers in the area, today there are just under three hundred. [5]

Another cultural resource heavily impacted by stormwater and flooding is cemeteries. With the sea level rising faster, coastal cities are having to examine the design of their towns and their general resiliency. High-tide flooding is up to nine (9) times more frequent on the US East Coast than it was fifty (50) years ago, with NOAA predicting the level to rise at least twelve (12) inches before 2100. While keeping houses, streets, and businesses above water is a top priority, it can be easy to forget that historic coastal towns like Charleston and Savannah are home to cemeteries that have been in use for hundreds of years.

During a recent storm event in Denham Springs, LA, over a dozen caskets came out of the ground, with four (4) escaping the fence into the city. Repeated disasters traumatize families and it be costly to re-bury loved ones. In some cases, caskets had to be sawed open so jewelry could be used for identification. With this type of incident happening more frequently, cemetery owners have begun planning for this eventuality by creating digital placement maps and identifying individual caskets with ID codes.

At present, there is no workable solution for prevention, and it will only get worse in coming years. Older cemeteries are prone to abandonment, especially smaller family graveyards, and when people call about their ancestors' caskets washing away, they sometimes find there is no one to fix the problem. [6]

While changing climate and resulting hazards and disasters can lead to physical destruction and deterioration of historic structures, it also can be disastrous for cultures and intangible heritage. The preservation of minority communities, cultures, and entire histories are at stake and must be accounted for alongside physical structures.



Bonaventure Cemetery, Savannah, GA

[5] Freeman, Michael. *Native American History of Savannah*. Arcadia Publishing, 2014.

[6] Aton, Adam. "Even the Dead Cannot Escape Climate Change." *Scientific American*, 31 Oct. 2019. <https://www.scientificamerican.com/article/even-the-dead-cannot-escape-climate-change/>

Previous Major Disasters



Over a dozen high-intensity hurricanes have struck the City over the years, not including other major tropical storms, floods, and tornados. Due to the geography of the coast, the City is rarely struck directly by a hurricane, but instead typically experiences flooding due to nearby landfall. After weather events began to be recorded and before widespread naming and tracking of hurricanes, the City suffered three (3) major storms in 1927, 1940, and 1947. These Category 1 storms caused extensive damage, flooding downtown, and left around \$1 million in structural damage in 1940 dollars (\$21m today).

Select Storm Events in Savannah, GA

1952

Hurricane Able – Category 1 storm that came ashore near Beaufort and devastated the town.

1959

Tropical Storm Gracie – Made landfall north of Savannah and destroyed much of Charleston in the most devastating storm recorded to date.

1979

Hurricane David – Category 1 hurricane that directly hit Savannah, bringing 90 mph winds. This storm destroyed trees and power lines, causing widespread power outages; an estimated 85% of Savannah homes were without power for a week.

1985

Hurricane Bob – Category 1 hurricane that came ashore near Beaufort.

1989

Tropical Storm Hugo – Hugo was a tropical storm when making landfall in Savannah but directly struck the city of Charleston as a category 4 hurricane, running all the way to Charlotte 200 miles inland as a category 1 storm. This hurricane destroyed much of Charleston and caused severe flooding and heavy rain all across the southeast for weeks.

1999

Hurricane Floyd – A category 2 hurricane that evacuated 2 million people around Savannah and southern South Carolina, Floyd reached 580 miles in diameter, making it one of the largest recorded hurricanes ever.

2016

Tropical Storm Hermine – This tropical storm created significant flooding in Savannah, with 50 mph winds and high tide hitting 8.5 ft.

2016

Hurricane Matthew – Category 1 hurricane that knocked power out of 140,000 homes in Chatham County. Debris cleanup alone cost the county \$22 million.

2017

Hurricane Irma – A category 1 storm that unexpectedly went ashore in Florida, leaving Savannah with high flood levels. [7]

[7] Brimmer, Adam Van. "Savannah's Storm History: A Look Back at a Century of (Mostly) near Misses from Hurricanes." *Savannah Morning News*, Savannah Morning News, 30 Sept. 2022, <https://www.savannahnow.com/story/news/2022/09/29/history-hurricane-tropical-storm-threats-savannah-georgia/10458771002/>.

LITERATURE REVIEW

This Literature Review is designed to give a high-level overview of existing plans which have recently been adopted in the Savannah Metro Area, as well as case studies from around the United States of effective hazard mitigation plans.

Relevant Federal and Local Plan Documents

Coastal Georgia Historic Resource Survey

The Coastal Georgia Historic Resource Survey was performed post 2017 Hurricane Irma to look at historic properties which are potentially eligible resources in Georgia's unincorporated coastal counties. The survey inventoried historic resources over fifty (50) years of age to determine eligibility for the National Register of Historic Places. This survey can be used for research on the historic resources in unincorporated Chatham County. Over 1,400 buildings were surveyed in Chatham County with 107 entries being updated on GNAHRGIS and 1,343 new entries being created.

Table 9: Number of Resources Surveyed in Chatham County by Type

Category	Number of Resources
Surveyed Resources	
Buildings	1,400
Structures	11
Objects	13
Sites	10
Landscape Features	1
Total Resources Surveyed (extant and non-demolished)	1,435
Non-extant/Demolished Since Previous Survey	15
GNAHRGIS Entries	
GNAHRGIS Entries Updated	107
New GNAHRGIS Entries Created	1,343
NRHP Data	
Historic Districts (previously recorded within survey area)	1
Resources listed in the NRHP (previously recorded within survey area)	6
Potentially eligible resources surveyed by this project	64
Potential NRHP-eligible historic districts tentatively identified by this project	4

The following is an excerpt from the Coastal Georgia Historic Survey Report by LG2 Environmental Solutions Inc., submitted to Georgia Department of Community Affairs Historic Preservation Department in 2022, describing a study of hurricane impacts to coastal Georgia:

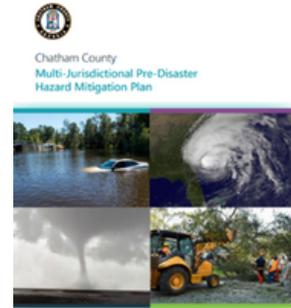
“A historical analysis of hurricanes indicates direct hurricane impacts to the Georgia coast sometimes occur over successive years, then can cease for decades. This cycle appears to have been fulfilled with Hurricane Matthew (2016) and Hurricane Irma (2017), the first hurricanes to hit the Georgia coast since Hurricane David (1979), which occurred nearly 40 years ago. In September 2017 Hurricane Irma, the subject of this study, caused extensive flooding on the coastal mainland and barrier islands in all coastal counties of Georgia. Out of the 3,910 historic period resources surveyed by this project, a total of 168 had recorded damage from Hurricane Irma, including 108 instances of flooding. This is not a complete accounting of damage for historic period resources, as this does not include those resources located in incorporated municipalities, state-owned or federal government-owned land, and incomplete data from Camden and McIntosh Counties...

Recommendations of this report are as follows. The state should fund an effort to comprehensively identify NRHP [National Registry of Historic Places] -eligible and listed resources within, minimally, all 100-year flood zones in coastal counties, to include state-owned properties and properties in incorporated areas. The 11 potential historic districts identified by this inventory should also be more thoroughly investigated to confirm NRHP eligibility. Counties can then use this data to produce Cultural Resource Hazard Mitigation Plans to prepare for future inundation impacts on historic properties both from hurricanes and projected sea level rise.”

[Chatham County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan \(Existing Plan, 2020\)](#)

CEMA’s Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan, adopted in 2020, allows readers to learn about and identify which natural disasters are most likely to occur in upcoming years and the threats each pose to historic and cultural resources in Chatham County.

The Hazard Risk Assessment portion of this plan covers all of Chatham County. The risk assessment process identifies and profiles relevant hazards while assessing the exposure of lives, property, and infrastructure to these natural hazards. This assessment aims to make it easier to interpret future natural hazards posed to the County. Following are some natural disasters which negatively impact historic buildings and resources within the County.



Hurricane, Sea Level Rise, Flooding

Flooding is the most frequent and costly natural disasters in the U.S, resulting in more than 10,000 deaths since 1900. The City and the County experience four types of flooding including: coastal tidal flooding, riverine flooding, flash flooding, and stormwater flooding, all of which impact historic properties.

Drought

Between 2000 and 2018, Chatham County was in some level of drought 47.3% of the time. Chatham County experienced the greatest magnitude of drought between 2006 and 2008, totaling over twenty-five (25) inches of precipitation deficit. The Fourth National Climate Assessment reports that average and extreme temperatures are increasing across the country and average annual precipitation is decreasing across the southeast. Droughts will more than likely increase in intensity and duration in the southeast. Droughts can cause structural damage to buildings in areas with shrinking and expansive soils, which will critically affect historic preservation efforts.

Erosion

Coastal erosion has multiple causes including large storms, strong wave action, sea level rise, and inappropriate land uses near water. According to NOAA, coastal erosion is responsible for approximately \$500 million per year in coastal property loss in the US. Along with coastal erosion, stream bank erosion poses a threat to the City and the County through increased velocity of runoff water. This additional water can lead to increased flooding during a storm event, negatively impacting historic properties in the path.

The conclusions drawn from each individual hazard profile and vulnerability assessment were used to prioritize all potential hazards to Chatham County using the Priority Risk Index (PRI). This method provides a standardized numeric value to each hazard for comparability. A higher PRI value indicates a hazard poses a higher risk to the community. The PRI is a weighted sum of values assigned across five categories: probability, impact, spatial extent, warning time, and duration. Each hazard is assigned a value between 1 and 4 for each category based on a defined set of criteria. Details on these values can be found in Section 2.3. Table 1.11 below summarizes the PRI results for the hazards addressed in this plan.

Table 1.11 – Summary of PRI Results

Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Dam Failure	Unlikely	Limited	Negligible	Less than 6 hrs	Less than 1 week	1.8
Drought	Likely	Minor	Large	More than 24 hrs	More than 1 week	2.5
Earthquake	Possible	Limited	Moderate	Less than 6 hrs	Less than 6 hrs	2.3
Erosion	Likely	Limited	Small	More than 24 hrs	Less than 1 week	2.3
Extreme Heat	Highly Likely	Critical	Large	More than 24 hrs	Less than 1 week	3.3
Flood	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 1 week	3.3
Hurricane	Likely	Catastrophic	Large	More than 24 hrs	Less than 1 week	3.3
Sea Level Rise	Likely	Critical	Moderate	More than 24 hrs	More than 1 week	2.9
Severe Weather (Hail) ¹	Highly Likely	Minor	Small	Less than 6 hrs	Less than 6 hrs	2.4
Severe Weather (Lightning) ¹	Highly Likely	Minor	Negligible	Less than 6 hrs	Less than 6 hrs	2.2
Severe Weather (Winds) ¹	Highly Likely	Limited	Large	Less than 6 hrs	Less than 6 hrs	3.1
Severe Winter Weather	Likely	Limited	Large	More than 24 hrs	Less than 1 week	2.7
Tornado	Likely	Critical	Small	Less than 6 hrs	Less than 6 hrs	2.7
Wildfire	Likely	Limited	Moderate	Less than 6 hrs	Less than 1 week	2.8
Hazardous Materials	Likely	Critical	Moderate	Less than 6 hrs	Less than 24 hrs	3.0
Terror Threat	Unlikely	Catastrophic	Negligible	Less than 6 hrs	More than 1 week	2.2

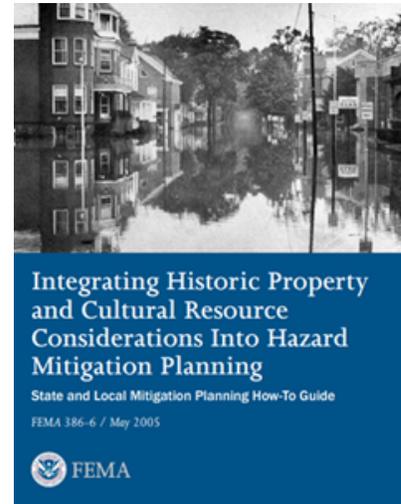
Figure 6, Hazard Identification and Risk Assessment Chart

[Chatham County - Savannah Plan 2040](#)

Plan 2040 is the Comprehensive Master Plan for Chatham County-Savannah, which includes goals of protecting historic and cultural resources from sea level rise and other climate change impacts. Chatham County will see anywhere from 0.5 to 1.5 meters of sea level rise by the year 2100. One (1) meter of sea level rise would place 94,000 buildings and 105 historic sites at risk (Georgia Conservatory, 2012). Additionally, Plan 2040 looks to ensure that resources in critical areas are surveyed and that survey practices are inclusive.

[Integrating Historic Property and Cultural Resource Consideration into Hazard Mitigation Planning](#)

The Federal Emergency Management Agency (FEMA) has developed a series of guides for mitigation planning in assisting Tribes, states, and local governments in developing effective hazard mitigation planning processes. Listed below are the recommended steps from FEMA's guide on "Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning."



Phase 1

1: Access Community Support

The planning team must define what is considered a historic property and cultural resource within Chatham County. There are already key communities in Chatham County and Savannah metro area which consider historic preservation important and essential to the sustainability of the community. The bridge between preservation and hazard mitigation can be found through outreach and education.

2: Build the Planning Team

A stakeholder group has been identified and engaged including private and public partner, neighborhood associations and nonprofits.

3: Engage the Public

Stakeholder meetings have been scheduled to continue community outreach and uncover opportunities.

Phase 2

1 & 2: Identify and Profile Hazards

Chatham County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan (Existing Plan, 2020) outlines and evaluates Chatham County's biggest threats regarding natural hazards. The plan provides options for the timing surrounding warning the community of pending hazards and the predicted duration of events.

3: Inventory Historic Property and Cultural Assets

Chatham County Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan (Existing Plan, 2020) outlines a list of community historic properties and cultural assets around Chatham County.

Phase 3

1: Develop mitigation goals and objectives for preservation hierarchy

2: Identify, evaluate, and prioritize actions

3: Prepare an implementation strategy

4: Document mitigation planning processes completed for historic properties and cultural resources

Phase 4

Consideration 1: Sensitivity of information

Consideration 2: Required regulatory review

Consideration 3: Interagency coordination/ agreements

Consideration 4: Evaluating and updating your plan

Consideration 5: Updating your inventory data

Case Study

The City of Annapolis' Planning Initiative "Weather it Together: Protect our Historic Seaport"

Weather it Together builds on clear goals and objectives towards public awareness/ engagement programs, flood adaptation/ mitigation, disaster response/ recovery, and public improvements. The study area of the hazard mitigation is in Annapolis' historic district, which is a much smaller land area compared to Chatham County. The plan has a clear table of acronyms and abbreviations laid out for the readers of the document. Annapolis, although not as large as Savannah, relies heavily on the tourism industry in the National Landmark District. The document references using hazard mitigation to preserve the quality of life for Annapolis residents but also preserving the robust economy of the city, as the threat of natural hazards to their historic landmarks has been identified and documented.

Much like parts of Chatham County, Annapolis struggles with climate threats, specifically related to tidal flooding, extreme storm events, and rising sea levels. Through Annapolis' historic resource and cultural assets inventory, the city identified forty-five (45) resources which were of "High Community Value Ranking." These historic and cultural resources provide a powerful sense of place to locals and tourists alike and were valued as the most important to preserve through hazard mitigation.

The Annapolis Plan followed the FEMA Integrating Historic Property and Cultural Resource Consideration into Hazard Mitigation Planning for the outline of their plan.

Action Steps Proposed from Plan

Increase freeboard for buildings in flood prone areas.

Integrate stormwater management into surface and structural parking approaches. Minimize use of surface parking lots.

Downzone in flood prone overlays. Require new developments with more intense uses to obtain special-use permits.

Provide tax credits to make improvements towards hazard mitigation.

Increase setbacks for waterfront properties.

Limit building size and density by base zoning to create less impervious surfaces in areas prone to flooding.



IDENTIFYING HAZARDS AND STRATEGIES FOR RESILIENCY AND PRESERVATION

There are a variety of natural hazards that impact Chatham County’s natural, cultural, and historic resources. They include coastal storms, flooding, and tornadoes, drought, extreme heat, hailstorms, lightning, thunderstorms, high wind, wildfires, storm surge and sea level rise.[8] There have also been several documented incidents of hazardous materials incidents affecting highways, railroads, water, and air.[9] These incidents have been documented by CEMA in their 2015 Hazard Mitigation Plan and are accessible online. Although this list does not specifically call out historic and cultural resources, knowing the history and frequency of natural disasters in a given area helps determine the best preventative measures for these resources.

Observation of the types of hazards and geography of this area makes it apparent that incorporating disaster recovery, resiliency and mitigation strategies into local historic preservation ordinances is essential. With an increase in the occurrences and magnitude of flooding events, historic property owners are faced with the challenges of preparing for and mitigating potential and actual damages.

In 2021, the City drafted a document titled City of Savannah, Georgia Program for Public Information which discusses the community’s public information needs regarding flood incidents and flood hazard reduction measures. Savannah is rated a Class 5 in the National Flood Insurance Program (NFIP) which provides flood insurance policy holders with a 25% reduction in flood insurance premiums.[10]

Best Practices – Resiliency and Preservation

Resilience is an ongoing process that evolves as needs and circumstances change. It is essential to keep a sense of flexibility within a resiliency plan. The key elements for best practices include preparation, mitigation, recovery, and adaptation. For historic resources there are treatments recommended by the Secretary of the Interior’s Guidelines on Flood Adaptation for Rehabilitating Historic Buildings.

This publication was created as a result of the increasing requests from historic property owners for guidance on how to approach flood risks surrounding historic resources within moderate to high-risk areas. There are a variety of treatment options to be considered as part of an ordinance, and can include:

- **Planning and Assessment for Flood Risk Reduction**
- **Temporary Protective Measures**
- **Site and Landscape Adaptations**
- **Protect Utilities**
- **Dry Floodproofing**
- **Wet Floodproofing**
- **Fill the Basement**
- **Elevate the Building on a New Foundation**
- **Elevate the Interior Structure**
- **Abandon the Lowest Floor**
- **Move the Historic Building**[11]

[8] Chatham Emergency Management Agency. Hazard Mitigation Plan- Annex A: Hazard Identification, Risk Assessment and Vulnerability, p. A-4.

[9] Ibid, pp. A26-A42.

[10] City of Savannah. City of Savannah, Georgia Program for Public Information. p. 1

[11] National Park Service. Secretary of the Interior’s Guidelines on Flood Adaptation for Rehabilitating Historic Buildings. p. 9

The National Park Service recommends that prior to designating a treatment for a historic property, that a Planning and Assessment for Flood Risk Reduction is completed.[11] Aside from reduction of flood risk, other factors to consider involve feasibility and affordability, and maintaining historic character.[12]

The field of emergency management is growing and incorporating more topics as the frequency of large-scale disasters increases. More than ever, historic preservation professionals are included in the conversations on best practices and recovery strategies.

Below is a brief overview of the four key elements of best practices in relation to historic and cultural resources. This is not intended to be an all-encompassing description but rather an introduction to the framework of disaster recovery efforts.

<p><u>Preparation</u> Preparation is critical in disaster and recovery planning. No other treatments or mitigation strategies should be considered until a situation is deemed safe, with life safety as a top priority. For historic and cultural resources, the above-mentioned treatments are ways to prepare for an ever-changing environment and climate factors that may not have affected these resources at the time of construction. Preparing historic resources ahead of future disasters can help minimize negative effects.</p>	<p><u>Mitigation</u> There are proactive and reactive strategies working together for resiliency and preservation planning. Understanding and assessing risk ahead of a disaster is a proactive, whereas mitigation can be either proactive or reactive. Some mitigation strategies are preventative but, in many cases, they are implemented to reduce the severity of something that has already taken place. Mitigation strategies are needs-based and dependent on the degree of damage, whether actual or anticipated.</p>	<p><u>Recovery</u> In the wake of a disaster, recovery measures are implemented almost immediately. Depending on the seriousness of the incident, there may be loss of life and property. Once an area is deemed safe enough to access, assessment of damages can begin. Historic resources in a disaster zone may be more susceptible to structural issues, for example. Best practices for recovery are dependent on the severity of the damage as well as what can be done without risking life safety.</p>	<p><u>Adaptation and Adaptability</u> In most cases there will be a degree of adaptability needed within the uncertainty and unpredictability of natural disasters, as well as those resulting from human-made interventions. A strategy that works well for one resource may not work for another, which is why it is necessary to allow for flexibility within recovery plans and ordinances. No two events are alike, and a strong disaster recovery plan should contain specific standards while allowing the space for adaptability and flexibility.</p>
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[12] Ibid., p. 9

[13] Ibid., p. 10

Challenges

Although there are treatments available for historic properties that need flood hazard reduction protections in place, these are not without their share of challenges. Affordability is critical for flood adaptation projects and also flood insurance. Costs of flood insurance may be reduced with the City's Class 5 standing but this does not extend to the rest of the County. Flood insurance is also cost-prohibitive for many property owners, and it often disproportionately affects minorities.

Other challenges are faced by natural, cultural, and historic resources in more critical areas that may not be as accessible as an urban setting. Archaeological sites and cemeteries are some examples of resources that may not have a clear outline of work that needs to be done. In some cases, cemeteries have fallen into a state of disrepair to a point where all graves are no longer marked, and the boundaries are unknown. This can be resolved by historic and cultural resource surveys that have current information and have identified as many resources as possible.

The amount of growth in the City and County areas is creating more impermeable surfaces. This reduces the amount of groundwater that is naturally absorbed during heavy rains that can lead to flash flooding. Additionally, the current ordinances for the City and County do not explicitly allow for best practice measures when it comes to the resiliency of historic structures. While they are not expressly disallowed, omitting them within the ordinance leads to a degree of subjectivity when property owners seek to apply an adaptation measure to their building. The lack of standards regarding hazard mitigation of historic resources may discourage property owners from seeking out these methods and may lead to future damage to these resources.

Opportunities

Biggest opportunities for successful disaster and resiliency planning are:

- **Identify stakeholders including residents, property and business owners, local organizations, government agencies from local, state and national levels.**
- **Allow public input through dialogue and surveys to bring to light different perspectives, factors, and data.**

This can also be true in making ordinance revisions that reflect these specific needs.

Key factors for a successful hazard mitigation plan are **life safety, environmental and historic preservation, and community/stakeholder engagement**. There is no universal plan that fits every jurisdiction or resource, so a sense of adaptability and flexibility is necessary. Managing expectations is also an important part of the process, as certain elements will take longer to implement. For example, adding signage for pedestrian exit points to higher ground during a flash flood and the installation of warning sirens take less time to put in place than a channel widening project, or the writing of a comprehensive disaster plan. Ordinances that include disaster preparedness and mitigation measures, such as limitations on the quantity of new non-permeable surfaces allowable in flood-prone areas, will also help to ensure that proactive approaches are taken.

In conclusion, awareness of the risk factors for disasters, both natural and human-made, will help inform the best action plans for protecting the historic and cultural resources of Savannah and Chatham County. No solution is 100% foolproof, but, with knowledge of past incidents and effective treatments there is an opportunity to better anticipate and prepare for the higher occurrences of extreme weather events.

GOALS AND PRIORITIES

Chatham County contains many critical historic and cultural resources within its borders. As climate change occurs and natural disasters become more prevalent, such resources are at risk of damage and loss, which will have detrimental impacts on the community, both economically and culturally. The sections above are intended to inform several goals for the MPC, in partnership with Savannah and Chatham County, to begin to approach and incorporate best practice hazard mitigation for historic and cultural resources into our ordinances, procedures and policies. Additionally, this document looks to lay the groundwork for future work to provide property owners in Savannah, and beyond, with adaptation and protection guidelines that are specific to the Chatham County environment and its historic and cultural resources.

The following recommendations can aid in reaching these goals:



PREPARING FOR A DISASTER

Be ready before a disaster strikes to keep you, your family, and your property safe.

Get informed

Know the hazards in your area and your risks. Learn about warning systems and evacuation routes.

Make a plan-what to do BEFORE a disaster strikes

Make sure insurance is up to date and adequate. Make a list of possessions and take photos. Have important papers and important contact information (i.e., utilities, insurance company, etc.) in one place. Make sure all home warning systems are maintained, especially smoke detectors.

Have a plan with your family including meeting spots communication methods, escape routes, a safe place, and out of town contacts. Plan for those with disabilities and special needs. Plan for pets. Practice your safety drill.

Assemble a kit

Water, non-perishable food, food for infant/babies, can opener, water, flashlights, batteries, radio, medication, first aid kit, matches, pet supplies, blankets and jackets, personal hygiene items, photocopies of identification, cash, and seasonal supplies.

For more detailed information visit

<https://www.fema.gov/pdf/library/pfd.pdf>.

For more information on local resources and the Hurricane Registry process visit <https://www.chathamemergency.org/>



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