Natural Resources Draft

CHAPTER 7
NATURAL RESOURCES ELEMENT

Savannah and Unincorporated Chatham County are defined by one of the most distinctive coastal landscapes in the Southeast, a place where people have long been drawn to live near tidal rivers, marshes, and oak-lined shores. These natural systems shape the region's identity and provide essential benefits such as flood protection, clean water, habitat, and recreation. As the population grows and development expands, the balance between community needs and environmental stewardship becomes increasingly important. With thoughtful planning and a shared commitment to protecting natural resources, Chatham County and its jurisdictions can remain a healthy, resilient, and beautiful place for generations to come.

Introduction

Chatham County contains exceptional natural resources vitally important to the quality of life, resilience, health, and economy of the region. The County therefore has an interest in promoting, developing, sustaining, and protecting its natural resources for current residents and future generations.

This chapter of The Comprehensive Plan 2040 Update includes an existing conditions assessment of specific natural resources and natural resource issues found in Chatham County as well as specific goals and objectives for the management and protection of these resources for the next 20 years.

Coastal Resources

Georgia's coastal marshlands and beaches are seen as one of the State's greatest resources and a defining characteristic feature of Chatham County. The beaches draw new residents and tourists to the area, while the marshlands are an essential ecosystem for many plant and animal specials, protecting coastal residents from much of the impacts of storms and higher than normal tides. The landscape along the Georgia coast is also dotted with marsh hammocks - back barrier islands or small upland areas surrounded by tidal waters and marshes that provide a haven for wildlife.

As the state's coastal population grows and development pressures threaten Georgia's coastal resources, public policies protecting and conserving coastal lands need to be implemented. The preservation of the region's coastal resources through land-use regulations and land acquisition programs is essential to the resiliency of the community, the local economy, and the quality of life for its residents.

Water Resources

Water Supply Watersheds

Chatham County is located within the Atlantic Coast Flatwoods section of the State within both the Savannah and Ogeechee River Basins and more specifically within the boundaries of the Lower Savannah, Lower Ogeechee, and Ogeechee Coastal Watersheds.

The Ogeechee River Basin headwaters is in mid to southeastern Georgia and is flanked by the Altamaha and Oconee River Basins to the west and the Savannah River Basin to the east. The headwaters are in the southeastern edge of the Piedmont province and the basin continues southeastward to the Atlantic Ocean. The river basin is located entirely in the State of Georgia

and drains approximately 5,540 square miles and plays a significant role in forming Wassaw, Ossabaw, Saint Catherine's, Black Beard and Sapelo islands off the coast of Chatham County.

The Savannah River Basin is a 10,577 square mile watershed whose headwaters originate in the Blue Ridge Province of North Carolina, South Carolina, and Georgia. The Savannah River forms the boundary between South Carolina and Georgia as it flows southeast to the Atlantic Ocean at Savannah. The Savannah River is the most extensively used surface water source in the Savannah River Basin.

Public Water Supply Sources

The groundwater resources of Coastal Georgia, specifically the Floridan Aquifer system, are recognized as some of the most productive in North America. This particular system underlies an area of about 100,000 square miles in southern Alabama, southeastern Georgia, southern South Carolina, and all of Florida. The depth below the ground surface to reach the top of the Floridan Aquifer increases from less than 150 feet in coastal South Carolina to more than 1,400 feet in Glynn and Camden counties, Georgia.

The majority of households in the City of Savannah and Unincorporated Chatham County are served by municipal or community water systems that rely primarily on withdrawals from the Floridan Aquifer. Access to centralized water infrastructure is nearly universal across the region. According to the 2024 American Community Survey 5-Year Estimates, Chatham County contains 140,781 housing units, of which 139,008 units (approximately 98.7%) have complete plumbing facilities, defined as hot and cold running water, a flush toilet, and a bathtub or shower. Within the City of Savannah, approximately 98.7% have complete plumbing, with only a small share of units lacking full facilities. These data confirm that municipal and community water systems serve the vast majority of households throughout Savannah and Chatham County, and that reliance on private wells is limited and increasingly uncommon as utility service areas expand and redevelopment occurs.

Public Water Supply Issues and Long-Range Management

Groundwater pumping in the Savannah region and surrounding coastal areas has altered groundwater levels, changed recharge and discharge patterns, and shifted the direction of groundwater flow within the Floridan Aquifer system. These changes increase vulnerability to saltwater intrusion, particularly along the Savannah - Hilton Head interface. As population growth and economic development increase water demand, managing withdrawals from the Floridan Aquifer remains critical to protecting the region's primary drinking water source.

Efforts to reduce reliance on the aquifer began in 1995 with adoption of the Chatham County Comprehensive Water Supply Management Plan. This plan represented a coordinated effort among municipalities, major domestic water suppliers, and industrial users to lower groundwater withdrawals. In 1997, the Georgia Environmental Protection Division (EPD) capped additional pumping from the Floridan Aquifer and required a 10-million-gallon reduction in withdrawals by 2005. The Sound Science Initiative was completed in 2010. This study confirmed patterns of lateral and vertical saltwater migration and led to a multi-step, science-based approach for managing groundwater withdrawals along the Georgia coast.

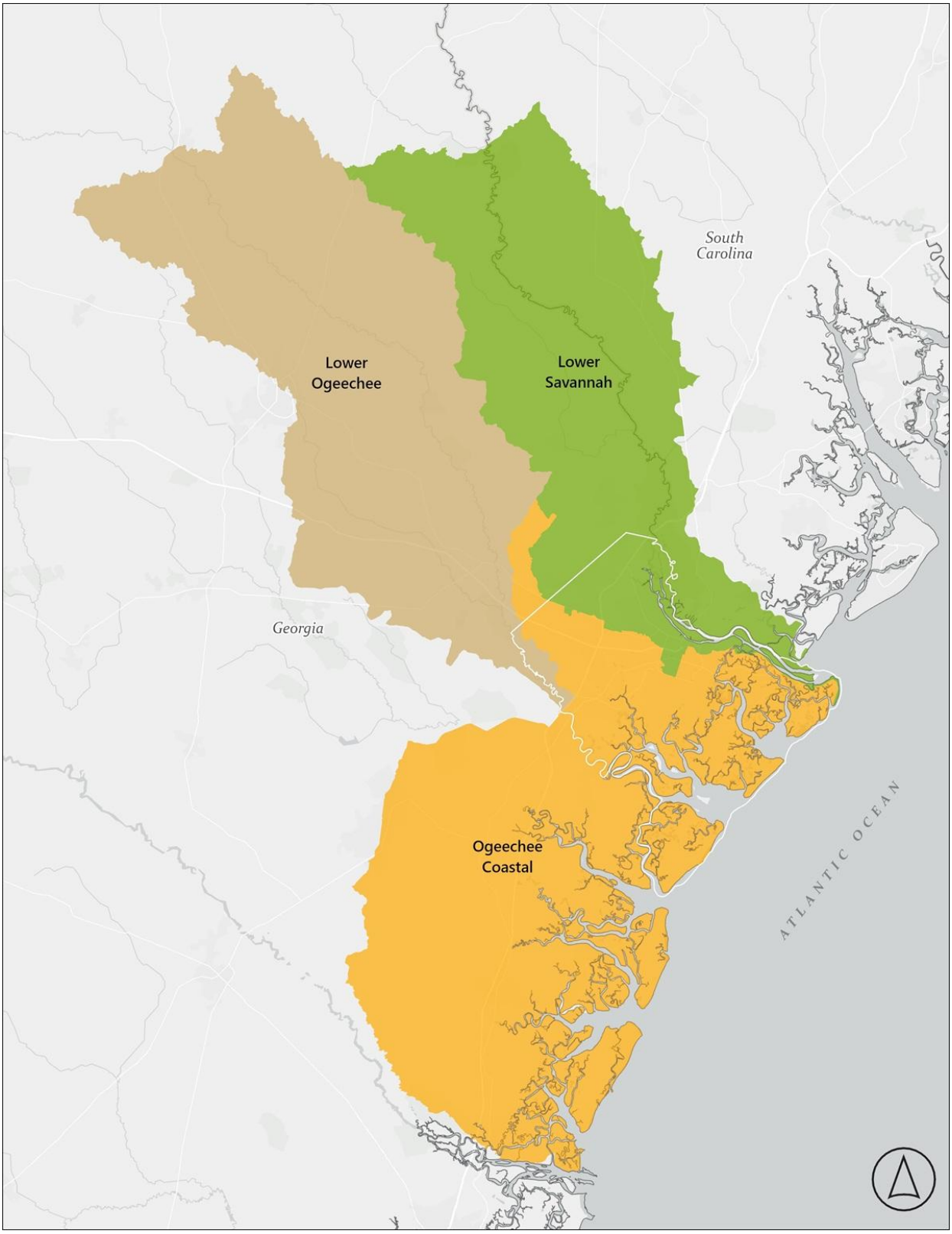


Exhibit 7.1 - Georgia Watersheds

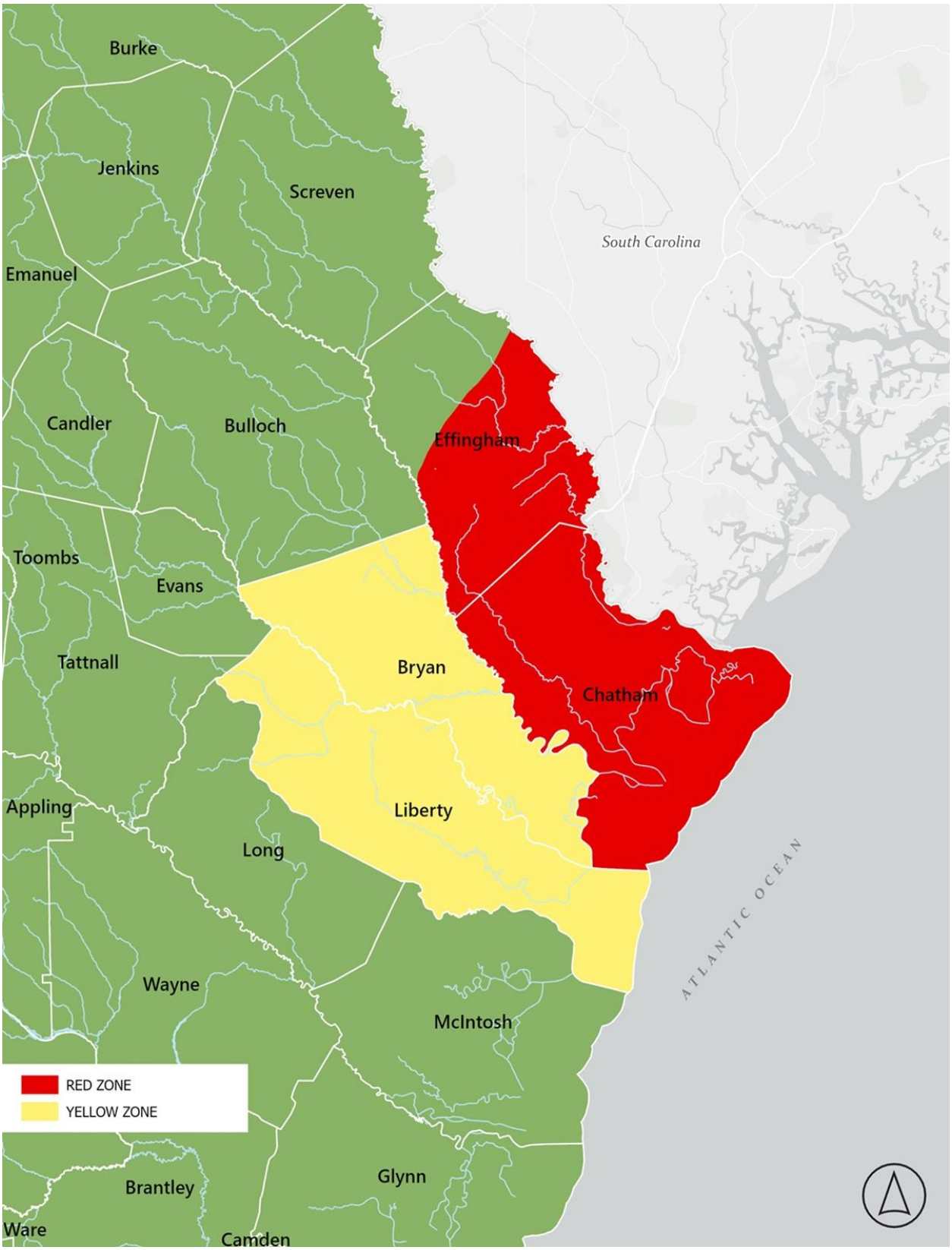


Exhibit 7.2 – Red Zone: Chatham and Effingham Counties

Chatham and Effingham Counties were later designated as part of the “Red Zone,” where EPD significantly reduced groundwater withdrawal permits to slow the advance of saltwater intrusion. Additional regulatory limits were imposed in 2015. These required most Red Zone permittees to reduce withdrawal limits by roughly 22% by 2025. Local governments and water providers have made measurable progress through conservation and system optimization. However, full compliance with the final 2025 reduction target has not yet been documented in publicly available reports. Municipal and county systems continue coordinating long-term water supply planning, evaluating alternative sources, and exploring regional partnerships to reduce reliance on the Upper Floridan Aquifer.

New industrial development has introduced additional complexity to regional groundwater management. The Hyundai Motor Group Metaplant America (HMGMA) near the Red and Yellow Zone boundary is expected to require withdrawals between 4 to 6.6 million gallons of water per day for operations. While regulatory evaluations have concluded that projected pumping will have only minor long-term effects on drinking water supplies, monitoring wells in coastal areas already show localized cones of depression associated with historic industrial pumpage. These depressions can alter groundwater flow gradients and increase the potential for saltwater migration. The recent closure of major industrial users such as International Paper has reduced overall groundwater stress, but the addition of new high-demand facilities may offset some of those gains.

Because groundwater withdrawals in one part of the region influence aquifer conditions throughout the basin, the impacts of industrial, municipal, and agricultural pumping must continue to be addressed on a regional basis. Long-term monitoring, strict enforcement of withdrawal limits, and careful review of new industrial water demands remain essential to protecting the aquifer. Continued coordination among local governments, utilities, EPD, and regional stakeholders will be required to ensure that the Floridan Aquifer remains a viable and resilient water supply for households, industry, and ecological systems.

Groundwater Recharge Areas & Pollution Susceptibility

Groundwater recharge area is the land where the water that eventually seeps down into an aquifer first enters the ground. Groundwater can move readily through soils and rocks that are porous, such as sand, gravel, sandstone, or limestone. However, soils and rocks classified as non-porous, such as clay, shale, or granite, will hinder water movements. The principal aquifer recharge zone for the Floridan Aquifer system is located approximately 100 miles northwest of the City of Savannah where the upper boundary of the aquifer’s confining layer outcrops at the surface near the Fall Line separating the Piedmont province from the Coastal Plain. Soils vary, consisting of nearly level, moderately well-drained to poorly drained soils with a loamy surface layer and firm clay or loamy subsoil. Smaller areas of groundwater recharge are specifically located in the Miocene/Pliocene-Recent unconfined aquifer system within Chatham County. These local recharge areas are generally located on Wilmington Island, Skidaway Island and along the Abercorn Street corridor in Savannah.

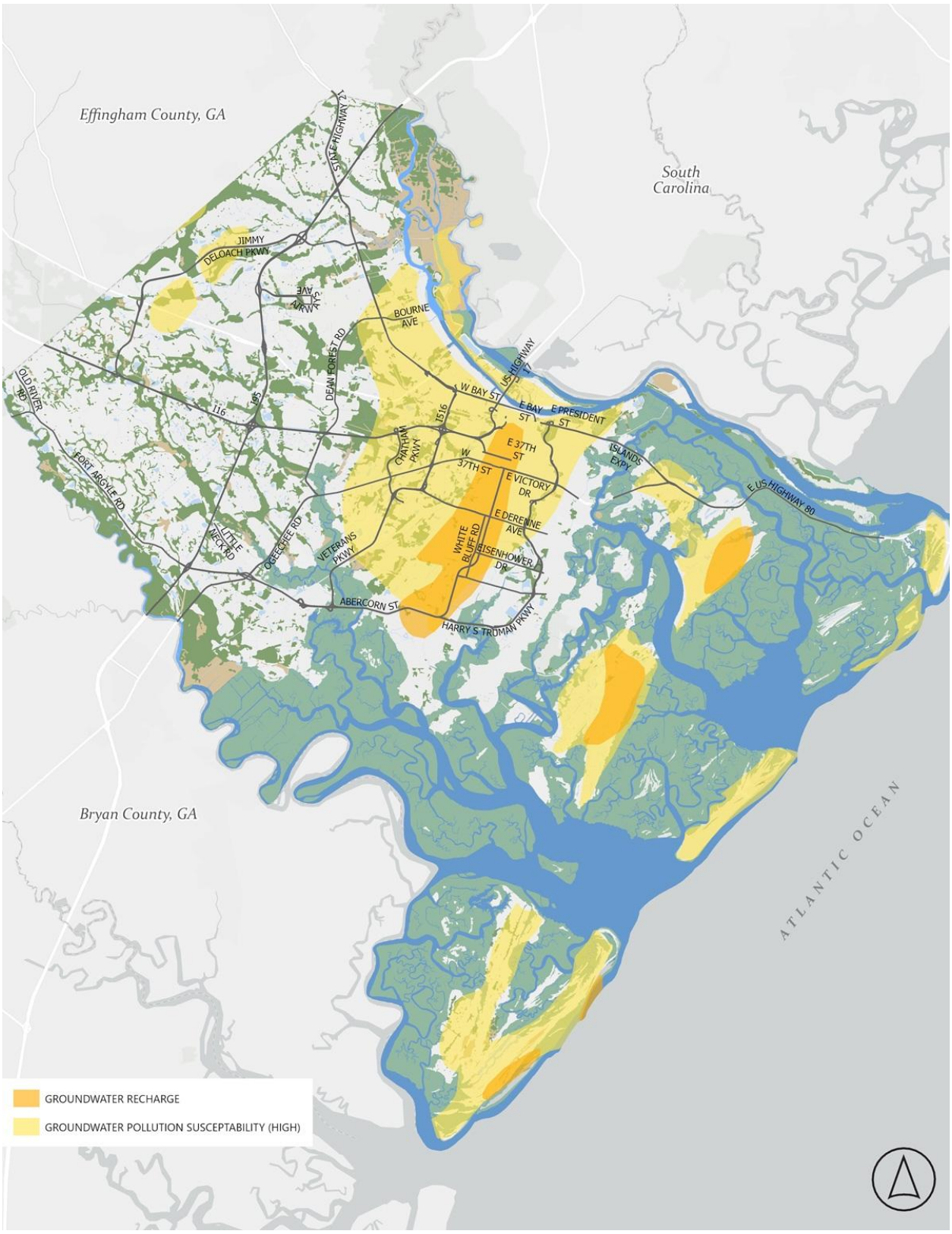


Exhibit 7.3 – Groundwater Recharge and Pollution Susceptibility Areas

If hazardous or toxic substances pollute the water that seeps into the ground in a recharge area, these pollutants are likely to be carried into the aquifer and contaminate the groundwater, ultimately affecting the drinking water source. Once polluted, it is almost impossible for a groundwater source to be cleaned up. For this reason, local wellhead protection ordinances have been passed and each local jurisdiction in Chatham County routinely performs inspections of community wells to prevent wellhead contamination and to address any stormwater pollutants that have the potential to impact groundwater quality through the wellhead.

In Chatham County and Savannah, the protection of groundwater recharge areas is also overseen by restricting land uses that generate, use, or store pollutants within groundwater recharge areas and by establishing minimum sizes for lots within groundwater recharge areas that are served by on-site sewage management systems. Prior to the issuance of a building permit or a demolition permit, the Zoning Administrator assesses whether the proposed activity is located within a groundwater recharge area as identified by the Georgia Department of Natural Resources (GA DNR). All lands identified as groundwater recharge areas are subject to restrictive development standards.

Specific areas within Chatham County have also been deemed to have a higher pollution susceptibility. Careful consideration should be taken within these areas when deciding on land uses and new development to protect the area's groundwater system.

Impaired Waterbodies

Under related environmental protection measures, section 303(d) of the 1972 Clean Water Act mandates that all states develop lists of impaired waters within their jurisdiction. The Georgia Department of Natural Resources Environmental Protection Division has a complete "303(d) list" for the State of Georgia and Chatham County. Currently, there are a number of impaired waterways within Chatham County that are currently being monitored and investigated for measures to improve the water quality. The current list can also be found on EPD's website.

Wetlands

Over the past several decades, wetlands in Georgia, particularly freshwater wetlands on the Coastal Plain, have been altered or converted to other uses as a result of development pressures, population growth, and changing land use demands. This loss has reduced natural flood storage capacity and contributed to increased flooding frequency and severity. The impacts extend beyond ecological degradation, affecting infrastructure, property, and quality of life as floodwaters have fewer natural areas in which to disperse.

In response to these challenges, wetland protection in Savannah and Chatham County is implemented through a coordinated framework of federal, state, and local regulations applied during development review and permitting. Projects that contain or are adjacent to wetlands are required to identify and delineate wetlands using accepted federal methodologies prepared by qualified professionals, with review coordinated through the U.S. Army Corps of Engineers and the Georgia Environmental Protection Division. Local regulations require wetlands and associated buffers to be preserved to the greatest extent practicable, and construction activities within wetlands and required buffers are generally restricted except where authorized through applicable permits.

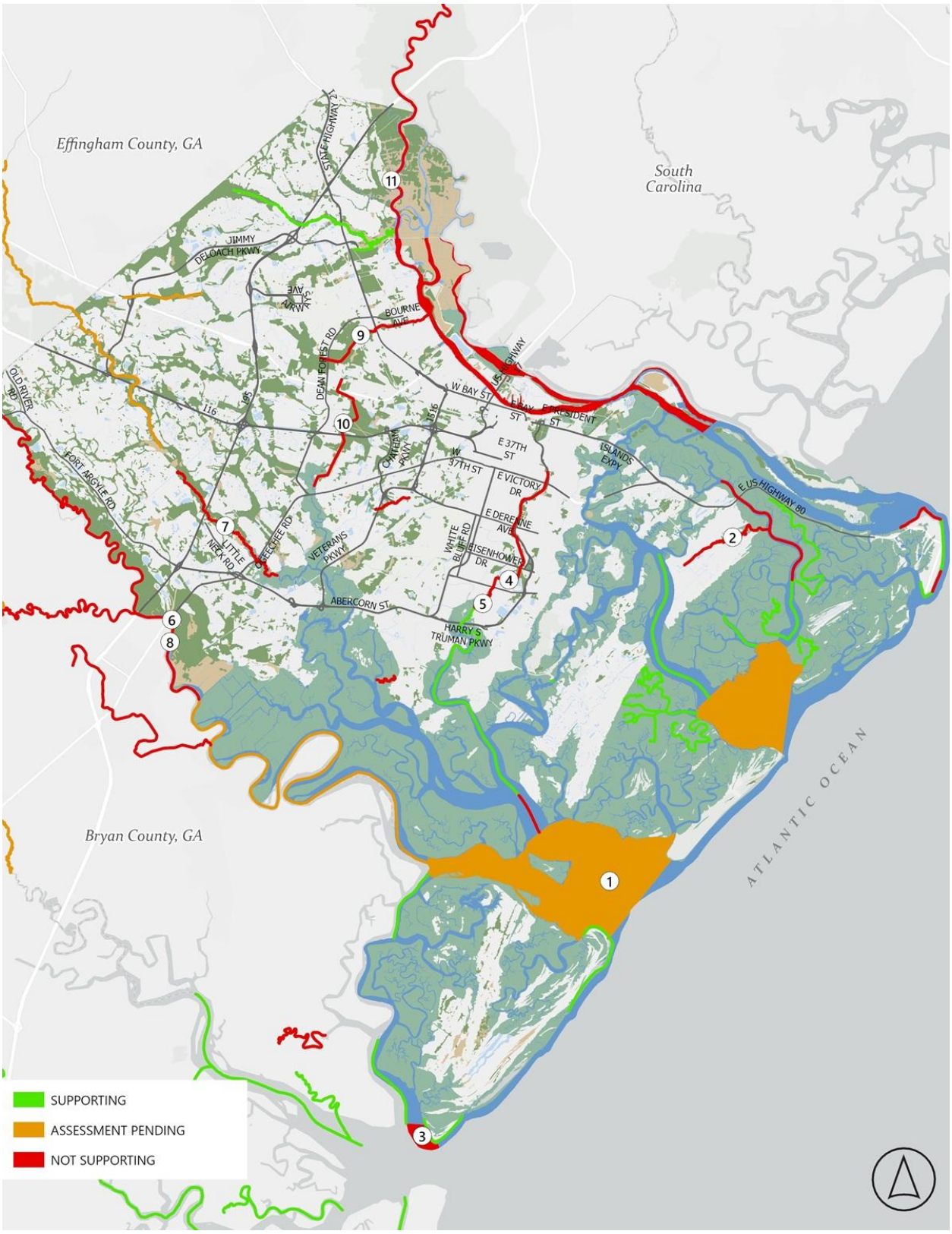


Exhibit 7.4 – Savannah-Chatham County: Impaired Waterbodies

Impaired Waters 305(b)/303(d) List (2024)			
No.	**Impaired Water Body**	**No.**	**Impaired Water Body**
1	Little Ogeechee River	9	Tributary to Salt Creek (GAR030602040213)
2	Ogeechee River	10	Pipemakers Canal
3	Tributary to Hoover Creek (GAR030602040211)	11	Little Ogeechee River (aka Green Island Sound)
4	Savannah River / Front River / Harbor	12	Bull River
5	Betz Creek	13	Tybee Island - Polk Street Beach (End of Beach to Jetty)
6	Casey Canal	14	Tybee Island - Strand Beach at Pier
7	Hayners Creek (known upstream as Casey Canal)	15	St. Catherine's Sound
8	Salt Creek	Source: (2020 GA Biota Impaired Waters with 1 Mile Buffer	

Figure 7.1 – Savannah-Chatham County: Impaired Waters 305(b)/303(d) List (2024)

Stormwater management ordinances adopted by the City of Savannah and Chatham County further support wetland conservation by requiring new development and redevelopment to manage runoff in a manner that minimizes non-point source pollution, protects natural drainage features, and reduces downstream flooding impacts. During site plan review, wetland delineations, buffer requirements, construction constraints, and stormwater controls are evaluated alongside erosion and sediment control standards. Best management practices, including vegetated buffers, bio-retention areas, constructed wetlands, and detention facilities are required or encouraged to treat runoff and reduce pollutant loads. Together, these regulatory and incentive-based approaches reinforce wetland preservation as both an environmental resource and a functional component of the region's stormwater infrastructure, supporting long term water quality, flood resilience, and ecosystem health.

Stormwater management ordinances such as those implemented by all of the jurisdictions within Chatham County can be used to protect wetlands as a means of reducing non-point source pollutants and to create artificial wetlands for the treatment of surface runoff. In addition, pollution controls may be used to prohibit discharges into area wetlands.

NOAA Coastal Change Analysis Program land cover data indicate that Chatham County experienced substantial land cover change between 1996 and 2021, driven largely by continued development and urbanization. During this period, high intensity developed land, (resulting in significant impervious surface coverage, often greater than 50%, and high-density structures, including commercial, industrial, and multi-family residential developments) increased by approximately 15.1 square miles and low intensity developed land (such as small commercial and office, single family/ low density residential, and parks) increased by about 10.3 square miles, reflecting ongoing conversion of natural and rural lands to residential, commercial, and infrastructure uses.

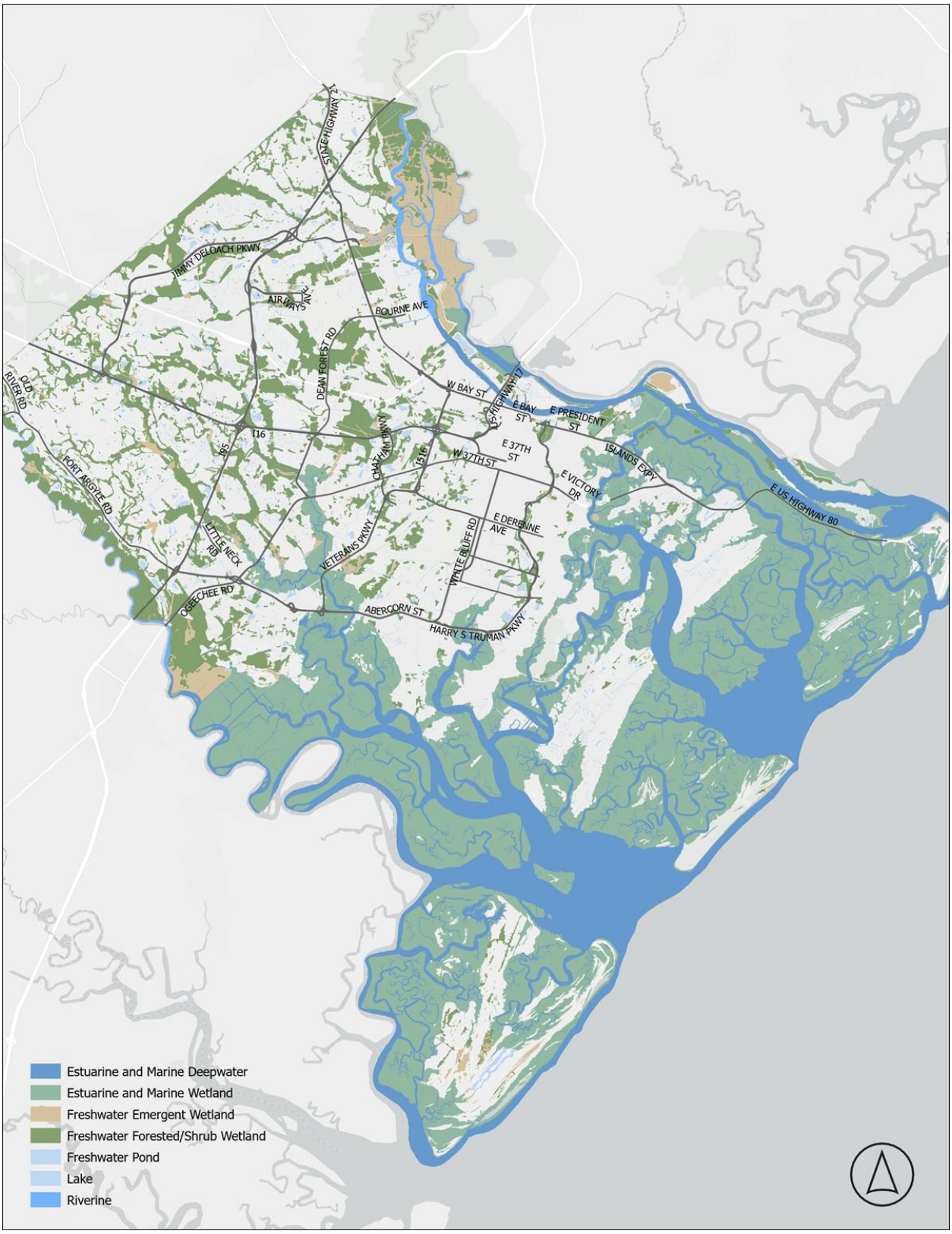
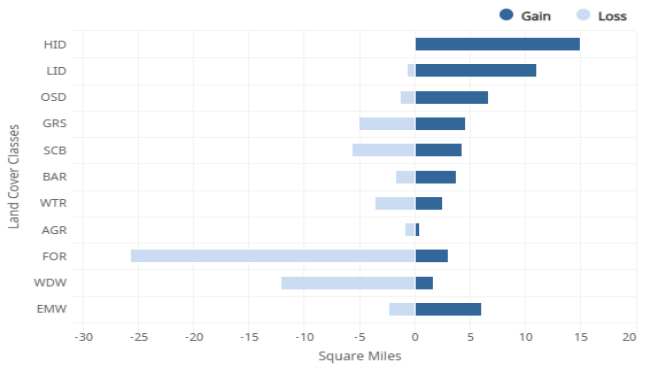


Exhibit 7.5 – Savannah-Chatham County Wetlands



Concurrently, forested and wetland systems have experienced notable losses and shifts. Forest land declined by approximately 22.6 square miles, while woody wetlands decreased by roughly 10.4 square miles, reducing the landscape's capacity for flood storage, habitat support, and ecosystem resilience. Emergent wetlands increased by approximately 3.6 square miles, representing a modest gain that likely reflects changes in hydrology, restoration activity, and coastal processes rather than a net expansion of wetland resources. Together, these trends highlight a shift in land cover composition and underscore the importance of continued wetland protection, forest conservation, and integrated land use and stormwater planning to balance growth with long term environmental sustainability.

Distribution of Change (Losses and Gains) By Land Cover						
Land Cover Class	**1996 Area (sq. mi.)**	**Area Lost (sq. mi.)**	**Area Gained (sq. mi.)**	**2021 Area (sq. mi.)**	**Net Change (sq. mi.)**	**Percent Change**
HID (High Intensity Developed)	19.15	0	15.06	34.21	15.06	78.7%
LID (Low Intensity Developed)	38.14	-0.73	11.01	48.42	10.28	26.9%
OSD (Open Space Developed)	22.31	-1.33	6.71	27.68	5.38	24.1%
GRS (Grassland / Herbaceous)	8.36	-5.05	4.57	7.88	-0.48	-5.8%
AGR (Agriculture)	3.54	-0.94	0.49	3.09	-0.45	-12.8%
FOR (Forest)	89.97	-25.7	3.1	67.37	-22.6	-25.1%
SCB (Scrub / Shrub)	8.76	-5.64	4.33	7.45	-1.31	-14.9%
WDW (Woody Wetlands)	78.04	-12.13	1.7	67.6	-10.44	-13.4%
EMW (Emergent Wetlands)	155.91	-2.4	6.05	159.55	3.64	2.3%
BAR (Barren Land)	9.09	-1.68	3.75	11.16	2.07	22.8%
WTR (Open Water)	199.03	-3.64	2.5	197.88	-1.14	-0.6%
Source: NOAA Coastal Change Analysis Program						

Figure 7.2 - Distribution of Change (Losses and Gains) By Land Cover

Protected Rivers and Corridors

The State of Georgia requires every community to identify and put mechanisms in place to protect specific critical resources such as mountains, rivers, and river corridors that flank major rivers. The coastal region does not contain any protected statewide mountain areas; however, the coast's beautiful rivers and corridors are not only critical ecosystems, but they are paramount to the community's future growth and sustainability.

These river corridors are of vital importance since they help preserve those qualities that make a river suitable as a habitat for wildlife, a site for recreation, and a source for clean drinking water. River corridors also allow the free movement of wildlife from area to area within the State, help control erosion and river sedimentation, and help absorb floodwaters during natural events, and allow the natural migration of floodwaters due to sea level rise.

In an effort to protect the Savannah River corridor, Savannah and Chatham County adopted the Georgia Coastal Regional Commission's (CRC) 2003 Regional River Corridor Protection Plan for the Savannah River. The maintenance of a 100-foot natural vegetative buffer, often referred to as a "riparian buffer", on both sides of the river is part of the Plan. Similarly, under the State of Georgia Erosion and Sedimentation Act, a requirement is in place that land-disturbing activities shall not be conducted within 25 feet of the banks of any State waters.

Riparian buffers are of particular importance to the overall protection of water quality and habitat within the Lowcountry and coastal areas of Georgia. Scientific research has found many reasons for riparian buffers, including:

- To reduce the volume and velocity of stormwater runoff in order to protect the hydrological profiles of the surrounding waterways;
- To reduce the sediment and pollutants going into the open water;
- To provide upland wildlife habitat areas;
- To help maintain the in-stream temperatures provided by the shade within the tree canopy of the buffer system;
- Buffering adjacent neighborhoods, and
- Enhancing community appearance.

Floodplains

Floodplains are flat or lowland tracts of land adjacent to lakes, wetlands, and rivers that are typically covered by water during a flood. The ability of the floodplain to carry and store floodwaters should be preserved in order to protect human life and property from flood damage. However, undeveloped floodplains also provide many other natural and economic resource benefits. Floodplains often contain wetlands and other areas vital to a diverse and healthy ecosystem. By making wise land use decisions in the development and management of floodplains, beneficial functions are protected and negative impacts to the quality of the environment are reduced. Both the City of Savannah and Chatham County have updated their Floodplain Protection Ordinances to begin addressing sea level rise and the natural migration of waters along the coast. However more attention must be given, and measures must be enacted in the near future to allow for further protection of the coastal community from rising waters due to changes in the environment.

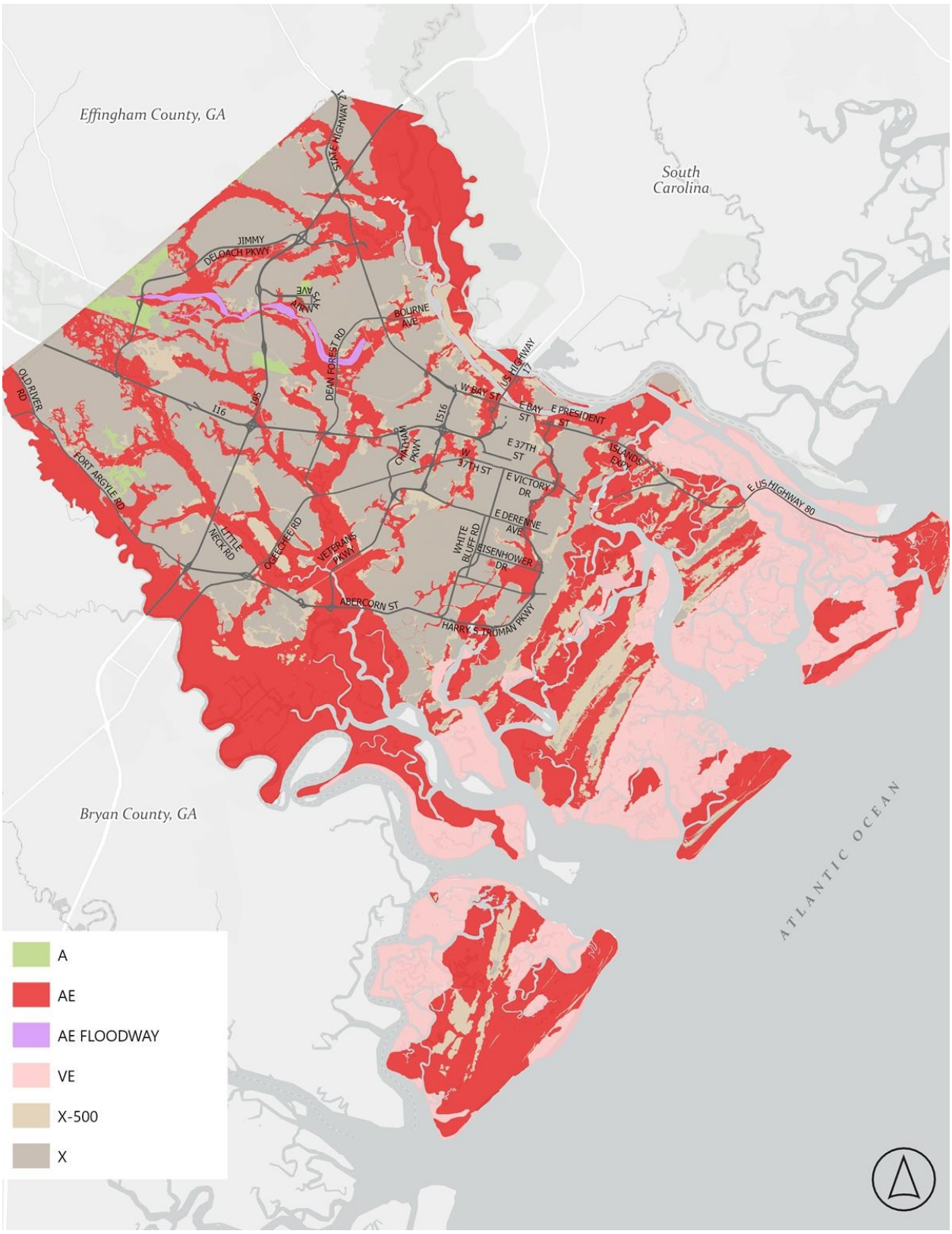


Exhibit 7.6 – Savannah-Chatham County Flood Zones

Geology and Soil Types

All of Chatham County, Georgia, is labeled as the Atlantic Coast Flatwoods area of Georgia. The Atlantic Coast Flatwoods area occurs along the seaward portion of Georgia and is characterized by nearly level topography and poorly drained soils that are underlain by marine sands, loams, and/or clays. A series of marine terraces, roughly paralleling the coast, extends inward from sea level to an elevation of approximately 100 feet. The lower lying flat terraces do not have well-defined drainage systems, and runoff moves slowly into slow-moving canals, streams, rivers, and finally into the ocean. The overall elevation in this region ranges from sea level to about 80 feet.

The County's soils tend to predominantly fall into the D-type category of soils, with shallow water tables, thus, making infiltration difficult. Group D soils are clay loam, silty clay loam, sandy clay, silty clay, or clay. This Hydrologic Soil Group has the highest runoff potential. They have very low infiltration rates when thoroughly wetted and consist chiefly of: Clay soils with a high swelling potential,

- Soils with a permanent high-water table,
- Soils with a claypan or clay layer at or near the surface and
- Shallow soils over nearly impervious material.

The average soil rating, as measured by the National Commodity Crop Productivity (NCCPI) is 47.

Coastal Resource Management

Stormwater Management

Stormwater runoff is generated from rain that flows over land or impervious surfaces, such as paved streets, parking lots, and building rooftops, and does not soak into the ground. The runoff picks up pollutants like trash, chemicals, oils, dirt, and sediment that can harm our rivers, streams, lakes, and coastal waters. To protect these resources, communities, construction companies, industries, and others, use stormwater controls, known as Best Management Practices (BMPs). BMPs filter out pollutants and/or prevent pollution by controlling it at its source.

The State and Local National Pollutant Discharge Elimination System (NPDES) stormwater programs regulate stormwater discharges through municipal separate storm sewer systems (MS4s). Depending on population size, operators of the MS4s are required to obtain an NPDES permit before they can discharge stormwater. This permitting mechanism is designed to prevent stormwater runoff from washing harmful pollutants into local surface waters. (NPDES Stormwater Program | US EPA)

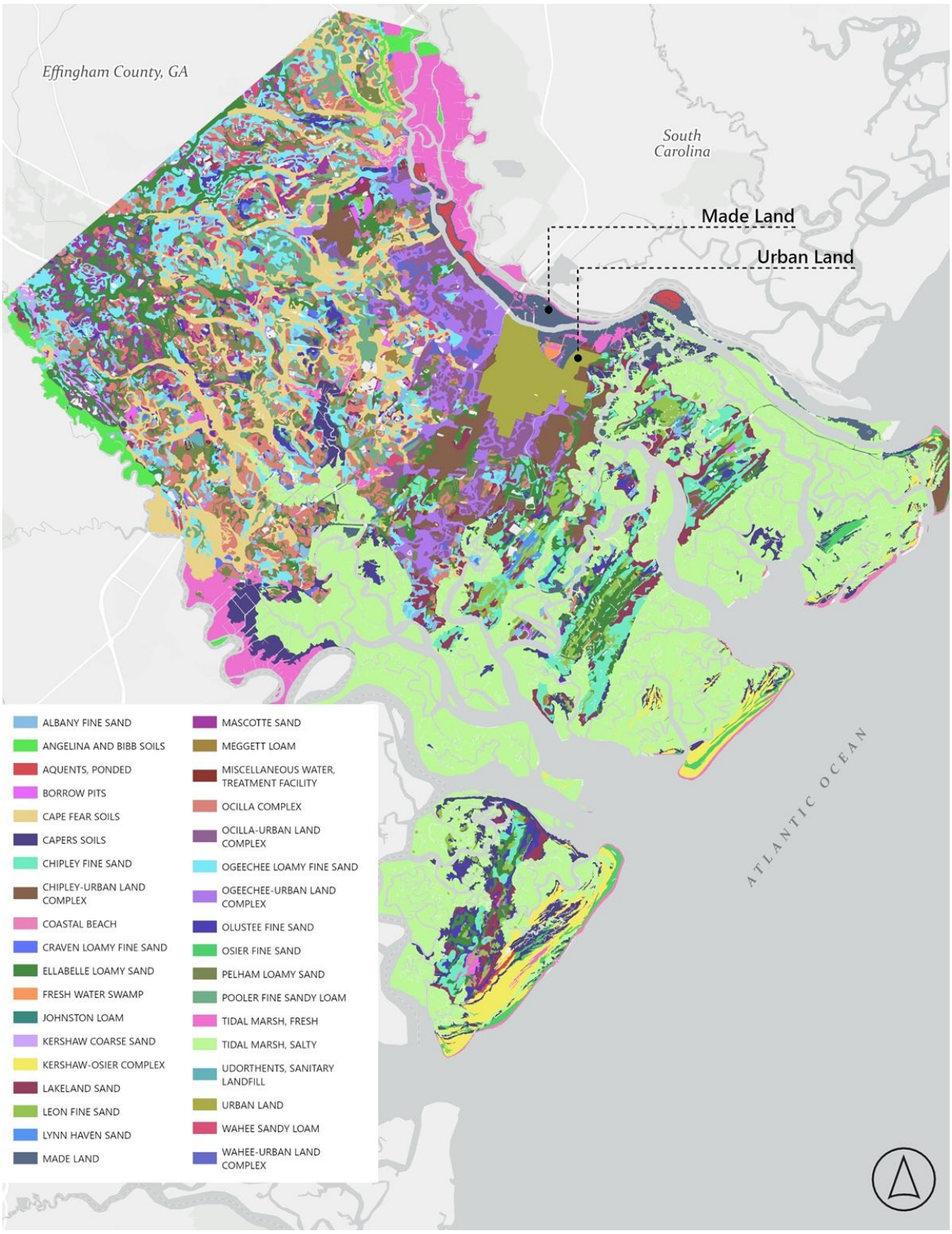


Exhibit 7.7 – Savannah-Chatham County Soils Classifications

Stormwater Management Programs (SWMPs) have been adopted by the City of Savannah and Chatham County in compliance with the National Pollutant Discharge Elimination System (NPDES) administered by the Georgia Environmental Protection Division (GA EPD). Both jurisdictions operate municipal separate storm sewer systems (MS4s) regulated under Phase I Medium MS4 permits issued by GA EPD (City of Savannah Permit No. GAS000205; Chatham County Permit No. GAS000206). These permits authorize stormwater discharges and require the implementation of comprehensive stormwater management programs, including routine water quality monitoring, pollutant load assessment, identification and elimination of illicit discharges, staff training, preparation of annual reports, and public education and outreach initiatives designed to reduce stormwater pollution and protect receiving waters.

All of the jurisdictions within Chatham County have adopted the Coastal Stormwater Supplement to the Georgia Stormwater Management Manual (CSS). The CSS is a tool intended to provide Georgia's coastal communities with comprehensive guidance on an integrated, green infrastructure-based approach to natural resources protection, stormwater management, and site design.

As water flows across municipal boundaries and stormwater management efforts, or lack thereof, impact neighboring jurisdictions, it is suggested that the County and its' municipalities should work towards addressing stormwater issues in a regional manner to ensure that efforts being made are as efficient and effective as possible, such as the creation of a Regional Stormwater Committee or Commission.

Statistically, most stream quality indicators decline when watershed impervious cover exceeds 10%, with severe degradation expected beyond 25%. In Chatham County, the majority of growth is targeted within western areas of the County. It is likely that future stream health indicators (e.g., biological health, streambank stability) will be impacted in watersheds that have a substantial amount of land development. Several of these watersheds may transition over to an Impacted category. As a result, these impacted watersheds are excellent target areas for advanced stormwater management, riparian buffer management, and development principles that protect water quality, such as low-impact development.

Major Park, Recreation and Conservation Areas

The natural and scenic amenities of Chatham County offer many recreational and cultural opportunities. Due to the annual reduction of open space resulting from development in Chatham County, it is imperative to explore all available means for land conservation. Land acquisition programs such as the Chatham County Resource Protection Commission should be funded and utilized in conjunction with stringently enforced land use regulations to ensure the open space needs of the region will continue to be met.

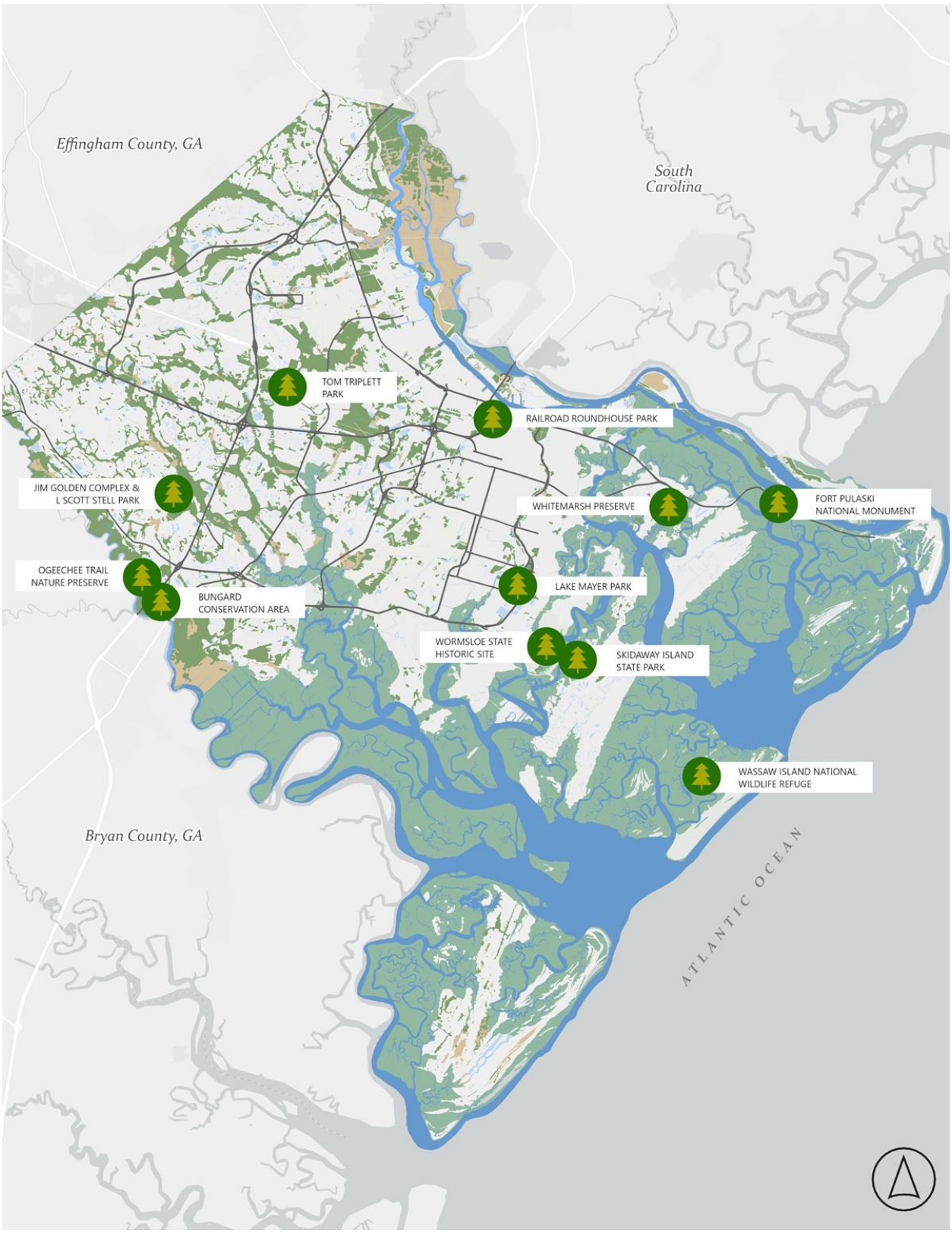


Exhibit 7.8 - Chatham County Parks, Recreation, and Conservation Areas

In addition to providing an adequate quantity (acres) and type (ballfields, wildlife habitat) of open space, it is important to endeavor to ensure equity to all residents. The objective is for residents to have access to a variety of parks, recreation, and open space within close proximity to their residence, typically targeted within one-half to one mile walking distance. The County and City are working to incorporate trails, bikeways, pedestrian paths as well as other non-vehicular paths into such areas to provide access for those without personal transportation, with the added benefit of simultaneously reducing vehicle trips.

"Open space" references an area that is valued for active and passive recreation and protection of the natural resources (including natural processes and wildlife) and which provides public benefit, and which is part of one or more of the following categories: developmentally difficult lands, natural resource areas, commercially used natural resources areas, natural amenity areas, recreational areas and urban form areas".

Under the "open space" definition, there are five subjects under Federal jurisdiction and five subjects under State jurisdiction within Chatham County that fall within this title of conservation/recreation areas. Additionally, there are a number of recreational and conservation areas within Chatham County that are not under State or Federal jurisdiction. Some of the conservation and recreational areas within Chatham County include the following sites:

Chatham County Conservation and Recreation Resources		
Federal	**State**	**Local/NGO**
Fort Pulaski National Monument	Little Tybee/Cabbage Island	Oatland Island Education Center
Tybee National Wildlife Refuge	Skidaway Island State Park	Savannah Ogeechee Canal Trail
Savannah Coastal National Wildlife Refuge	Ossabaw Island Wildlife Management Area	L. Scott Stell Community Park/ The Jim Golden Complex
Wassaw Island National Wildlife Refuge	University of Georgia Marine Extension Center	Lower Ogeechee Conservation Corridor
Atlantic Intracoastal Waterway	Wormsloe Historic Site	Lake Mayer
		King's Ferry Park
		Tom Triplett Park
		McQueen's Island Trail
		Whitemarsh Preserve
		Pennyworth Island
		Bacon Park

Figure 7.3 – Chatham County Conservation and Recreation Resources

Prime Agricultural and Forest Land

The loss of agricultural and forest land is a nationwide trend driven by ongoing development pressure, as land once used for farming or forestry is converted to residential and commercial uses. This conversion has significant environmental impacts, including increased impervious surfaces that contribute to flooding and nonpoint source pollution, reduced air quality due to the

loss of tree cover, and higher energy consumption associated with transporting food over longer distances. As agricultural land declines, communities also become more dependent on external food sources, reducing local food security and resilience.

In Chatham County, agricultural activity has shifted in both scale and structure over the past decade. According to the 2022 U.S. Department of Agriculture Census of Agriculture, the number of farms declined to 41 from 67 in 2017. However, total land acreage in farms increased to 7,742 acres, resulting in an average farm size of 189 acres, reflecting consolidation of operations rather than growth in farm numbers. Despite this shift, small and specialty operations remain important, with approximately 61% of farms under 50 acres, and 17% selling directly to consumers. These trends highlight agriculture's continuing role in supporting local food systems, preserving open space, and maintaining rural character, even as development and land use change place increasing pressure on remaining agricultural lands.

In addition, while not designated agricultural land, there are a multitude of community gardens throughout Chatham County that contribute to the objective of supporting local, healthy food systems.

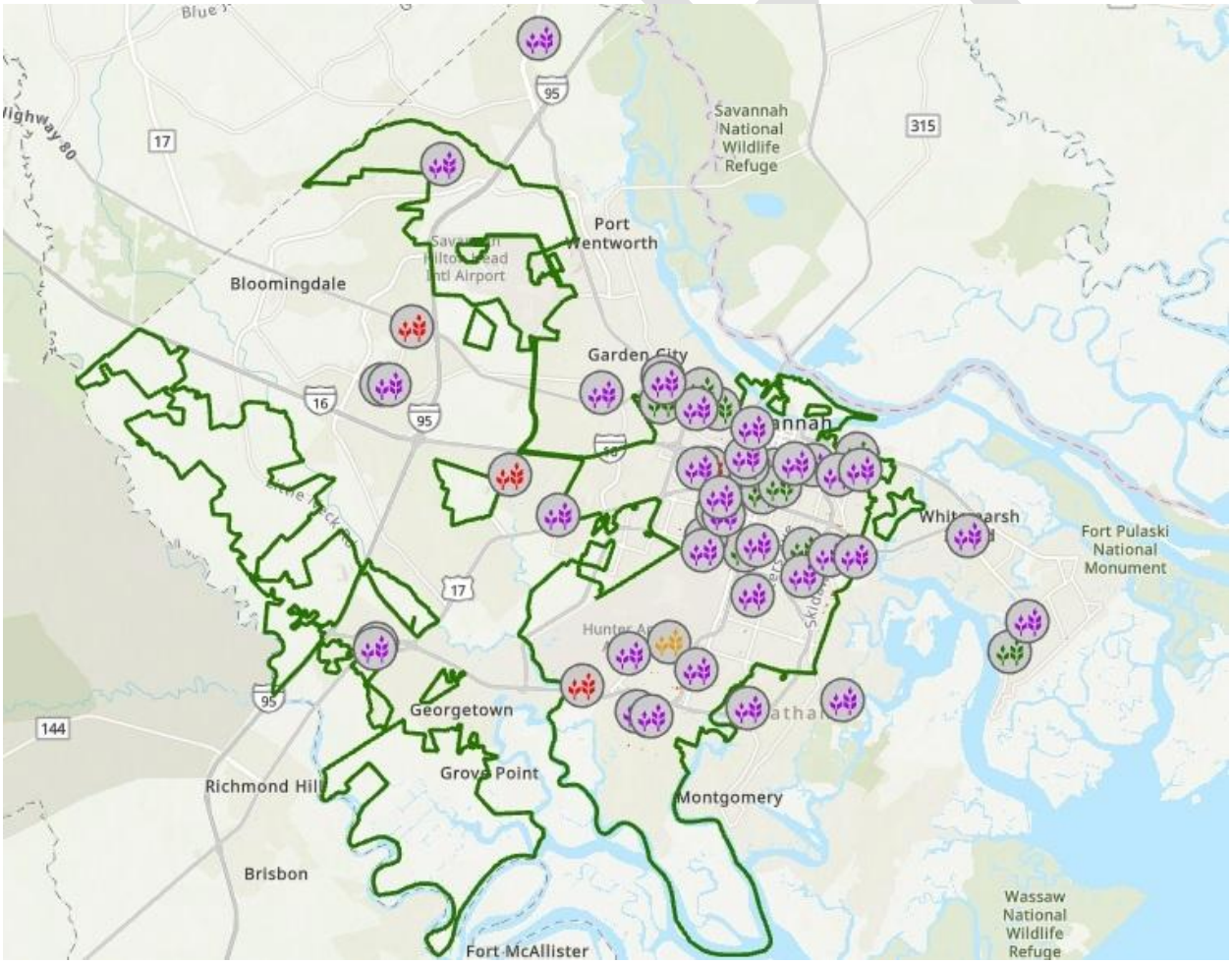


Exhibit 7.9 – Savannah-Chatham County: Community Gardens

Tree Canopy

The Savannah Tree Foundation's 2020 Tree Canopy Assessment remains the most comprehensive locally focused evaluation of tree canopy conditions in Chatham County. The assessment used high-resolution aerial imagery to document changes in vegetation cover between 2014 and 2020 and identified countywide trends in tree canopy gain and loss across incorporated and unincorporated jurisdictions. The study reported a 1.2% reduction in tree canopy, with the most significant clear cutting occurring on development sites and commercial timber fields.

While overall vegetation cover increased in several jurisdictions during the study period, the assessment found that gains were often associated with younger or lower-quality vegetation rather than mature tree canopy. The loss of large, established trees was most evident in areas experiencing rapid development, particularly large-scale industrial and infrastructure projects. The assessment also highlighted the impacts of inconsistent or unenforced tree protection ordinances, demonstrating that canopy gains do not necessarily equate to preservation of the ecological benefits provided by mature trees.

More recent modeled estimates from the U.S. Forest Service i-Tree Landscape tool and the National Land Cover Database suggest that tree canopy coverage in Chatham County has remained under continued pressure from development since 2020, particularly in rapidly growing industrial and logistics corridors. These datasets provide regional-scale estimates and support the need for updated local canopy assessments to better track changes in canopy quality, distribution, and long-term resilience.

Tree Canopy Change Over Time (2014–2020)				
Municipality	**2014 % Vegetation**	**2020 % Vegetation**	**% Change**	**Estimated Acreage Change**
Unincorporated Chatham County	25%	32%	7%	14,655
Savannah	39%	49%	10%	7,137
Garden City	53%	66%	13%	1,207
Pooler	62%	63%	1%	204
Bloomingdale	83%	83%	0%	-5
Tybee Island	7%	15%	8%	168
Thunderbolt	17%	31%	14%	146
Port Wentworth	66%	73%	8%	812
Vernonburg	73%	83%	10%	26
Countywide Average	34%	41%	7%	23,757
Source: Savannah Tree Foundation, 2020 Tree Canopy Assessment				

Figure 7.4 – Chatham County: Tree Canopy Change Over Time (2014 – 2020)

Tree canopies can greatly assist in lowering the temperatures and overall "heat stress" in communities dealing with known heat island effects. Sustained regional growth and industrial expansion will continue to drive the reduction in tree canopy with fewer trees being replanted versus what is being removed during construction.

Aging Tree Canopy

Chatham County is dealing with an aging tree canopy, particularly in downtown Savannah. The majority of Savannah's downtown tree canopy was planted in the late 1890s and early 1900s. Most urban planted live oaks are anticipated to live an average of 150 years, which indicates they will be aging out by roughly 2040. To ensure that a consistent tree cover continually remains intact, each jurisdiction will need to ensure that funds are programmed, trees are systematically replanted, and strict protection and planting ordinances are in place. Major factors in canopy reduction are increased occurrences of pests and disease alongside climate change.

Solid Waste Management

Historically the method for handling solid waste in Chatham County has been primarily through the disposal of solid waste in area landfills. This arrangement has been satisfactory from the standpoint of the landfill operators and their customers who enjoy the benefits of the profits generated (operators) and the relatively inexpensive disposal fees (customers). However, because of the high land costs in Chatham County, it is unlikely that land will be available to construct new landfills in the County when the landfills in the County reach capacity, at which time the residents of the County will be required to pay the additional transportation costs to new landfills in other counties. In addition, it is likely that the surrounding counties will demand a premium to accept waste generated outside of their area.

The City of Savannah successfully started a curbside single-stream recycling program in 2008 and the County had drop-off facilities/transfer stations prior to 2008. Both recycling programs are popular with residents and have proven to be successful in removing materials from the waste stream prior to disposal in area landfills. However, the cheaper cost of certain raw materials in comparison to the cost incurred to recycle that material continues to be a challenge in making recycling even more successful. In addition, recent years have seen adjustments in the recycling industry due to global market changes, leaving some materials unable to be recycled at all. Education campaigns should be adjusted to emphasize the need to reduce consumption and reuse materials where possible.

Solid Waste Landfill Facilities

Facility	Facility Type	Avg. Daily Tons	Net Volume Annual	Rate of Fill yd3/day	Years to Capacity	Estimated Fill Date	Operating Days per Year
Savannah - Dean Forest Rd (SL)	MSWL	276	109,415	329	3	6/1/2024	333
Superior Landfill & Recycling Center Site 2 MSWL	MSWL	2,463	766,270	2,737	9	10/9/2030	280

Source: Georgia Environmental Protection Department
MSWL = Municipal Solid Waste Landfill

Figure 7.5 – Solid Waste Landfill Facilities

Preserving the capacity of the landfills through reduction of the waste stream by reduction of

waste generated, recycling, composting, and mulching of yard waste should be a priority of the County. The City of Savannah is currently planning for expansion of its Dean Forest Landfill. However, as shown by the number of operating years remaining for each of the two area landfills, and because the management of solid waste requires a long-term perspective, a regional outlook and discussion on solid waste management is warranted.

Renewable Energy

Continued reliance on fossil fuels contributes to air pollution and climate-related risks. Renewable energy is essential to improving environmental quality, reducing greenhouse gas emissions, and strengthening long-term resilience in coastal Georgia. The State has made significant recent progress in clean energy production, including expanded solar capacity and new nuclear generation, helping reduce emissions while supporting public health and local clean-energy transitions.

The State has rapidly expanded low-carbon energy through large-scale solar development and the completion of new nuclear generation at Plant Vogtle, which together provide significant emissions-free electricity and strengthen grid reliability. At the same time, the State has become a major hub for electric vehicle and battery manufacturing, with billions in investment and tens of thousands of jobs that support cleaner transportation and long-term economic growth, including major facilities near Savannah.

Chatham County and the City of Savannah have taken significant steps to expand renewable energy adoption in alignment with statewide clean energy progress. In 2020, Savannah adopted a 100 percent Clean Energy Resolution committing the community to transition all electricity to renewable sources by 2035 and all remaining energy uses, including transportation and heating, by 2050. This policy establishes a foundation for reducing greenhouse gas emissions, improving air quality, and strengthening resilience to climate-related impacts. Implementation is underway through investments in solar and energy efficiency on municipal facilities, including a second phase of solar installations completed in 2025 expanding on-site generation at public buildings.

Solar Energy

Chatham County has pursued complementary actions through its first municipal solar program launched in 2023. Solar energy systems were installed at four County facilities under a long-term procurement agreement that required no upfront capital investment and provides stable energy costs. These installations now supply more than 15% of electricity demand at the participating facilities while reducing operational emissions and utility expenses. The program also supports workforce development through solar training opportunities for local residents, and clean energy goals are integrated into the County's broader resilience planning efforts established in 2022.

Renewable Energy at Port of Savannah

Momentum is also building in other local sectors. The Georgia Ports Authority has undertaken significant initiatives to electrify and modernize operations at the Port of Savannah in support of air quality improvement and climate goals. These efforts include a $170 million investment to replace diesel-powered equipment with 55 hybrid-electric rubber-tired gantry cranes, which are expected to reduce crane-related emissions by approximately 50% and avoid nearly 7,000 metric

tons of carbon dioxide emissions annually once fully deployed. Additional measures, such as truck idle-reduction programs, cleaner fuels, and equipment electrification, help reduce diesel emissions in surrounding communities and demonstrate how major public infrastructure operators can advance low-emission transportation and freight operations.

Electric Vehicles

Clean energy and transportation electrification are advancing together in Savannah and Chatham County, supporting both environmental quality and economic resilience. As of early 2024, Georgia had approximately 1,859 electric vehicle charging stations, with continued expansion supported by public and private investment. The State has allocated $3.3 million in FY2024 specifically for EV charging deployment, alongside federal incentives such as the Inflation Reduction Act tax credit of up to $7,500 for new EV purchases and a Georgia income tax credit covering 10% of the cost of EV charging equipment for businesses. These investments are accelerating EV adoption, reducing transportation-related emissions, and supporting local fleet electrification efforts by the City of Savannah and Chatham County, including the transition of municipal vehicles and planning for electric transit.

Priorities for Continued Clean Energy Progress - Savannah & Chatham County	
Priority Area	**Focus and Key Actions**
Clean-Energy Workforce Development and Job Creation	• Expand solar, energy efficiency, and EV workforce training programs • Partner with technical colleges and state workforce initiatives • Support apprenticeships and industry-aligned training for clean-tech jobs
Energy Efficiency Programs	• Increase residential and commercial energy-efficiency retrofits • Promote weatherization, HVAC upgrades, and efficient appliances • Leverage federal and state incentives to expand access, including for low-income households.
Solar Installations and Community Solar	• Streamline permitting for rooftop solar installations • Explore community solar models for residents without suitable rooftops • Conduct education and outreach to reduce adoption barriers
Energy Storage and Grid Resilience Infrastructure	• Upgrade substations, transmission systems, and smart grid technologies • Expand battery storage at utility, community, and household scales • Evaluate solar-plus-storage and microgrids at critical facilities
Electric Vehicle Adoption and Fleet Electrification	• Transition municipal fleets to electric vehicles as replacements occur • Expand public EV charging infrastructure • Encourage private fleet electrification and alternative mobility options

Figure 7.6 - Continued Clean Energy Progress Priorities

The Savannah region is also benefiting directly from the growth of EV manufacturing and supply chains. The Hyundai Motor Group Metaplant under construction near Savannah represents one of the largest EV production investments in the United States, with planned capacity of up to 500,000 vehicles per year and an investment exceeding $7 billion, including associated battery manufacturing. Hyundai suppliers have committed more than $1.8 billion statewide, with a

significant share located in the Savannah area. In Chatham County, supplier PHA is investing over $67 million in an EV components facility that will create approximately 400 jobs, supporting the Metaplant's operations. Together with state investments of $19.5 million in EV workforce training and recruitment programs, these developments demonstrate how renewable energy, electrification, and industrial growth are jointly shaping Savannah and Chatham County's economic future while reducing emissions and improving air quality.

Climate Resiliency and Preparedness

Natural Disasters and Climate Challenges

Hurricanes

Hurricane season runs from June 1 through November 30, with peak storm formation occurring early to mid-September. In recent decades the Southeast coast has experienced shifts in storm behavior. Warmer ocean temperatures, higher sea levels, and changing atmospheric patterns have increased the potential for more intense storms and more damaging coastal flooding. NOAA reports indicate that Atlantic hurricane seasons are becoming more variable, with a greater likelihood of extremely active years. Peer-reviewed studies show that the proportion of Atlantic hurricanes reaching major intensity has increased since the 1980s. Research published in 2024 and 2025 projects that storms affecting the Southeast United States may intensify more quickly and maintain stronger winds because of warmer sea-surface temperatures.

The six coastal Georgia counties at highest risk of storm-surge evacuation are Bryan, Camden, Chatham, Glynn, Liberty, and McIntosh. Coastal population growth and increased development have expanded the number of people and structures located within storm-surge zones. Evacuation and sheltering logistics have become more challenging as large numbers of residents, tourists, and evacuees from neighboring states travel inland during storm events.

Sea-level rise is already affecting coastal Georgia. Long-term tide-gauge records at Fort Pulaski show a steady rise in mean sea level, which raises the baseline elevation for tides and storm surge. Peer-reviewed studies confirm that this higher baseline results in more frequent high-tide flooding and increases the destructive potential of surge, even from moderate storms. Analyses of storm magnitude along the U.S. East Coast through 2022 show significant increases in storm energy at many locations. These trends make low-lying marsh edges, tidal creek systems, neighborhoods built on historical estuarine fill, and waterfront areas in Chatham County more vulnerable than in previous decades.

Chatham County has experienced several damaging storms in recent years. Hurricane Matthew in 2016 produced strong winds, extensive tree damage, and major coastal flooding despite remaining offshore. Hurricane Irma in 2017 caused severe surge flooding that inundated roads and damaged structures along rivers and marshes. Hurricane Michael in 2018 brought heavy rainfall and tropical-storm-force winds across Georgia. Hurricane Dorian in 2019 passed offshore as a major hurricane but generated significant tidal flooding and erosion.

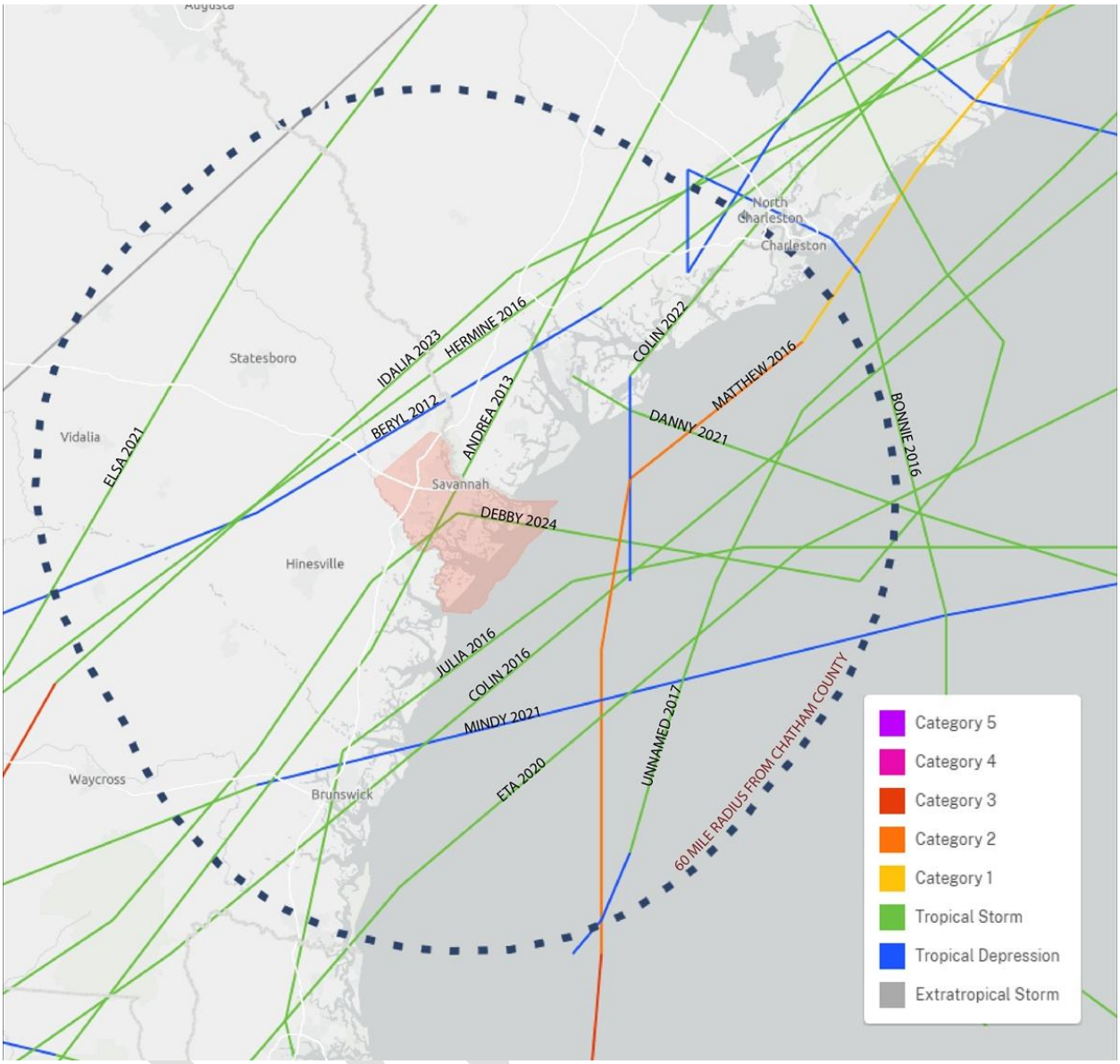


Exhibit 7.10 – Historical Hurricane Tracks (noaa.gov)

More recently, Hurricane Idalia in 2023 produced storm surge, roadway flooding, and wind impacts in coastal Georgia. Hurricane Helene in 2024 caused widespread heavy rainfall, strong wind gusts, and notable flooding across southeast Georgia, demonstrating that storms making landfall outside the state can still generate significant local impacts.

Forecasting improvements have reduced storm-related fatalities, but economic losses have increased because development has expanded into flood-prone areas. Peer-reviewed studies of coastal settlement patterns show that much of the nation's coastal growth continues to occur in areas most at risk from sea-level rise and storm surge. Locally, this trend reinforces the importance of strong land-use regulations, floodplain management, and disaster-resilient construction.

Given these evolving hazards, Chatham County and the City of Savannah must continue integrating updated climate science, sea-level projections, and storm-surge modeling into planning and policies. Future development should consider projected sea-level rise, compound flooding from tide and rainfall interactions, and the increasing likelihood of more intense storms. Preserving natural floodplains, improving drainage infrastructure, elevating critical facilities, and directing growth away from the most vulnerable areas are essential steps to protect residents, natural resources, infrastructure, and community character.

Sea Level Rise

Concerns of sea level rise and the negative impacts associated with it are resulting in many coastal communities considering implementing measures to reduce risks to private property owners and public investments. It is important to identify what areas are at risk and gauge the level of risk, or severity of impacts, for each area to determine the most appropriate means to protect it. Land use regulations, land purchase/buyout programs and policies that do not allow for the investment of public funds for infrastructure or other development in areas at risk for flooding due to sea level rise reduce the number of vulnerable structures and infrastructure, while efforts such as the elevation of existing roads or lift stations mitigate the impacts on existing investments. It is more costly to mitigate than to prevent development in areas that are at a higher risk. All future capital improvement projects should include an assessment of potential sea-level rise impacts through the expected life cycle design of the projects.

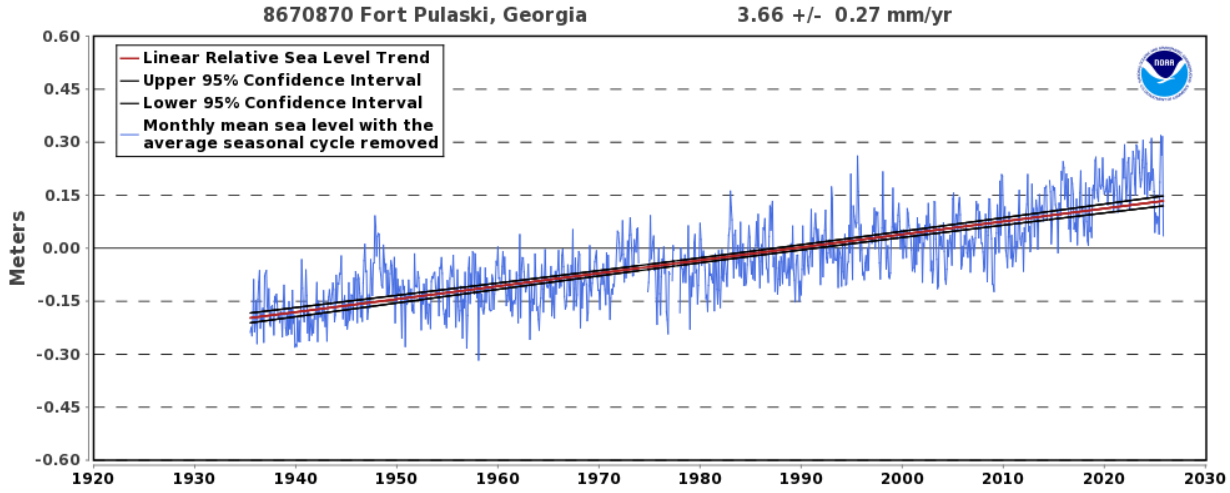


Figure 7.7 – Relative Sea Level Trend – 8670870 Fort Pulaski, GA

In an effort to have the information necessary for making decisions about future needs and infrastructure investments, Chatham County and the City of Savannah collaborated to assess the vulnerability of the region's stormwater management system to future changes due to sea level rise. The Stormwater System Sea Level Rise Vulnerability Assessment and Coastal Watershed Management Plan (CWMP) was completed in 2020 and provides actionable information for Chatham County, the City of Savannah, and other jurisdictions to use in developing plans and implementing appropriate capital improvement projects that can increase the resilience of the regional stormwater system to future conditions.

Between 2016 and 2020, coastal resilience planning in Savannah and Chatham County shifted from localized adaptation efforts to regionwide, data-driven infrastructure assessments. Early work, including the 2016 Tybee Island Sea Level Rise Adaptation Plan, established a proactive, scenario-based approach to managing rising seas, flooding, and infrastructure vulnerability, particularly for barrier island communities. Subsequent regional studies, such as the 2019 Savannah River Watershed Coastal Resilience Assessment, expanded this lens to the watershed scale, identifying priority areas where wetlands, marshes, and open space could buffer storm surge and flooding while supporting ecosystem health. These efforts emphasized nature-based solutions, marsh migration corridors, and strategic conservation as essential complements to engineered infrastructure.

From 2020 through 2024, planning efforts increasingly focused on system-level vulnerabilities and implementation. The 2020 Stormwater System Sea Level Rise Vulnerability Assessment provided detailed analysis of stormwater infrastructure exposure under present and future tidal conditions, demonstrating that a growing share of drainage assets already experience tidal interference and will face regular inundation under projected sea level rise. This technical foundation was reinforced by the County's Hazard Mitigation Plan, Plan 2040, and subsequent MPC flood modeling studies, which highlighted compound flooding risks affecting both stormwater and transportation systems. The most recent Floodplain Management Plan update in 2024 integrates these findings into enforceable policies and capital priorities, emphasizing floodplain protection, infrastructure upgrades, equitable investment, and long-term adaptation, forming a coordinated body of work guiding Savannah and the County toward resilient land use, infrastructure planning, and watershed management in the face of accelerating coastal change.

Flood Inundation

Tidal Flooding

High-tide flooding at Fort Pulaski has increased significantly over the last four decades, reflecting the accelerating impacts of sea level rise on coastal Georgia. From 1980 through the early 2000s, high-tide flooding was infrequent, typically limited to zero to five days per year and often associated with storm events. Since approximately 2012, the data show a clear shift toward more frequent and persistent flooding, with many recent years experiencing 10 to more than 20 flood days annually. This trend corresponds with the observed relative sea level rise rate at Fort Pulaski of 3.6–3.7 millimeters per year and indicates a transition from occasional nuisance flooding to chronic high-tide flooding occurring even in the absence of rainfall.

Seasonal patterns in the data show that high-tide flooding is most prevalent during the fall months, with secondary peaks in summer, while winter and spring experience fewer flood days. This seasonal concentration reflects higher astronomical tides and elevated baseline sea levels later in the year and has important implications for infrastructure planning and operations. Repeated tidal flooding increases stress on stormwater systems by causing tidal backflow through drainage networks, accelerating wear on pumps, and contributing to roadway and access disruptions in low-lying areas. Together, these trends confirm that sea level rise is already affecting daily conditions in Chatham County and underscore the need for near-term adaptation measures, such as tide gates, pump upgrades, and revised design standards alongside longer-term resilience planning.

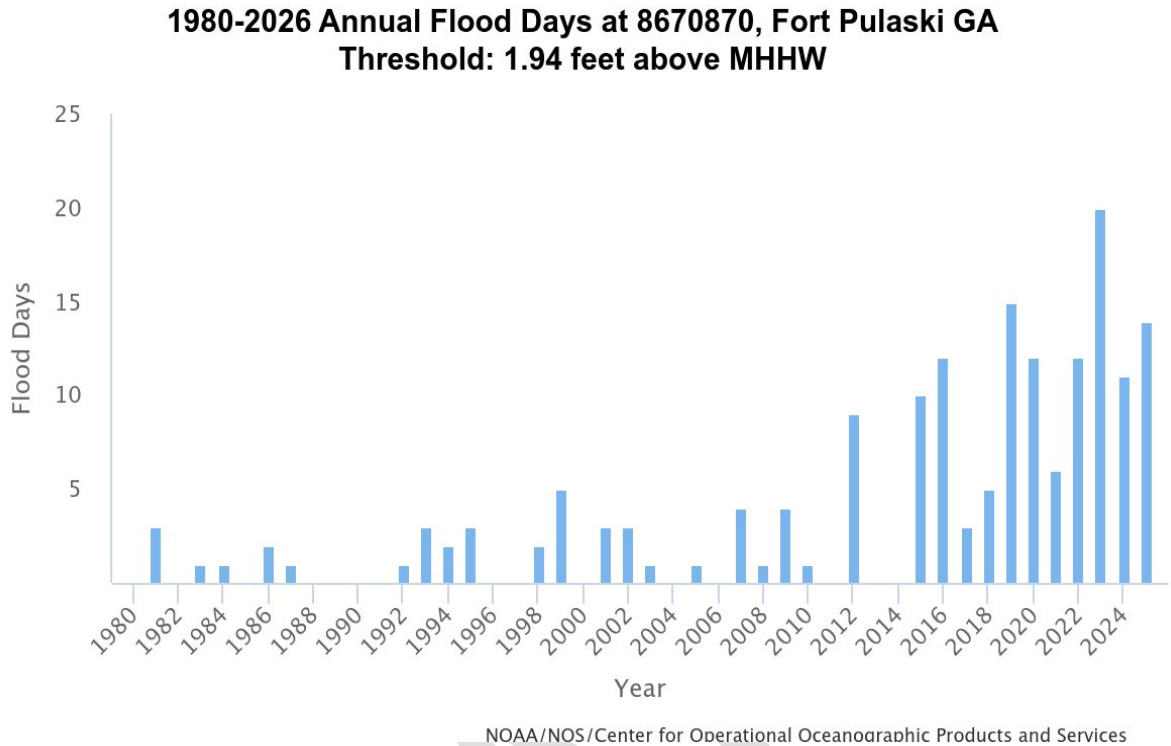


Figure 7.9 - Annual Days at Fort Pulaski-Pluvial/Fluvial Floods 1980-2026

Flooding in Chatham County is driven not only by tidal influences, but also by rainfall-based pluvial and fluvial flooding, as documented in FEMA Flood Insurance Studies, the Chatham County Flood Mitigation Plan, the City of Savannah Flood Hazard Mitigation Plan, and the Savannah Repetitive Loss Area Analysis. These sources consistently identify intense rainfall, flat topography, poorly draining soils, high groundwater tables, and limited stormwater system capacity as primary contributors to inland flooding. Large portions of the County lie at low elevations, where heavy rain can overwhelm drainage systems even outside FEMA-mapped floodplains. Inland waterways such as the Little Ogeechee River, Vernon River tributaries, and numerous canals and ditches experience flooding driven primarily by rainfall and riverine flow rather than tides, affecting residential neighborhoods, roadways, and critical infrastructure.

The Savannah Repetitive Loss Area Analysis confirms recurring rainfall-related flood losses in inland neighborhoods, particularly older areas with undersized infrastructure and rapidly developing areas with increased impervious surfaces.

In response, Chatham County and the City of Savannah have developed a robust framework of planning, technical studies, and implementation efforts focused on non-tidal flooding. Countywide and city mitigation plans establish a mix of structural and policy-based actions, including drainage upgrades, property acquisition, ordinance updates, and public education, while FEMA flood mapping provides the regulatory basis for floodplain management. These efforts are supported by detailed modeling and prioritization tools developed through MPC and CORE MPO flood studies, as well as ongoing stormwater capital improvement programs, green infrastructure initiatives, and enhanced floodplain management standards. Together, these coordinated actions address the

growing risks posed by increasingly frequent and intense rainfall events and underscore the need for continued investment in stormwater systems, land-use controls, and targeted mitigation across both urban and unincorporated areas of Chatham County.

Climate Change and Vulnerability Index

Climate change affects the Chatham County region through a range of interconnected impacts, including rising temperatures, more frequent extreme heat events, changes in precipitation patterns, warmer ocean waters that intensify hurricanes, beach erosion, saltwater intrusion into freshwater systems, infrastructure damage, and increased flooding associated with sea level rise and recurrent “sunny day” tidal flooding. These impacts threaten public safety, strain infrastructure, degrade natural systems, and diminish quality of life while increasing long-term public and private costs. According to the Georgia Climate Project, up to 178,787 people in Georgia could be at risk from sea level rise by 2100, and a three-foot rise in sea level could result in the loss of approximately 36 square miles of salt marsh statewide.

Changes occurring along Georgia’s coast are expected to significantly modify ecosystems and redistribute species, affecting services that support wildlife habitat, recreation, seafood production, water quality, erosion control, flood mitigation, and carbon sequestration. These impacts carry substantial economic consequences, including increased public expenditures for mitigation and infrastructure protection and potential losses to coastal-dependent industries such as fishing, tourism, and agriculture. Addressing these challenges will require coordinated mitigation and adaptation strategies, including land use and development practices that reduce greenhouse gas emissions, preserve natural systems, and prepare infrastructure and communities for unavoidable climate impacts through long-range planning and multi-jurisdictional cooperation.

The U.S. Climate Vulnerability Index indicates that climate risk in Chatham County is widespread and not limited to coastal or tidal exposure. Most census tracts rank in the upper national percentiles for climate impacts and extreme events, reflecting heightened exposure to intense rainfall, flooding, heat, and storm-related disruptions across both inland and coastal areas. The Extreme Events indicator shows particularly high vulnerability in western, southern, and low-lying inland portions of the county, reinforcing local and regional findings that pluvial and fluvial flooding driven by short-duration, high-intensity rainfall poses a significant countywide risk. These patterns align with documented issues related to flat topography, poorly draining soils, high groundwater tables, and limited stormwater capacity, which allow heavy rainfall to overwhelm drainage systems well beyond FEMA-mapped coastal floodplains.

The Index further demonstrates that physical climate hazards intersect with elevated health, social, and economic vulnerability, compounding overall risk. The Health indicator shows consistently high vulnerability across much of Chatham County, indicating that flooding, extreme heat, and storm-related service disruptions are likely to exacerbate existing public health challenges, including increased exposure to mold, waterborne contaminants, and interruptions to healthcare access.

When rainfall-driven flooding disrupts homes, roads, utilities, or employment access, these communities face greater difficulty recovering, increasing the risk of prolonged displacement, economic loss, and long-term neighborhood disinvestment. The spatial overlap of high hazard exposure and high underlying vulnerability underscores the need for equity-focused flood mitigation and resilience strategies that prioritize stormwater upgrades, transportation reliability, green infrastructure, and supportive policies in communities facing both the greatest physical flooding risk and the lowest capacity to absorb and recover from climate impacts.

The Community Baseline and Social & Economic indicators reveal pronounced inequities in adaptive capacity, particularly in inland and western Savannah, Garden City, Port Wentworth, and parts of unincorporated Chatham County. These areas are characterized by lower household incomes, higher housing cost burdens, limited transportation access, and greater concentrations of renters, seniors, and medically vulnerable populations.

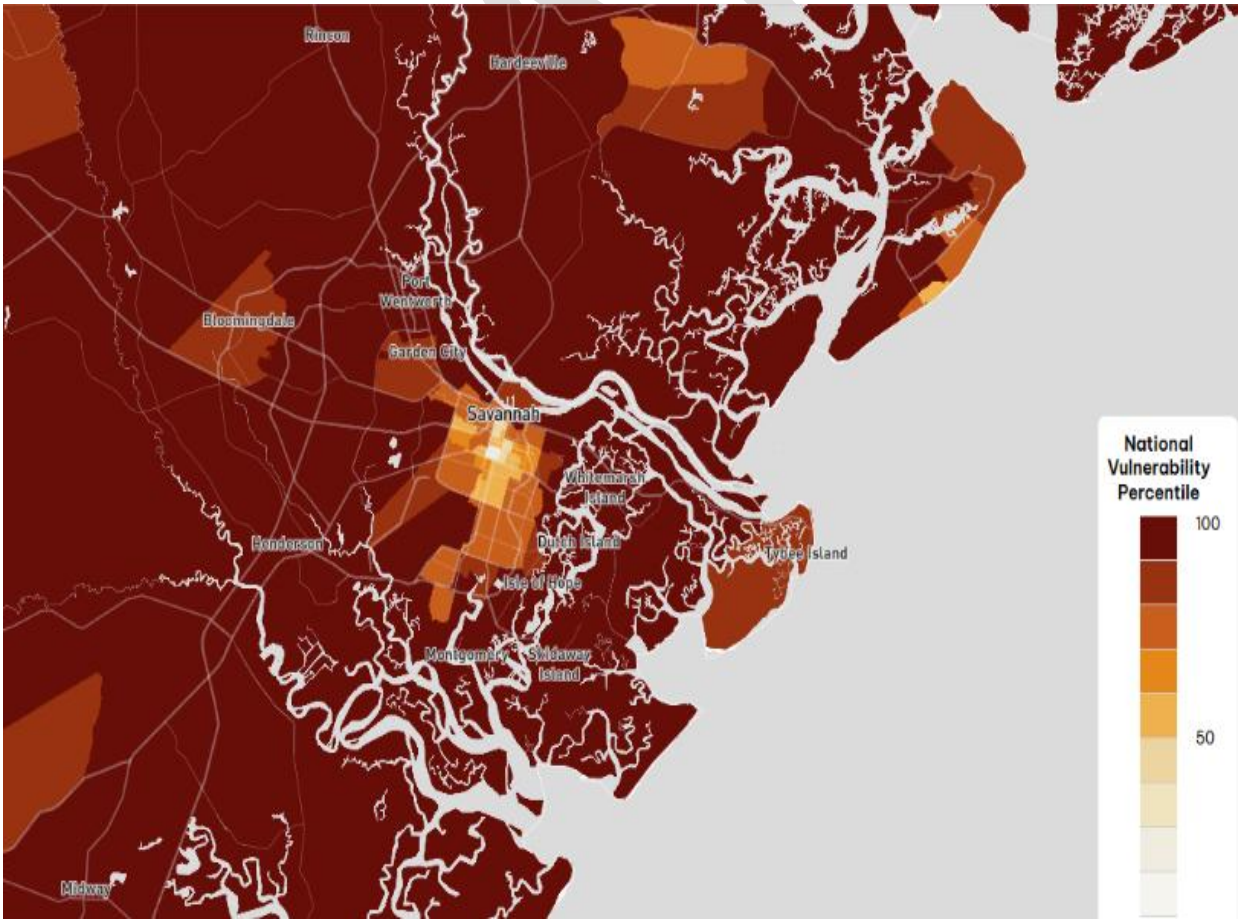


Exhibit 7.11 - Climate Impacts

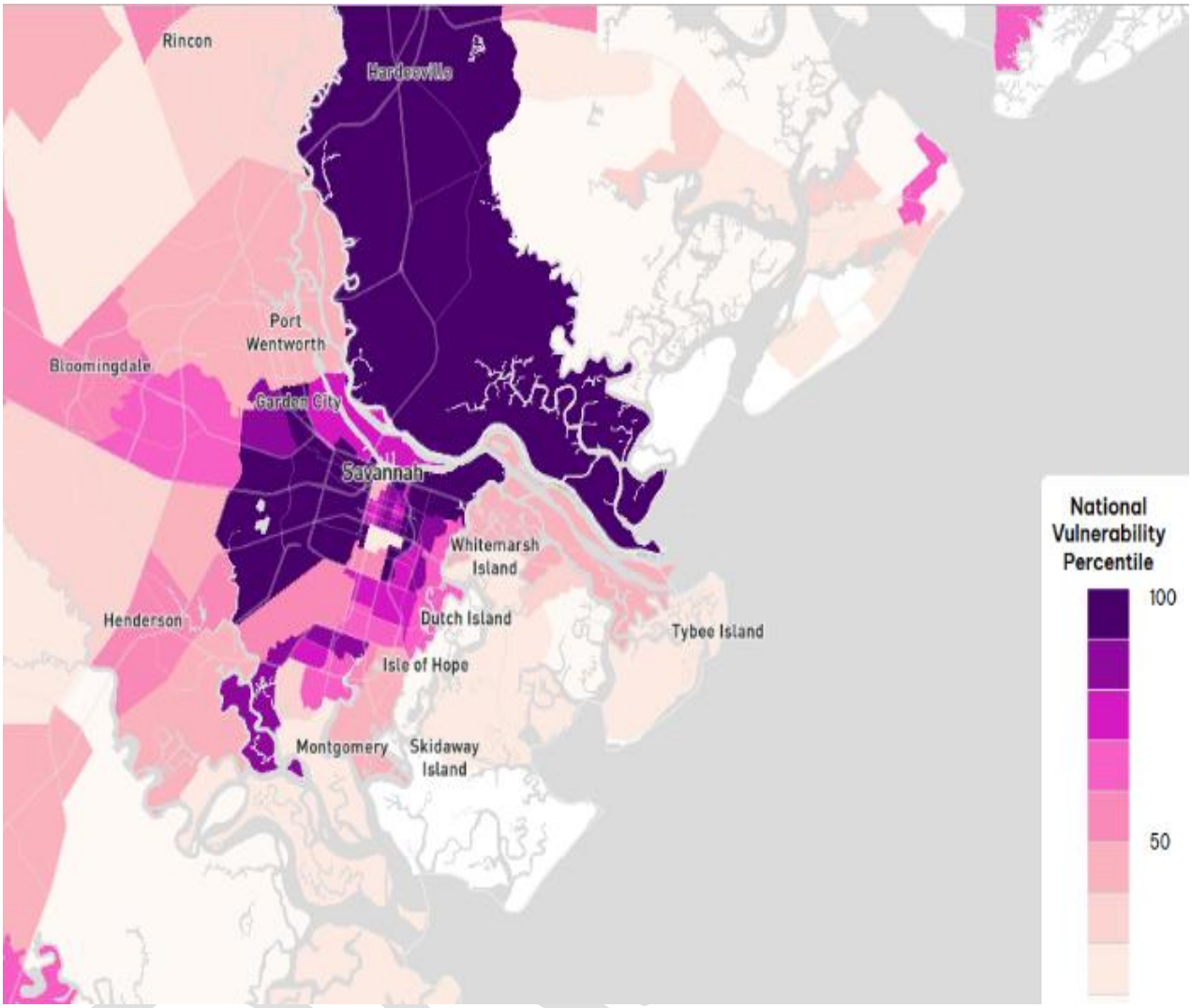


Exhibit 7.12 – Community Baseline

Climate and Resilience Challenges

The implementation of smart strategies can help our community adapt to these changes as well as other challenges that could arise regardless of climate change. Main challenges facing Chatham County include:

Infrastructure Vulnerability and Public Health Risks

Chatham County's infrastructure and public health systems face increasing stress from rising temperatures, more frequent extreme heat events, heavier rainfall, and recurrent flooding. Roads, drainage systems, utilities, and public facilities are increasingly exposed to climate-related damage, while heat exposure and vector-borne disease present growing risks to residents, particularly children, seniors, and outdoor workers.

Increasing Flood Risk in Coastal and Low-lying Areas

Sea level rise, intensified rainfall, and tidal flooding are increasing flood frequency and severity across coastal and inland low-lying areas of Chatham County. These conditions threaten homes, businesses, transportation corridors, cultural resources, and critical infrastructure, with projections indicating that some areas may experience regular high-tide flooding without significant adaptation measures.

Transformation and Loss of Natural Ecosystems

Climate change is altering Chatham County's natural systems, including wetlands, forests, estuaries, and coastal habitats. Rising temperatures, shifting precipitation patterns, stronger storms, and sea level rise are expected to redistribute species and reduce the capacity of ecosystems to provide flood storage, water quality protection, habitat, and other essential services that support community resilience.

Economic Impacts and Workforce Vulnerability

Key regional industries such as manufacturing, tourism, fishing, shrimping, and agriculture are increasingly exposed to climate-related risks. Extreme heat, flooding, and changing coastal conditions threaten labor productivity, disrupt supply chains, and place pressure on small businesses and labor-intensive occupations, compounding existing economic vulnerabilities.

Key Challenges

Although adaptation and resilience strategies can help reduce climate-related impacts, communities already facing social, health, and economic stressors will remain more vulnerable and less able to respond effectively. In Chatham County, rising temperatures, increasing heat-related health risks, and recurrent drought are expected to place growing pressure on public health systems, water resources, ecosystems, and energy infrastructure as climate conditions change. These interacting stressors highlight the need for coordinated planning and targeted investment to address both climate impacts and underlying vulnerabilities across the county.

Equity, Health, and Community Resilience Challenges

Climate impacts are not experienced equally across Chatham County. Low-income households, rural communities, seniors, and residents with limited access to healthcare face greater exposure to heat, flooding, and economic disruption while having fewer resources to adapt. Without targeted interventions, climate change risks widening existing social and health disparities.

Water Resource and Saltwater Intrusion Risks

Sea level rise and changing hydrologic conditions increase the risk of saltwater intrusion into freshwater systems and place additional strain on regional water resources. Drought, rising demand from population growth, and ecosystem needs create long-term challenges for maintaining reliable water supplies for residents, industry, and natural systems.

Planning Capacity, Insurance, and Implementation Constraints

Local governments face growing challenges related to flood insurance affordability, evolving regulatory requirements, and the need to integrate future climate conditions into planning and investment decisions. Limited data, funding, and technical capacity complicate efforts to proactively address climate risks, while rising insurance costs and repeated losses threaten housing stability and redevelopment in vulnerable areas.

Community resiliency includes implementing safeguards so that all members of the community are better prepared for events, such as a hurricane, pandemic, or infrastructure failure, ensuring the fastest recovery feasible. Community resiliency also protects against more common occurrences such as sea level rise, sunny day flooding, and severe economic inequities. Building a strong network focused on addressing equity gaps and elevating vulnerable populations is necessary in creating a truly resilient community.

Coastal Empire Resilience Network

The Metropolitan Planning Commission began work in 2020 to expand earlier efforts addressing sea level rise impacts along Chatham County's coast by partnering with the City of Savannah, the University of Georgia, Georgia Sea Grant, the Georgia Department of Natural Resources Coastal Resources Division, and other stakeholders to establish the Coastal Empire Resilience Network (CERN). Since its formation, CERN has evolved from a planning concept into an active regional collaboration, establishing a formal governance structure, convening public, nonprofit, and academic partners, and supporting coordinated resilience initiatives across coastal Georgia. CERN engages regional community partners, municipal staff, and policymakers to align strategies that address the physical, economic, and social challenges associated with climate change and other hazards, with a focus on capacity building, data sharing, education, and the integration of equity and environmental justice into regional resilience efforts.

Smart Growth Policies

Smart growth policies contribute to both mitigating and adapting to climate change as well as natural disasters, economic changes, and other challenges that could arise regardless of climate change. Mitigation strategies for climate change reduce greenhouse gas emissions from development, and adaptation strategies make communities more resilient to the effects of a changing climate. Smart growth strategies also bring environmental benefits and provide economic advantages to local governments and the private sector. Additional benefits include energy and transportation cost reduction, particularly important for low-income residents, and help protect human health.

Mitigation

Communities can reduce greenhouse gas emissions from development and redevelopment by implementing the following land planning concepts and standards:

- Build compactly and use energy-efficient, green building techniques, which reduce emissions from both electricity generation and transportation.
- Reuse existing infrastructure and buildings to take advantage of previous investments and the energy already used to build them.

- Put homes, jobs, stores, parks, schools, and other destinations close to each other so that people can easily walk, bike, use public transit, or drive shorter distances.
- Preserve green space, which can sequester CO2, by conserving ecologically valuable land and promoting development in previously developed areas, which helps reduce pressure to build on undeveloped land.
- Determine which areas are both well-connected to existing development and less vulnerable to current and projected climate change impacts such as sea level rise and higher storm surges, and riverine flooding, and encourage growth in these areas.
- Discourage building in areas that are currently or are projected to be more vulnerable to climate change-related impacts. Making it easier to build in safer areas can help relieve pressure to develop in more vulnerable areas.
- Preserve large, contiguous areas of open space to better protect ecosystems that might be under pressure from the changing climate. Open space preserved along water bodies can also absorb flood waters and reduce flooding in developed areas.
- Coordinate land use and transportation infrastructure decisions, and incorporate climate change projections into these decisions.
- Encourage water- and energy-efficient buildings and land use patterns so that communities can continue to thrive if energy prices rise. This strategy can also help communities and their residents better cope with drought and extreme heat.
- Upgrade stormwater systems to better manage heavier storm flows and use green infrastructure to reduce the amount of runoff from paved surfaces.
- Encourage green roofs, parks, street trees, and other elements that can reduce ambient air temperatures and filter pollutants from stormwater runoff and the air.
- Design buildings with adaptation and resilience in mind.

Communities that recognize the long-term challenges associated with climate change and take proactive steps to adapt will be much better prepared to retain population while moving residents away from danger.

Environmental Planning Criteria, Planning Issues, and Opportunities

It has been previously discussed that Chatham County and its municipalities have adopted environmental planning criteria to protect water supply watersheds, groundwater recharge areas, wetlands, and river corridors, as required by state law. These criteria are implemented through zoning, development standards, and management practices and are increasingly informed by flood mitigation, stormwater, and climate resilience studies documenting rising rainfall intensity, inland flooding, and compound climate risks.

Water Supply Watersheds and Groundwater Protection

Criteria for water supply watersheds safeguard public health by protecting surface drinking water sources through stream buffers, impervious surface limits, and approved management practices. Reservoir protection measures are coordinated with the Georgia Department of Natural Resources. Groundwater recharge areas are protected through zoning controls, Wellhead Protection Ordinances, and restrictions on septic systems, hazardous materials, and stormwater infiltration. These protections are increasingly coordinated with floodplain management and drainage standards, recognizing the role of high groundwater tables and saturated soils during heavy rainfall events.

Wetlands and River Corridor Protection

Wetlands Protection Ordinances adopted by the County and its municipalities coordinate federal permitting with local development review to ensure wetland impacts are evaluated prior to land disturbance. Vegetated buffers along rivers and streams are maintained to protect floodplain function and reduce development impacts, with standards addressing septic systems, crossings, hazardous materials, landfill operations, and construction activities.

Growth Management and Natural Resource Conservation

Planning issues related to environmental protection are closely tied to growth patterns and land use decisions. Coastal and marsh-adjacent areas, including barrier islands and southeastern Chatham County, contain sensitive wetlands, hammocks, and back-barrier systems that require continued enforcement of buffers, setbacks, and development standards. Long-term protection of high-value natural resources should be pursued through zoning, conservation easements, acquisitions (including SPLOST-funded opportunities), and partnerships. Rapid growth in western Chatham County presents additional risks, requiring targeted conservation strategies and stronger site-level stormwater controls.

Stormwater, Flooding, and Climate Resilience

Stormwater capacity, land use decisions, and transportation planning to address non-tidal and compound flooding risks should be an integrated countywide approach. Continued implementation of stormwater Best Management Practices, including Low Impact Development strategies, is essential. Shared design standards, evaluation of stormwater utility models, and aligned capital investments present key opportunities to improve system performance. As well,

planning and regulatory updates are needed to ensure that building standards, zoning, stormwater and drainage infrastructure design systems account for long-term climate conditions.

Public Infrastructure, Equity, and Preparedness

Environmental challenges intersect with infrastructure resilience and social equity. Neighborhoods with aging infrastructure, limited tree canopy, and historic disinvestment experience higher heat exposure and recurring inland flooding, with reduced capacity to recover from climate impacts. Future policies should prioritize equitable distribution of stormwater investments, tree canopy expansion, green space, and flood mitigation measures to address both physical risk and underlying vulnerability.

Chatham County's Disaster Recovery Plan and Hazard Mitigation Plan provide the framework for preparedness, response, and long-term resilience. Continued coordination is needed to align infrastructure planning, growth decisions, and emergency preparedness for roads, utilities, housing, and critical facilities.

Integration with Regional Planning and Ongoing Studies

Environmental planning criteria are implemented in coordination with the Regional Water Plan, stormwater programs, FEMA Flood Insurance Studies, and flood mitigation planning. These criteria are intended to be periodically reviewed and updated as new modeling, climate data, and technical studies become available.

The Coastal Incentive Grant (CIG) project currently underway provides a critical opportunity to translate updated flood risk, marsh migration, and climate resilience analysis into long-range planning. While the project timeline has been extended due to recent furloughs, its findings will directly inform updates to the Future Land Use Map and related policy language, strengthening alignment between environmental protection, flood mitigation, and future development decisions.

Needs & Opportunities Summary

Issue Area	Key Conditions & Challenges	Opportunities / Strategic Actions
Countywide Flooding Across Multiple Watersheds	Rainfall-driven (pluvial and fluvial) flooding affects multiple inland basins (Casey Canal, Springfield Canal, Bilbo Basin, Placentia Canal, and other low-lying drainage areas). Flat topography, high groundwater tables, aging infrastructure, and limited stormwater capacity contribute to flooding beyond tidal zones.	Advance basin-specific stormwater and drainage capital projects; integrate green infrastructure; prioritize investments using updated modeling and equity-based criteria.
Sea-Level Rise and Drainage System Constraints	Sea-level rise reduces gravity drainage efficiency and exacerbates inland flooding during heavy rainfall, increasing compound flooding risk even away from the coast.	Incorporate sea-level rise and compound flooding projections into zoning, land development regulations, and infrastructure design standards.
Storm Surge and Coastal Infrastructure	Storm surge threatens coastal and marsh-adjacent areas, including evacuation routes, utilities, and critical facilities;	Strengthen surge modeling integration in land use and transportation planning;

Issue Area	Key Conditions & Challenges	Opportunities / Strategic Actions
Risk	interactions with rainfall and drainage systems create broader systemwide risk.	coordinate coastal resilience strategies with inland stormwater management.
Sedimentation and Reduced Conveyance Capacity	Sedimentation in canals, ditches, and tidal creeks reduces stormwater conveyance, increases localized flooding, and degrades water quality and habitat.	Expand maintenance and dredging cycles; enforce erosion and sediment control standards; restore riparian buffers to improve system performance.
Urban Water Quality Impairments	Fecal coliform, nutrient loading, low dissolved oxygen, and legacy contaminants persist in inland waterways, particularly following storm events that mobilize runoff.	Enhance monitoring; strengthen sewer and septic oversight; reduce pollutant sources through stormwater retrofits and watershed-based planning.
Groundwater Protection and Saltwater Intrusion	The Floridan Aquifer remains vulnerable to saltwater intrusion and contamination, especially in western Chatham recharge areas affected by septic systems and stormwater.	Protect recharge zones through land use controls; expand sewer service where feasible; strengthen groundwater protection policies.
Habitat Fragmentation in Growth Areas	Rapid development in western and inland Chatham County continues to fragment wetlands, tree canopy, and ecological corridors that provide flood attenuation and climate resilience.	Identify and protect priority conservation corridors; require low-impact development practices in growth areas.
Urban Heat and Impervious Surface Expansion	Loss of tree canopy and increasing impervious cover intensify urban heat, particularly in historically underserved neighborhoods that also face flooding risks.	Expand tree canopy and green space; integrate heat-mitigation strategies into redevelopment standards and capital projects.
Environmental Justice and Climate Vulnerability	Social and economic vulnerability often overlaps with areas experiencing frequent flooding, heat exposure, and infrastructure deficiencies.	Apply equity-based prioritization to flood mitigation, stormwater, and transportation investments to address compounding risks.
Solid Waste, Illegal Dumping, and Drainage Obstruction	Illegal dumping and unmanaged waste in ditches, canals, and wooded areas obstruct drainage and worsen flooding and water quality issues.	Strengthen enforcement; expand disposal access; implement targeted community outreach to reduce dumping and protect drainage systems.

Figure 7.10 – Needs and Opportunities Summary

Goals and Policies

Goal 1 - Protect the public health, safety, and welfare of residents from flood hazards.

Protecting all residents from flood hazards is a vital step in creating a more resilient and equitable community. The low-lying elevation of the region has left many residents and properties vulnerable to the threats of flood hazards, with the frequency, quantity and financial impacts of flood waters increasing with the addition of impervious surfaces associated with development and the rise in sea levels due to climate change. Historically, the negative impacts of flooding have been disproportionately felt by low-income and minority communities that were developed on the lowest lying lands in the area. As sea levels rise and changes in climate bring increases in precipitation and in the frequency and intensity of storms, the flooding that has plagued low-lying areas will continue to be a chronic issue impacting more residents and properties.

Objectives:

- 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

Goal 2 - Improve public education and outreach efforts related to water, flooding, and hazards.

Public education and outreach efforts can be a key to the success of public programs put in place to protect residents and property from the impacts of flooding and hazard related issues, as well as programs to protect the water quality of the region. Such efforts help garner support for these programs and generate understanding of the benefits to the community. They can also be effective in teaching residents how to comply with any associated regulations. Public education can create a partnership between the government and residents in furthering the goals of public programs. Education can empower residents to be good stewards of the community and educate others on the importance of the programs, as well as publicly supporting or advocating for policies and regulations associated with efforts.

Objectives:

- 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.

Goal 3 - Implement plans, policies, and property protection to reduce potential

damages from climate change.

Environmental conditions are continuously changing, and it is imperative that local plans, policies, and regulations are cognizant of and evolve with the changes as needed. As science, technology and building standards improve or real-world conditions and future projections change, the guiding documents of the community should also progress in order to best protect residents and property from potential damages and mitigate other negative impacts. Efforts to proactively prevent potential damages to future public and private investments must be of paramount importance in the development of plans, policies, and regulations. Growth and new development should be directed away from current or future high-risk areas and encouraged in more appropriate areas.

Objectives:

- Evaluate existing plans, policies, and regulations to ensure that they are utilizing the most up to date data and projections and are consistent with current best practices.
- Routinely monitor new technologies and practices for areas of improvement in existing guiding documents.
- Identify areas most at risk of potential damages and implement policies and standards that prevent private or public investments in such areas.

Goal 4 - Conserve and protect potable water sources to ensure adequate drinking water supplies for existing and future residents.

Water is a finite resource and although water covers approximately 70% of the earth's surface, the majority of that is saltwater. Freshwater is far less abundant and is a precious resource because water suitable for drinking is a basic necessity for survival. It is essential to preserve and protect any potable water sources from overuse, pollutants, and saltwater intrusion. The Floridan Aquifer system is the coastal area's groundwater source of drinking water. If hazardous or toxic substances pollute the water that seeps into the ground, it is possible that those pollutants can contaminate the groundwater and render it useless. Extracting too much water from the aquifer can result in saltwater intrusion, reducing the amount of potable water for future use.

Objectives:

- Address drinking water source protection and conservation efforts regionally.
- Explore and prioritize land conservation efforts that preserve and protect potable water sources.
- Evaluate existing policies, plans, and regulations to ensure that they are consistent with best management practices in regards to water usage and the protection of water sources during site development.

Goal 5 - Preserve and enhance scenic views.

Chatham County and Savannah are known for their natural beauty and scenic views. They improve the quality of life of residents that are lucky enough to enjoy them as a part of their daily lives and draw tourists who dream of moss-covered trees and Spartina filled marshes to the area. Development pressures have resulted in the loss of some of these cherished views, diminishing the aesthetic pleasures for all that live and visit the area. Without adequate land use and buffer controls, the likelihood of these scenic areas to be impacted will increase and long-term loss will occur.

Objectives:

- Create criteria for what constitutes a scenic viewshed worthy of preservation and/or enhancement– Identify scenic viewsheds to be protected.
- Partner with nonprofits and other agencies to identify funding sources and other methods to preserve/enhance identified viewsheds.
- Review existing ordinances and policies for amendments to better protect viewsheds.
- Include viewshed analysis in the development process for developments that may negatively impact identified viewsheds.

Goal 6 - Conserve existing tree canopy and require planting of additional native trees during the development process to mitigate negative impacts of stormwater runoff, heat islands, reduced air quality, and loss of tree species from rising ambient temperatures.

Trees and their canopy play an important role in the quality of life and protection of natural resources in the region. Over 90% of respondents to the Comprehensive Plan 2040 Update survey felt that development should protect important environmental features including tree canopy, wetlands and waterways. In addition to the aesthetic qualities of trees, they play an active role in reducing temperatures by providing shade, improving air quality through filtering out pollutants, and alleviating the impacts of stormwater runoff by capturing rainfall and allowing for better infiltration of water into the ground. The loss of existing tree canopy during the development process negatively impacts the community in a variety of ways. Protecting and preserving existing tree canopy during the development process, as well as into the future, is vital. When not possible it is critical to require the planting of native trees as replacements for those lost.

Objectives:

- Inventory existing tree canopy in each jurisdiction and establish programs to ensure a minimum tree canopy is maintained countywide.
- Engage with property owners to educate on the importance of trees to the community and their role as private property owners to protect the region’s tree canopy.

Goal 7 - Improve the ability of our community to adapt to changing natural and built environments.

A resilient community has strategies in place to respond, adapt, and prosper in the face of changing conditions. It is important for a community to be able to withstand disruptions created by not only natural disasters and the changing climate but also due to shifts in demographics, changes in the economy, and impacts to its infrastructure. Increasing the communities' ability to adapt and be more resilient benefits all residents by improving the quality of life, allowing for healthy growth, providing durable systems, and conserving resources for current and future generations.

Objectives:

- Review development regulations, policies, plans and incentive programs to identify means to better prepare for potential events that will create disruptions and develop measures that allow for action in the face of uncertainty or unexpected events.
- Enact policies and regulations that will reduce impacts of human activities that intensify climate changes.
- Identify strategies and create networks to provide support and safety nets for the most vulnerable residents in the community that have the fewest resources to adapt and be resilient in the face of disruptions.

Goal 8 - Manage the impacts of climate change as it relates to land use and development through mitigation and adaptation measures.

Climate change is the long-term change in average weather patterns and it has a broad range of observed effects. Coastal Georgia is facing many of the impacts of climate change. Sea levels are rising, weather patterns are less predictable, storms are increasing in frequency and intensity, temperatures are rising, drought conditions are lasting longer, air quality is declining, transmitted mosquito-borne disease rates are increasing, and natural ecosystems are being destroyed. In addition to environmental impacts, climate change has financial and societal costs, and those in poverty suffer the harshest consequences with the least ability to cope. Land use and development decisions can significantly impact climate change, either by exacerbating conditions or providing proactive measures to prevent further impacts and mitigate existing conditions. Almost 90% of respondents to the Comprehensive Plan 2040 Update survey noted the importance of reducing excessive heat in neighborhoods through shade, vegetation and cooling measures and also indicated support for encouraging environmentally friendly building practices and materials in new development. Now is the time to implement solutions to address the changing climate.

Objectives:

- Coordinate land use and transportation infrastructure decisions, and incorporate climate change projections into these decisions.
- Review and amend policies and regulations as necessary to remove barriers to mixed uses within close proximity of each other in order to reduce vehicle trips.
- Evaluate existing policies, plans, and regulations to ensure that they are consistent with best management practices in regard to smart growth, energy efficiency, and reduction of emissions.

Goal 9 - Plan for the mitigation and redevelopment of brownfields for productive uses.

Over 80% of the respondents to the Comprehensive Plan 2040 Update survey indicated that future growth should focus on improving and reusing existing developed areas before expanding outward. Brownfields are an untapped resource. They are properties, once developed, that now sit vacant and often are considered blighted or contaminated. Cleaning up and redeveloping brownfield sites promotes community revitalization, creates employment opportunities, increases tax revenue, potentially reduces community exposure to hazardous contaminants, and alleviates pressure to develop green spaces. The mitigation and redevelopment of brownfields for productive uses is the epitome of Smart Growth.

Objectives:

- Identify all potential brownfields and their potential contaminants.
- Explore grants and other funding sources to assist in the cleanup and/or redevelopment of brownfield sites.
- Review and amend policies and regulations as necessary to remove barriers to the redevelopment of brownfields and identify means to incentivize their redevelopment.

Goal 10 - Proactively manage stormwater runoff.

Stormwater runoff is when rain cannot infiltrate the ground because of impervious surfaces and instead flows into storm drains and nearby water ways. In times of heavy rainfall, stormwater can be a nuisance, causing flooding resulting in property damage. It can also carry pollutants into nearby water bodies, degrading the water quality for humans and other species. Proactively managing stormwater runoff protects the environment, financial investments of the community (private and public), quality of life of residents, and public health.

Objectives:

- 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.

Goal 11 - Implement a municipal clean energy action plan.

The use of fossil fuels creates pollution that puts the community's health at risk, exacerbates the negative impacts of climate change, and reduces the resiliency of the community by diverting limited resources from investing in efforts to create a more resilient community instead to combating the increasing dangers of climate change. Proactively making the shift from fossil fuels

to clean energy now, rather than waiting until they eventually run out, protects the environment and the community, and encourages the creation of new jobs and innovation. Implementing a municipal clean energy action plan is an important step in working towards a healthier, safer future for all residents.

Objectives:

- Adopt the Chatham County Clean Energy Plan
- Establish a Clean Energy Action Plan committee
- Identify community partners and state agencies to participate in the process
- Develop an energy vision
- Assess the current energy profile
- Develop energy goals and strategies
- Identify and prioritize actions
- Identify funding sources to implement the plan
- Develop a blueprint for implementation