

Regional Assessment of Coastal Georgia

The region has an opportunity to shape the scope and character of future development, identify existing and emerging needs and update the Regional Plan to assure that top issues are addressed and communities are able to continuously revitalize.

Coastal Regional Commission

Coastal Regional Commission

The Coastal Regional Commission (CRC) is the regional planning and intergovernmental coordination agency created by local governments in the region pursuant to legislation passed by the Georgia General Assembly. The CRC has authority under state law as a Regional Commission (RC), effective July 2009, as outlined by House Bill 1216 in 2008.

The CRC is the forum through which local governments in the region meet to solve mutual problems and decide issues of region-wide importance. Additionally, the CRC collaborates in programs of research and study, and engages in planning that affects the coastal region.

The CRC works closely with the region's counties and cities to address a wide range of issues, including infrastructure, resources, economic development, historic preservation, growth management, and the delivery of services to older adults, persons with disabilities, and their family caregivers. Over the course of decades, the CRC has maintained a strong working relationship with the members it serves and has achieved national recognition for its ability to develop and promote efforts that impact the region as a whole.

Regional Assessment Partners

The CRC works closely with higher education institutions as these institutions are aligned with and dedicated to the livability and economic vitality of the 10-county coastal region.

Leaders from regional partnerships include:

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College of Environment + Design, UGA

In July 2013, the CRC created a formal partnership with University of Georgia. This partnership assessed how well existing planning tools address hazard risk and community resiliency with the goal of integrating resiliency guidelines and performance standards into the Update of the Regional Plan.

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The mission of the Center for Sustainability at Georgia Southern is to 1) increase education and awareness of sustainability issues, both on campus and in the community; 2) provide incentives for faculty, staff, and students to incorporate sustainability in research, teaching and service; 3) form partnerships with local community to improve sustainability; 4) implement best practices in sustainability. The Center is directed by Lissa M. Leege, PhD, Professor of Biology & Director, Center for Sustainability, Georgia Southern University, Statesboro, GA.

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Introduction

Georgia is home to one of the most pristine and undeveloped coastlines in the eastern seaboard. This eastern shore stretches almost 100 miles from Savannah at its northern point to St. Marys at its southern tip. It's here one finds abundant wildlife, beautiful beaches and over 2300 miles of tributaries and salt marsh.

Equally important, one finds historic towns, industries, major ports, and a thriving tourism trade, each driving some part of the region's economic engine. Positive growth is important in maintaining coastal Georgia as unique area of the state. Together, coastal leaders are meeting the challenges of how to encourage and plan for quality economic growth while protecting the integrity of the coastal region's natural resources.

Regional Assessment Purpose

The purpose of the Regional Assessment is to present a factual and conceptual foundation upon which the rest of the regional plan is built. Preparation of the Regional Assessment is largely a staff or professional function of collecting and analyzing data and information about the region and presenting the results in a concise, easily understood format for consideration by the public and decision-makers involved in subsequent development of the Regional Agenda.

The Regional Assessment is the first part of the regional plan initiative. It is an objective and professional assessment of data and information about the region intended to be prepared without extensive direct stakeholder involvement.

The Regional Assessment includes: (1) **a list of potential issues and opportunities** the region may wish to take action to address;(2) analysis of projected regional development patterns, including **a map of desired future development patterns for the region**; (3) **evaluation of current policies, activities, and development patterns** in the region for consistency with the Quality Community Objectives; and (4) **analysis of data and information** to check the validity of the above evaluations and the potential issues and opportunities.

The product of the Regional Assessment must be a concise and informative report for decision-making by stakeholders during development of the Regional Agenda portion of the plan. The Regional Assessment identifies and confirms the region's needs. In addition to meeting the requirements of the regional assessment for the Georgia Department of Community Affairs (DCA), the **Assessment also identifies critical findings that lay the groundwork for policy and program development** during the regional development planning process.

Regional Assessment

Since the first Regional Plan of Coastal Georgia was adopted in 2010, and updated to include the Regionally Important Resource Plan in 2012, Coastal Georgians continuously worked to create a region that is culturally vibrant, intellectually curious, innovative and beautiful. Coastal Georgia linked land use, transportation, economic development, green spaces and people, and poured effort and resources into developing regional leaders.

We cleaned rivers, promoted new ways of managing stormwater and became a major player as the eastern seaboard's growing port and distribution hub. Since the adoption of the Plan, Coastal Georgia has shown it can grow a vital economy, protect the natural environment and support vibrant places to live and work.

Today, despite these many successes, education, jobs, housing, and workforce development need attention, and there are major challenges on the horizon. As we update the Regional Plan we ask, "How do we develop the region, compete as a region, attract talent and ensure high-paying employment, and maintain our regional identity?"

"How do we develop the region, compete as a region, attract talent and ensure high-paying employment, and maintain our regional identity?"

To effectively tackle these challenges, we set a focused, strategic path forward – a path based on a clear understanding of conditions and trends, challenges and strengths.

Methodology

In July 2013, the CRC created a partnership with the College of Environment + Design from the University of Georgia. This partnership's first task was to **assess how well existing planning tools addressed hazard risk and community resiliency**. Students from the Environment and Design Studio were on site to collect data, establish contacts and present initial findings at the American Planning Association (APA) GA Chapter State Conference on Jekyll Island. A **Hazard and Resilience Assessment for the Coast of Georgia, February 2014** was completed and promulgated to propose Resilient Communities as a topic of importance in the Update of the Regional Plan. See Appendix A.

With continuing efforts to create Resilient Communities as a topic of regional importance, in **December 2014, the objective of defining how urban form impacts climate and how design could aid the process of adaptation was addressed and defended** by Mariana Barreto Alfonso. The research assessed how climate factors combined with physical landscapes interact; what are the different climatic responses between the built environment and the natural landscape; what key climate factors have direct impact in climatic perception and effect comfort; and what design solutions can be examined that could improve the effects of the built environment on climate. The methodological approach took into account three different scales including the regional scale, city scale, and the site specific scale.

The major professor for the **Planning with Climate: Urban Design as a Tool for Adaption** was Rosanna G. Rivero. The Dean of the Graduate School was Maureen Grasso and Committee Members were John F. Crowley III, J. Marshall Shepherd, and Lupita McClenning of the CRC. See Appendix B.

In the spring of 2014, a **Sustainable Communities Plan for Coastal Georgia** was completed over a 15 week period for a five-county study area including Bryan, Camden, Glynn, Liberty and McIntosh Counties. This project assessed existing conditions, development types and patterns, and the natural environment; and explored issues and opportunities. See Appendix C.

In March 2015, the effort to assess the resiliency of communities continued with the creation of **Resiliency Matrix to Test the Resilience of Planning Documents for Coastal Georgia**. A matrix was created by Shruti Agrawal to be used **as a checklist to evaluate the performance of planning documents for managing the conditions generated by the impact of a natural event and to help in identifying missing portions of documents that need to be completed in the future**. According to the multi-hazard mitigation plan status by FEMA, of the 11 states in the country with the FEMA approved enhanced state mitigation plan, Florida and North Carolina have mandated it for the coastal cities. Although Georgia has a statewide hazard mitigation element in the plan, it is not adopted by cities in their comprehensive plan. **The matrix too can easily be used for evaluation of the planning documents and be updated depending upon the type of natural event. The resiliency matrix tool can be used as a simple framework for evaluating the performance of planning documents.** The major professor was Umit Yilmaz, PhD., committee members include John (Jack) Crowley III, PhD., Rosanna Rivero, PhD., Pratt Cassity and Lupita McClenning, CRC Director of Planning. See Appendix D.

The CRC also utilized the Quality Growth Effectiveness (QGE) Assessment Survey as an Evaluation and Monitoring tool to measure performance standards as they relate to ongoing implementation of the Regional Plan. The QGE survey compiles A State of the Region through responses from local jurisdictions regarding consistency with the Regional Plan of Coastal Georgia. These answers determine the Plan's effectiveness, identifies implementation barriers, areas of best practices and most importantly areas of the Regional Plan that may require modification moving forward.

The CRC assessed the region and the current Regional Plan's effectiveness through local government feedback during formal Plan Implementation Meetings. Feedback is garnered during DRI consultation, CRC Leadership programs such as city and county retreats, CRC Practicums, GIS technical assistance and support, grant exploring opportunities, and through participation with the Georgia Initiative for Community Housing (GICH).

Feedback from key staff and elected officials during Plan Implementation Meetings recommend that for the Update of the Regional Plan that performance standards be created with a threshold specific to rural areas. Feedback during Plan Implementation Meetings also recommend that the Agriculture Land performance standards be revised to include points for local farmers market, and local businesses who utilize local seafood and farmers' markets.

Additionally, it was discussed that the Plan should identify meaningful performance standards by more carefully selecting clear goals that can improve smaller local governments approach to best practices.

What did We Discover?

Coastal Georgia has distinct issues based on 1) unique topographies, 2) natural features, and 3) varying demographics. The region is geographically large, covering 5,863 square miles (15,185 square km); and consisting of ten counties including urban, suburban, and rural areas, 35 municipalities of varying population, and large areas of very low population density. Planning is essential for any region with a wide variety of development patterns in order to ensure that rural, suburban, and urban areas have equitable access to infrastructure and services. In addition, planning is important for any region with a large number of jurisdictions in order to encourage cooperation and collaboration.

List of Potential Issues and Opportunities

Issues	Opportunities
Economic Development	
<p>Employment:</p> <ul style="list-style-type: none"> • Too high proportion of low-paying jobs. • The community has seen a shift from higher paying manufacturing jobs to lower paying service jobs. • The region lacks sufficient jobs or economic opportunities for local residents. • The community does not have many jobs for skilled labor. • The community has few jobs for unskilled labor. 	<p>Employment:</p> <ul style="list-style-type: none"> • Need to strengthen and enhance the local economic base. • Need to develop more high value, environmentally sound industry of all types. • Enhancement of the intensity of training and numbers of persons trained for high-skill levels of occupations would greatly strengthen the marketability of the community's labor force, especially for industries requiring large numbers of highly trained employees.
<p>Education:</p> <ul style="list-style-type: none"> • Lack of labor skills to support a diverse group of industries. • Perception of public school systems as underperforming can detract from economic development efforts. • The long history of low educational attainment for local residents in Coastal Georgia creates difficulties in raising expectations for local school systems. 	<p>Education:</p> <ul style="list-style-type: none"> • Need to provide a quality education system – world class universities and training. • Healthcare – university research • Growth of population of engineering students at Georgia Tech. • Partner with local community colleges and technical colleges to provide satellite classes and courses for local citizens. • There is a good supply of professionals, technical information, and expertise available in the region.
<p>Business:</p> <ul style="list-style-type: none"> • Small and minority businesses are only a small portion of local economies. • Lack of communication between governments, authorities, businesses and citizens in planning and implementing economic development plans. • There has been a shift from locally owned retail stores to regional shopping centers, which has diminished the viability of many downtowns. • The region has a reputation among some developers as a tough place to do business. • The existing economic development program(s) do not have an entrepreneur support program. • Coastal Georgia faces competition from South Carolina and Florida to attract desired businesses. 	<p>Business:</p> <ul style="list-style-type: none"> • Competitive tax and utility rates. • The regions high quality of life is a positive attraction to highest concentrations of high income households in the region making it an ideal location for high-end retail. • Utilize the local chambers of commerce to promote the area's towns, counties, and local businesses. • Utilize airport, transit system, and other regional transportation initiatives to attract businesses to the area.

Issues	Opportunities
Economic Development	
<p>Fisheries Industry:</p> <ul style="list-style-type: none"> Declining coastal commercial fisheries industry: Jobs and livelihoods dependent upon the coastal fisheries industry are susceptible to a variety of factors from global economics to local droughts. 	<p>Fisheries Industry:</p> <ul style="list-style-type: none"> Seek state and local support for programs to maintain a viable coastal fisheries industry.
<p>Silviculture Industry:</p> <ul style="list-style-type: none"> The traditional silviculture industry is threatened both from global economic factors to anti-forestry attitudes. 	<p>Silviculture Industry:</p>
<p>Manufacturing:</p> <ul style="list-style-type: none"> Decline of manufacturing industry: Many jobs have been lost due in part to competition with lower labor costs, lower taxes, and relaxed environmental regulations available in foreign countries or other states. This competition often translates to lower taxes and regulation important for local and regional quality of life 	<p>Manufacturing:</p> <ul style="list-style-type: none"> Conversion of existing heavy industry; re-use and re-development of existing land uses. Recruitment of growth industries that can use the skills of workers in declining industries: One possible opportunity to help stabilize the declining paper industry is the development of ethanol as an alternative fuel. Job training: Provide support for programs that help build the skills of workers in declining industries to transition to industries being recruited.
<p>Tourism:</p> <ul style="list-style-type: none"> Lack of corridor management on I-95 and its interchange gateways: Neither state nor local governments have adequate resources to fund the landscaping or litter management programs necessary to maintain the scenic quality of corridors at levels that are maintained in Florida and parts of southern South Carolina. The difference in aesthetic character is becoming increasingly evident and threatens to place Georgia at a competitive disadvantage in its appeal to the subset of tourists for whom aesthetics and perceived quality of life are an important consideration in their decision-making about where to spend their time and money. Lack of coordinated way-finding signage: Informational and directional signage along important corridor and gateway routes in the coastal region seems to lack the kind of deliberate visitor-friendly design that has been employed in neighboring Florida and Beaufort County, SC. Also, street signs, even at major intersections are small and difficult to read, especially at night. Lack of funding to develop alternative scenic routes to I-95 for Florida-bound tourists: The East Coast Greenway and US 17 (Southern Passages: the Atlantic Heritage Coast) provide an opportunity to showcase the Georgia coast to the subset of tourists who have the time and money to spend in sightseeing. Yet state and local governments lack funding to pursue the development of these corridors and are falling behind neighboring Florida in the development of these attractions. Outdoor Advertising: Billboards and signs provide an important service for tourists and residents. They also provide jobs within the outdoor advertising industry. Yet, a relative lack of billboard and signage regulation by local governments in Georgia compared to neighboring cities and counties in Florida and Beaufort County, SC again threatens to place Georgia at a competitive disadvantage in benefiting from spending and investment decisions of tourists and business and industry recruits for whom character and aesthetics of development are important. 	<p>Tourism:</p> <ul style="list-style-type: none"> Tourist development can help tax collections and funding without new state and local tax increases. Prioritize spending: Focus limited financial resources toward infrastructure improvements to sidewalks, lighting, and crosswalks along critical gateway intersections and corridors. Partner with universities, DOT, or other entities to design a regional way-finding master plan. Focus limited financial resources toward infrastructure improvements to sidewalks, lighting, and crosswalks along critical gateway intersections and corridors. Promote the use and development of alternative routes through coordination of marketing for festivals and events related to the important natural, historic, and cultural resources of the coast. Pursue funding support for implementation of the East Coast Greenway and Southern Passages development plans: The East Coast Greenway is a route that would have strong appeal to tourists who have leisure time and who are likely more able to spend time and money than the average tourist. A gateway to Georgia from Florida at St. Marys via passenger ferry service from Fernandina Beach would help form strong first and/or last impressions of Georgia that could translate to greater investment in Georgia. Develop and adopt regulations that will create a level playing field for the development of all new billboards and signs that avoid placing the local governments and their businesses of coastal Georgia at a competitive disadvantage with those of neighboring states. Seek methods to help the industry phase out non-conforming billboards, especially along critical corridors.

Issues	Opportunities
Economic Development	
<p>Miscellaneous:</p> <ul style="list-style-type: none"> • Regional leadership: • Water consumption limits on industry, commercial, forestry, residential pose constraints for growth and development. • Similar limits on processing waste water can be a deterrent to economic growth and development. • “Me” people vs. “We” people: There is a general lack of community vision among local governments of the region and strategic plans for economic development that help guide growth in a manner that is mutually beneficial to all coastal Georgians. • Lack of access to undeveloped barrier islands constrains tourism potential. 	<p>Miscellaneous:</p> <ul style="list-style-type: none"> • Regional Leadership: Support programs that encourage participation in existing regional leadership programs. • “We” people vs. “Me” people; “Big” Picture vs. “My” Picture: Develop effective public relations and public involvement to include all stakeholders in a way that promotes consensus building. • Marsh and barrier islands still preserved but enjoyed. • Barrier islands nationally recognized for pristine nature. • Access without automobiles to barrier islands. • Water taxis from St. Marys, Darien, etc. to barrier islands. • Creative and innovative access programs: Develop programs that facilitate a Cumberland Island type of access to other islands but limited to individuals who earn rights to such access via resource appreciation coursework available through curriculum offered in school, college, and continuing education venues. Such unique approach to access to the protected barrier islands would foster a greater understanding and appreciation of the resource while providing a way for all people to enjoy the resource. • Develop or enhance collaboration between local economic development agencies and community based organizations. • Improve overall quality of life by preserving rural character, open space, developing greenways, and improving healthcare and education. • Downtown revitalization and infill. • Capture more of the retirement community. • Capitalize upon and enhance the natural environment.
Natural and Cultural Resources	
<p>Marshlands:</p> <ul style="list-style-type: none"> • Impacts from upland development: An increasing desire for unobstructed views of coastal marshlands and waterways is causing waterfront property owners to remove natural vegetation that buffers marshlands from the impacts of non-point source pollution from fertilizers, pesticides, oils and greases associated with upland development. • Impacts from erosion: Increased recreational boating activity threatens to damage or destroy marshland through wake-related wave erosion, particularly in the exposed marsh beds where marsh die-off was severe during the drought of 2004-05. • Impacts from dock construction: An increasing desire for private docks is causing damage from construction activity in the marsh, as well as subsequent impacts caused by shading of marsh grasses. The increased demand is also creating political pressure to relax protective regulatory measures established by the state’s coastal marshlands protection legislation. 	<p>Marshlands:</p> <ul style="list-style-type: none"> • Education about the value of marshlands for sustaining quality of life – including their role as nurseries for healthy sea life and the industries that depend on sea life; as well as their role in the production of oxygen. • Education about the economic value of buffers: It is possible to have both marsh views and buffers. In fact the market for buffered views may exceed that of un-buffered views, because a view of a buffered edge on the other side of the marsh can often be more valuable than a view of an un-buffered edge. • Local marsh edge buffer incentives: Create adequate incentives within the local development process for the preservation or creation of natural vegetated buffers along marsh edges. • Boater education. • Boating licenses. • Contractor Education.

Issues	Opportunities
Natural and Cultural Resources	
<p>Undeveloped Barrier Islands/Hammocks:</p> <ul style="list-style-type: none"> • Impacts from unmanaged access: Recreational boaters are landing on the undeveloped islands and hammocks and creating unnecessary impacts that include leaving litter and debris that is both harmful to wildlife and inconsiderate of others who will follow. There are also reports of a growing practice of illegal harvesting of sea turtle eggs for black market trade. • Increasing pressure to relax regulation of development of hammocks: Market demand for coastal properties is raising development pressures in coastal Georgia for any available properties on barrier islands and hammocks. • Impacts from invasive exotic plants and animals: Port-related activity worldwide poses a growing concern for the impacts from non-native plant and animal life into environments that provide no natural predators to manage the population of such species. A recent example in Georgia is the introduction via packing material at Port Wentworth of the Ambrosia Beetle from Asia, that has nearly extirpated Red Bay, arguably one of the region's most beautiful evergreen trees. 	<p>Undeveloped Barrier Islands/Hammocks:</p> <ul style="list-style-type: none"> • Provide incentives for local governments to adopt regulations consistent with the recommendations of the Coastal Hammocks Advisory Committee. • Maintain natural state of undeveloped barrier islands and hammocks through conservation easements or acquisition.
<p>Developed Barrier Islands/Hammocks:</p> <ul style="list-style-type: none"> • Pressure to increase density and intensity of use: Increasing demand for coastal property is creating pressure to relax height and mass restrictions that help maintain the bucolic character of our developed barrier islands. Older smaller residences are being torn down for larger structures, often with multiple units. • Impacts to protective coastal dunes: Erosion in various places due to both natural and manmade causes threatens dunes from the ocean side of our protective dune systems at a time when property values are fostering development to encroach upon the dune systems from the other side. • Impacts of development on sea turtles: Lighting from development can disorient hatchling sea turtles and decrease their survival rates in the critical minutes between their hatching on the beach and reaching relative safety in the ocean. Also, sand materials used for beach re-nourishment that differ from original sand materials can impair sea turtle nesting. • Impacts from development of hammocks: Unregulated development of hammocks can impact numerous environmentally sensitive resources uniquely associated with coastal hammocks, including the adjacent protected marshlands. 	<p>Developed Barrier Islands/Hammocks:</p> <ul style="list-style-type: none"> • Identify the types of existing units that merit protection for their consistency with the desired community character, and provide incentives that direct redevelopment activity to other properties. • Provide incentives for local governments to adopt night lighting ordinances that shine lights away from the beach, during sea turtle nesting season. • Provide incentives for the local governments involved in beach re-nourishment to require the use of beach materials that are similar to original beach materials. • Provide incentives for local governments to adopt regulations consistent with the recommendations of the Coastal Hammocks Advisory Committee.

Issues	Opportunities
Natural and Cultural Resources	
<p>Estuarine/Tidal Rivers and Streams:</p> <ul style="list-style-type: none"> • Impacts of pollution from septic tanks associated with residential development: Much of the growth in the coastal region is occurring along the borders of estuarine/tidal rivers and streams, away from cities and/or developments that provide public sewer systems. The proliferation of private septic tanks used to support this pattern of growth increases the risk of pollution and threatens the quality of water for swimming as well as for fishing and the entire commercial fisheries industry. • Impacts of pollution from recreational boating: Increased boating and marina activity on coastal tidal waters increases the amount of oils and greases, sewage, and litter that enters our estuarine waters, affecting the health of marine fisheries and other marine life important for regional and global quality of life. • Impacts to endangered species from boating activity: Increased port traffic, as well as increasing recreational boating activity is threatening the survival of endangered and beloved species such as the North Atlantic Right Whale and the West Indian Manatee. Meanwhile there is political resistance by many recreational boaters for boating regulation. 	<p>Estuarine/Tidal Rivers and Streams:</p> <ul style="list-style-type: none"> • Develop incentives and disincentives to direct growth toward planned developments served by public water and sewer systems. • Clean marina program: Create incentives for all local governments adjacent to coastal waters to adopt standards consistent with the CRD's clean marina program [need to verify whose program that is]. • Education programs for school-age children and recreational boaters. • Incentives for speed limits on estuarine waters.
<p>Freshwater Wetlands:</p> <ul style="list-style-type: none"> • Development in Wetlands: The economics of development often value wetlands low enough to make them affordable for such land uses as auto and auto-related salvage yards, or other activities that can harm the environment and overall quality of life. Such activities are so prevalent that there is political resistance to regulate such activity, especially at the local level in the areas where this is a problem. Tires are a breeding ground for mosquitoes. • Local governments, where local land use decision-making authority resides, often leave wetland protection to state and federal governmental agencies. These agencies are not able to reject uses that are inherently harmful to wetlands, but that local governments do not prohibit in wetlands. [need a DNR expert's perspective here] 	<p>Freshwater Wetlands:</p>

Issues	Opportunities
Natural and Cultural Resources	
<p>Freshwater Rivers and Streams:</p> <ul style="list-style-type: none"> • Water quality and quantity. • Impacts from inter-basin transfers: Population growth in the northern metro Atlanta region is creating demand for inter-basin transfers that can damage our environment and inhibit growth. • The economics of the timber industry is encouraging the harvesting of river bottom timber in a process that threatens to harm water quality and damage critical environmental resources on which many coastal ecosystems depend. • Impacts from exotic invasive species: Increased recreational boating activity increases the threat of the transport of harmful exotic plants and fishes (e.g., hydrilla, water hyacinth, and others identified at http://www.fws.gov/invasives/Index5A.html) into coastal waters. 	<p>Freshwater Rivers and Streams:</p> <ul style="list-style-type: none"> • Educational programs for school age students and for recreational boaters
<p>Groundwater/Aquifer Resources:</p> <ul style="list-style-type: none"> • Impacts from saltwater intrusion: Increases in population and growth of water-consuming industries in the coastal region creates a political environment of competition and conflict among local governments, all of which works against the ability to coordinate the wise use of the region's groundwater resources for the benefit of all. • Impacts from point and non-point source pollution: There is a lack of capacity within many local governments of the region to regulate potentially harmful land use activities within the zones of influence of public groundwater wells. • Risks to private water wells: Local governments lack adequate capacity to regulate activities that can impact private wells, for which there a variety of contaminants that do not affect taste or odor. (e.g., Lead scavengers, etholene dibromide (EDB)). • Risk of contamination from aquifer injection: There is a market for a growing practice of injecting treated water into aquifers for storage for future withdrawal. This practice has been used in Florida and proposed in Georgia. 	<p>Groundwater/Aquifer Resources:</p> <ul style="list-style-type: none"> • Revise comprehensive plans to reflect the policy recommendations of the Sound Science Initiative (http://ga2.er.usgs.gov/coastal/) and create incentives for compliance with the recommendations. • Wellhead Protection: Revise comprehensive plans to identify zones of influence to public wells and develop wellhead protection standards for the protection of all groundwater resources used for potable water. • Increase education available to about the information provided by such entities as the National Groundwater Trust (www.agwt.org/watertest.htm). • Require that such practice be done or not done consistent with the results of sound science analysis.
<p>Clean Air:</p> <ul style="list-style-type: none"> • Various industries within the coastal region emit each year into the atmosphere tons of chemical pollutants that can be dangerous to health of coastal residents, and that often detract from the bucolic characteristics that make the region attractive to quality growth and development. As pillars of many local economies, there is widespread political resistance to local and state regulation, or even to attempts at seeking win-win solutions that protect jobs and profits while mitigating the negative impacts. 	<p>Clean Air :</p> <ul style="list-style-type: none"> • Maintain and improve air quality. • No paper mill smells.

Issues	Opportunities
Natural and Cultural Resources	
<p>Historic Resources:</p> <ul style="list-style-type: none"> • “Tear-down” and/or “extreme makeover” redevelopment in neighborhoods that potentially qualify for historic designation. • Impacts to scenic roadways from modern DOT standards: Canopied roads and landscaped memorial drives that define the character of many coastal communities are threatened by modern DOT design standards that preclude the ability to maintain the canopies and landscaping of these scenic drives. 	<p>Historic Resources:</p> <ul style="list-style-type: none"> • Well-developed natural and historic resources. • Context Sensitive Design.
<p>Cultural Resources:</p> <ul style="list-style-type: none"> • Protection of culturally significant communities: Increasing value of coastal property is causing residents of communities such as Hog Hammock to divest their properties into the hands of people and developers who have little or no connection to the historic communities. 	<p>Cultural Resources:</p> <ul style="list-style-type: none"> • Develop an Integrated Cultural Resources Management Plan (ICRMP). • Seek support for preservation through development of a coastal heritage museum.
<p>Miscellaneous:</p> <ul style="list-style-type: none"> • Protection of environmentally sensitive resources crucial to long term quality of life is inconsistent from one local government to another. • Competition among local governments for opportunities to grow their tax bases creates a natural disincentive for any one local government to adopt regulations that would drive developers to a neighboring jurisdiction. 	<p>Miscellaneous:</p> <ul style="list-style-type: none"> • Develop a regional GIS/mapping system. • Educational improvements can lead to general improvements

Issues	Opportunities
Housing	
<p>Affordable Housing</p> <ul style="list-style-type: none"> • Increasing land values in coastal counties are precluding the ability to develop affordable housing for low and moderate income workers. The costs, both in money and time, of transportation to inland areas where affordable workforce housing exists often offset or exceed the savings due to the lower costs of the inland area housing. • The proliferation of single use developments lacking the pedestrian friendly connections with existing adjacent development or opportunities for connections with future development increase the proportion of income that must be devoted to private transportation, especially in rural and suburban areas not served by public transportation. • The housing market is dominated by multi-family housing and high-end single family homes and land values are significantly higher than in surrounding areas, leaving few options for homebuyers. • The high cost of housing compared to surrounding jurisdictions has led to a shortage of homes for young professionals, middle-income families, and “empty-nesters”. • There is some community opposition to higher density and affordable housing. • There is a need for low to moderate income housing opportunities. 	<p>Affordable Housing</p> <ul style="list-style-type: none"> • Thriving older communities, live/work centers, technical centers within each community. • Modify the local planning and zoning regulatory framework of local governments within the region to foster the development of neo-traditional, mixed use developments that incorporate affordable workforce housing into the site plans via garden level or carriage house apartments, apartments above street-level retail and office etc., consistent with successful, traditional examples within the coastal Georgia region.
<p>Financial Assistance</p> <ul style="list-style-type: none"> • Lack of sufficient financial assistance programs to assist first time home buyers 	
<p>Special needs</p> <ul style="list-style-type: none"> • Escalating land values are precluding the ability to develop housing for people with special needs. • Lack of special needs housing (elderly, handicapped, etc). 	
<p>Substandard Housing</p> <ul style="list-style-type: none"> • Rehabilitation of properties is often hindered by heirs rights issue. • Lack of neighborhood design often creates subdivisions that do not have the qualities that foster re-investment throughout the housing life cycle. • Lack of adequate housing ordinances and regulations. • Poor maintenance of some housing in the downtown residential areas, especially among older renter-occupied units, as well as in some rural pockets. • Many community neighborhoods are in need of revitalization. 	<p>Substandard Housing</p> <ul style="list-style-type: none"> • Continue to utilize existing development regulations and procedures to implement safe, healthy and varied housing opportunities to the community.

Issues	Opportunities
Housing	
<p>Manufactured Housing</p> <ul style="list-style-type: none"> • There are numerous areas containing abandoned or substandard manufactured housing units that create nuisances and safety hazards, and that, in turn discourage investment and reinvestment. • Manufactured housing is susceptible to damage and destruction from storm events that are common in the coastal Georgia region. 	<p>Manufactured Housing</p> <ul style="list-style-type: none"> • Liberty County has developed a program that may serve as a model for the region.
<p>Miscellaneous:</p> <ul style="list-style-type: none"> • Many existing and new residential developments lack modern equivalents of the characteristics of neighborhood design and architectural style that have fostered reinvestment in neighborhoods and rehabilitation of housing units within many neighborhoods of the region that have the traditional versions of these characteristics. • Gentrification: increasing property values in the region, and especially within older neighborhoods of the region's historic districts threatens to foster gentrification. 	<p>Miscellaneous:</p> <ul style="list-style-type: none"> • Partner with University System and private colleges and universities to develop standardized designs for residential development that is affordable across the spectrum of regional income levels and that consistent with and contains modern equivalents to traditional characteristics that have proven to foster reinvestment and appreciation of long term value of housing. • Maintain economically and multi-culturally diverse neighborhoods. • Reduce costs of transportation for workforce demographic by requiring pedestrian connectivity of new development with adjacent existing or planned developments. • Provide incentives that help transform single use developments to mixed-use neighborhoods by locating small stores, such as local markets, within easy walking distance of residences. • Create rehabilitation programs, incentives programs for affordable infill housing, and readily available homebuyer education programs.

Issues	Opportunities
Transportation	
<p>Highway</p> <ul style="list-style-type: none"> • Lack of coordination of right-of-way acquisition. • Lack of coordination between land use and transportation: (see Land Use/Miscellaneous). • Impacts from capacity expansion: Increased development creates the need for capacity expansion, which often damages or destroys the character and quality of neighborhoods and historic streetscapes. (e.g., Tybee Road/Victory Drive, Frederica Road). • Hurricane evacuation: Growth creates a need for capacity expansion to accommodate hurricane evacuation, and these expansions often foster overdevelopment that absorbs the excess capacity and fuels a new round of capacity expansion. In addition, Florida evacuees often clog Georgia evacuation routes and prevent safe evacuation of Georgians. • Lack of adequate planning for parking: Historic districts developed before the automobile have too few parking spaces, while suburban malls often have too many parking spaces on too much asphalt. • Unattractive corridors: (see Economic Development/ Tourism). 	<p>Highway</p> <ul style="list-style-type: none"> • Develop transportation concurrency management programs to manage potential impacts. • Improve east-west transportation routes • Parking garages: Replace surface lots with garages in downtowns and at regional activity centers. • Corridor Management: (see Economic Development/ Tourism).
<p>Rail</p> <ul style="list-style-type: none"> • Non-signalized rail crossings: The number of accidents at such intersections is increasing. There are many substandard crossings in the coastal region. Local governments lack resources to provide adequate signalization. • Passenger service is limited and threatened by federal budget cuts that reduce quality of service and further discourage the development of rail capacity for the region. Because freight transportation is more lucrative than passenger service, railroads are disinclined to accommodate the schedules of passenger trains. 	
<p>Rivers/Sea</p> <ul style="list-style-type: none"> • Impacts of port development on natural resources: The economics of shipping is creating larger and larger ships, which in turn increases pressure on ports to accommodate the larger ships, often to the detriment of the local environment. In Georgia, the deepening of shipping channels poses threats to many sensitive resources important to coastal Georgia's quality of life. • Impacts of port development on highway infrastructure. • Lack of adequate cruise ship terminal(s): The cruise ship industry offers the potential for economic growth in tourism, as well as some potential negative impacts. 	<p>Rivers/Sea</p> <ul style="list-style-type: none"> • Bulk freight to Andrews Island leaving downtown Brunswick full of mixed use development • Ports expansions including military port at Kings Bay – all with good ratings

Issues	Opportunities
Transportation	
<p>Miscellaneous:</p> <ul style="list-style-type: none"> • Lack of a regional transportation system. • Lack of adequate mass transit. 	<p>Miscellaneous:</p> <ul style="list-style-type: none"> • Improve east-west corridors. • System of ferries from Jacksonville to Charleston to attract tourism. • Centers of density, nodes of development, public transportation options to include trams. • Interstates continue to be important. • Mass transit is here! • Monorail along I-95 corridor. • Transportation corridors are different – not like today. • Opportunities to address gridlock due to growth.
Facilities and Services	
<p>Potable Water</p> <ul style="list-style-type: none"> • Development outside the service boundary of public or private water systems requires a lower density than what is optimal for minimizing the costs of providing and maintaining public service to these areas at build out. 	
<p>Sewerage</p> <ul style="list-style-type: none"> • Development outside the service boundary of public sewer systems or private package treatment plants requires a lower density than what is optimal for minimizing the ultimate costs of providing and maintaining public service to these areas at a future date. 	<p>Sewerage</p> <ul style="list-style-type: none"> • Regional water/sewer authorities can reduce the cost to local governments to create and support their own, smaller systems.
<p>Parks</p> <ul style="list-style-type: none"> • Development often excludes adequate provision for parks and open space. • Escalating land values make open space less affordable for developers. 	
<p>Schools</p> <ul style="list-style-type: none"> • Coordination of school facilities is not a part of the state's comprehensive planning program. • Lack of coordination between local governments and school boards: Decision-making about sites for new schools is often kept secret, even from local governments that are expected to provide services to the facilities. The price of land often causes school boards to locate new schools away from the population centers where children are located. 	
<p>Miscellaneous:</p> <ul style="list-style-type: none"> • Funding of infrastructure: Local governments lack the ability to pay for the infrastructure needed to accommodate current growth patterns. 	<p>Miscellaneous:</p> <ul style="list-style-type: none"> • Defray the costs of service provision and maintenance through the adoption of impact fees, tap-on fees, etc. • Concurrency management: Consider adoption of local programs to require that water and sewer facilities necessary to maintain adopted levels of service be available at the time of the impacts of development.

Issues	Opportunities
Land Use	
<p>Agriculture/Silviculture:</p> <ul style="list-style-type: none"> • Timberland conversion: A downturn in the economics of the paper industry is causing much timberland to be divested, often in parcels of less than 100 acres that are developed in single use developments that have little or no connectivity or planned continuity with adjacent land uses. Resulting development patterns often fail to provide adequate consideration and planning for the cumulative impacts of development at ultimate build-out with regard especially to the protection of environmental resources and optimal use of community infrastructure. • Contemporary timber harvesting equipment and land clearing practices often damage or destroy the pastoral and natural characteristics of the land that attract visitors and prospective residents to coastal Georgia. Much of the native vegetation that enhances the aesthetic appeal of and forms much of the basis of the attraction for the region's most valuable real estate is being extirpated by such harvesting and land clearing activities. • Contemporary timber harvesting practices often lead to the clearing of wetland areas that provide important habitat for endangered species of plants and animals, as well as other species that provide biological and ecological diversity critical to the region's quality of life. 	<p>Agriculture/Silviculture:</p> <ul style="list-style-type: none"> • Recruit country's best developers • Learning from best practices from national and international developers • Foster win-win partnerships between owners of large tract timber holdings and development companies that follow state-of-the-art quality growth principles in the development of large tracts. Examine and improve upon the examples of the Chattahoochee Hill Country villages in southwestern Fulton County and St. Joe Communities in the Florida panhandle. • Identify critical corridors important to both quality growth and environmental sustainability and provide increased incentives for land owners and developers in these areas to use the above-referenced Silviculture BMPs. • Modify Silviculture BMPs and provide regional incentives to plan for future development and conservation of the appropriate areas of each timber tract.

Issues	Opportunities
Land Use	
<p>Residential Development:</p> <ul style="list-style-type: none"> • Long term fiscal sustainability: Tax revenues generated by all but the highest price levels of residential development often fail to cover the costs that local governments must bear to provide the range of services required to support such development. • Quality/Character of development: Much of our new residential development is based on designs that come from catalogs that often do not relate well to or complement the traditional or historic styles of architecture along the coast. Also, much of the built environment has been shaped or formed by contractors who have little formal education or training in land development BMPs. • Site Planning: The economics of the development process often discourage or preclude preservation or conservation of on-site features of natural and environmental or historical and cultural resources. • Modern construction equipment used for residential development often damages or destroys the pastoral and natural characteristics of the land that attract visitors and prospective residents to coastal Georgia. Much of the native vegetation that enhances the aesthetic appeal of and forms much of the basis of the attraction for the region's most valuable real estate is being extirpated by the development of residential subdivisions, often replacing native vegetation with non-native species that do not relate well or complement the traditional coastal landscape. 	<p>Residential Development:</p> <ul style="list-style-type: none"> • Analyze for the coastal region the current and projected levels of density for each price range of housing required to reduce the per unit costs of infrastructure and services to levels that will optimize the long term fiscal health of communities. • Encourage local governments to adopt policies that foster such densities for each price range of residential development. • Also encourage the adoption of policies that foster site designs and architectural style for each type of density for new developments that will encourage long-term reinvestment and rehabilitation of the residential properties. Look to the successful examples of reinvestment and rehabilitation associated with the densities of development and community site design of various historic districts in the coastal region from St. Augustine to Charleston. • Foster mixed use development. • Ambiance of mainland and inland counties blends with coastal flavor: clean, green space, well-planned, streetscapes. • Old European style development on Sea Island – attractive designs. • Increase education opportunities for members of the development community to learn about land development BMPs and provide incentives for the use of such BMPs • Modify the development process within as many local governments in the region as possible to create the opportunity for local TDR and PDR programs. Partner with existing local and regional industrial development authorities to create mixed-use parks that would be the receiving areas of transferred development rights. • Provide sufficient tax or regulatory incentives for the development community to consider conservation easements a viable option. • Encourage local governments to adopt land development regulations for Low Impact Development. • Encourage local adoption of tree regulations applicable to residential and commercial development requiring protection of native vegetation or replacement of mature specimens with approved native species or species that promote the traditional coastal landscape.

Issues	Opportunities
Land Use	
<p>Commercial and Office Development:</p> <ul style="list-style-type: none"> • Auto-dependent development patterns: The conventional development process that began after WWII and continues in many areas of the region today fosters the separation of land uses and does not accommodate nor plan for future accommodation of pedestrian or automobile connectivity with adjacent land uses. • Redevelopment of aging urban areas. • Urban Sprawl: Many corridors have developed into strips or ribbons of commercial sprawl with characteristic impacts related to traffic congestion, pedestrian safety, urban blight, etc. • Anywhere USA: The proliferation of corporate franchise and big box development, pre-fabricated metal buildings, auto sales lots, and outdoor billboard advertising has diminished the unique characteristics that distinguish the coastal Georgia region from anywhere else. 	<p>Commercial and Office Development:</p> <ul style="list-style-type: none"> • Develop state incentives to encourage local adoption of land use policies and regulation of site plan design that foster pedestrian and auto connectivity. Rural areas without zoning may look to DCA's Model Code. • New re-development of existing areas can enhance older communities and preserve currently undeveloped land. • Corridor rejuvenation: Develop strategies for corridor rehabilitation to include grayfield redevelopment tools with maximum setback regulations for new development, guidelines for architectural style consistent with traditional coastal character, rear-lot or shared parking facilities, etc. [Exhibit] • Design Guidelines: Partner with public and private colleges and universities or other entities to create coastal-specific architectural design guidelines and/or blueprint catalogs for various types of commercial uses typically found along any commercial corridor. Encourage local governments to adopt the guidelines for high profile corridors.
<p>Industrial Development:</p> <ul style="list-style-type: none"> • Impacts on water and sewer infrastructure: Many communities in the region lack the capacity to analyze the fiscal impacts that prospective industries will have on infrastructure capacity that may ultimately costs taxpayers more than they receive in tax revenues and payroll benefits. This may be especially problematic for local governments in the highly competitive race to attract the jobs and tax revenues associated with industrial growth. • Impacts on environmental resources: Many communities in the region lack the capacity to analyze the impacts of industry on environmental resources and long term costs that taxpayers must pay for cleanup and restoration. Local governments often fail to consider in their decision-making process the potential threat of contamination from accidents related to flooding and storm surge. • Impacts on transportation infrastructure: The trucking activity associated with industrial uses, but particularly port-related development is generating congestion and other along coastal Georgia highways, at highway interchanges, as well as within neighborhoods and communities throughout our coastal region. • Impacts to coastal character and scenic vistas: Industrial activity can detract from or conflicts with the scenic character that is the engine for tourism and quality growth in the region stretching from Charleston to St. Augustine. One example is the developing liquefied natural gas storage complex on Elba Island and its impacts on scenic views from US 80. Other examples are the paper mills visible from I-95 both at Brunswick and at Riceboro. • Brownfield Redevelopment: Costs of environmental cleanup are a deterrent to re-investment. Smaller local governments lack the expertise to negotiate redevelopment plans to the best advantage of the community. 	<p>Industrial Development:</p> <ul style="list-style-type: none"> • Location criteria: Include steps in the land use decision-making process to consider potential impacts to coastal environment and quality of life when identifying future areas where industrial activity can be accommodated. Provide adequate incentives to draw industry to these preferred sites, and disincentives for location outside these areas. • Buffers regulations/incentives for industrial development.

Issues	Opportunities
Land Use	
<p>Recreation:</p> <ul style="list-style-type: none"> • Increasing costs of land for recreation: The escalating cost of land in the coastal region inhibits local government investment in recreation facilities and related services. 	<p>Recreation:</p> <ul style="list-style-type: none"> • Levels of service: Consider creating regional levels of service for recreation that local governments can adopt and require as part of the development approval process. • Impact fees: Consider impact fees as a mechanism for the provision of adequate recreation facilities and services. • Concurrency management: Consider adoption of local programs to require that recreation facilities necessary to maintain adopted levels of service be available at the time of the impacts of development.
<p>Conservation and Open Space:</p> <ul style="list-style-type: none"> • Planning for Conservation and Open Space: The escalating cost of land creates a strong disincentive for the conservation of land. • Local governments lack the expertise to negotiate with developers for lands that can be devoted to conservation and open space. 	<p>Conservation and Open Space:</p> <ul style="list-style-type: none"> • Develop capacity to identify land to preserve. • Develop programs to advocate for well-planned green space infrastructure. • Direct more of the projected growth to PUDs, where conservation and open space can be incorporated into planning requirements. • Develop programs to encourage local government use of such tools as conservation easements and land banks for conservation and open space.

Issues	Opportunities
Land Use	
<p>Miscellaneous:</p> <ul style="list-style-type: none"> • Reactive vs. Proactive • Accelerated Growth can bring issues such as changes in traditional uses (forestry, agriculture, hunting). • Competition for development perceived to be necessary for building tax base inhibits local governments from adopting ordinances that are more stringent than neighboring local governments. • The intangible value of environmentally sensitive areas is not a factor in the development process. • The development process contains insufficient incentives to foster development that is consistent with local government comprehensive plans, the implementation of which often raises concerns about takings and private property rights. • Most local governments lack adequate planning and zoning expertise to manage the negative impacts of growth. • Alteration of Natural Hydrology: Development projects in the coastal region often include the construction of canals and ditches that alter the natural hydrology needed for biological and ecological diversity. Such practices are intended to alleviate the potential for flooding over the developed areas of the properties, but they in fact do not alleviate the potential for flooding but reduce the duration of the period of flooding. • Land use policies that foster rural and urban sprawl [see Transportation also]: Individuals and developers often seek and local governments permit the subdivision of property adjacent to rural state- or county-maintained roads and highways. State law, in turn, allows (or prohibits the denial of) access for each lot along such roadway. This practice encourages residential development along rural two-lane roadways and highways that – at the time of initial development – function much like collector streets of a neighborhood or town, but that eventually transform with growth of the community into major arterials. This transformation creates stresses and pressures on the residential properties to convert to commercial or office uses for which they were not designed, often resulting in the inefficient, inappropriate development pattern known as ribbon commercial sprawl. 	<p>Miscellaneous:</p> <ul style="list-style-type: none"> • Proactive vs. Reactive • Accelerated growth has potential to bring benefits. • Seek region-wide support for regulations that protect all local governments experiencing similar levels of growth and similar types of impacts. • Develop programs that analyze the value of resources typically overlooked in the development decision-making process and establish mechanisms to factor costs associated with the impacts to these resources into the development process. • Develop effective public relations and public involvement that includes all stakeholders at appropriate stages of the decision-making process. • Consider development of programs that analyze the savings to taxpayers that can be realized by developing the community in a manner consistent with the comprehensive plan. Create incentives that pass these savings to developers based on the degree to which their developments are consistent with the comprehensive plan. • Projected growth rates translate into predictable numbers of housing units and square footage of commercial and office space that could be directed into planned developments that optimize both fiscal sustainability of local governments and developer profits. • Tighten the coordination between the review processes for 404 wetland permitting and local land use decision-making processes. Establish a Model Code ordinance that local governments can use. Create incentives for local adoption of such ordinances. • Create incentives for TDRs and PDRs that allow development to be directed to areas away from wetlands. Also create incentives for development to be directed to large tract PUDs where wetlands can be included in conservation areas of the development. • Encourage local governments to prohibit or provide disincentives for the subdivision of properties adjacent to rural roads and highways, and instead require or provide incentives for such subdivisions of property to be accomplished through a Planned Unit Development process. • Create good balance between second-home owners and full-time residents. • Region-wide Live Oak preservation ordinance.

Issues	Opportunities
Intergovernmental Coordination	
<ul style="list-style-type: none"> • Home rule: Despite all its benefits, home rule can create a competitive disadvantage for local governments that do not spend the extra money to plan for and/or regulate the impacts of development. • Different levels of current planning, regulation and resources. • Cities and counties often conflict over annexation issues due to revenue distribution and service delivery issues. • Land use issues among local governments with different or conflicting development regulations (or limited regulations) undermine the ability for all governments to effectively regulate development patterns. • The perceived idea that design or environmental regulations will drive away new development has limited the political will for such regulation. • As communities grow they may expand beyond their jurisdictional boundaries. The limited incentive for intergovernmental cooperation hinders development and can force disjointed land use patterns. • Limited incentives for cooperation reduce the effectiveness of multi-jurisdictional cooperation in order to conserve important historic, cultural and natural resources and remain fair to local landowners. • Competition among local governments for limited state and federal grant monies often fosters a competitive nature rather than cooperative. • Intergovernmental disputes over Service Delivery issues have created an atmosphere of conflict in some coastal communities. 	<ul style="list-style-type: none"> • Cooperation between municipalities can provide the basis for reducing public costs (and taxes), sharing revenues, protecting environmentally sensitive areas, managing economic opportunities, maintaining local control of growth and development. • Intergovernmental agreements on issues of greenspace and open space can enhance nature-based tourism efforts around the region. • A unified corridor management plan along I-95 can provide opportunities for local governments to influence the coastal look of this important transportation route. • Multi-jurisdictional involvement is already underway for the Highway 17 corridor (Southern Passages) and can serve as a model for other asset-based cooperation. • The East Coast Greenway plan offers opportunities for intergovernmental cooperation in providing for recreational opportunities along the entire Georgia Coast. • The Coastal GA RDC provides regular opportunities for local elected officials to meet and consider regional approaches. Several existing standing committees (historic preservation, environmental protection, tourism development) provide vehicles for expanded cooperation across the region.

Development of Key Theme

The **Evaluation and Monitoring Report** reports on recent changes and recommends amendments to the Plan as data is collected, trends emerge and best practices are explored. The region has an opportunity to shape the scope and character of future development, identify existing and emerging needs and update the Regional Plan to assure that top issues are addressed and communities are able to continuously revitalize. By this definition, built environments become livable; ecosystems become healthier; economic development becomes more responsive; and the benefits of improved environmental and economic development become more equitably distributed among the region.

Regional Assessment Key Finding – Community Resiliency



Resilience is important in a changing world. Coastal Georgia faces major uncertainties including competition for resources and the impacts of coastal risks and vulnerabilities. While these issues affect the entire region, some communities are more vulnerable. In order to recover from potential setbacks, Coastal Georgia must become more resilient in a variety of ways and at a variety of levels. The regional coast of Georgia needs a well-designed and strong social, ecological, and economic infrastructure to adapt to its evolving future.

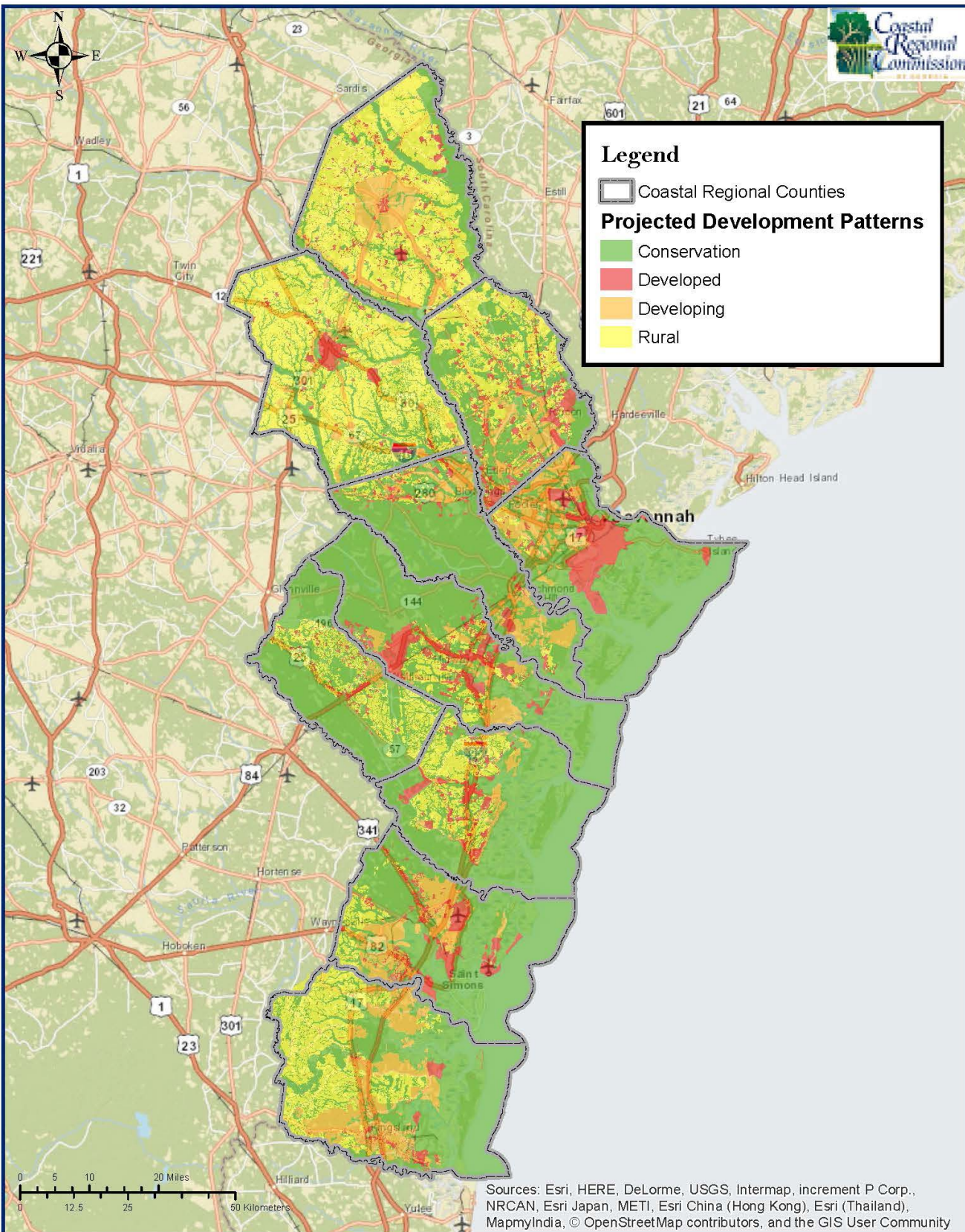
States, counties and municipalities must have an approved Hazard Mitigation Plan in order to apply for and/or receive hazard mitigation grant funding. There are notable differences found in Comprehensive Plans and Hazard Mitigation Plans. Hazard Mitigation Plans are often developed without active participation of local community development and/or planning staff. Strategies often include a focus on structural projects versus non-structural measures such as land use or policy alternatives. Hazards Mitigation Plans are generally stand-alone documents that don't link to other community based plans. Including community resiliency in the Regional Plan of Coastal Georgia as a topic of regional importance can mitigate longer-term risks by promoting suitable development patterns.

For the purposes of this Assessment, the factors that define “resilience” are identified for the field of urban planning specifically for events like hurricane and tropical storms in the coastal cities of the South Atlantic Coastal Region.

For a planning document to support the resilience of different factors such as demographic, infrastructure, and ecology it is important to be aware of the issues that define these factors.

Environment + Design, UGA reviewed academic literature, several case studies and planning documents and identified different factors and issues for which resilience is discussed when considering urban planning. A matrix listing all those factors and their issues was created called the Resiliency Matrix. This matrix was used to test the performance of the local governments planning documents.

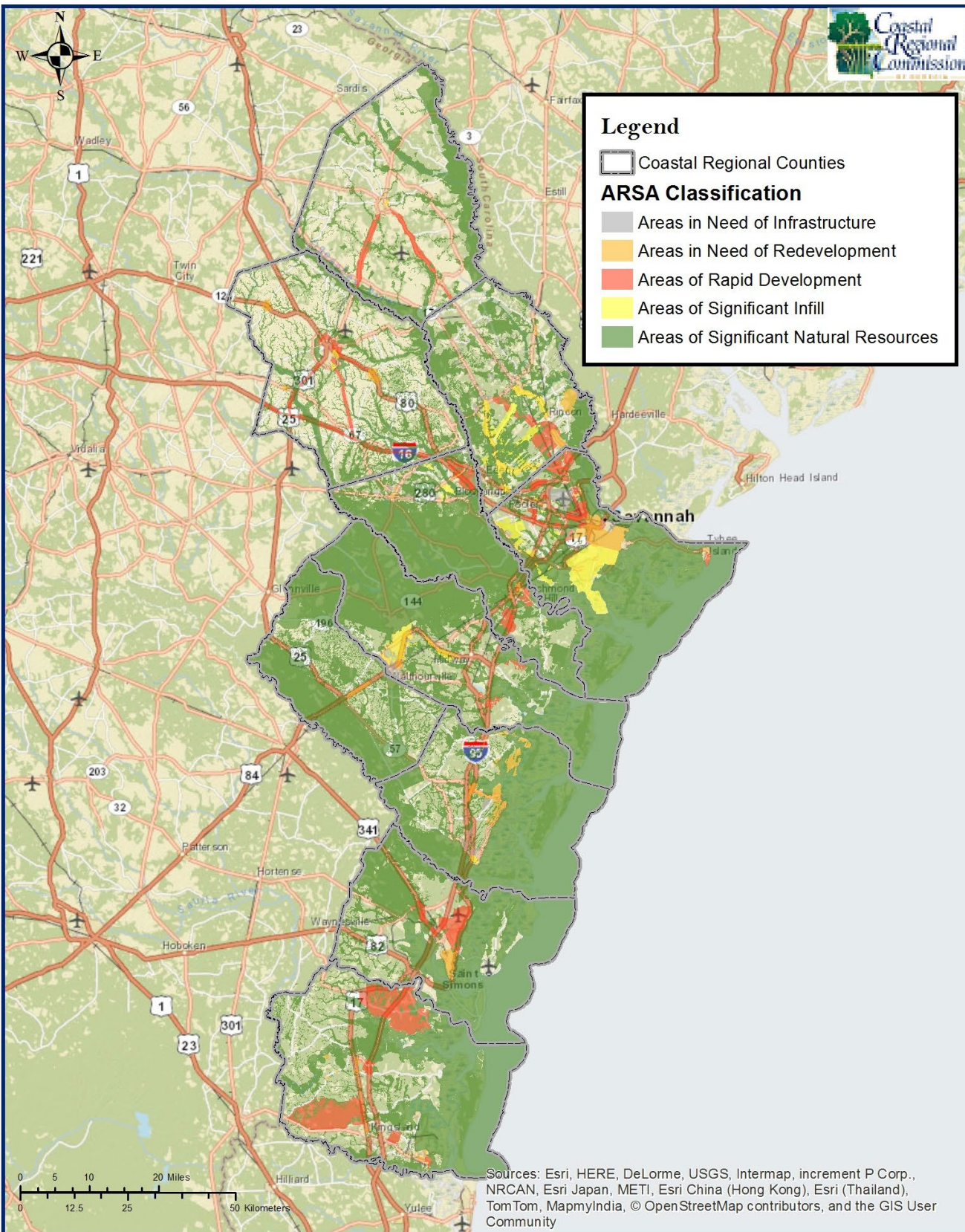
The results indicate two things: (1) the resilience scores of the city, and (2) the missing sections of the documents that can be updated for enhancing its performance for mitigating the impact of natural event in future.



Author: CRC

Projected Development Patterns

June 2015



Author: CRC

Areas Requiring Special Attention

June 2015

Analysis of Regional Development Patterns

Regional Mapping

Projected Development Patterns

Projected Development Patterns Map The Regional Projected Development Pattern Map is created by incorporating the **Regionally Important Resources** map with each jurisdiction's map from their adopted local Comprehensive Plans and analyzed for current trends as it relates to developing, developed, and rural development patterns. The Regional Projected Development Patterns Map reflects the most recent trends and projected land use patterns from local Comprehensive Plans created or updated under DCA's Local Planning Requirements and the most recent comprehensive inventory of the Region's natural and cultural resources.

Regional Development Patterns include:

Conservation: Primary conservation areas include, but are not limited to, wetlands, flood plains, streams, endangered species and critical habitat, prime agricultural lands, and federal or state listed species. Conservation areas include essential buffers along streams and wetlands, and water bodies that require riparian buffers.

Identifying and preserving coastal Georgia's Green Infrastructure network supports biodiversity and functional ecosystems, protects native plant and animal species, lessens the disruption to natural landscapes, limits invasive species, which in turn will enhance and support water quality, provides for quality growth land use planning, support the implementation of stormwater management plans and regulations, encourages the creation of transportation corridors and connections, fosters ecotourism, tourism and outdoor recreation, enhances the business climate, and ensures a high quality of life for coastal residents.

Rural: Areas not expected to urbanize or require urban services.

Efforts to maintain the character of rural areas are encouraged to protect viewsheds by providing for tree buffers along roadways, endorsing landscaping and significant tree preservation plans, and regulating unsightly uses such as junk yards or outdoor storage of heavy equipment. Local governments should make a conscientious effort to withstand pressure to provide water and sewer services to dispersed areas and discourage urban development from occurring in areas at substantial distances from existing urban areas, or leaping over undeveloped land suitable for development.

Developed: Areas demonstrating urban development patterns and also illustrate the areas where water and sewer services are being provided.

A coordinated land use and infrastructure planning policy encourages the concentration of new development in and around cities; promotes infill and redevelopment. Local governments should give top priority to repairing and reinvesting in existing infrastructure such as roads, water, sewer and utilities, by fixing and maintaining what exists. Funding for expansion, growth, and new purchases is limited and such a strategy helps communities avoid subsidizing sprawl. Exercising this approach promotes reinvestment in blighted areas and combats disappearing rural scenery. It also avoids excessive costs in providing public services and facilities for developments outside of urban boundaries.

Developing: Areas likely to become urbanized and require urban services in the next 20 years.

New development should be planned with mixed uses, blending residential development with schools, parks, recreation, retail business and services; linked in a compact pattern that encourages walking and minimizes the need for auto trips. Policies should include connectivity and continuity between planned developments. Safe and reliable vehicular and pedestrian or bicycle connections to retail and commercial services as well as internal street connectivity, connectivity to adjacent subdivisions, and multiple site access points are basic elements for establishing quality growth.

Areas Requiring Special Attention

Considering the **Projected Development Patterns Map** and other sources, land use trends are evaluated within the region to identify areas requiring special attention, including:

- Areas identified on the Regionally Important Resources map;
- Areas where significant natural or cultural resources are likely to be impacted by development;
- Areas where rapid development or change of land uses are likely to occur, especially where the pace of development has and/or may outpace the availability of community facilities and services, including transportation;
- Areas in need of redevelopment and/or significant improvements to aesthetics or attractiveness (including strip commercial corridors);
- Areas with significant infill development opportunities, including scattered vacant sites, large abandoned structures, or sites that may be environmentally contaminated.

Characteristics of an individual or a group can affect the manner in which they prepare for a potential disaster. Their level of response can have a significant impact on their personal well-being as well as the success of a community. The purpose of this Assessment identified and mapped the following areas of special attention, specifically the vulnerable populations as it relates to natural hazards and resiliency. See pages 48 - 57.

- Map 1 - County population growth greater than the 15% regional average, 2000-2010
- Map 2 – County population growth greater than the projected 32% regional average, 2010-2030
- Map 3 - County population under 5 greater than the 8% regional average, 2010
- Map 4 - County population aged 65+ greater than the 11% regional average, 2010
- Map 5 - Census tracts where population aged under 5 is above county's average
- Map 6 - Census tracts where population aged 65+ is above county's average
- Map 7 - Census tracts where median family income rate is below county's average low/mod income level
- Map 8 - Census tracts where family poverty rate is above county's average
- Map 9 - Census tracts where percentage of households without vehicles is above county's average
- Map 10 - Census tracts where percentage of mobile homes is above county's average

Quality Community Objectives

Economic Prosperity

The Coastal Regional Commission encourages development or expansion of businesses and industries that are suitable for the region and its communities. Factors to consider when determining suitability include job skills required; long-term sustainability; linkages to other economic activities in the region; impact on the resources of the area; or prospects for creating job opportunities that meet the needs of a diverse local workforce.

Resource Management

The Coastal Regional Commission promotes the efficient use of natural resources and identification and protection of environmentally sensitive areas of the region and its communities. This may be achieved by promoting energy efficiency and renewable energy generation; encouraging green building construction and renovation; utilizing appropriate waste management techniques; fostering water conservation and reuse; or setting environmentally sensitive areas aside as green space or conservation reserves.

Efficient Land Use

The Coastal Regional Commission encourages maximizing the use of existing infrastructure and minimizing the costly conversion of undeveloped land at the periphery of its communities. This may be achieved by encouraging development or redevelopment of sites closer to the traditional core of those communities; designing new development to minimize the amount of land consumed; carefully planning expansion of public infrastructure; or maintaining open space in agricultural, forestry, or conservation uses.

Local Preparedness

The Coastal Regional Commission encourages identifying and putting in place the prerequisites for the type of future the communities within the region seek to achieve. These prerequisites should include infrastructure (roads, water, and sewer) to support or direct new growth; ordinances and regulations to manage growth as desired; leadership and staff capable of responding to opportunities and managing new challenges; or undertaking an all-hazards approach to disaster preparedness and response.

Sense of Place

The Coastal Regional Commission promotes the protection and enhancement of its communities' unique qualities. This may be achieved by maintaining the downtown as focal point of the community; fostering compact, walkable, mixed-use development; protecting and revitalizing historic areas of the community; encouraging new development that is compatible with the traditional features of the community; or protecting scenic and natural features that are important to defining the community's character.

Regional Cooperation

The Coastal Regional Commission strongly encourages cooperation with and among neighboring jurisdictions to address shared needs. This may be achieved by actively participating in regional organizations; identifying joint projects that will result in greater efficiency and less cost to the taxpayer; or developing collaborative solutions for regional issues such as protection of shared natural resources, development of the transportation network, or creation of a tourism plan.

Housing Options

The Coastal Regional Commission promotes an adequate range of safe, affordable, inclusive, and resource efficient housing in the region and its communities. This shall be achieved by encouraging communities to develop a variety of housing types, sizes, costs, and densities; promoting programs to provide housing for residents of all socio-economic backgrounds, including affordable mortgage finance options; instituting programs to address homelessness issues in the community; or coordinating with local economic development programs to ensure availability of adequate workforce housing in the community.

Transportation Options

The Coastal Regional Commission encourages communities within the region to address their transportation needs, challenges and opportunities of all residents. This may be achieved by fostering alternatives to transportation by automobile, including walking, cycling, and transit; employing traffic calming measures throughout the community; requiring adequate connectivity between adjoining developments; or coordinating transportation and land use decision-making within the community.

Educational Opportunities

The Coastal Regional Commission encourages communities within the region to make educational and training opportunities readily available to enable all community residents to improve their job skills, adapt to technological advances, manage their finances, or pursue life ambitions. This can be achieved by expanding and improving local educational institutions or programs; providing access to other institutions in the region; instituting programs to improve local graduation rates; expanding vocational education programs; or coordinating with local economic development programs to ensure an adequately trained and skilled workforce.

Community Health

The Coastal Regional Commission encourages communities within the region to ensure that all community residents, regardless of age, ability, or income, have access to critical goods and services, safe and clean neighborhoods, and good work opportunities. This may be achieved by providing services to support the basic needs of disadvantaged residents, including the disabled; instituting programs to improve public safety; promoting programs that foster better health and fitness; or otherwise providing all residents the opportunity to improve their circumstances in life and to fully participate in the community.



Supporting Analysis of Data and Information

Vulnerability Assessment

Like many coastal regions sea level rise and hurricanes present a prevailing issue within this developing coast. Because of Georgia's low coastal elevation, it is susceptible to the effects of detrimental flooding occurring due to storm surges from hurricanes. Listed below are the region's coastal counties and each county's vulnerability as outlined by *FEMA, Task 5, and Section 4: Conduct Risk Assessment, Summarize Vulnerability*.

The vulnerability ranking is given a color coded system with red the most likely and most hazardous; and blue ranking as negligible with damage being unpredictable in severity. Each extent, location, and hazard probability utilized the description outlined in *FEMA Task 5-3, Conduct Risk Assessment Analyze Risk*. For the purposes of this assessment, sea level rise is assessed for a 6ft rise in 2100 as the extreme prediction by NOAA. (Appendix A).










Results are summarized by an index of risk, vulnerability, and resilience, which varies with each theme or topic (e.g. built environment, infrastructure, and natural environment) and based on a ranking system. This system addresses the level of risk and vulnerability by county or by hazard area, and provides how resilient a community is to any future hazards.

Natural Hazards

Bryan County

According to the research conducted by the College of Environment + Design, Bryan County is affected by the possibility of extreme drought to due to the low precipitation levels throughout the county. Only a small amount of the County is within the floodplain and flooding is only likely in that area.

Hurricanes, and storm surges are considered highly likely. The storm surge during a category 5 can reach up to 31 feet as predicted by National Oceanic and Atmospheric Administration (NOAA).

Hazard	County	Location	Maximum Probable Extent	Probability of Future Events	Overall Ranking
Drought	Bryan	County wide, extensive	Extreme	Likely	
Extreme Cold	Bryan	Entire county, extensive	3°F, weak	Unlikely	
Extreme Heat	Bryan	Entire county, extensive	105°F, moderate	Occasional	
Flood	Bryan	Part of county, significant	Severe	Likely	
Hurricane	Bryan	County wide, extensive	Category 5, extreme	Occasional	
Lightning	Bryan	Negligible	Weak to moderate	Occasional	
Sea Level Rise	Bryan	County wide, extensive	6 ft, extreme	Highly likely	
Storm Surge	Bryan	County wide, extensive	Category 5/ 31 ft, extreme	Highly likely	
Wildfire	Bryan	Parts of county, negligible	405.6 acres, weak	High in times of drought, likely	

Ranking Color Code















-  Highly likely, covers a large extent, results in severe damage lasting weeks to months
-  Likely, covers a large to moderate extent, results in damage that can be severe, lasts weeks
-  Occasional to likely, covers a moderate extent, results in damage lasting days to weeks
-  Limited, covers a small extent, damages lasts hours to days
-  Negligible, covers a random small extent, damage is hit or miss in severity

Table 1.1.1 FEMA Hazard Summary Worksheet 5.1 for Bryan County.

Camden County

Natural Hazard

According to the research by the College of Environment + Design, flooding in Camden County is an extreme occurrence due to most of the county lying within the flood plain. However, during periods of drought due to low precipitation for the region, wildfires are a likely probability. A hurricane in Camden County can have severe repercussions with a Category 5 hurricane creating a 31 foot storm surge as predicted by NOAA.

Hazard	County	Location	Maximum Probable Extent	Probability of Future Events	Overall Ranking
Drought	Camden	County wide, extensive	Extreme	Likely	
Extreme Cold	Camden	Entire county, extensive	4°F, weak	Unlikely	
Extreme Heat	Camden	Entire county, extensive	104°F, moderate	Occasional	
Flood	Camden	Parts of county, significant	Severe	Highly Likely	
Hurricane	Camden	County wide, extensive	Category 5	Occasional	
Lightning	Camden	Negligible	Weak to moderate	Occasional	
Sea Level Rise	Camden	County wide, extensive	6 ft, extreme	Highly Likely	
Storm Surge	Camden	County wide, extensive	Category 5, 31 ft, extreme	Highly Likely	
Wildfire	Camden	Parts of county, negligible	No information available	High in times of extreme drought	

Ranking Color Code






	Highly likely, covers a large extent, results in severe damage lasting weeks to months
	Likely, covers a large to moderate extent, results in damage that can be severe, lasts weeks
	Occasional to likely, covers a moderate extent, results in damage lasting days to weeks
	Limited, covers a small extent, damages lasts hours to days
	Negligible, covers a random small extent, damage is hit or miss in severity

Table 1.1.2 FEMA Hazard Summary Worksheet for Camden County.

Chatham County

Natural Hazards

According to the research by the College of Environment + Design, Chatham County's main natural hazard threats are hurricanes, flooding, sea level rise, and storm surges. Chatham County has risk of severe flooding especially during times of hurricanes, storm surges, and sea level rise as these factors increase the likelihood of county-wide flooding. Additionally, flooding is an extreme occurrence due to most of the county lying within the flood plain.

A hurricane of any category can make landfall on the county. The storm surge caused by hurricanes can reach levels of 31 feet as predicted by NOAA. These storm surges can cover most of the county during a Category 5 hurricane.

Hazard	County	Location	Maximum Probable Extent	Probability of Future Events	Overall Ranking
Drought	Chatham	County wide, extensive	Extreme	Likely	Orange
Extreme Cold	Chatham	Savannah area-entire county, extensive	3°F, weak	Unlikely	Light Blue
Extreme Heat	Chatham	Savannah area-entire county, extensive	105°F, moderate	Occasional	Yellow
Flood	Chatham	Significant, covers a large portion of county	Severe	Highly likely	Red
Hurricane	Chatham	County wide, extensive	Category 5, extreme	Occasional	Red
Lightning	Chatham	Negligible	Weak to moderate	Occasional	Dark Blue
Sea Level Rise	Chatham	County wide, extensive	6 ft, extreme	Highly likely	Red
Storm Surge	Chatham	County wide, extensive	Category 5/ 31 ft, extreme	Highly likely	Red
Wildfire	Chatham	Parts of county, negligible	1217.21 acres burned, moderate to severe	High in times of drought, likely	Light Blue

Ranking Color Code






	Highly likely, covers a large extent, results in severe damage lasting weeks to months
	Likely, covers a large to moderate extent, results in damage that can be severe, lasts weeks
	Occasional to likely, covers a moderate extent, results in damage lasting days to weeks
	Limited, covers a small extent, damages lasts hours to days
	Negligible, covers a random small extent, damage is hit or miss in severity

Table 1.1.3 FEMA Hazard Summary Worksheet for Chatham County

Glynn County

Natural Hazards

According to the research by the College of Environment + Design, floods, hurricanes, storm surges, and sea level rise are highly likely and considered the most severe for Glynn County. A Category 5 hurricane can cause 31 foot storm surges as predicted by NOAA. These storm surges can flood cover most of the county. During periods of precipitation there is a likely risk of extreme drought.

Hazard	County	Location	Maximum Probable Extent	Probability of Future Events	Overall Ranking
Drought	Chatham	County wide, extensive	Extreme	Likely	Orange
Extreme Cold	Chatham	Savannah area-entire county, extensive	3°F, weak	Unlikely	Light Blue
Extreme Heat	Chatham	Savannah area-entire county, extensive	105°F, moderate	Occasional	Yellow
Flood	Chatham	Significant, covers a large portion of county	Severe	Highly likely	Red
Hurricane	Chatham	County wide, extensive	Category 5, extreme	Occasional	Yellow
Lightning	Chatham	Negligible	Weak to moderate	Occasional	Dark Blue
Sea Level Rise	Chatham	County wide, extensive	6 ft, extreme	Highly likely	Red
Storm Surge	Chatham	County wide, extensive	Category 5/ 31 ft, extreme	Highly likely	Red
Wildfire	Chatham	Parts of county, negligible	1217.21 acres burned, moderate to severe	High in times of drought, likely	Dark Blue

Ranking Color Code






	Highly likely, covers a large extent, results in severe damage lasting weeks to months
	Likely, covers a large to moderate extent, results in damage that can be severe, lasts weeks
	Occasional to likely, covers a moderate extent, results in damage lasting days to weeks
	Limited, covers a small extent, damages lasts hours to days
	Negligible, covers a random small extent, damage is hit or miss in severity

Table 1.1.4 FEMA Hazard Summary Worksheet 5.1 for Glynn County

Liberty County

Natural Hazards

According to the research by the College of Environment + Design, Liberty County is likely affected by extreme drought due to its low precipitation levels. Hurricanes, sea level rise, and storm surges are highly likely within this area due to the large portion of the county that all three disasters can affect. A Category 5 hurricane can bring 31 foot storm surge as predicted by NOAA.

Hazard	County	Location	Maximum Probable Extent	Probability of Future Events	Overall Ranking
Drought	Liberty	County wide, extensive	extreme	Likely	
Extreme Cold	Liberty	Entire county, extensive	3°F, weak	Unlikely	
Extreme Heat	Liberty	Entire county, extensive	105°F, moderate	Occasional	
Flood	Liberty	Part of county, significant	Severe	Highly likely	
Hurricane	Liberty	County wide, extensive	Category 5, extreme	Occasional	
Lightning	Liberty	Negligible	Weak to moderate	Occasional	
Sea Level Rise	Liberty	County wide, extensive	6 ft, extreme	Highly likely	
Storm Surge	Liberty	County wide, extensive	Category 5/ 31 ft, extreme	Highly likely	
Wildfire	Liberty	Parts of county, negligible	893.42 acres, weak to moderate	High in times of drought, likely	

Ranking Color Code















	Highly likely, covers a large extent, results in severe damage lasting weeks to months
	Likely, covers a large to moderate extent, results in damage that can be severe, lasts weeks
	Occasional to likely, covers a moderate extent, results in damage lasting days to weeks
	Limited, covers a small extent, damages lasts hours to days
	Negligible, covers a random small extent, damage is hit or miss in severity

Table 1.1.5 FEMA Hazard Summary Worksheet 5.1 for Liberty County

McIntosh County

Natural Hazards

According to the research by the College of Environment + Design, McIntosh County can suffer from extreme drought due to the low precipitation levels of the region. Flooding is highly likely due to large portions of the county lying within the flood plain. Hurricanes can become a Category 5 with a 31 foot storm surge as predicted by NOAA.

Hazard	County	Location	Maximum Probable Extent	Probability of Future Events	Overall Ranking
Drought	McIntosh	County wide, extensive	Extreme	Likely	
Extreme Cold	McIntosh	Entire county, extensive	3°F, weak	Unlikely	
Extreme Heat	McIntosh	Entire county, extensive	105°F, moderate	Occasional	
Flood	McIntosh	Part of county, significant	Severe	Highly Likely	
Hurricane	McIntosh	County wide, extensive	Category 5	Occasional	
Lightning	McIntosh	Negligible	Weak to moderate	Occasional	
Sea Level Rise	McIntosh	County wide, extensive	6 ft, extreme	Highly Likely	
Storm Surge	McIntosh	County wide, extensive	Category 5; 31 ft, extreme	Highly Likely	
Wildfire	McIntosh	Parts of county, negligible	933.11 acres, severe	High in times of extreme drought, likely	

Ranking Color Code






	Highly likely, covers a large extent, results in severe damage lasting weeks to months
	Likely, covers a large to moderate extent, results in damage that can be severe, lasts weeks
	Occasional to likely, covers a moderate extent, results in damage lasting days to weeks
	Limited, covers a small extent, damages lasts hours to days
	Negligible, covers a random small extent, damage is hit or miss in severity

Table 1.1.6 FEMA Hazard Summary Worksheet 5.1 for McIntosh County

Natural Environment

The assessment for the region includes the following natural features: hydrology, wetlands and riparian zones, water recharge areas, critical vegetation habitats, areas of development/disturbance, and conservation land. Through identification of valuable and critical areas, other key natural features and processes are addressed indirectly including: soil and erosion, storm water runoff, and continuous wildlife corridors.

Georgia tides represent a dynamic process for the marsh ecosystem. Incoming tides provide food for the grasses of the marsh while outgoing tides carry food and nutrients produced by the marsh to the sea. The coming together of these two water sources provides critical habitat for fish, turtles, birds, mammals and the fisheries of Georgia. Seventy percent of Georgia's fish, shrimp, crabs, and shellfish spend a portion of their life in the estuarine waters of the salt marshes. These estuaries are nutrient driven by tidal waters which average 6.5 feet twice a day. During king tides these tides can average 10 feet.

Maritime dunes lie landward of the coastal beaches and seaward of the maritime forests. The dunes closest to the beach are vegetated by salt-tolerant species that provide nesting habitat for a variety of animals, such as loggerhead and leatherback turtles. Maritime dunes are among the most picturesque and heavily visited environments of the coastal region; protecting their economic value depends on also conserving their ecological values. Sand sharing, sediment transport, and longshore currents are natural processes that sustain maritime dunes. Limiting coastal development, channelization of coastal rivers, upstream impoundment, and seawall/jetty construction protects from interference with the natural movement of sand, sediments, and currents.

Additionally the wetlands, marshes, and riparian zones act as buffers against offshore storms. The vegetation has a dissipating effect on wave intensity. Hurricanes and storm surges would have larger negative impacts to infrastructure without natural marshes and vegetation. Management of salt marshes, wetlands, and riparian zones should be integrated into coastal hazard mitigation plans and sea level rise adaptation policies.

Storm Surge and Development

Inundation zone 1, also referred to as storm surge zone, shows that Glynn County has the most coverage of developed area, approximately fifteen percent. All other counties reveal that development is below ten percent within storm surge zone 1.

Storm surge zone 2 shows that the percent of developed land increases. Camden, Chatham, and McIntosh contain twenty to thirty percent of developed land and Glynn County contains forty percent development.

Chatham and McIntosh show an increase in development at thirty percent for storm surge zone 3. Camden, Glynn and Liberty counties are fifteen to twenty-five percent developed.

In inundation zone 4, the development coverage decreases to fewer than twenty percent. In inundation zone 5, the development coverage is equal to or less than ten percent.

Tropical storm and inundation 1 zone should limit development. The inundation zone 2 and 3 have the most developed coverage that should be considered in resiliency planning as Figure 1.2.1.

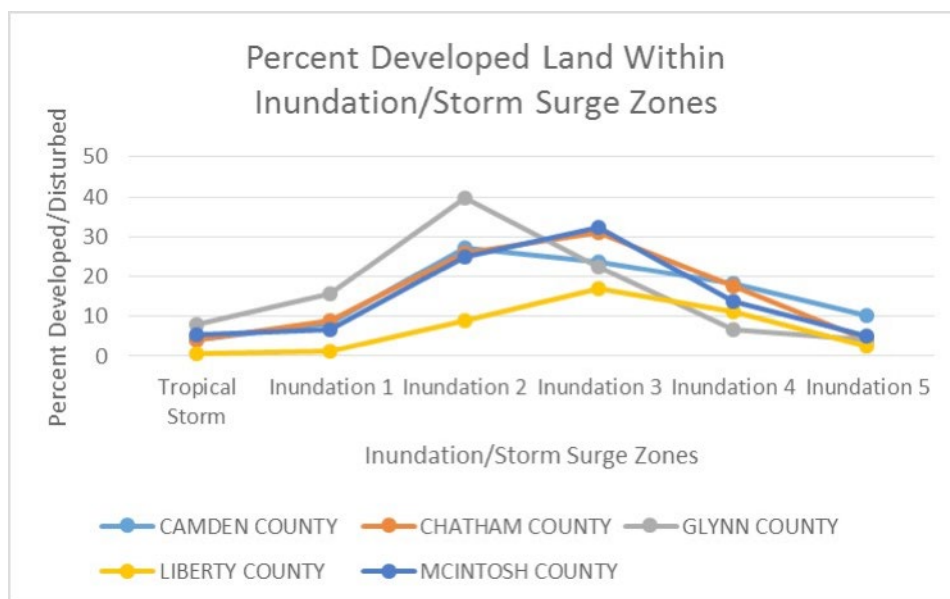


Figure 1.2.1

Vegetation/Open Water Buffers

Riparian buffers can be given a value based on their presence and allowance from open water and wetlands towards the built and developed environment. Three categories of consideration include: 100, 150, and 200-foot riparian buffers. A 100-foot riparian buffer is the recommended minimum based on literature reviews by the scientific community. As reported by the U.S. Agriculture and U.S. Environmental Protection agency in 1997, there are specific riparian widths that are associated with specific objectives. The recommended buffer width for flood control should be up 200 feet. This buffer width provides flood and sediment control as well as wildlife habitat.

Buffers narrower than 35 feet can provide some limited benefits but may require long-term maintenance since their ability to trap sediments is reduced (Giovengo, 2012). Currently, **The Soil Erosion and Sedimentation Act of Georgia** sets minimum standards for land-disturbing activities that counties enforce. Counties and municipalities must adopt comprehensive ordinances that establish procedures for controlling land-disturbing activities. One requirement is the installation of best management practices that avoid soil erosion caused by storm water runoff. Another aspect of the act requires that no land-disturbing activities be undertaken within 25 feet from state waters.

Five counties have approximately ninety percent vegetation within the 100-foot riparian buffer as noted in Figure 1.2.2. Within the 150-foot riparian buffer the vegetation coverage decreases slightly. The largest decrease in vegetation is within Glynn and Chatham Counties that declines from around eighty percent to seventy percent and sixty percent respectively. McIntosh and Liberty County's vegetation coverage does not change drastically, staying between ninety and eighty percent. This represents the effects of development and the importance of maintaining buffers on the riparian zone for protection of vegetation and hydrology. The expanding built environment continues to threaten the natural environment. The state currently mandates a 25-foot buffer from hydrology, which is inadequate for protecting the vital natural system.

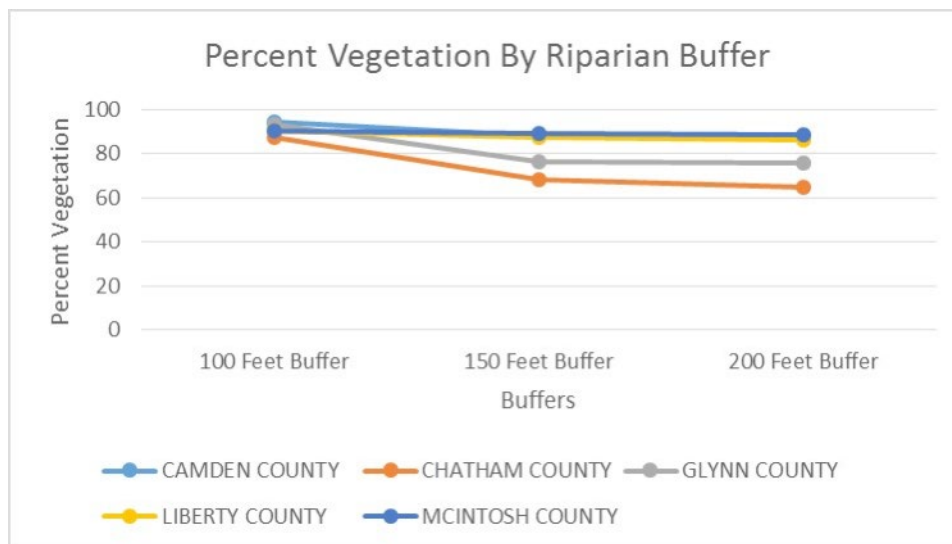


Figure 1.2.2 Data derived from GIS vegetation data provided by DNR. Bryan County is not included because there is no vegetation data provided.

Vulnerable Populations

A key factor in examining resiliency is understanding and quantifying vulnerable populations. These populations include not only those residents who live in vulnerable areas, the 100-year and 500-year flood plains, but also those who may have difficulty in heeding evacuation orders due to age, income, and mobility.

Provided below are county snapshots identifying these most vulnerable populations. These groups included children less than five years old, the elderly and frail elderly, persons living in poverty, and persons without reliable transportation that live in communities with limited public transportation. For elderly, we have identified the percentage of the population 65 and older. There is no specific age cohort for frail elderly, but the literature defines frailty in people 65 and older that called for the diagnosis when three or more of the following five criteria were present: unintentional weight loss of 10 pounds or more in the past year, self-reported exhaustion, weakness as measured by grip strength, slow walking speed and low physical activity. The frail elderly are individuals, over 65 years of age, dependent on others for activities of daily living, and often in institutional care.¹ For evidence of reliable transportation we used U. S. Census data showing the percentage of households that do not have a vehicle available. Also included are percentages of families who live in mobile homes as these are considered particularly vulnerable in the event of a storm or other natural disaster.

¹ "A Firm Diagnosis of Frailty," New York Times, Karen Pennar, June 25, 2012; "Who Are the Frail Elderly," Quarterly Journal of Medicine, New Series 68, No. 255, pp. 505-506, July 1988.

Bryan County Snapshot

Population Growth

The population of Bryan County grew from 23,417 to 30,233 between 2000 and 2010. The population is projected to grow to 45,272 by 2020 and to 59,534 by 2030. This represents a growth rate of 23 percent between the two most recent census counts, and a projected growth of 49 percent from the current census count to 2030.

Bryan County Population Growth			
2000	2010	2020	2030
23,417	30,233	45,272	59,534
Source: U. S. Census; Georgia Office of Planning and Budget			

Age Vulnerable Populations

In Bryan County the percentage of children under 5 grew by 18 percent from 2000 to 2010, while the percentage of persons 65 and older grew by 37 percent during the same period.

Bryan County Age Vulnerable Populations			
	2000	2010	Percent Change
Children Under 5	1,800	2,203	18 %
Persons 65 and older	1,703	2,715	37 %
Source: U. S. Census; Georgia Office of Planning and Budget			

Income and Poverty Level

Income can directly relate to a family's ability to have reliable transportation, which then directly relates to a family's ability to evacuate their homes in the event of an evacuation order. Income also impinges upon a family's ability to secure temporary lodging (hotels or motels) beyond publicly provided shelter, or to obtain replacement housing should they lose their homes due to a storm event or natural disaster.

According to the U. S. Census' American Community Survey 2013 – Economic Characteristics, Bryan County's Median Family Income (MFI) is \$74,513. Low- and moderate-income (LMI) is defined as up to 80 percent of MFI, which would be \$59,610 for Bryan County. Poverty levels are established by the federal government and are based upon income and family size. For Bryan County, 31 percent of the population is LMI and 8.6 percent of families fall below the poverty level.

Means of Transportation

The U. S. Census reports on the number of vehicles available to households. This is an important indicator of the percentage of the population that has reliable transportation should they need to evacuate their homes in the event of a storm or other natural disaster. In Bryan County 3.1percent of households do not have a vehicle available.

Housing Type

Mobile homes have been identified as a particularly vulnerable type of housing during storm events due to their susceptibility to damage caused by high winds and flying debris. In Bryan County 13.9percent of families live in mobile homes.

Bulloch County Snapshot

Population Growth

The population of Bulloch County grew from 55,983 to 70,217 between 2000 and 2010. The population is projected to grow to 88,071 by 2020 and to 109,034 by 2030. This represents a growth rate of 20percent between the two most recent census counts, and a projected growth of 36percent from the current census count to 2030.

Bulloch County Population Growth			
2000	2010	2020	2030
55,983	70,217	88,071	109,034

Source: U. S. Census; Georgia Office of Planning and Budget

Age Vulnerable Populations

In Bulloch County the percentage of children under 5 grew by 22 percent from 2000 to 2010, while the percentage of persons 65 and older grew by 19 percent during the same period.

Bulloch County Population Growth			
	2000	2010	Percent Change
Children under 5	3261	4197	22 percent
Persons 65 and older	5207	6401	19 percent

Source: U. S. Census

Income and Poverty Level

Income can directly relate to a family's ability to have reliable transportation, which then directly relates to a family's ability to evacuate their homes in the event of an evacuation order. Income also impinges upon a family's ability to secure temporary lodging (hotels or motels) beyond publicly provided shelter, or to obtain replacement housing should they lose their homes due to a storm event or natural disaster.

According to the U. S. Census' American Community Survey 2013 – Economic Characteristics, Bulloch County's Median Family Income (MFI) is \$52, 100. Low- and moderate-income (LMI) is defined as up to 80percent of MFI, which would be \$41,680 for Bulloch County. Poverty levels are established by the federal government and are based upon income and family size. For Bulloch County, 35percent of the population is LMI and 16.3percent of families fall below the poverty level.

Means of Transportation

The U. S. Census reports on the number of vehicles available to households. This is an important indicator of the percentage of the population that has reliable transportation should they need to evacuate their homes in the event of a storm or other natural disaster. In Bulloch County 6.1percent of households do not have a vehicle available.

Housing Type

Mobile homes have been identified as a particularly vulnerable type of housing during storm events due to their susceptibility to damage caused by high winds and flying debris. In Bulloch County 18.3 percent of families live in mobile homes.

Camden County Snapshot

Population Growth

The population of Camden County grew from 43,664 to 50,513 between 2000 and 2010. The population is projected to grow to 70,548 by 2020 and to 96,743 by 2030. This represents a growth rate of 14percent between the two most recent census counts, and a projected growth of 48percent from the current census count to 2030.

Camden County Population Growth			
2000	2010	2020	2030
43,664	50,513	70,548	96,743

Source: U. S. Census; Georgia Office of Planning and Budget

Age Vulnerable Populations

In Camden County the percentage of children under 5 grew by 4 percent from 2000 to 2010, while the percentage of persons 65 and older grew by 50 percent during the same period.

Camden County Population Growth			
	2000	2010	Percent Change
Children under 5	3,804	3,983	4 percent
Persons 65 and older	2,277	4,556	50 percent

Source: U. S. Census

Income and Poverty Level

Income can directly relate to a family's ability to have reliable transportation, which then directly relates to a family's ability to evacuate their homes in the event of an evacuation order. Income also impinges upon a family's ability to secure temporary lodging (hotels or motels) beyond publicly provided shelter, or to obtain replacement housing should they lose their homes due to a storm event or natural disaster.

According to the U. S. Census' American Community Survey 2013 – Economic Characteristics, Camden County's Median Family Income (MFI) is \$60,101. Low- and moderate-income (LMI) is defined as up to 80percent of MFI, which would be \$48,081 for Camden County. Poverty levels are established by the federal government and are based upon income and family size. For Camden County, 39percent of the population is LMI and 13.7percent of families fall below the poverty level.

Means of Transportation

The U. S. Census reports on the number of vehicles available to households. This is an important indicator of the percentage of the population that has reliable transportation should they need to evacuate their homes in the event of a storm or other natural disaster. In Camden County 5.3percent of households do not have a vehicle available.

Housing Type

Mobile homes have been identified as a particularly vulnerable type of housing during storm events due to their susceptibility to damage caused by high winds and flying debris. In Camden County 14.2 percent of families live in mobile homes.

Chatham County Snapshot

Population Growth

The population of Chatham County grew from 232,048 to 265,128 between 2000 and 2010. The population is projected to grow to 290,615 by 2020 and to 324,098 by 2030. This represents a growth rate of 12 percent between the two most recent census counts, and a projected growth of 18 percent from the current census count to 2030.

Chatham County Population Growth			
2000	2010	2020	2030
232,048	265,128	290,615	324,098
Source: U. S. Census; Georgia Office of Planning and Budget			

Age Vulnerable Populations

In Chatham County the percentage of children under 5 grew by 15 percent from 2000 to 2010, while the percentage of persons 65 and older grew by 9 percent during the same period.

Chatham County Population Growth			
	2000	2010	Percent Change
Children under 5	15,663	18,526	15 percent
Persons 65 and older	29,770	32,864	9 percent

Source: U. S. Census

Income and Poverty Level

Income can directly relate to a family's ability to have reliable transportation, which then directly relates to a family's ability to evacuate their homes in the event of an evacuation order. Income also impinges upon a family's ability to secure temporary lodging (hotels or motels) beyond publicly provided shelter, or to obtain replacement housing should they lose their homes due to a storm event or natural disaster. According to the U. S. Census' American Community Survey 2013 – Economic Characteristics, Chatham County's Median Family Income (MFI) is \$55,978. Low- and moderate-income (LMI) is defined as up to 80percent of MFI, which would be \$44,782 for Chatham County. Poverty levels are established by the federal government and are based upon income and family size. For Chatham County, 44percent of the population is LMI and 13.5percent of families fall below the poverty level.

Means of Transportation

The U. S. Census reports on the number of vehicles available to households. This is an important indicator of the percentage of the population that has reliable transportation should they need to evacuate their homes in the event of a storm or other natural disaster. In Chatham County 7.9percent of households do not have a vehicle available.

Housing Type

Mobile homes have been identified as a particularly vulnerable type of housing during storm events due to their susceptibility to damage caused by high winds and flying debris. In Chatham County 4.6percent of families live in mobile homes.

Effingham County Snapshot

Population Growth

The population of Effingham County grew from 37,535 to 52,250 between 2000 and 2010. The population is projected to grow to 80,563 by 2020 and to 112,062 by 2030. This represents a growth rate of 28percent between the two most recent census counts, and a projected growth of 53percent from the current census count to 2030.

Effingham County Population Growth			
2000	2010	2020	2030
37,535	52,250	80,563	112,062

Source: U. S. Census; Georgia Office of Planning and Budget

Age Vulnerable Populations

In Effingham County the percentage of children under 5 grew by 22 percent from 2000 to 2010, while the percentage of persons 65 and older grew by 37 percent during the same period.

Effingham County Population Growth			
	2000	2010	Percent Change
Children under 5	2,857	3,668	22 percent
Persons 65 and older	3,016	4,763	37 percent

Source: U. S. Census

Income and Poverty Level

Income can directly relate to a family's ability to have reliable transportation, which then directly relates to a family's ability to evacuate their homes in the event of an evacuation order. Income also impinges upon a family's ability to secure temporary lodging (hotels or motels) beyond publicly provided shelter, or to obtain replacement housing should they lose their homes due to a storm event or natural disaster.

According to the U. S. Census' American Community Survey 2013 – Economic Characteristics, Effingham County's Median Family Income (MFI) is \$69,450. Low- and moderate-income (LMI) is defined as up to 80percent of MFI, which would be \$55,560 for Effingham County. Poverty levels are established by the federal government and are based upon income and family size. For Effingham County, 32 percent of the population is LMI and 7.9 percent of families fall below the poverty level.

Means of Transportation

The U. S. Census reports on the number of vehicles available to households. This is an important indicator of the percentage of the population that has reliable transportation should they need to evacuate their homes in the event of a storm or other natural disaster. In Effingham County 3.6 percent of households do not have a vehicle available.

Housing Type

Mobile homes have been identified as a particularly vulnerable type of housing during storm events due to their susceptibility to damage caused by high winds and flying debris. In Effingham County 24 percent of families live in mobile homes.

Glynn County Snapshot

Population Growth

The population of Glynn County grew from 67,568 to 79,626 between 2000 and 2010. The population is projected to grow to 93,461 by 2020 and to 109,771 by 2030. This represents a growth rate of 15 percent between the two most recent census counts, and a projected growth of 27 percent from the current census count to 2030.

Glynn County Population Growth			
2000	2010	2020	2030
67,568	79,626	93,461	109,771
Source: U. S. Census; Georgia Office of Planning and Budget			

Age Vulnerable Populations

In Glynn County the percentage of children under 5 grew by 18 percent from 2000 to 2010, while the percentage of persons 65 and older grew by 18 percent during the same period.

Glynn County Population Growth			
	2000	2010	Percent Change
Children under 5	4398	5352	18 percent
Persons 65 and older	9761	11976	18 percent
Source: U. S. Census			

Income and Poverty Level

Income can directly relate to a family's ability to have reliable transportation, which then directly relates to a family's ability to evacuate their homes in the event of an evacuation order. Income also impinges upon a family's ability to secure temporary lodging (hotels or motels) beyond publicly provided shelter, or to obtain replacement housing should they lose their homes due to a storm event or natural disaster.

According to the U. S. Census' American Community Survey 2013 – Economic Characteristics, Glynn County's Median Family Income (MFI) is \$56,221. Low- and moderate-income (LMI) is defined as up to 80percent of MFI, which would be \$44,977 for Glynn County. Poverty levels are established by the federal government and are based upon income and family size. For Glynn County, 45percent of the population is LMI and 15.3percent of families fall below the poverty level.

Means of Transportation

The U. S. Census reports on the number of vehicles available to households. This is an important indicator of the percentage of the population that has reliable transportation should they need to evacuate their homes in the event of a storm or other natural disaster. In Glynn County 6percent of households do not have a vehicle available.

Housing Type

Mobile homes have been identified as a particularly vulnerable type of housing during storm events due to their susceptibility to damage caused by high winds and flying debris. In Glynn County 12.7percent of families live in mobile homes.

Liberty County Snapshot

Population Growth

The population of Liberty County grew from 61,610 to 63,453 between 2000 and 2010. The population is projected to grow to 78,740 by 2020 and to 93,821 by 2030. This represents a growth rate of 3% between the two most recent census counts, and a projected growth of 32% from the current census count to 2030.

Liberty County Population Growth			
2000	2010	2020	2030
61,610	63,453	78,740	93,821
Source: U. S. Census; Georgia Office of Planning and Budget			

Age Vulnerable Populations

In Liberty County the percentage of children under 5 grew by 2% from 2000 to 2010, while the percentage of persons 65 and older grew by 39 percent during the same period.

Liberty County Population Growth			
	2000	2010	Percent Change
Children under 5	6,412	6,552	2 percent
Persons 65 and older	2,432	3,971	39 percent
Source: U. S. Census			

Income and Poverty Level

Income can directly relate to a family's ability to have reliable transportation, which then directly relates to a family's ability to evacuate their homes in the event of an evacuation order. Income also impinges upon a family's ability to secure temporary lodging (hotels or motels) beyond publicly provided shelter, or to obtain replacement housing should they lose their homes due to a storm event or natural disaster.

Long County Snapshot

Population Growth

The population of Long County grew from 10,304 to 14,464 between 2000 and 2010. The population is projected to be 14,386 in 2020 and to grow to 17,171 by 2030. This represents a growth rate of 29percent between the two most recent census counts, and a projected growth of 16percent from the current census count to 2030.

Long County Population Growth			
2000	2010	2020	2030
10,304	14,464	14,386	17,171
Source: U. S. Census; Georgia Office of Planning and Budget			

Age Vulnerable Populations

In Long County the percentage of children under 5 grew by 16percent from 2000 to 2010, while the percentage of persons 65 and older grew by 44percent during the same period.

Long County Population Growth			
	2000	2010	Percent Change
Children under 5	1,133	1,355	16 percent
Persons 65 and older	594	1,055	44 percent
Source: U. S. Census			

Income and Poverty Level

Income can directly relate to a family's ability to have reliable transportation, which then directly relates to a family's ability to evacuate their homes in the event of an evacuation order. Income also impinges upon a family's ability to secure temporary lodging (hotels or motels) beyond publicly provided shelter, or to obtain replacement housing should they lose their homes due to a storm event or natural disaster.

According to the U. S. Census' American Community Survey 2013 – Economic Characteristics, Long County's Median Family Income (MFI) is \$50,522. Low- and moderate-income (LMI) is defined as up to 80percent of MFI, which would be \$40,418 for Long County. Poverty levels are established by the federal government and are based upon income and family size. For Long County, 33 percent of the population is LMI and 17 percent of families fall below the poverty level.

Means of Transportation

The U. S. Census reports on the number of vehicles available to households. This is an important indicator of the percentage of the population that has reliable transportation should they need to evacuate their homes in the event of a storm or other natural disaster. In Long County 6.5percent of households do not have a vehicle available.

Housing Type

Mobile homes have been identified as a particularly vulnerable type of housing during storm events due to their susceptibility to damage caused by high winds and flying debris. In Long County 49.2percent of families live in mobile homes.

McIntosh County Snapshot

Population Growth

The population of McIntosh County grew from 10,847 to 14,333 between 2000 and 2010. The population is projected to be 16,039 in 2020 and to grow to 20,686 by 2030. This represents a growth rate of 24percent between the two most recent census counts, and a projected growth of 31percent from the current census count to 2030.

McIntosh County Population Growth			
2000	2010	2020	2030
10,847	14,333	16,039	20,686

Source: U. S. Census; Georgia Office of Planning and Budget

Age Vulnerable Populations

In McIntosh County the percentage of children under 5 grew by 9 percent from 2000 to 2010, while the percentage of persons 65 and older grew by 48 percent during the same period.

McIntosh County Population Growth			
	2000	2010	Percent Change
Children under 5	715	785	9 percent
Persons 65 and older	1,280	2,478	48 percent

Source: U. S. Census

Income and Poverty Level

Income can directly relate to a family's ability to have reliable transportation, which then directly relates to a family's ability to evacuate their homes in the event of an evacuation order. Income also impinges upon a family's ability to secure temporary lodging (hotels or motels) beyond publically provided shelter, or to obtain replacement housing should they lose their homes due to a storm event or natural disaster.

According to the U. S. Census' American Community Survey 2013 – Economic Characteristics, McIntosh County's Median Family Income (MFI) is \$54,036. Low- and moderate-income (LMI) is defined as up to 80percent of MFI, which would be \$43,229 for McIntosh County. Poverty levels are established by the federal government and are based upon income and family size. For McIntosh County, 25percent of the population is LMI and 10.5percent of families fall below the poverty level.

Means of Transportation

The U. S. Census reports on the number of vehicles available to households. This is an important indicator of the percentage of the population that has reliable transportation should they need to evacuate their homes in the event of a storm or other natural disaster. In McIntosh County 5.2percent of households do not have a vehicle available.

Housing Type

Mobile homes have been identified as a particularly vulnerable type of housing during storm events due to their susceptibility to damage caused by high winds and flying debris. In McIntosh County 39.6percent of families live in mobile homes.

Screven County Snapshot

Population Growth

The population of Screven County decreased from 15,374 to 14,593 between 2000 and 2010. The population is projected to be 17,819 in 2020 and to grow to 20,036 by 2030. This represents a population loss of 5percent between the two most recent census counts, and a projected growth of 27percent from the current census count to 2030.

Screven County Population Growth			
2000	2010	2020	2030
15,374	14,593	17,819	20,036

Source: U. S. Census; Georgia Office of Planning and Budget

Age Vulnerable Populations

In Screven County the percentage of children under 5 decreased by 2 percent from 2000 to 2010, while the percentage of persons 65 and older grew by 1 percent during the same period.

Screven County Population Growth			
	2000	2010	Percent Change
Children under 5	1,012	993	-2 percent
Persons 65 and older	2,155	2,174	1 percent

Source: U. S. Census

Income and Poverty Level

Income can directly relate to a family's ability to have reliable transportation, which then directly relates to a family's ability to evacuate their homes in the event of an evacuation order. Income also impinges upon a family's ability to secure temporary lodging (hotels or motels) beyond publicly provided shelter, or to obtain replacement housing should they lose their homes due to a storm event or natural disaster.

According to the U. S. Census' American Community Survey 2013 – Economic Characteristics, Screven County's Median Family Income (MFI) is \$46,591. Low- and moderate-income (LMI) is defined as up to 80percent of MFI, which would be \$37,273 for Screven County. Poverty levels are established by the federal government and are based upon income and family size. For Screven County, 39percent of the population is LMI and 21percent of families fall below the poverty level.

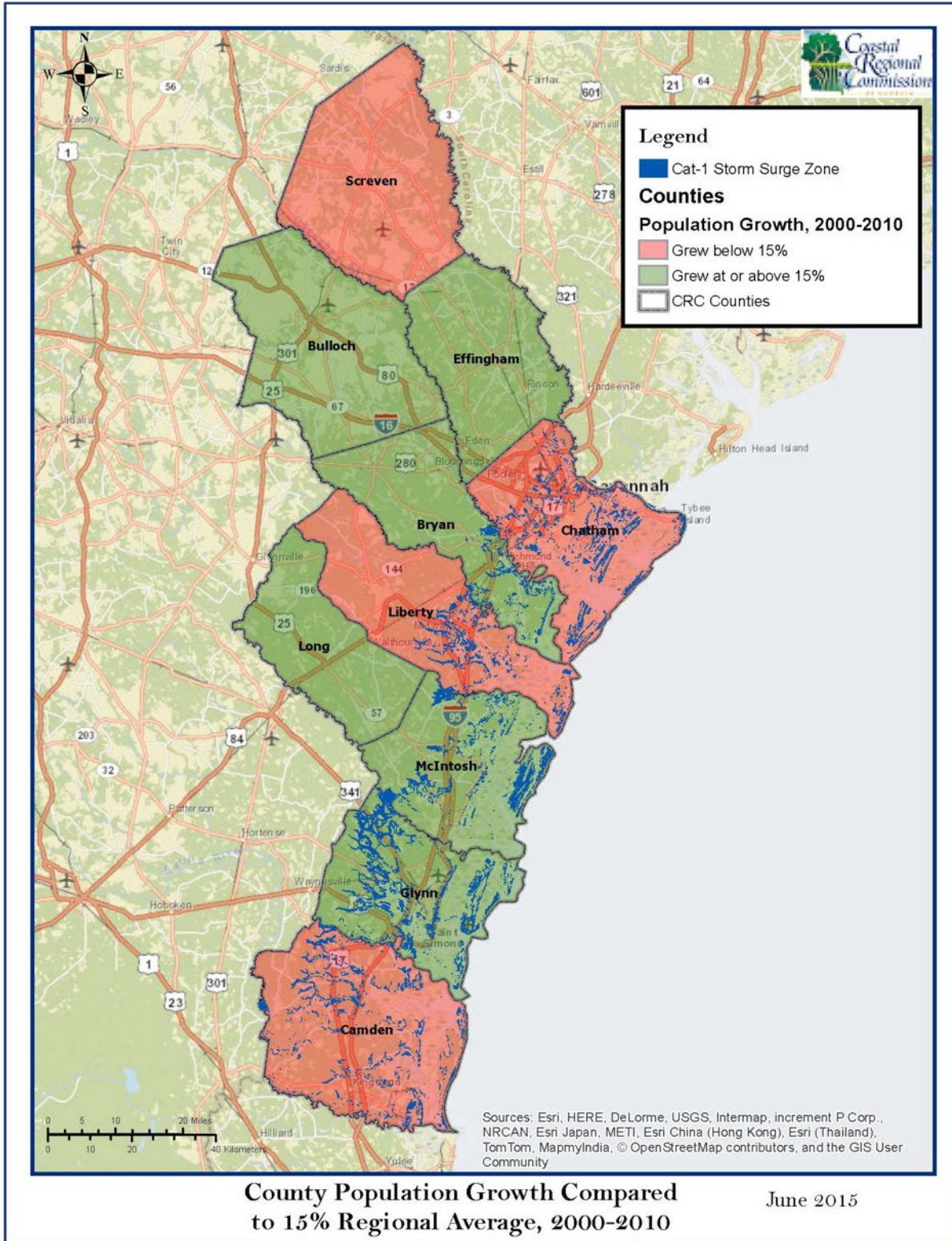
Means of Transportation

The U. S. Census reports on the number of vehicles available to households. This is an important indicator of the percentage of the population that has reliable transportation should they need to evacuate their homes in the event of a storm or other natural disaster. In Screven County 10.1percent of households do not have a vehicle available.

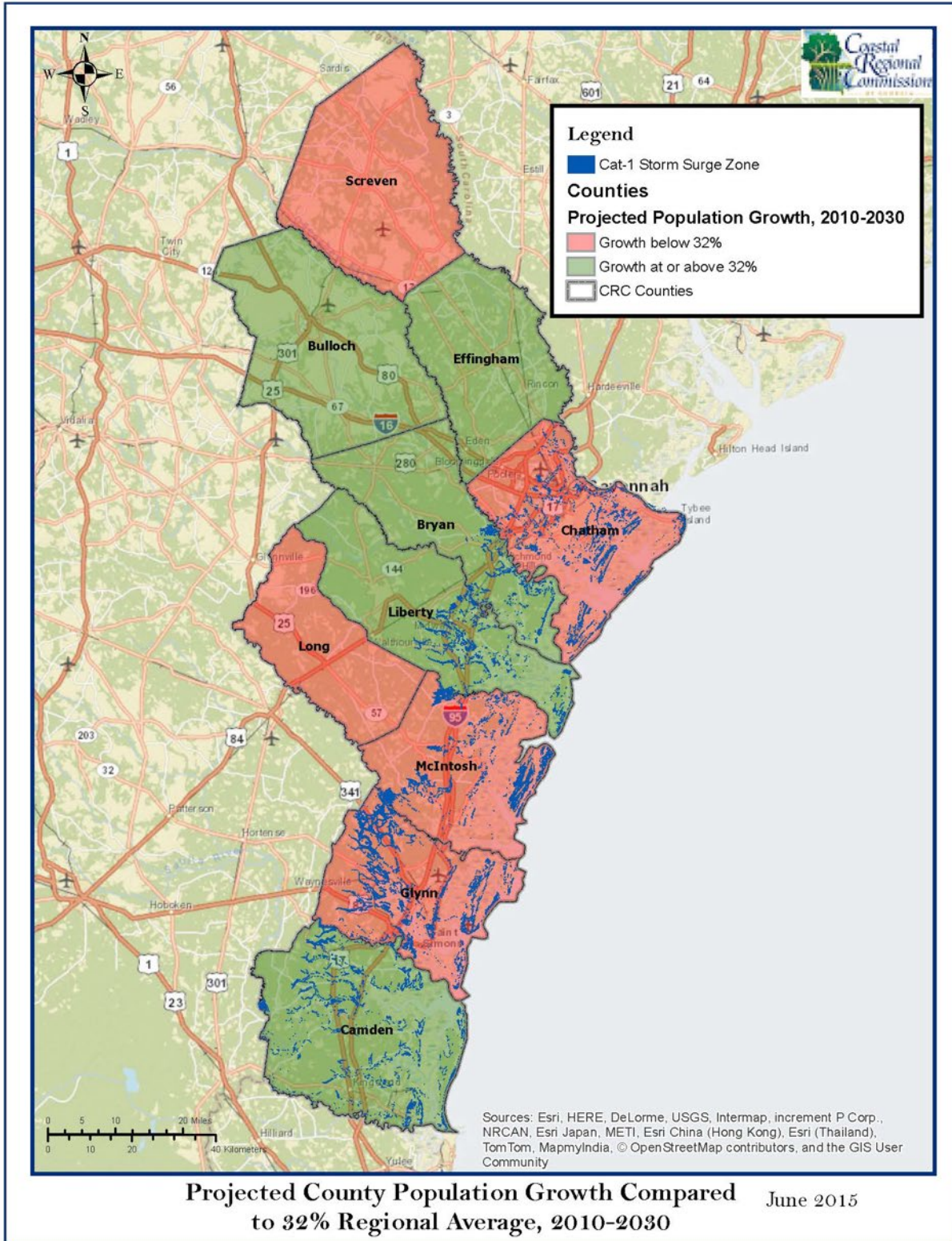
Housing Type

Mobile homes have been identified as a particularly vulnerable type of housing during storm events due to their susceptibility to damage caused by high winds and flying debris. In Screven County 34percent of families live in mobile homes.

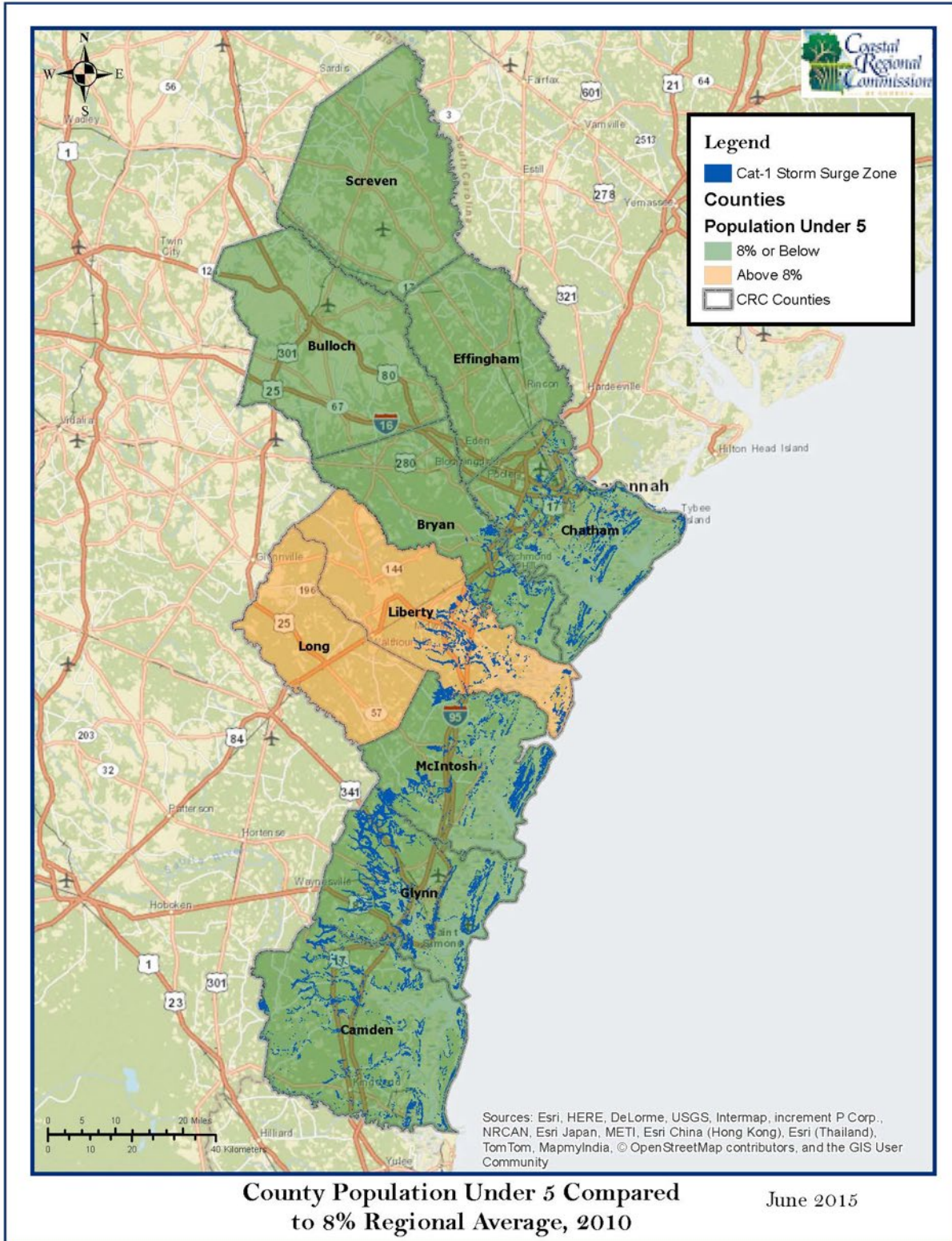
Map 1



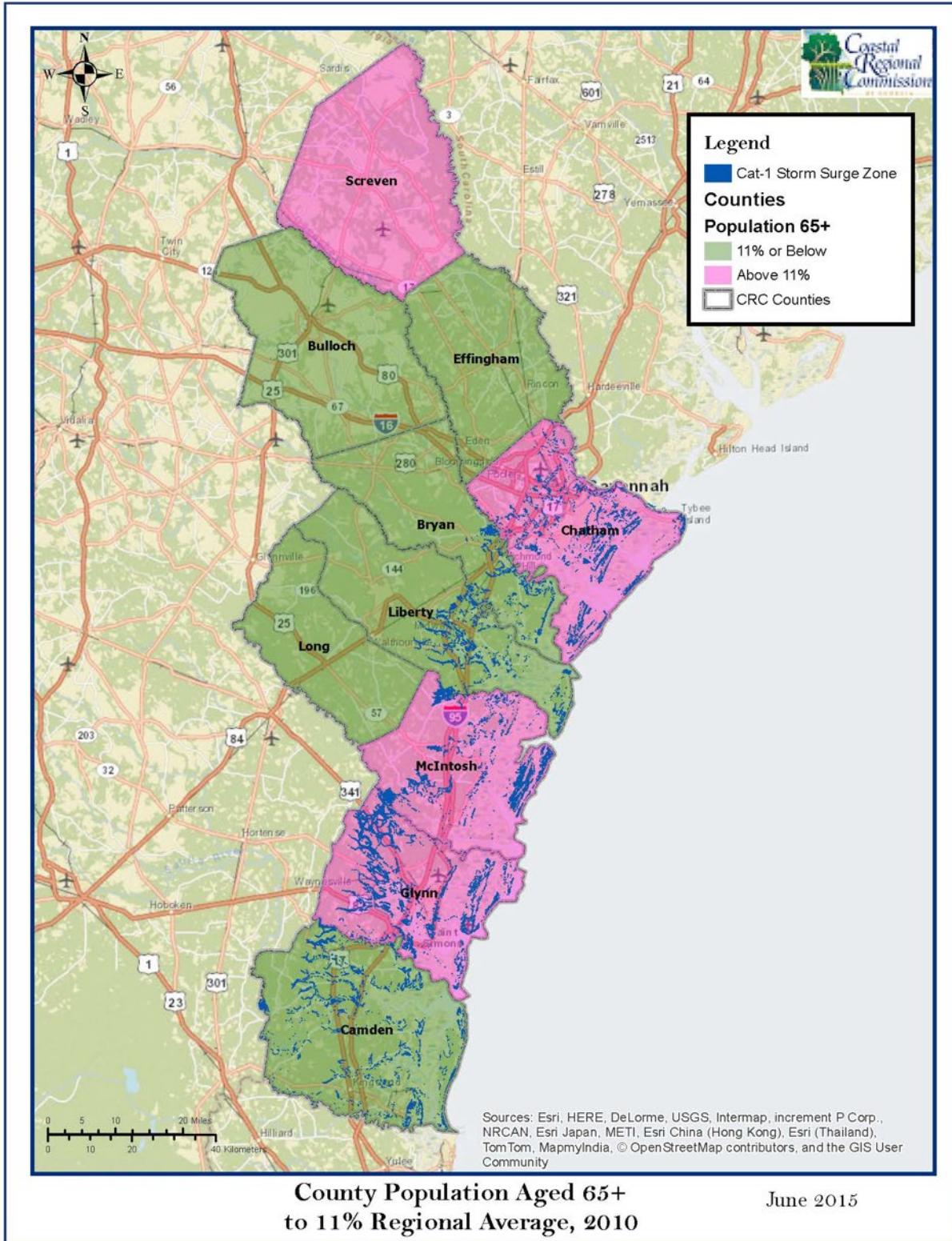
Map 2



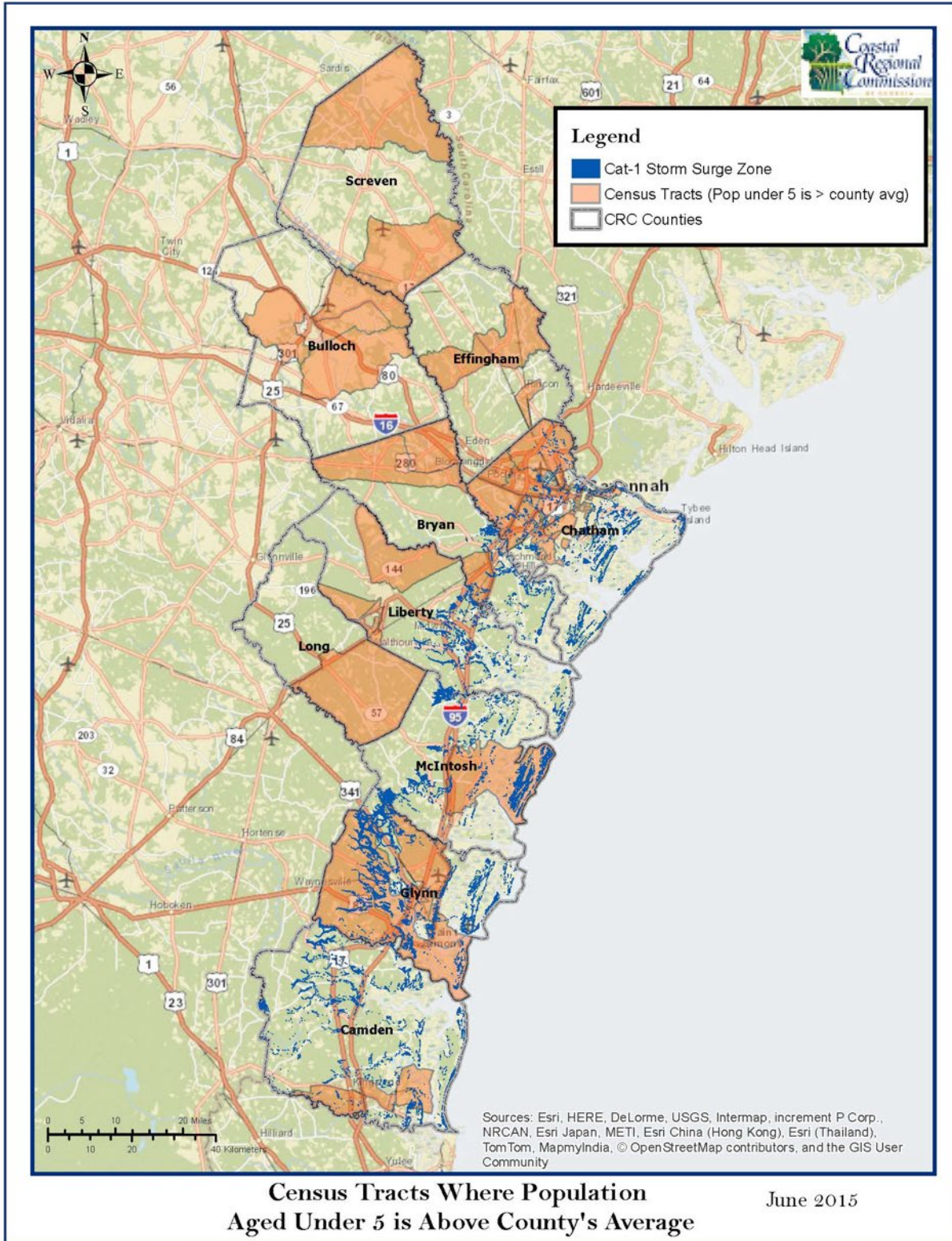
Map 3



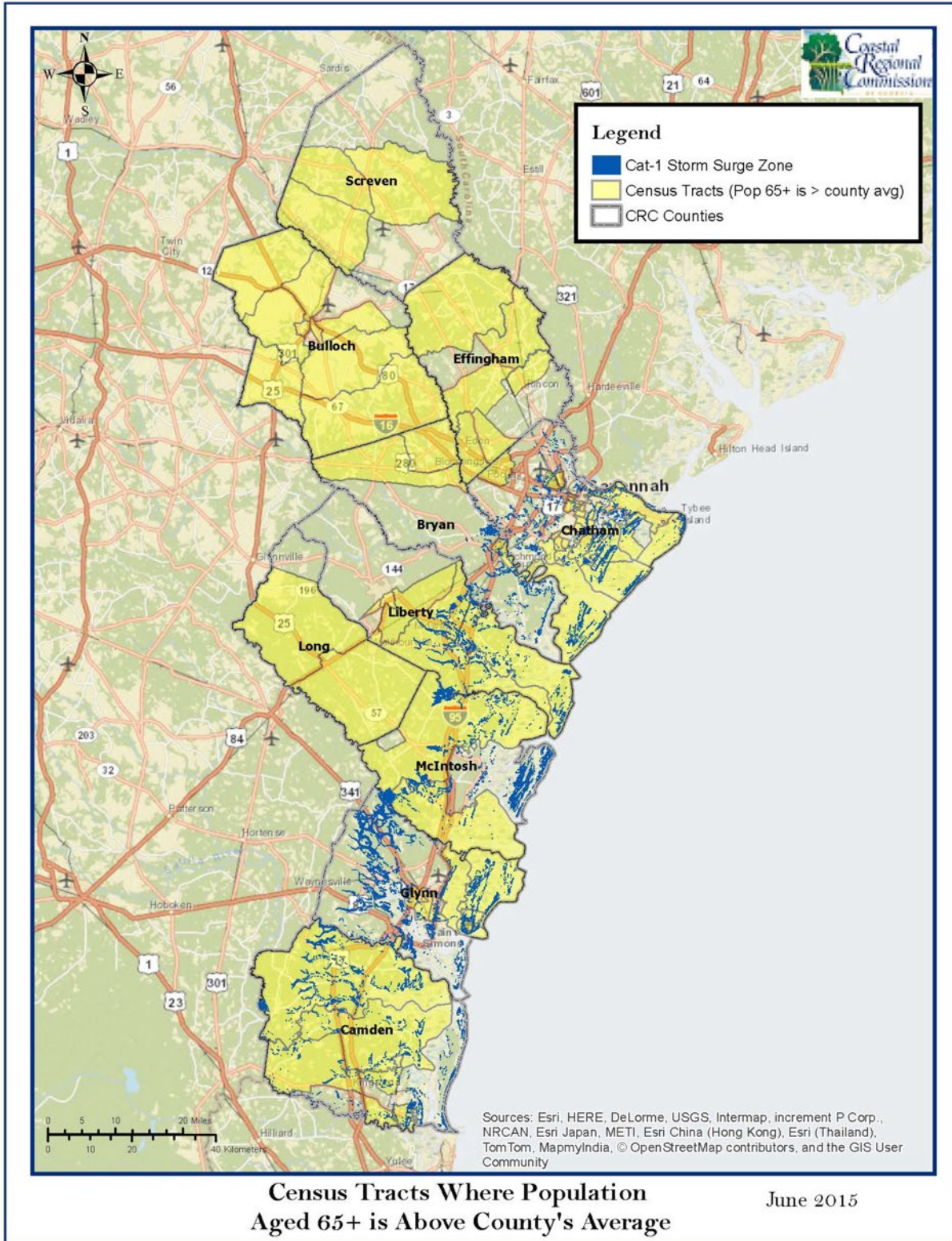
Map 4



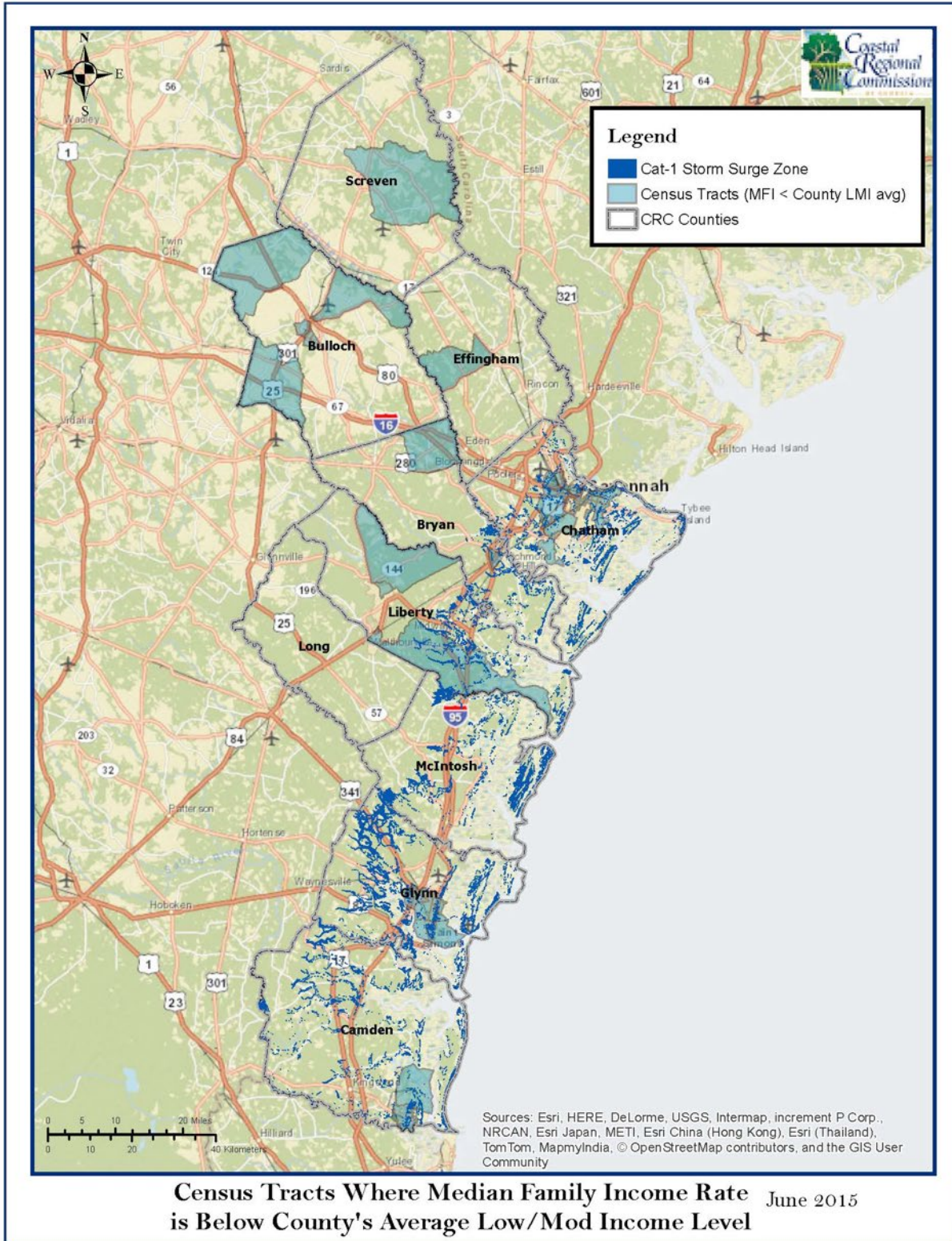
Map 5



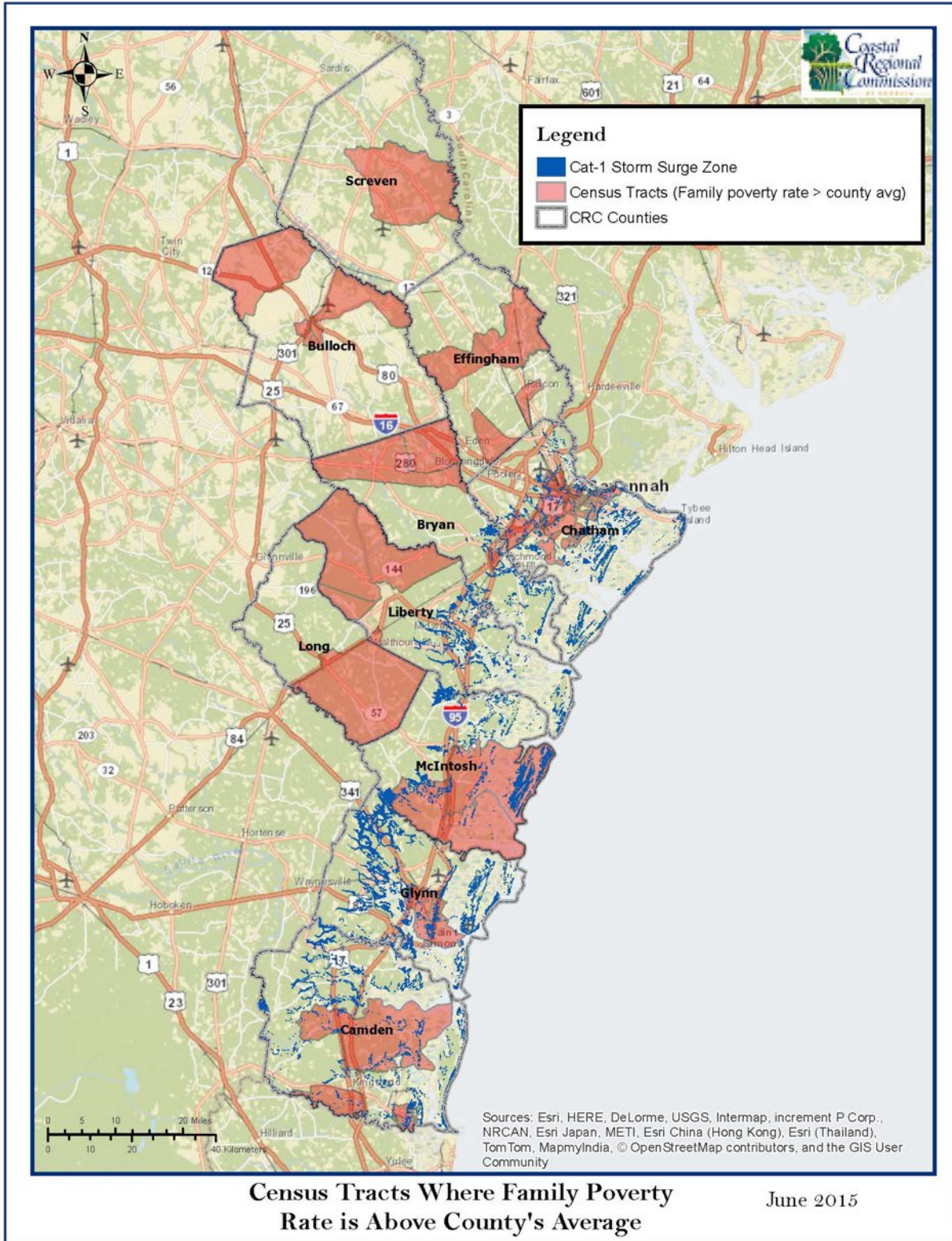
Map 6



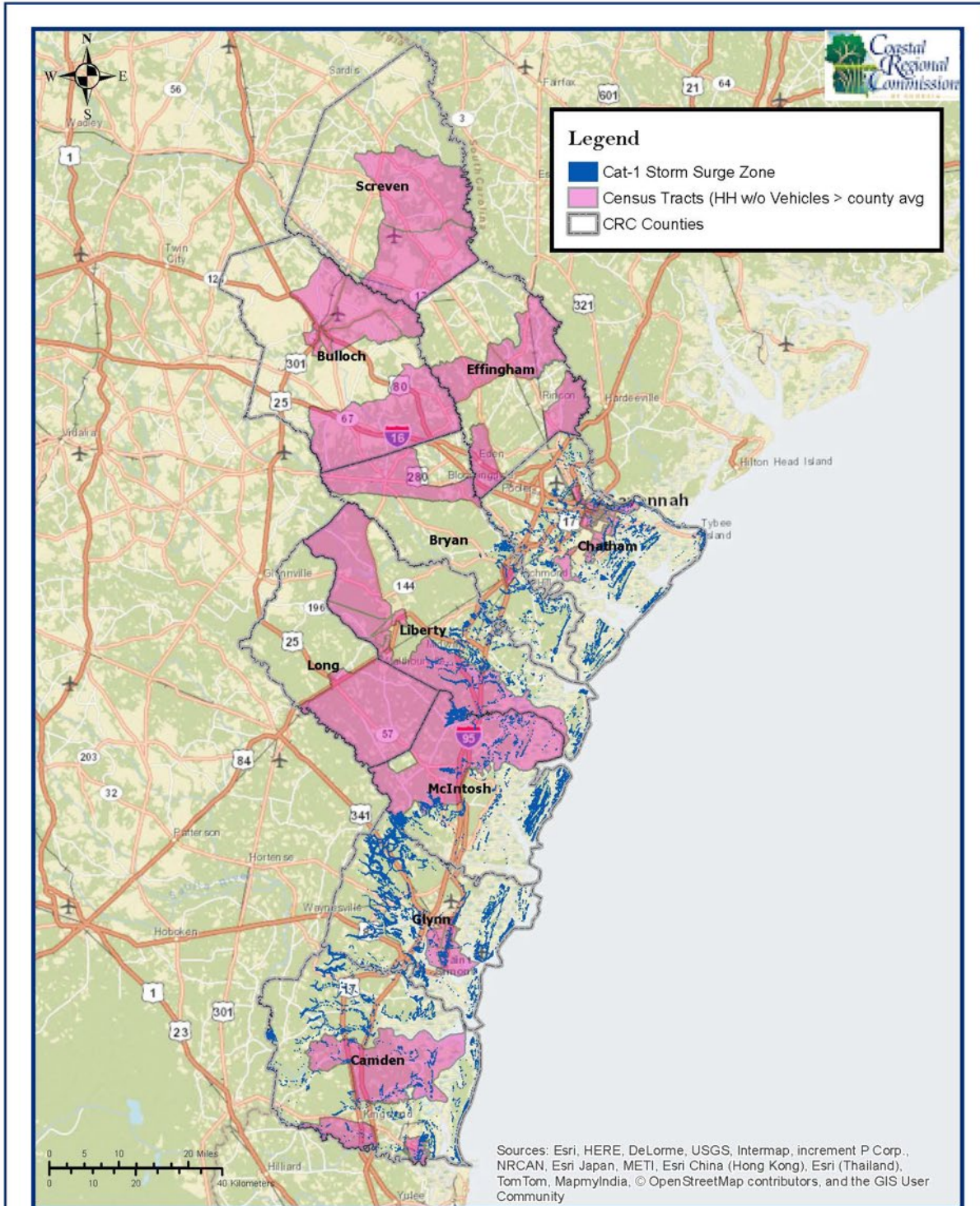
Map 7



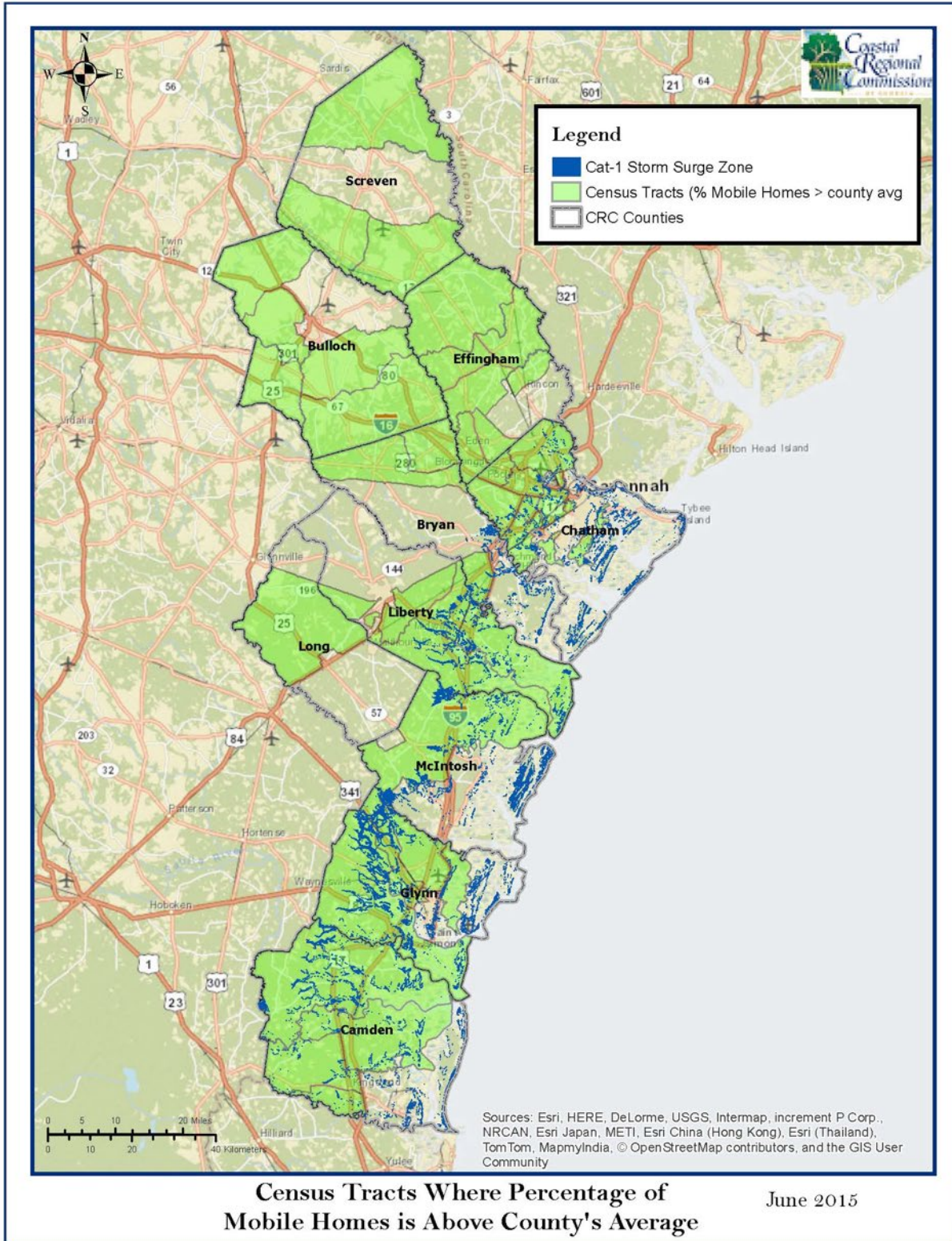
Map 8



Map 9



Census Tracts Where Percentage of Households Without Vehicles is Above County's Average June 2015



Regional Growth Trends

Coastal Counties Percent Change in Population 1980 - 2030								
County	1980-1990	1990-2000	2000-2005	2005-2010	2010-2015	2015-2020	2020-2025	2025-2030
Bryan	52%	52%	22%	6%	11%	20%	31%	13%
Bulloch	21%	30%	10%	14%	11%	11%	13%	11%
Camden	126%	45%	5%	10%	13%	-7%	58%	16%
Chatham	7%	7%	3%	11%	8%	7%	0%	5%
Effingham	40%	46%	25%	11%	11%	11%	49%	17%
Glynn	14%	8%	6%	11%	6%	6%	14%	8%
Liberty	40%	17%	-7%	14%	7%	8%	14%	9%
Long	46%	66%	8%	31%	17%	16%	-19%	9%
McIntosh	7%	26%	2%	29%	8%	7%	10%	13%
Screven	-1%	11%	0%	-5%	1%	0%	29%	5%
Region	19%	17%	5%	12%	9%	7%	15%	10%

Adapted from Coastal Georgia RDC Regional Plan Update 2004 to include six coastal counties.

Coastal Counties Population Growth 1980 - 2030

County	1980	1990	2000	2005	2010	2015	2020	2025	2030
Bryan	10,175	15,438	23,417	28,549	30,233	33,510	40,097	52,466	59,534
Bulloch	35,785	43,125	55,983	61,454	70,217	78,019	86,985	98,387	109,034
Camden	13,371	30,167	43,664	45,759	50,513	56,836	52,935	83,431	96,743
Chatham	202,226	216,935	232,048	238,410	265,128	285,022	306,088	307,506	324,098
Effingham	18,327	25,687	37,535	46,924	52,250	58,232	64,553	96,094	112,062
Glynn	54,981	62,496	67,568	71,874	79,626	84,632	89,307	101,441	109,771
Liberty	37,583	52,745	61,610	57,544	65,327	70,032	75,540	86,448	93,821
Long	4,254	6,202	10,304	11,083	14,464	16,861	19,498	15,744	17,171
McIntosh	8,046	8,634	10,847	11,068	14,333	15,525	16,644	18,375	20,686
Screven	14,043	13,842	15,374	15,430	14,593	14,773	14,809	19,036	20,036
Region	398,791	475,271	558,350	588,095	656,684	713,442	766,456	878,928	962,956

Business Vulnerability

Using Nielsen business facts point data in conjunction with storm surge data provides a picture of what damage can be expected from various types of storms on coastal counties. This data provided the geo position for every business as well as an estimated number of employees and sales. This data is then combined with storm surge data to best understand the immediate impact of the various types of catastrophic events.

Storm Type	Businesses Effected	% Total Regional Businesses	Jobs Effected	% Total Regional Jobs	Sales Effected \$	% of Regional Sales Effected
Tropical Storm	665	2%	5,388	2%	1,542,195,000	3%
Category 1	2,323	8%	23,270	8%	3,796,970,000	7%
Category 2	8,435	29%	84,079	28%	17,498,820,000	32%
Category 3	16,135	56%	158,000	53%	33,881,203,000	61%
Category 4	21,453	75%	205,758	69%	46,208,863,000	83%
Category 5	22,667	79%	229,344	77%	48,539,801,000	88%

Economic Damage by Hurricane Surge for Coastal Georgia. Information provided by Claritas Nielsen (2013). Business Facts 2013. Part 1 [Data file]. NOAA and FEMA

Infrastructure

Infrastructure and Critical Facilities

The guidelines presented in Task 5 of the FEMA Hazard Mitigation Handbook were followed to assess the infrastructure of the following six Coastal Counties: Chatham, Bryan, Liberty, McIntosh, Glynn, and Camden County. According to FEMA guidelines, the most critical infrastructure systems and facilities to evaluate for mitigation opportunities include transportation, communication, power water and wastewater, and emergency services.

County data for many of these types of infrastructure is unavailable, so the focus of the assessment is transportation, emergency evacuations routes, and communication networks. Throughout the assessment process, an evaluation on the dependencies between infrastructure systems, critical facilities, and the populations they serve was conducted. Proposals for effective mitigation strategies are general and serve as guidelines, which can be tailored for specific applications which conform to the county's need.

The following chart from the FEMA Hazard Mitigation Handbook summarizes these critical areas:

Example **Infrastructure and Critical Facilities**

Critical Facilities	High Potential Loss Facilities	Infrastructure Systems
Hospitals and medical facilities	Nuclear power plants	Water and wastewater
Police and fire stations	Dams	Power utilities
Emergency operations centers	Military and civil defense installations	Transportation (roads, railways, waterways)
Evacuation shelters	Locations housing hazardous materials	Communication systems/centers
Schools		Energy pipelines and storage
Airports/heliports		

FEMA Hazard Mitigation Handbook, page 57

Methodology

Data was collected from the following sources: FEMA, GEMA, NOAA, Georgia Department of Transportation, Dewberry Consulting, CRC, and the six coastal counties.

Informational maps were created in ArcGIS by the overlaying of different types of infrastructure with storm surge and population data. This method allowed for the quick identification of areas of higher risk in the event of a tropical storm or hurricane.

An assessment of the vulnerability of infrastructure systems for each county by hurricane category was conducted. In order to create an assessment, FEMA guidelines and CRC documents were examined; criteria were formed based on this structure.

Infrastructure was divided into three main categories: transportation, communication, and critical facilities. The categories were further divided into subcategories.

A number of infrastructure items affected by hurricane category were calculated.

For single item infrastructure, such as cell towers and bridges, a count of each item was conducted. For infrastructure such as roads and railroads, mileage per hurricane category was conducted. These calculations, along with the GIS analysis, allowed for identification of areas within each county whose infrastructure is more vulnerable to storm surge and flooding. From this information 3 Scenarios were created.

After quantifying data in GIS, a chart was created to illustrate how numbers demonstrate a pattern reflective of the overall vulnerability of each county in terms of their infrastructure systems. This chart is divided into three scenarios, each representing the different hurricane category.

- Scenario 1 represents a tropical storm, which is its own category, since this storm is most likely to occur and cause excessive flooding.
- Scenario 2 represents hurricane Categories 1 and 2, which reflects a remarkable increase in potential inundation; and
- Scenario 3 represents hurricane Categories 3, 4, and 5 which reflects the catastrophic inundation caused by a major storm.

In order to visually display the change in impact from one scenario to another, a rating of *high, medium, or low* is assigned to each feature. These ratings were based on a total percentage of 100 divided into three equal parts. A “low” rating shows that less than 33 percent of an infrastructure type would be affected, “medium” shows that less than 67 percent would be affected, and the “high” rating means that over 67 percent of the infrastructure would be potentially inundated. If the range between hurricane categories resulted in two different ratings, the higher rating was applied.

The initial vulnerability assessment of infrastructure for each county identifies a number of infrastructure types per county affected by tropical storms up to a Category 5 hurricane. Critical areas were based on categories from Task 5 in the FEMA document. The counties with the highest number reflect highly vulnerable areas that should be noted as “Critical Areas.” Major roads, bridges communication tower and water facilities are most important in terms of resilience as they serve the core daily needs of the population. Based on the assessment charts below, Chatham, Glynn, and Camden counties have the highest number of infrastructure features, and have the largest amount of critical infrastructure that would be affected by a storm.

Each of these counties also contain inhabited barrier islands which play a crucial role in protecting the mainland, but are becoming more susceptible to damage as urban development increases. Such areas are especially susceptible during large storms. Flash flooding may inundate important transportation routes, or block emergency evacuations. For example, each of these barrier islands, Tybee, Saint Simons, and Jekyll are at sea level or a few feet above and have a single road leading off the island. During an evacuation, road inundation causes major problems. Adequate planning is needed to insure transportation routes can be integrated with existing routes. From this initial assessment a second chart was created to reflect the overall vulnerability of each county’s infrastructure, and determine any patterns.

An initial table was created to show the vulnerability assessment of critical infrastructure systems in each county. Some counties did not have public data available for certain types of infrastructure, which is noted with “N/A.” The totals reflect the levels of vulnerability of counties and their infrastructure networks to the effects of storm surge. McIntosh County has no emergency evacuation route data, which means that their hazard mitigation plans need to be updated or McIntosh County needs to develop appropriate evacuation routes that can be integrated with existing routes.

The tables below reemphasize the vulnerability of each county with the three different scenarios. Chatham, Glynn, and Camden County mitigating infrastructure networks in these areas should be a priority in a regional resiliency plan. Data was gathered from NOAA, the Georgia Department of Transportation, FEMA, GEMA, and each individual county website. Based on sets of data, it is determined that transportation is a top concern in all six counties. Transportation routes, such as U.S. Highway 17, connect hubs to one another, and critical areas along major arterials must be highlighted. The threat of flooding throughout the region is of concern, especially along U.S. Highway 17, where bridges and roads are near sea level elevation. Another major concern are the condition and location of evacuation routes. The infrastructure connected to these routes should be reevaluated by each county to ensure that the age and condition of major arterials and bridges meets quality performance standard. Traffic counts and populations in these areas are especially important when developing mitigation strategies and prioritizing infrastructure based on quality and use.

Transportation infrastructure is especially important in the port cities of Savannah and Brunswick. As one of the busiest ports in North America, the port of Savannah requires an intricate network of infrastructure to support and maintain its services; thus, these two cities will always have a higher vulnerability rating. The failure of port services, due to the failure of transportation routes, will have detrimental effects on the economy.

The results of Scenario 1 (Tropical Storm) are shown in the table below. Though the vulnerability rating seems low, it is important to remember that flooding still occurs and a “low” rating does not mean there no damage, only that the storm surge levels and threat for inundation is lower. However, the most critical infrastructure for a certain county may be inundated, even with this low rating. It is a county or city decision to assess which of their structures, especially along the coastline, should receive priority in mitigation strategies. The location, usage, and condition of the structure needs consideration when assessing their priority. The recommendation section of this report describes the process of creating a “priority” list in more detail. Since this scenario involves mostly flood damage possibilities, high attention should be paid to storm water management mitigation to keep roads, houses and business from being flooded. Flood gates, such as those in Tybee Island, are a possible solution to managing flood water in a coastal community. Effectively managing flood water subsequently protects most other forms of critical infrastructure.

Scenario 1: Tropical Storm											
County	Critical Infrastructure										Overall Vulnerability Rating
	Communication		Transportation				Ports*	Water Facilities*	Waste Facilities*	Power Stations*	
	Cell Towers*	Antenna Towers*	Roads**	Railroads**	Bridges*	Evacuation Routes**					
Chatham	2/12	8/127	139.4 /1778.1	16.43/179.5	60/265	1.11/79.9	1/1	1/8	N/A	N/A	9
Bryan	0/8	0/31	21 /528.4	1.33/38.7	8/88	0.15/64.6	N/A	N/A	N/A	N/A	6
Liberty	0/5	0/40	69.8 /1238.6	1.64/42.3	25/75	0.24/56.5	N/A	N/A	N/A	N/A	7
Mcintosh	0/5	0/18	149.3 /961.5	0/18.5	26/71	N/A	N/A	N/A	N/A	N/A	10
Glynn	0/8	15/63	130.8 /855.4	3.06/88.4	30/90	0.25/50	1/1	N/A	N/A	N/A	10
Camden	1/10	2/39	106.1 /763.6	5.8/54.7	44/133	0.31/24.47	N/A	N/A	N/A	N/A	7
Total	48	318	6125.5 mi	421.8 mi	724	275.5	2	N/A	N/A	N/A	
LEGEND	Low	Medium	High	* Calculated by count ** Calculated in miles			Sources: NOAA, GDOT, FEMA, GEMA, Individual County Data & Documents				

Scenario 2 (Category 1 & 2 Hurricanes) shows the increase in risk in the affected area from a tropical storm shown in Scenario 1. These are hurricane categories that may not seem as threatening as larger storms, but in fact cause potential damage due to storm surge and aggressive flooding. Glynn and McIntosh counties have high vulnerability ratings, since the majority of their critical infrastructure may be affected. Chatham and Camden Counties have medium ratings, but could be considered high-risk since most of the population lives near a river or the ocean. Each of these counties also have inhabited barrier islands which should be marked as highly vulnerable areas due to their limited access to the mainland. Though Liberty and Bryan Counties still show a “low” rating, they are vulnerable, as they serve as connection hubs between the northern and southern parts of the region, especially connecting the highest populated port cities of Savannah and Brunswick.

Scenario 2: Category 1 & 2 Hurricane											
County	Critical Infrastructure										Overall Vulnerability Rating
	Communication		Transportation				Ports*	Water Facilities*	Waste Facilities*	Power Station*	
	Cell Towers*	Antenna Towers*	Roads**	Railroads**	Bridges*	Evacuation Routes**					
Chatham	7.9/12	14.38/127	295.5-695.15 /1778.1	24.85 /71.28/179.5	69.114/265	2.71-14.07/79.9	1/1	N/A	N/A	N/A	13
Bryan	0-1/8	1-12/31	50.8-171.9 /528.4	1.63-7.55/38.7	12-17/88	0.98-7.80/64.6	N/A	N/A	N/A	N/A	7
Liberty	0/5	1-9/40	105.8-273.6 /1238.6	2.67-10.38/42.1	29-45/75	1.11-6.53/56.5	N/A	N/A	N/A	N/A	7
McIntosh	0/5	3/18	224.8-539.3 /961.5	0.78-6.58/18.5	48/71	N/A	N/A	N/A	N/A	N/A	13
Glynn	4/8	46/83	280.3-611.5 /855.4	13.86 /55.47/88.4	54/90	2.38-17.93/50	1/1	N/A	N/A	N/A	17
Camden	3/10	10/39	165.7-371.9 /763.6	5.85-18.95/54.7	85/133	0.80-2.63/24.47	N/A	N/A	N/A	N/A	10
Total	48	318	6125.5 mi	421.8 mi	724	275.5	2	N/A	N/A	N/A	
LEGEND	Low	Medium	High				* Calculated by count ** Calculated in miles	Sources: NOAA, GDOT, FEMA, GEMA, Individual County Data & Documents			

Scenario 3 (Category 3, 4, & 5 Hurricanes) reflects the highest threat to the coastal region. In this scenario, the majority of counties are at high risk. In a Category 3 hurricane, the majority of the coastal population and urban development areas are affected. Though this scenario seems less likely than the others, it should be planned for and considered when updating existing infrastructure systems or building new ones. Planning for the highest level threat is an efficient mitigation strategy that increases overall resilience of this region.

Scenario 3: Category 3, 4, & 5 Hurricane											
County	Critical Infrastructure										Overall Vulnerability Rating
	Communication		Transportation				Ports*	Water Facilities*	Waste Facilities*	Power Stations*	
	Cell Towers*	Antenna Towers*	Roads**	Railroads**	Bridges*	Evacuation Routes**					
Chatham	11-12/12	90-119/127	1238.5-1634.2 /1778.1	132.35 /70.48/179.4	172-250/265	27.45 /72.19/79.9	1/1	N/A	N/A	N/A	21
Bryan	3/8	16/31	227.8-240.4 /528.4	14.08- /18.04/38.7	36-52/88	20.44- /26.93/64.58	N/A	N/A	N/A	N/A	12
Liberty	4/5	19-24/40	520-636.2 /1238.6	22.04 /28.50/42.1	54-58/75	13.25- /23.96/56.5	N/A	N/A	N/A	N/A	14
McIntosh	1/5	11-14/18	810.4-915.95 /961.5	17.3-18.5/18.5	65-69/71	N/A	N/A	N/A	N/A	N/A	17
Glynn	8/8	60-63/63	751.8-822 /855.4	82.1-87.28/88.4	72-76/80	40.58-47-68/50	1/1	N/A	N/A	N/A	18
Camden	1-10/10	20-37/39	545.7-718.4 /763.8	18.72 /51.49/54.7	103-129/133	5.34-22-124.5	N/A	N/A	N/A	N/A	18
Total	48	318	6125.5 mi	421.8 mi	724	275.5	2	N/A	N/A	N/A	
LEGEND	Low	Medium	High				* Calculated by count ** Calculated in miles	Sources: NOAA, GDOT, FEMA, GEMA, Individual County Data & Documents			

Built Environment

Community Agendas represent the most important part of local governments Comprehensive Plans as it presents the community’s vision for the future and key issues and opportunities that communities choose to address along with the implementation program. The Community Agenda updates the material in the Community Assessment based on public input and includes a vision, a short and long term work program and list of policies for decision making.

Methodology

- 1) Review/Inventory of current hazard mitigation plans, comprehensive plans, and community agendas at a city and county scale.
- 2) Identify gaps within each plan
 - What year was the document created?
 - Number of pages in document? (Provide a sense of the thoroughness of each document)
 - Make an inventory of “key words” throughout document.
- 3) Create a ranking system based upon above criteria for each county and city.
- 4) Display all information on an easy to read chart.

Evaluation of Current Policies, Activities, and Development Patterns

Comprehensive Plans, Community Agendas and Hazard Mitigation Plans

Though individual city plans were assessed, the results are examined on a county scale. McIntosh County scores the highest on the assessment of the County Comprehensive Plans and Community Agendas. Liberty scores the second highest followed by Chatham, Glynn, Camden, and finally Bryan county. The three counties with updated Hazard Mitigation Plans receive the same overall ranking. There are common gaps in the County Comprehensive Plans, Community Agendas, and Hazard Mitigation Plans. The majority of the County Comprehensive Plans and Community Agendas lack specificity when addressing concerns related to infill development, the presence of aquifers and/or reservoirs, and shoreline, riparian and estuary protection.

In the three available hazard mitigation plans there is little or no mention of aquifers or reservoirs. Furthermore, major issues related to protecting vulnerable areas from potential hazards are ignored. In all three of the available Hazard Mitigation Plans there is a necessity for more detailed plans relating to the protection of estuaries, wetlands, and riparian and coastal zones.

1) Comprehensive plans, community agendas, and hazard mitigation plans: key words were identified for each Comprehensive Plan, Community Agenda and Hazard Mitigation plan, which include:

- Beach
- Dune
- Shore,
- Buffer
- Riparian
- “Estuar”
- Marsh
- Swamp
- Wetland
- Erosion
- “Sediment”
- Soil
- Flood
- Storm
- Aquifer
- Reservoir
- Brownfield
- Grey/Greyfield
- Infill
- Disaster
- Hazard,
- Risk
- Prevention
- Prevention
(in relation to crime)
- Protection
- “Mitig”
- “Re-mediat”

All key words listed in quotes are due to variations of the word being present within certain documents. For example, “mitig” would identify every time the words mitigate, mitigates, and mitigation are mentioned. Similar words are grouped together on the, “Review of Community Agendas & Hazard Mitigation Plans,” chart. The keyword groupings are as follows:

- | | |
|--------------------------|---------------------------------|
| 1. Beach/Dune/Shore | 8. Brownfield/Greyfield /Infill |
| 2. Buffer | 9. Disaster/Hazard/Risk |
| 3. Riparian/Estuaries | 10.Prevention |
| 4. Marsh/Swamp/Wetland | 11.Protection |
| 5. Erosion/Sediment/Soil | 12.Mitigation/Remediation |
| 6. Flood/Storm | 13.Overall Ranking |
| 7. Aquifer/Reservoir | |

With the above findings, two different assessments were completed:

A) Color Coding:

Color code ranks the documents based on how well the identified issues were addressed in various documents adopted by counties for community improvement. The analysis scanned documents for key words and determined how well these issues were addressed.

B) Numerical Ranking:

After assessing the details and evaluating the various documents for the issues identified, a numerical ranking was assigned (ranging from 0-3) to each issue depending on how well the topic was addressed by the counties. The map below shows the diagrammatic representation of this ranking system. Red symbolizes that the issue needs critical attention in the planning document; yellow symbolizes that the issue has been addressed but still needs improvement in some parts, and green symbolizes that the issue has been well addressed. Ranking zero represents missing information or is an irrelevant issue. On the basis of the ranking provided to each issue, an overall ranking was calculated for each county which is shown in the last column of the table. A similar assessment with the same criteria was done for the hazard mitigation plans for all the counties which is shown in table.

County	City	Year	Pages in Document	Beach	Dune	Shore	Buffer	Riparian	"Estuar"	Marsh
	Community Agendas/Comprehensive									
Bryan	Bryan County and the Cities of Pembroke and Richmond	Oct- 2008	Last 41 of 140	0	0	0	9	0	0	1
Bryan	Bryan County and the Cities of Pembroke and Richmond	Oct- 2008	First 99 of 140	0	0	0	18	0	0	3
Camden	Camden- Joint Comprehensive Plan	Oct- 2008	150	2	0	2	13	0	0	29
Chatham	Chatham County/Savannah-Tricentennial Plan	Nov- 2006	149	0	0	4	46	8	13	44
Chatham	Garden City- Community Agenda	Oct- 2008	117	0	0	0	17	1	0	2
Chatham	Port Wentworth- Community Agenda	Oct- 2008	137	0	0	0	4	0	0	5
Chatham	Tybee Island Master Plan- Community Agenda	Jan-2008	169	121	25	0	14	2	0	52
Glynn	Glynn County Comprehensive Plan Update	Oct- 2008	59	11	0	0	5	0	0	13
Glynn	Brunswick- Community Agenda	May-2008	98	3	0	3	1	0	0	33
Liberty	Liberty Community Assessment Consolidated	June- 2008	331	0	2	0	18	0	0	36
McIntosh	McIntosh & City of Darien Community Assessment Joint	Oct- 2007	190	8	11	16	3	0	20	71

Table: Evaluation of different documents including Comprehensive Plan and Community Agenda Documents by a color-coding system to understand how and in what depth the individual issues are addressed by individual counties.

County	City	Year	Pages in Document	Swamp	Wetland	Erosion	"Sediment"	Soil	Flood	Storm
	Community Agendas/Comprehensive									
Bryan	Bryan County and the Cities of Pembroke and Richmond	Oct- 2008	Last 41 of 140	1	11	0	0	0	1	7
Bryan	Bryan County and the Cities of Pembroke and Richmond	Oct- 2008	First 99 of 140	0	16	3	2	1	3	6
Camden	Camden- Joint Comprehensive Plan	Oct- 2008	150	1	13	0	0	6	1	10
Chatham	Chatham County/Savannah-Tricentennial Plan	Nov- 2006	149	0	16	4	4	9	18	38
Chatham	Garden City- Community Agenda	Oct- 2008	117	0	6	6	6	2	7	34
Chatham	Port Wentworth- Community Agenda	Oct- 2008	137	4	4	3	3	0	9	30
Chatham	Tybee Island Master Plan- Community Agenda	Jan-2008	169	0	3	4	3	0	5	34
Glynn	Glynn County Comprehensive Plan Update	Oct- 2008	59	0	37	1	0	4	38	26
Glynn	Brunswick- Community Agenda	May-2008	98	0	26	1	0	5	29	40
Liberty	Liberty Community Assessment Consolidated	June- 2008	331	0	35	21	16	21	37	17
McIntosh	McIntosh & City of Darien Community Assessment Joint	Oct- 2007	190	18	62	3	4	16	40	21

Table: Evaluation of different documents like Comprehensive Plan and Community Agenda Documents by a color-coding system to understand that how and in what depth the individual issues are addressed by individual counties.

County	City	Year	Aquifer	Reservoir	Brown-field	Grey/Gray-field	Infill	Disaster	Hazard	Risk	Prevention	(in relation to crime)	Protection	"Mitig"	"Remediat"	RANKING
	Community Agendas/Comprehensive															
Bryan	Bryan County and the Cities of Pembroke and Richmond	Oct-2008	0	0	5	5	8	0	0	0	0	0	36	5	0	1
Bryan	Bryan County and the Cities of Pembroke and Richmond	Oct-2008	2	0	0	0	8	0	3	1	0	0	99	2	0	1
Camden	Camden- Joint Comprehensive Plan	Oct-2008	0	0	0	0	37	2	1	0	1	0	129	9	0	1
Chatham	Chatham County/Savannah-Tricentennial Plan	Nov-2006	4	1	4	4	16	0	4	5	27	2	138	7	0	1
Chatham	Garden City- Community Agenda	Oct-2008	0	0	3	3	23	1	1	0	4	0	55	4	0	1
Chatham	Port Wentworth- Community Agenda	Oct-2008	0	0	0	1	29	1	2	0	8	0	50	1	0	1
Chatham	Tybee Island Master Plan-Community Agenda	Jan-2008	3	0	0	0	60	4	1	0	6	0	83	3	0	1
Glynn	Glynn County Comprehensive Plan Update	Oct-2008	0	0	0	1	19	0	4	0	14	0	29	0	0	1
Glynn	Brunswick- Community Agenda	May-2008	2	0	15	7	0	0	8	8	11	7	57	13	7	1
Liberty	Liberty Community Assessment Consolidated	June-2008	0	0	23	23	69	1	0	9	8	0	251	0	0	2
McIntosh	McIntosh & City of Darien Community Assessment Joint	Oct-2007	17	0	2	2	18	1	1	0	2	1	142	4	0	2

Evaluation of different documents like Comprehensive Plan and Community Agenda Documents by a color-coding system to understand that how and in what depth the individual issues are addressed by individual counties.

	= Need to address the issue
	= Needs to be addressed further
	= Not necessarily significant
	= Good score
	= A score of zero that is irrelevant because issue is ultimately addressed

Assessment criteria's defining tables

	Year	Number of Pages in Document	Beach	Dune	Shore	Buffer	Riparian	"Estuar"	Marsh	Swamp	Wetland	Erosion	"Sediment"	Soil	Flood
Hazard Mitigation Plan															
Bryan County			0	0	0	0	0	0	0	0	0	0	0	0	0
Camden County	?	185	5	4	3	3	0	1	27	1	10	52	10	3	225
Chatham County	Dec-2010	240	5	3	3	9	0	0	6	1	7	5	0	2	246
Glynn County			0	0	0	0	0	0	0	0	0	0	0	0	0
Liberty County	2010	120	4	4	4	4	0	0	6	0	10	8	3	4	234
McIntosh County			0	0	0	0	0	0	0	0	0	0	0	0	0

Evaluation of different documents of hazard mitigation plans, by a color-coding system to understand how and in what depth the individual issues are addressed by individual counties.

	Year	Number of Pages in Document	Storm	Aquifer	Reservoir	Brown-field	Grey/Gray-field	Infill	Disaster	Hazard	Risk	Prevention	(in relation to crime)	Protection	"Mitig"	"Remediat"	RANKING
Hazard Mitigation Plan																	
Bryan County			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Camden County	?	185	274	6	0	0	0	0	106	642	74	25	0	95	529	0	1
Chatham County	Dec-2010	240	236	0	0	0	0	0	513	996	158	19	0	103	997	0	1
Glynn County			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Liberty County	2010	120	175	1	6	0	0	0	44	569	147	20	0	54	608	0	1
McIntosh County			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Evaluation of different documents of hazard mitigation plans by color-coding system to understand how and what depth the individual issues are addressed by individual counties.

	= Need to address the issue
	= Needs to be addressed further
	= Not necessarily significant
	= Good score
	= A score of zero that is irrelevant because issue is ultimately addressed

Assessment criteria's defining tables

Building Construction Codes

2) Building construction codes:

Building construction codes were assessed utilizing the criteria from, "Home Builder's Guide to Coastal Construction" document by FEMA based on:

A) Do counties have a well laid-out building construction code for the whole county?

B) Does the construction code comply with the FEMA's builder's guide specifically in terms of:

- Designation of Conservation areas.
- Consideration of Flood Plain Elevation
- Identification of Different Flood Zone
- Relocation\Alteration of Utilities like water lines, gas lines
- Foundation specifications
- Lowest floor level
- Bottom horizontal structure level
- Construction below base flood elevation
- Enclosures below BFE (Base flood elevation)
- Addition and Reconstruction
- Building forms
- Building construction standards and materials

A chart utilizing a color coded system with a color coding of red (not in compliance with FEMA's Document); yellow (discussed but not in detail); and, green (complies with FEMA's Building Code) that specifies the depth to which each county considered the FEMA builder's code. An assessment and overall ranking (from 0-3) was given to each county for efforts incorporating FEMA's standards in their building construction codes.

NOTE: All the assessments were done on the basis of available resources. Low rankings in any category for counties can also be a result of missing or inaccessible data.

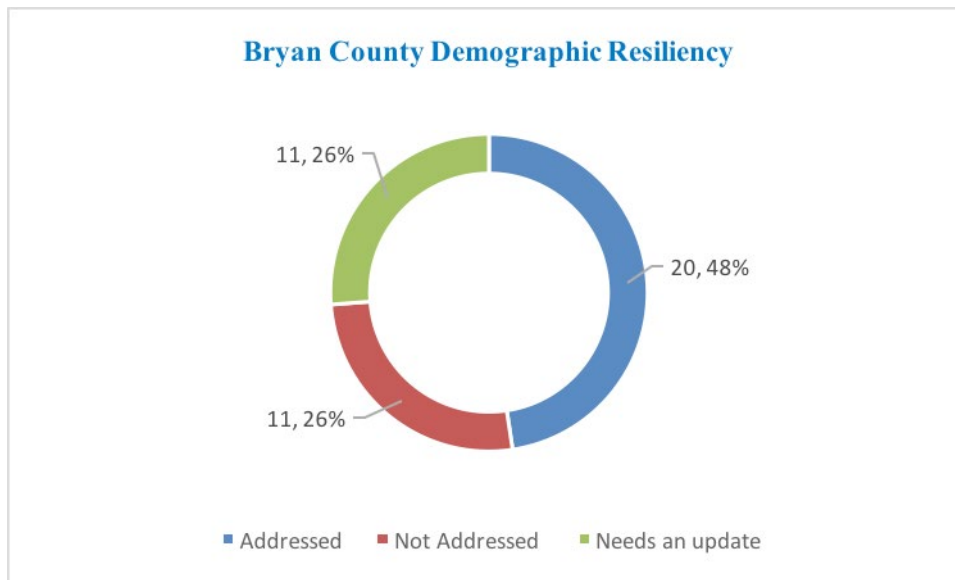
	Camden	Bryan	Chatham	Glynn	Liberty	McIntosh
Have a building construction code	Green	Green	Green	Green	Green	Green
Compliance with FEMA	Green	Red	Green	Green	Yellow	Red
1) Designation of conservation areas.	Green	Yellow	Green	Green	Red	Red
2) Consideration of Flood Plain Elevation	Green	Yellow	Green	Green	Red	Red
3) Identification of Different Flood Zone	Green	Yellow	Green	Green	Green	Red
4) Relocation\Alteration of Utilities like Water lines, gas lines	Green	Yellow	Green	Green	Green	Red
5) Foundation specifications	Green	Yellow	Green	Green	Red	Red
6) Lowest floor level	Green	Yellow	Green	Green	Red	Red
7) Bottom horizontal structure level	Green	Yellow	Green	Green	Red	Red
8) Construction below base flood elevation	Green	Yellow	Green	Green	Red	Red
9) Enclosures below BFE (Base flood elevation)	Green	Yellow	Green	Green	Red	Red
10) Addition and Reconstruction	Green	Yellow	Green	Green	Red	Red
11) Building form	Green	Yellow	Green	Green	Red	Red
12) Construction Standards and material	Green	Yellow	Green	Green	Red	Red
Documents Reviewed	Camden unified development codes	Bryan county building code ordinances, Bryan County Engineering Design Standards	Flood damage Prevention Ordinance	Comply with Flood plain Management in Georgia by Georgia department of Natural Resources	liberty county chapter , Building construction and other activities	No specific documents available
No of Pages	570	27, 128		23	76	103
Special Notes	--	--		No specific ordinance found in Glynn County Website, but it seems to comply with GDNR.	Compliance with : 1) International Building Codes 2) International Mechanical Code 3) International Gas Codes 4) International Plumbing codes 5) International Electrical Code 6) International Fire prevention Code	Couldn't Find any document specifically dealing with or explaining the construction codes.
RANKING	3	2	3	3	3	1
	<div style="display: flex; justify-content: space-between;"> <div style="width: 20%; background-color: red; height: 10px;"></div> <div style="width: 60%; border-bottom: 1px dashed black; padding-bottom: 2px;">Not in compliance with FEMA's Document</div> <div style="width: 20%; background-color: yellow; height: 10px;"></div> </div> <div style="display: flex; justify-content: space-between; margin-top: 2px;"> <div style="width: 20%; background-color: green; height: 10px;"></div> <div style="width: 60%; border-bottom: 1px dashed black; padding-bottom: 2px;">Have discussed but not in detail</div> <div style="width: 20%; background-color: white; height: 10px;"></div> </div> <div style="display: flex; justify-content: space-between; margin-top: 2px;"> <div style="width: 20%; background-color: green; height: 10px;"></div> <div style="width: 60%; border-bottom: 1px dashed black; padding-bottom: 2px;">Comply with FEMA's Building Code</div> <div style="width: 20%; background-color: white; height: 10px;"></div> </div>					

Chart that refers to different documents relating to building construction codes and compares it with FEMA's guidelines to assess the missing gaps for each county.

Regional Summary Report Resilience

Bryan County Summary

1) Demographic Resilience

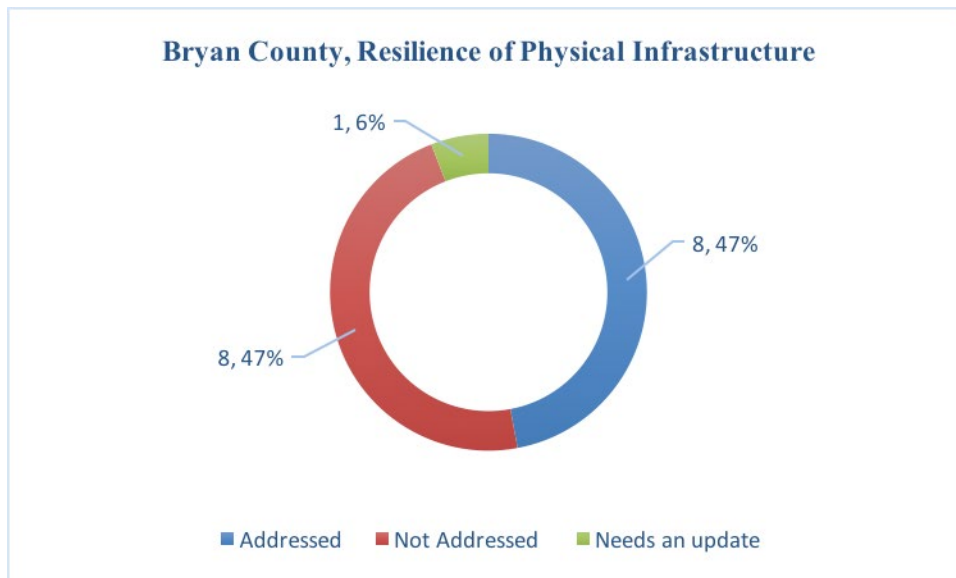


Note: The total number of issues identifies for demographic resilience are 42

- Sections of planning document that needs an update are:
 - a) Calculating the boundary of natural disasters
 - b) Addressing different population types in the hazard management plan
 - c) Considering critical populations (population above the age group of 65 years, and below 5 years of age), and population with chronic diseases.
 - d) Considering special needs, and evacuation plans required for the critical population, population with chronic disease.
 - e) Special evacuation plan for tourist (if that is one of the major economic source for the cities, and county)

- Missing sections of planning documents:
 - a) Emergency medical center's locations for both general public, and critical population
 - b) Animal rescue centers.
 - c) Mapping the major concentration (hot-spot) of economic center
 - d) Relocation plans for critical infrastructure in the natural hazard zone.
 - e) Special arrangements like, early evacuation facility, food supply, medical care, etc. for critical section of population.
 - f) Special insurance program for the critical section of population during the recovery process
 - g) Special education and outreach program for the critical section of population.

2) Resilience of Physical Infrastructure:

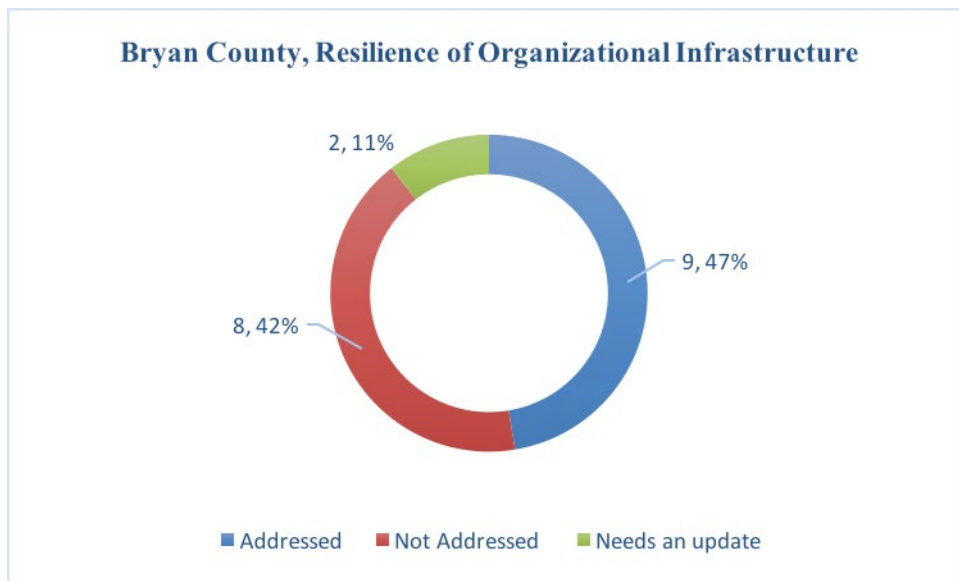


Note: The total number of issues identifies for resiliency of physical infrastructure are 17

- Sections of planning document that needs an update are:
 - a) Understand the type of impacts caused by different forms of (Solid, liquid, or gas) natural event.

- Missing sections of planning documents:
 - a) Validating the identified critical infrastructure identified for the city with the standard list of documents provided by Federal or national agencies.
 - b) Calculating social, and economical impact of disturbance in functioning of few major infrastructure like, electricity, water, food supply, and road conditions..
 - c) Map the identified critical infrastructure in hazard zone, to understand the potential damage.
 - d) Evaluate the physical condition of critical infrastructure
 - e) Relocation policy for critical infrastructures
 - f) Programs for alternate way of communication during the recovery period
 - g) Special health care facility for the population group associated with the critical infrastructure

3) Resilience of Organizational Infrastructure:

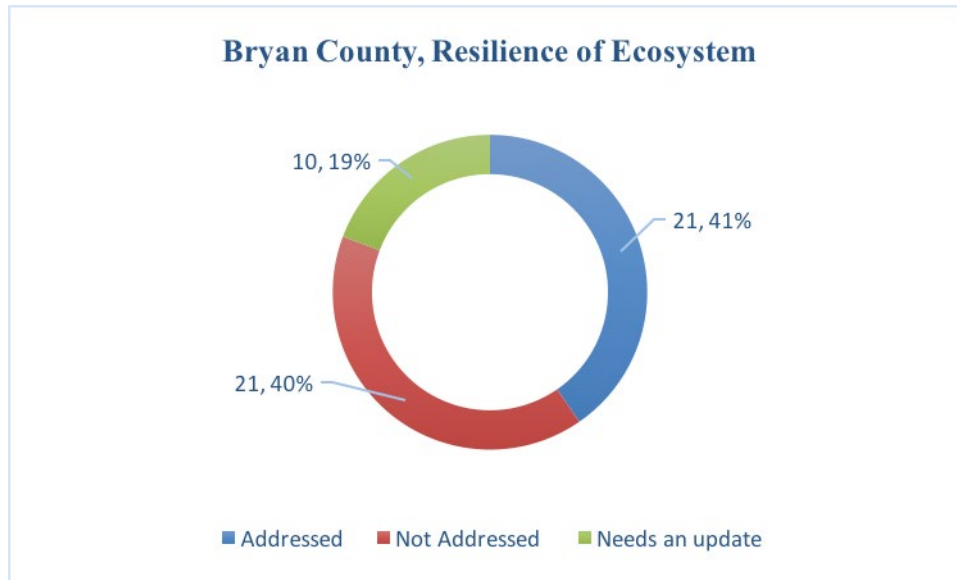


Note: The total number of issues identifies for resiliency of organizational infrastructure is 19

- Sections of planning document that needs an update are:
 - a) Policies for post-disaster child care facility
 - b) Emergency communication facility at the time for disaster

- Missing sections of planning documents:
 - a) Partnership with the response team to assist during the disaster
 - b) Disaster management program
 - c) Awareness, supply management, and public outreach programs
 - d) Temporary shelter, and health care facility for the local population during the disaster
 - e) Post-disaster cleanup program
 - f) Post disaster recovery plan

4) Resiliency of Ecosystem:



- Sections of planning document that needs an update are:
 - a) Air quality index for the counties
 - b) Data on energy, and oil consumption
 - c) Urban growth rate of the cities/ county

- Missing sections of planning documents:
 - a) Description of existing land cover
 - b) Ground water quality
 - c) Total urban, and rural population
 - d) Geomorphological study of the area
 - e) Measuring the change in natural buffer
 - f) Shore line protection policies (if valid)
 - g) Consideration for green power/ clean power production, and usage
 - h) Measuring the increase in heat island effect in the area

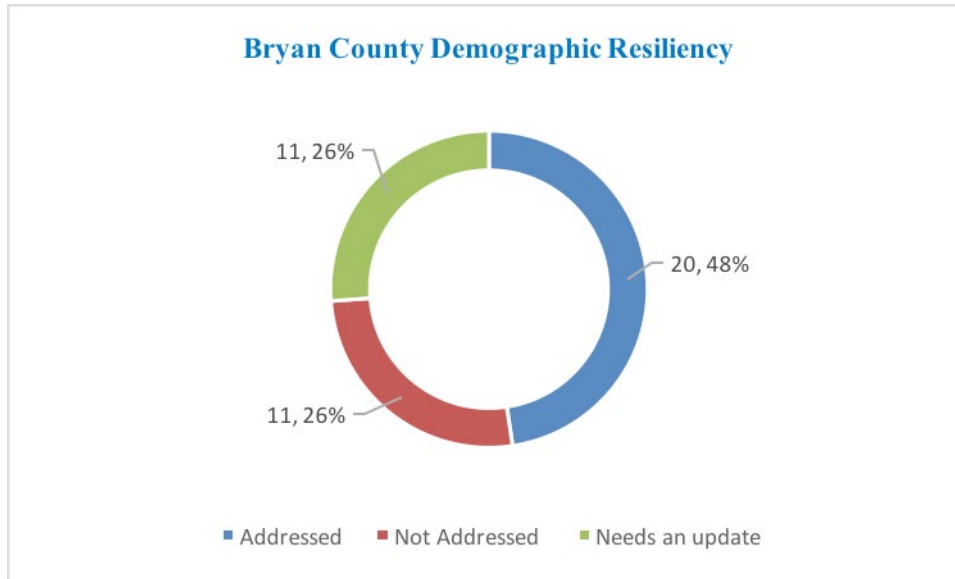
The final resilience score of the Bryan County (based on the available documents for review) is:

- Total number of issues: 130
- Addressed: 58 (1 point each) = 58 points
- Needs update: 24 (0.5 points each) = 12 points

Resilience score of Bryan county, GA = 70 points

Bulloch County Summary

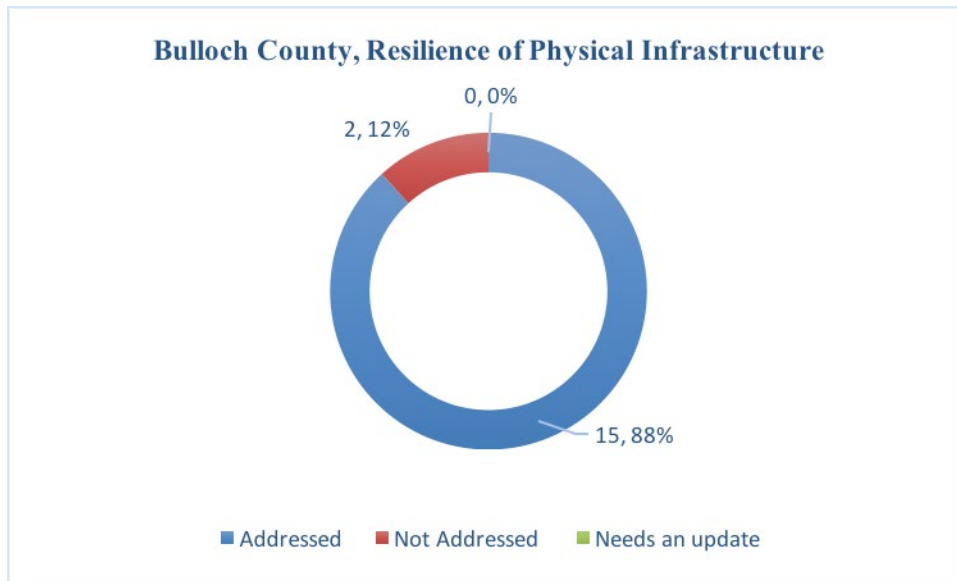
1) Demographic Resilience



Note: The total number of issues identifies for demographic resilience are 42

- Sections of planning document that needs an update are:
 - a) Location of county with respect to the proximity to natural disaster
 - b) Types of natural event occurring in the study area
 - c) Calculating the estimate loss by natural event by calculating the property value in the hazard zone
 - d) Considering special needs, and evacuation plans required for the critical population, population with chronic disease.
- Missing sections of planning documents:
 - a) Calculating the boundary of natural disasters
 - b) Percentage of city under the estimated boundary of natural event
 - c) Percentage of population under the estimated hazard zone
 - d) Percentage of critical group of population (population above age group of 65 years, or below 5 years of age group, along with the people suffering from chronic disease) under natural hazard zone
 - e) Special evacuation plan for tourist (if that is one of the major economic source for the cities, and county)
 - f) Mapping the major concentration (hot-spot) of economic center
 - g) Special arrangements like, early evacuation facility, food supply, medical care, etc. for critical section of population.
 - h) Special insurance program for the critical section of population during the recovery process
 - i) Special education and outreach program for the critical section of population

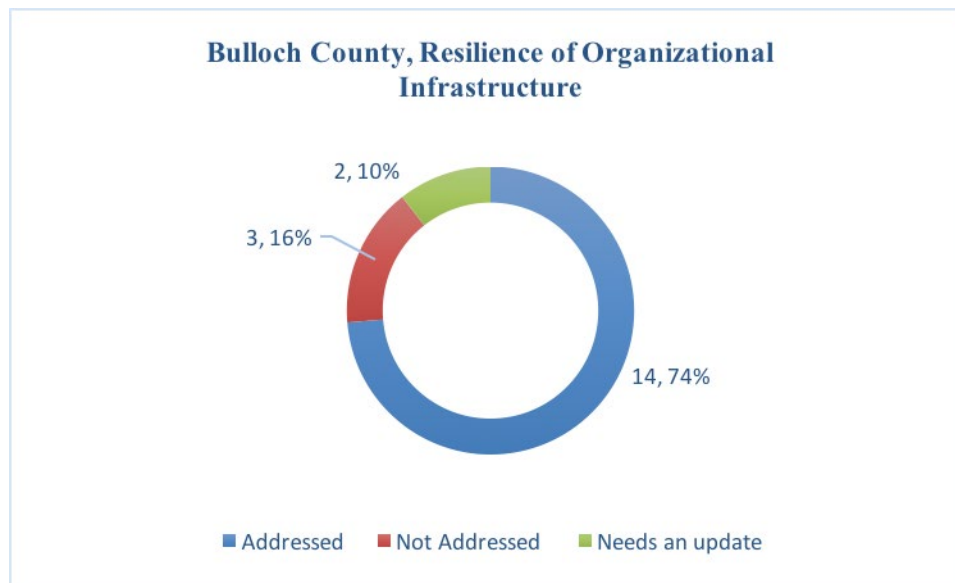
2) Resilience of Physical infrastructure:



Note: The total number of issues identifies for resiliency of physical infrastructure are 17

- Missing sections of planning documents:
 - a) Evaluate the physical condition of critical infrastructure
 - b) Special health care facility for the population group associated with the critical infrastructure

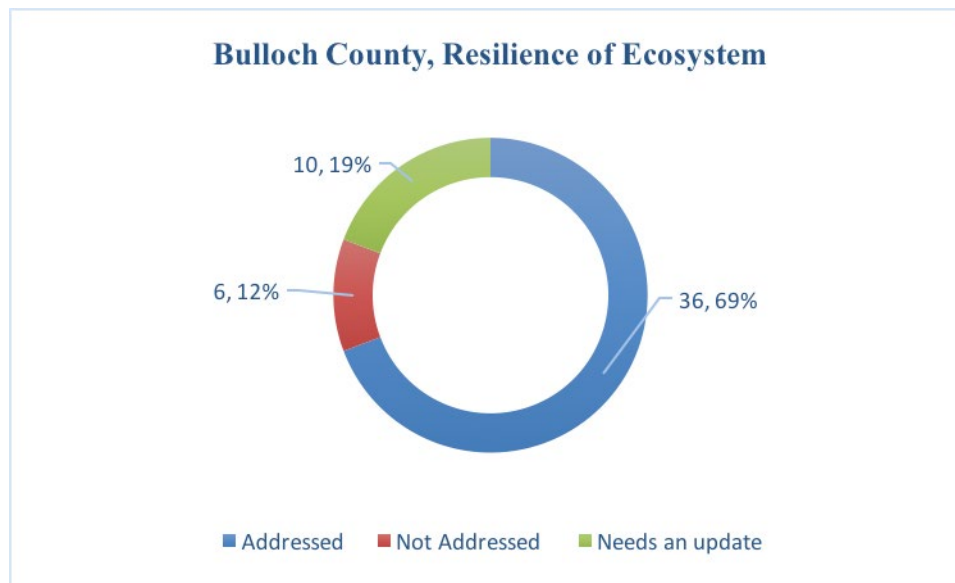
3) Resilience of organizational infrastructure:



Note: The total number of issues identifies for resiliency of organizational infrastructure is 19

- Sections of planning document that needs an update are:
 - a) Disaster warning system
 - b) Partnership with the response team to assist during the disaster
- Missing sections of planning documents:
 - a) Awareness, supply management, and public outreach programs
 - b) Post disaster, child care facility
 - c) Post-disaster cleanup program

4) Resiliency of ecosystem:



Note: The total number of issues identifies for resiliency of ecosystem is 52.

- Sections of planning document that needs an update are:
 - a) Air quality index for the counties
 - b) Data on energy, and oil consumption
 - c) Ecosystem management program
 - d) Consideration for green power/ clean power production, and usage

- Missing sections of planning documents:
 - a) Measuring the change in natural buffer
 - b) Shore line protection policies (if valid)
 - c) Measuring the increase in heat island effect in the area

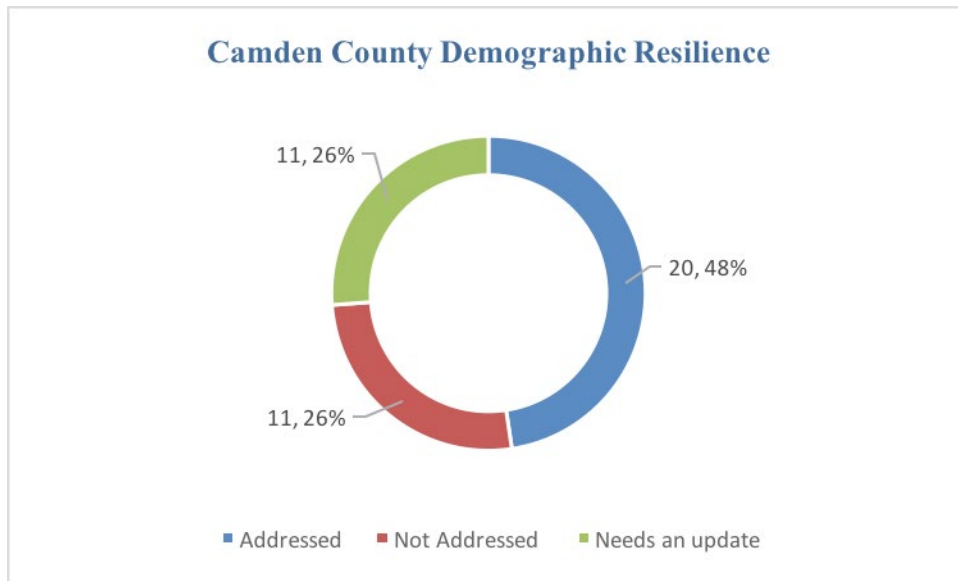
The final resilience score of the Bulloch County (based on the available documents for review):

- Total no of issues: 130
- Addressed: 92 (1 point each) = 92 points
- Needs and update: 15 (0.5 points each) = 7.5 points

Resilience score of Bulloch County, GA = 99.5 points

Camden County Summary Report

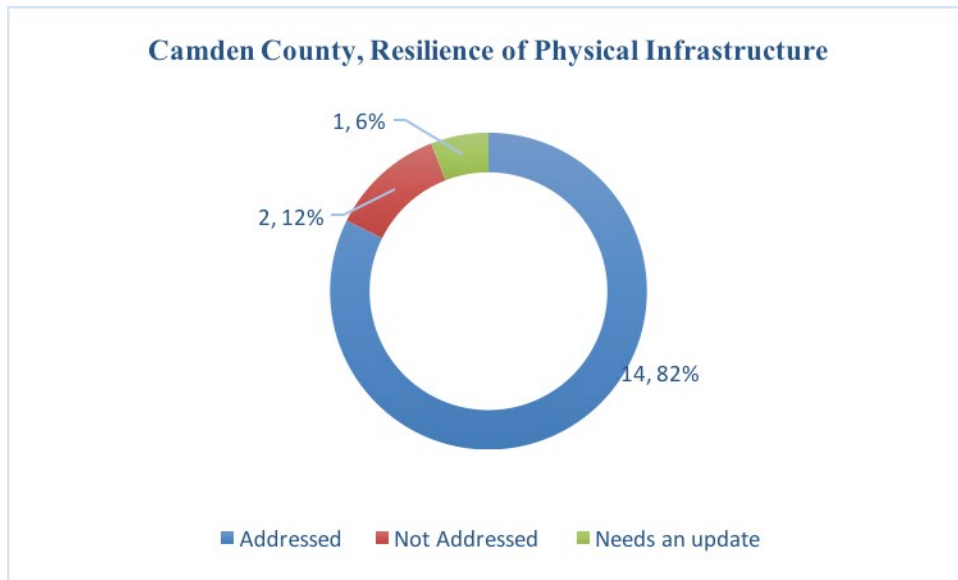
1) Demographic Resilience



Note: The total number of issues identifies for demographic resilience are 42

- Sections of planning document that needs an update are:
 - a) Addressing different population types in the hazard management plan
 - b) Emergency medical center's locations for both general public, and critical population
 - c) Back-up plans for the emergency supply in the medical centers
 - d) Temporary shelter, and health care facility for the local population during the disaster
 - e) Calculating the estimate loss by natural event by calculating the property value in the hazard zone
 - f) Considering special needs, and evacuation plans required for the critical population group, and the vulnerable population like, population under poverty line
- Missing sections of planning documents:
 - a) Percentage of critical group pf population (population above age group of 65 years, or below 5 years of age group, along with the people suffering from chronic disease) under natural hazard zone
 - b) Animal rescue centers
 - c) Special evacuation plan for tourist (if that is one of the major economic source for the cities, and county)
 - d) Mapping the major concentration (hot-spot) of economic center
 - e) Special evacuation plan for tourist (if that is one of the major economic source for the cities, and county)
 - f) Special insurance program for the critical section of population during the recovery process
 - g) Special education and outreach program for the critical section of population

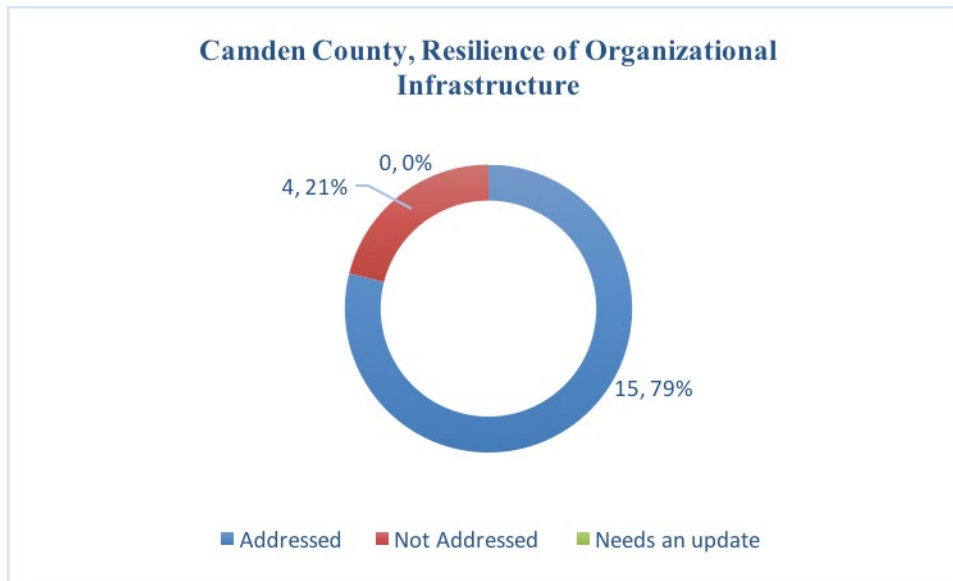
2) Resilience of Physical Infrastructure:



Note: The total number of issues identifies for resiliency of physical infrastructure are 17

- Sections of planning document that needs an update are:
 - a) Relocation policy for critical infrastructures
- Missing sections of planning documents:
 - a) Map the identified critical infrastructure in hazard zone, to understand the potential damage.
 - b) Calculating social, and economical impact of disturbance in the identified critical infrastructure

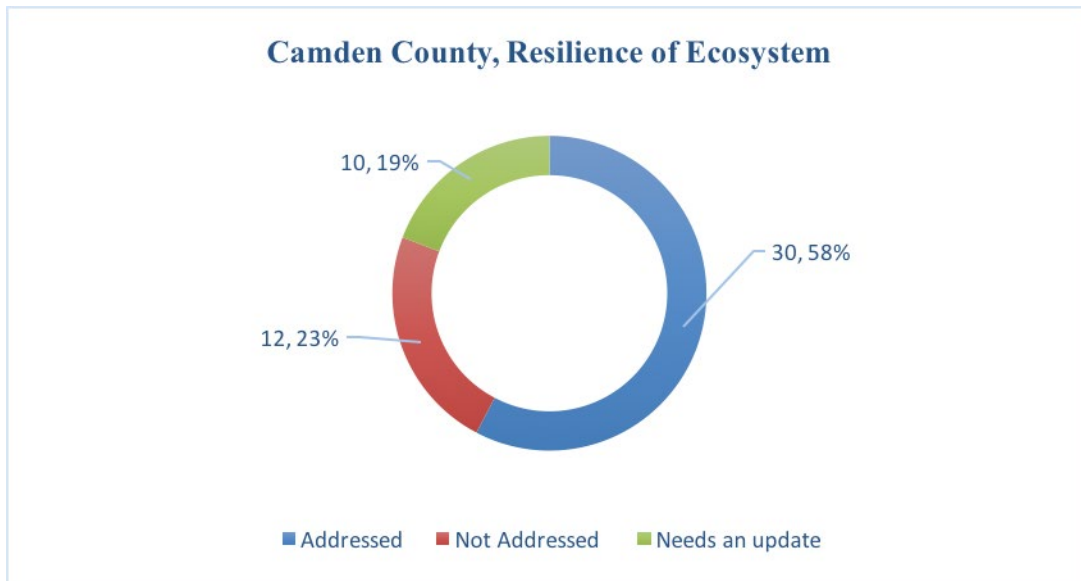
3) Resilience of Organizational Infrastructure:



Note: The total number of issues identifies for resiliency of organizational infrastructure is 19

- Missing sections of planning documents:
 - a) Disaster warning system
 - b) Post disaster, child care facility
 - c) Post-disaster cleanup program

4) Resiliency of ecosystem:



Note: The total number of issues identifies for resiliency of ecosystem is 52.

- Sections of planning document that needs an update are:
 - a) Air quality index for the counties
 - b) Data on energy, and oil consumption
 - c) Percentage of urban and rural development

- Missing sections of planning documents:
 - a) Effects of change in landscape pattern on Agriculture production (if valid)
 - b) Change in precipitation level
 - c) Measuring the change in natural buffer
 - d) Clean air and water act
 - e) Shore line protection policies (if valid)
 - f) Measuring the increase in heat island effect in the area

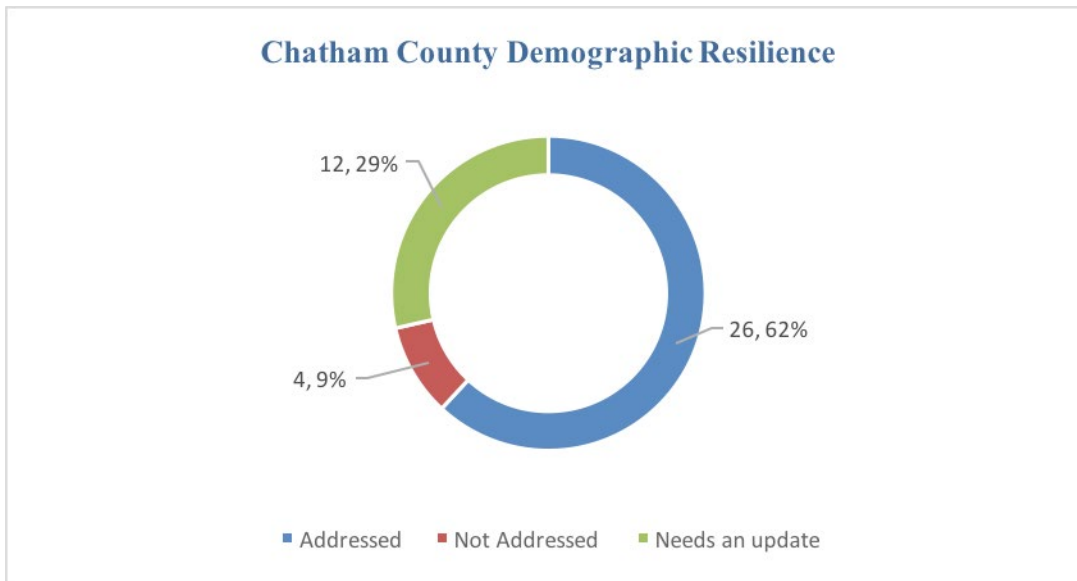
The final resilience score of Camden County (based on the available documents for review) is:

- Total number of issues: 130
- Addressed: 79 (1 point each) = 79 points
- Needs and update: 22 (0.5 points each) = 11 points

Resilience score of Camden County, GA = 90 points

Chatham County Summary Report

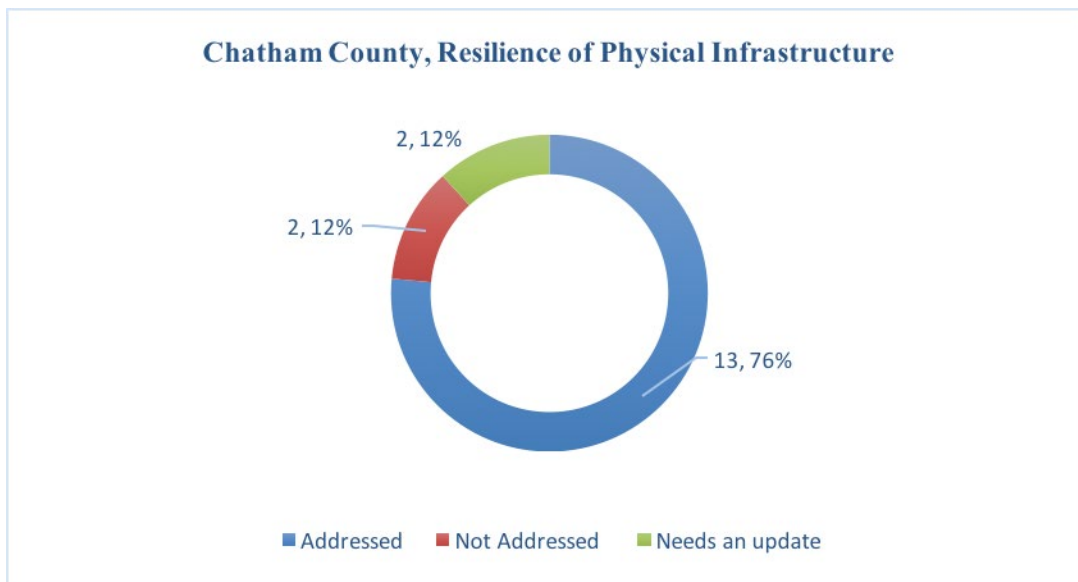
1) Demographic Resilience



Note: The total number of issues identifies for demographic resilience are 42

- Sections of planning document that needs an update are:
 - a) Critical facilities provided in hospitals for the case of emergency
 - b) Back-up plans for the emergency supply in the medical centers
 - c) Temporary shelter, and health care facility for the local population during the disaster
 - d) Calculating the estimate loss by natural event by calculating the property value in the hazard zone
 - e) Child care center
 - f) Construction standards/ codes
 - g) Insurance policies for buildings under hazard zone
 - h) Special evacuation plan for tourist (if that is one of the major economic source for the cities, and county)
- Missing sections of planning documents:
 - a) Special evacuation plan for tourist (if that is one of the major economic source for the cities, and county)
 - b) Awareness and disaster relief programs
 - c) Relocation plans for the critical infrastructure from the hazard zone

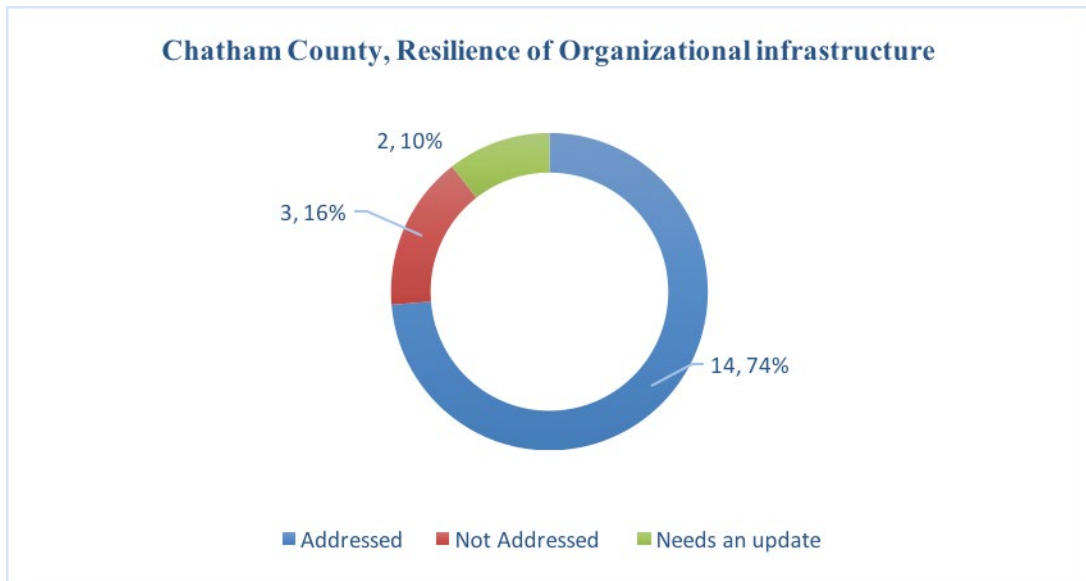
2) Resilience of Physical Infrastructure:



Note: The total number of issues identifies for resiliency of physical infrastructure are 17

- Sections of planning document that needs an update are:
 - a) Evaluate the physical condition of critical infrastructure
 - b) Funding, and policies for improving the condition of critical infrastructures
- Missing sections of planning documents:
 - a) Map the identified critical infrastructure in hazard zone, to understand the potential damage
 - b) Special health care facility for the population group associated with the critical infrastructure

3) Resilience of Organizational Infrastructure:

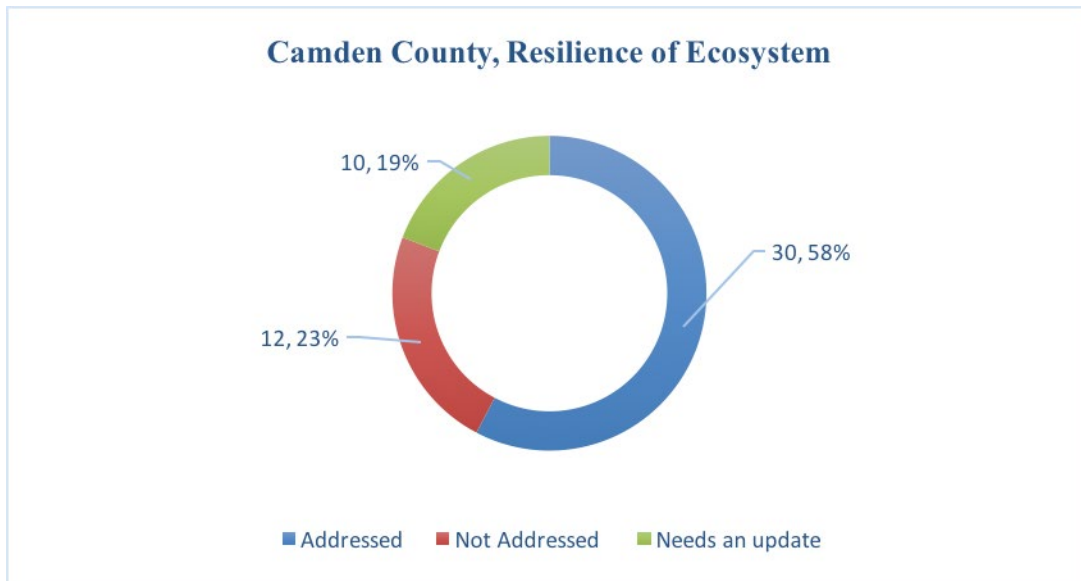


Note: The total number of issues identifies for resiliency of organizational infrastructure is 19

- Sections of planning document that needs an update are:
 - a) Disaster warning system
 - b) Partnership with the response team to assist during the disaster

- Missing sections of planning documents:
 - c) Awareness program
 - d) Post disaster, child care facility
 - e) Post-disaster cleanup program

4) Resiliency of ecosystem:



Note: The total number of issues identifies for resiliency of ecosystem is 52.

- Sections of planning document that needs an update are:
 - a) Air quality index for the counties
 - b) Data on energy, and oil consumption
- Missing sections of planning documents:
 - a) Measuring the change in natural buffer
 - b) Shore line protection policies (if valid)
 - c) Measuring the increase in heat island effect in the area

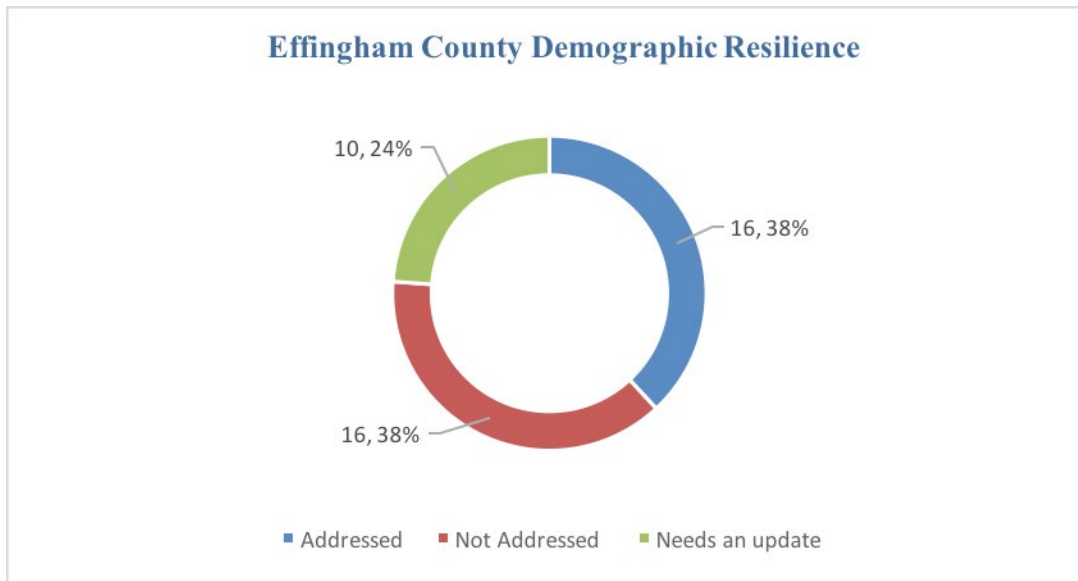
Thus the final resilience score of Chatham County (based on the available documents for review) is:

- Total no of issues: 130
- Addressed: 89 (1 point each) = 89 points
- Needs and update: 28 (0.5 points each) = 14 points

Resilience score of Chatham County, GA = 103 points

Effingham County Summary Report

1) Demographic Resilience

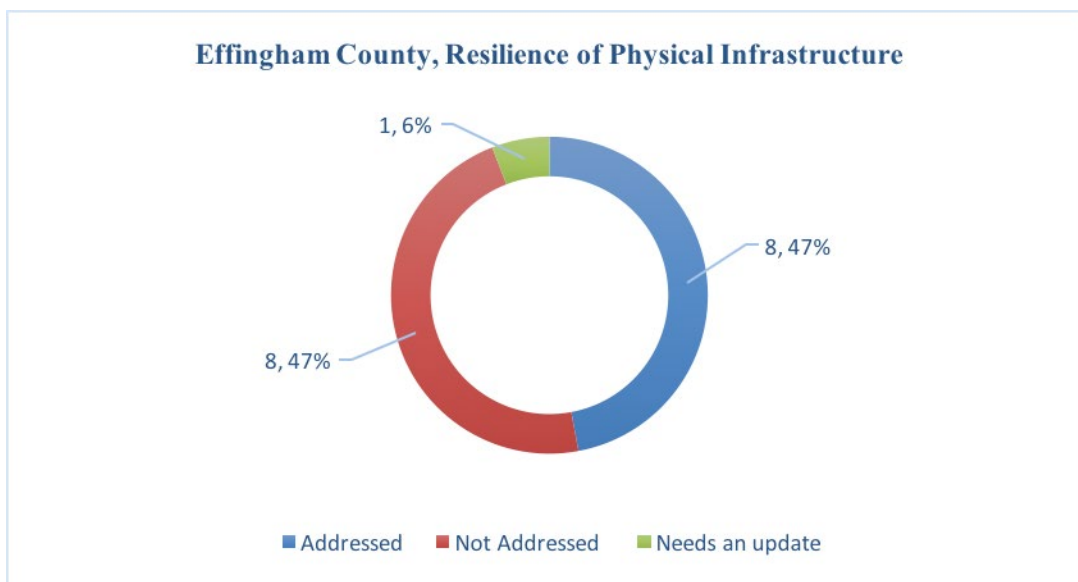


Note: The total number of issues identifies for demographic resilience are 42

- Sections of planning document that needs an update are:
 - a) Zone of impact of natural event
 - b) Addressing different population types in the hazard management plan
 - c) Critical facilities provided in hospitals for the case of emergency
 - d) Considering critical populations (population above the age group of 65 years, and below 5 years of age), and population with chronic diseases.
 - e) Understanding the census data of the city/ County
 - f) Construction standards/ codes
 - g) Relocation plans for the critical infrastructure from the hazard zone
 - h) Special evacuation plan for tourist (if that is one of the major economic source for the cities, and county)

- Missing sections of planning documents:
 - a) Emergency medical center's locations for both general public, and critical population
 - b) Critical facilities provided in the medical center for emergency situations
 - c) Back-up plans for the emergency supply in the medical centers
 - d) Child care center
 - e) Animal rescue center
 - f) Special evacuation plan for tourist (if that is one of the major economic source for the cities, and county)
 - g) Mapping the major concentration (hot-spot) of economic center
 - h) Special arrangements like, early evacuation facility, food supply, medical care, etc. for critical section of population.
 - i) Special insurance program for the critical section of population during the recovery process
 - j) Special education and outreach program for the critical section of population.

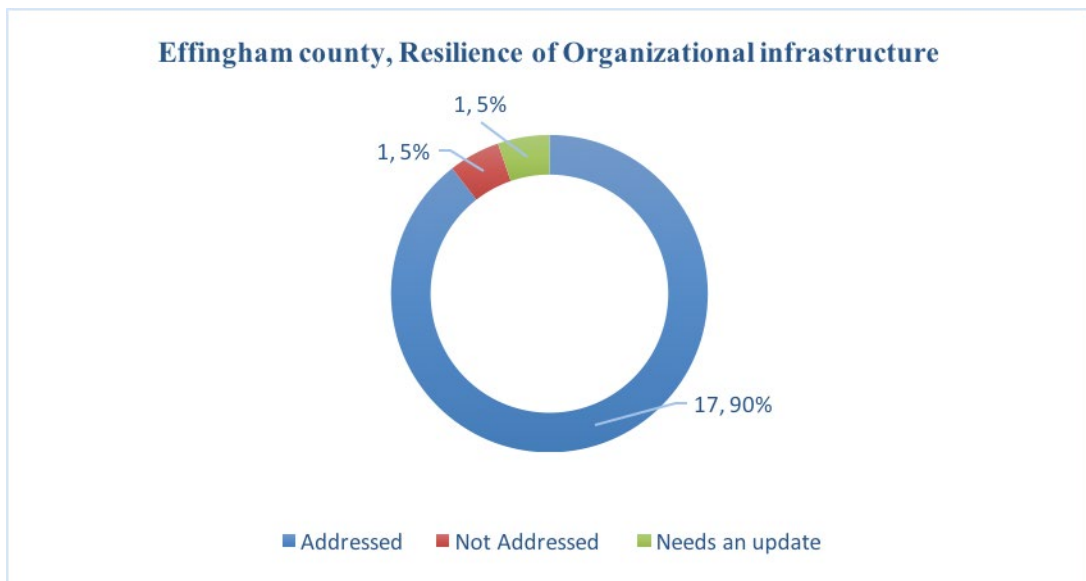
2) Resilience of Physical Infrastructure:



Note: The total number of issues identifies for resiliency of physical infrastructure are 17

- Sections of planning document that needs an update are:
 - a) Calculating social, and economical impact of disturbance in functioning of few major infrastructure like, electricity, water, food supply, and road conditions.
- Missing sections of planning documents:
 - a) Validating the identified critical infrastructure identified for the city with the standard list of documents provided by Federal or national agencies
 - b) Map the identified critical infrastructure in hazard zone, to understand the potential damage.
 - c) Evaluate the physical condition of critical infrastructure
 - d) Special insurance policies for the critical infrastructure under the Hazard zone
 - e) Relocation policy for critical infrastructures
 - f) Special health care facility for the population group associated with the critical infrastructure

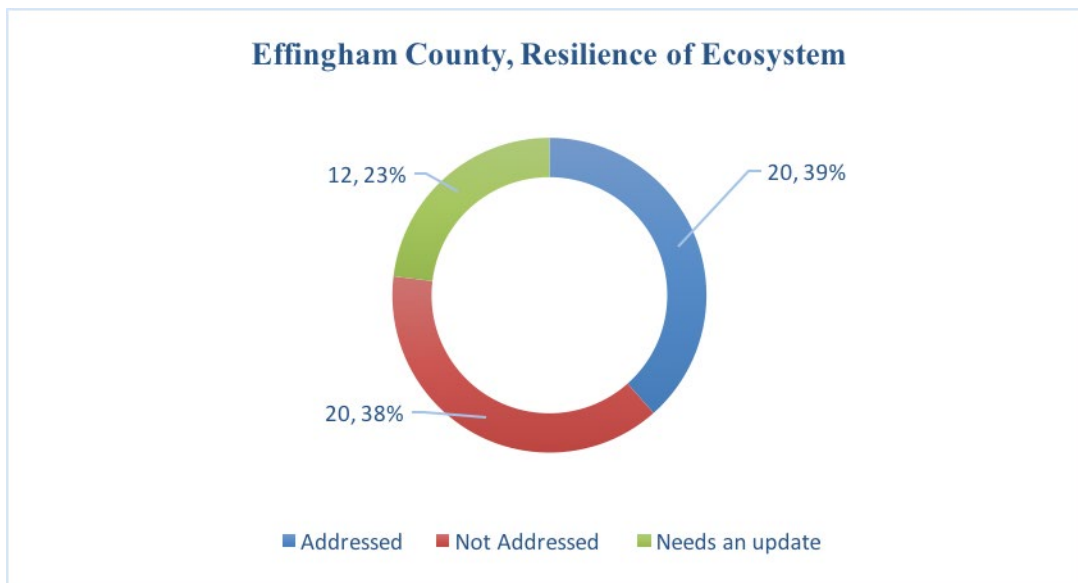
3) Resilience of Organizational Infrastructure:



Note: The total number of issues identifies for resiliency of organizational infrastructure is 19

- Sections of planning document that needs an update are:
 - a) Policies for defining critical infrastructure
- Missing sections of planning documents:
 - a) Post disaster, child care facility

4) Resiliency of ecosystem:



Note: The total number of issues identifies for resiliency of ecosystem is 52.

- Sections of planning document that needs an update are:
 - a) Air quality index for the counties
 - b) Data on energy, and oil consumption
 - c) Water quality
- Missing sections of planning documents:
 - a) Existing land use pattern
 - b) Change in land use pattern
 - c) Urban and Rural areas
 - d) Measuring the change in natural buffer
 - e) Change in temperature and precipitation
 - f) Change in ground water level and annual sea level rise
 - g) Clean air act
 - h) Shore line protection policies (if valid)
 - i) Tools for producing green power for the city/county
 - j) Measuring the increase in heat island effect in the area
 - k) Coastal mapping

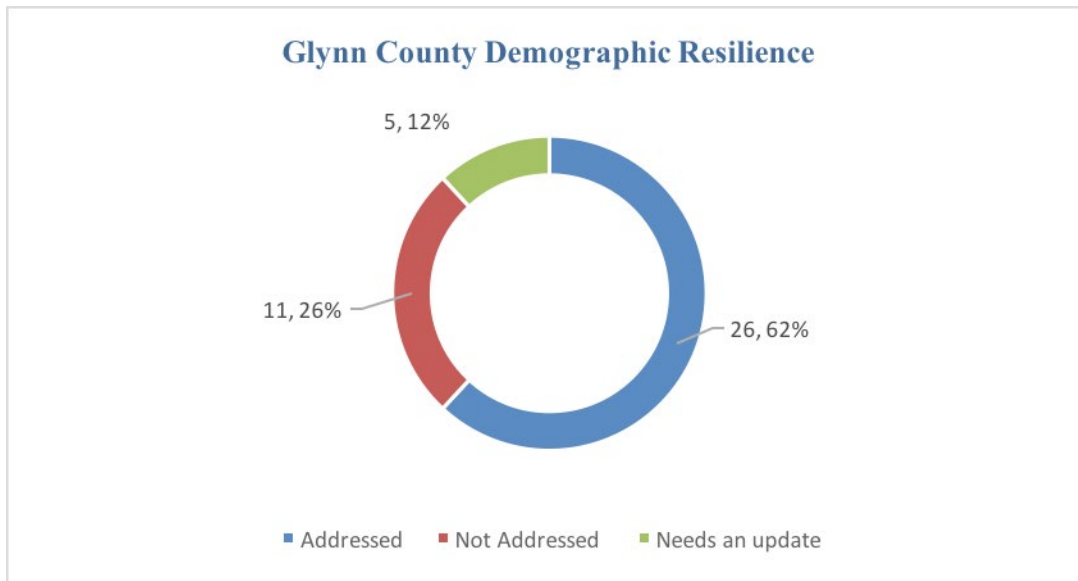
The final resilience score of Effingham County (based on the available documents for review) is:

- Total no of issues: 130
- Addressed: 61 (1 point each) = 61 points
- Needs and update: 24 (0.5 points each) = 12 points

Resilience score of Effingham county, GA = 73 points

Glynn County Summary Report

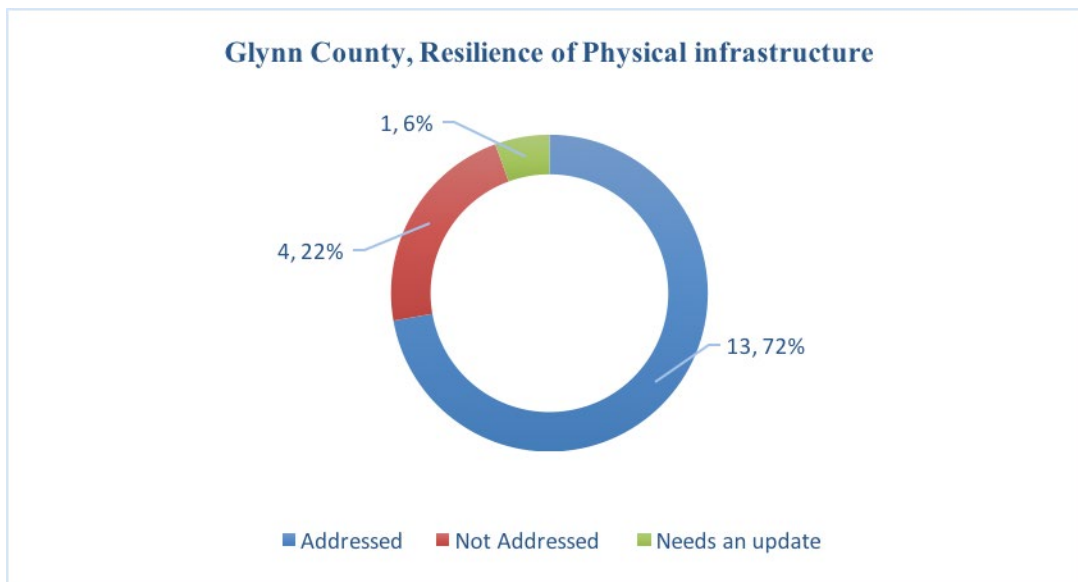
1) Demographic Resilience



Note: The total number of issues identifies for demographic resilience are 42

- Sections of planning document that needs an update are:
 - a) Relocation plans for the critical infrastructure from the hazard zone
 - b) Special evacuation plan for tourist (if that is one of the major economic source for the cities, and county)
- Missing sections of planning documents:
 - a) Mapping the major concentration (hot-spot) of economic center
 - b) Emergency medical center's locations for both general public, and critical population
 - c) Critical facilities provided in the medical center for emergency situations
 - d) Back-up plans for the emergency supply in the medical centers
 - e) Special evacuation plan for tourist (if that is one of the major economic source for the cities, and county)
 - f) Special arrangements like, early evacuation facility, food supply, medical care, etc. for critical section of population.
 - g) Special insurance program for the critical section of population during the recovery process

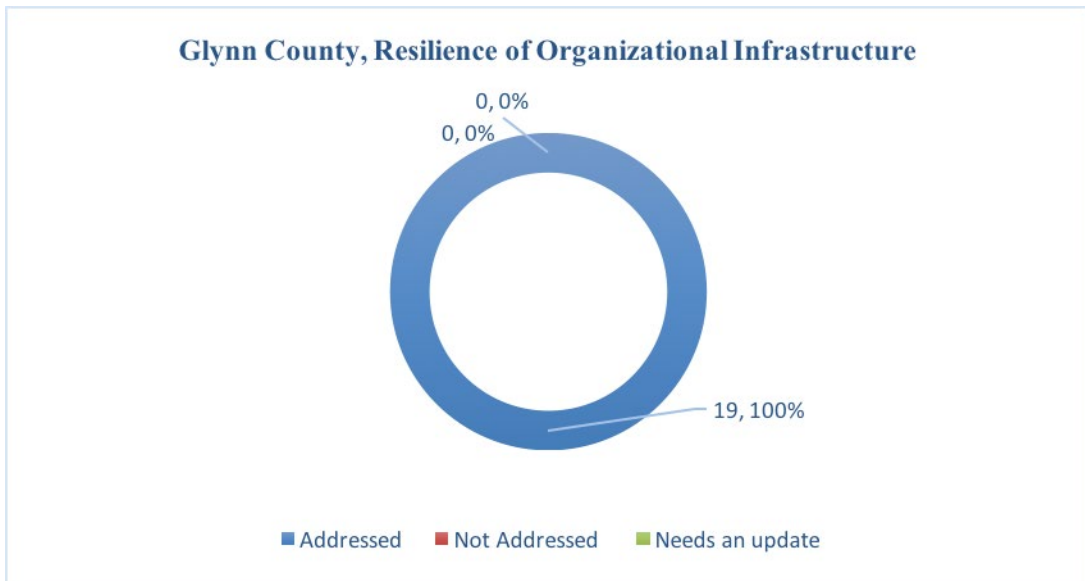
2) Resilience of Physical Infrastructure:



Note: The total number of issues identifies for resiliency of physical infrastructure are 17

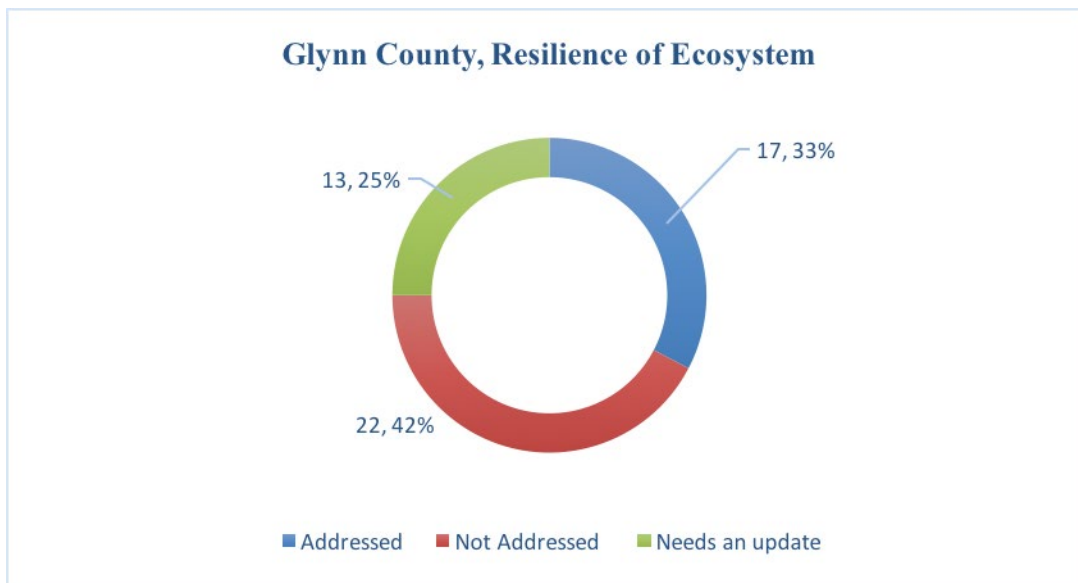
- Missing sections of planning documents:
 - a) Evaluate the physical condition of critical infrastructure
 - b) Special insurance policies for the critical infrastructure under the Hazard zone
 - c) Special health care facility for the population group associated with the critical infrastructure

3) Resilience of Organizational Infrastructure:



Note: The total number of issues identifies for resiliency of organizational infrastructure is 19

4) Resiliency of ecosystem:



Note: The total number of issues identifies for resiliency of ecosystem is 52.

- Sections of planning document that needs an update are:
 - a) Air quality index for the counties
 - b) Data on energy, and oil consumption
 - c) Water quality
 - d) Ecosystem management program

- Missing sections of planning documents:
 - a) Existing land use pattern
 - b) Change in land use pattern
 - c) Urban and Rural areas
 - d) Measuring the change in natural buffer
 - e) Change in temperature and precipitation
 - f) Clean air act
 - g) Shore line protection policies (if valid)
 - h) Tools for producing green power for the city/county
 - i) Measuring the increase in heat island effect in the area

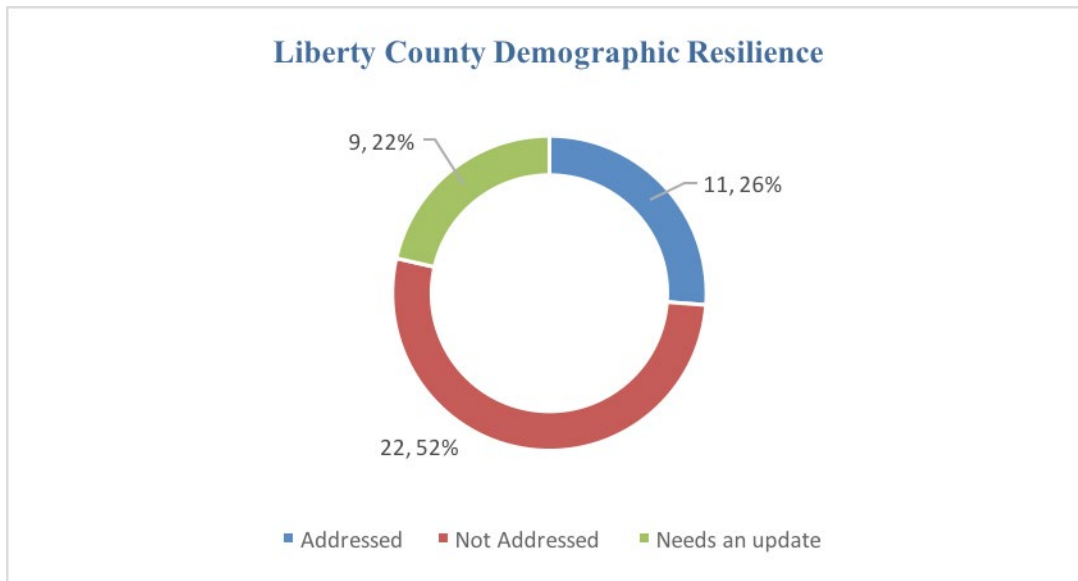
The final resilience score of the Glynn County (based on the available documents for review) is:

- Total no of issues: 130
- Addressed: 75 (1 point each) = 75 points
- Needs and update: 19 (0.5 points each) = 9.5 points

Resilience score of Glynn County, GA = 84.5 points

Liberty County Summary Report

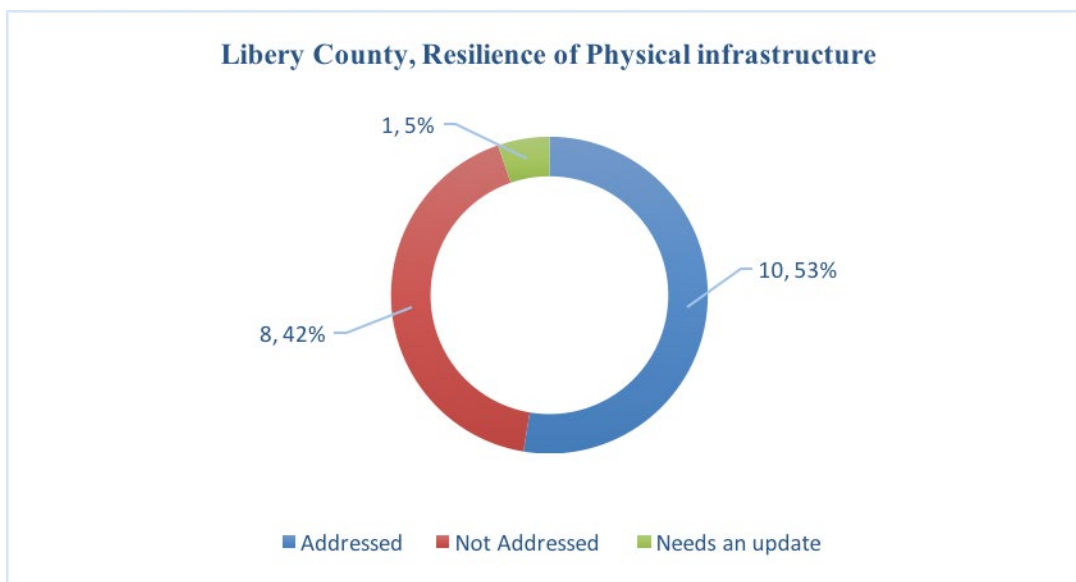
1) Demographic Resilience



Note: The total number of issues identifies for demographic resilience are 42

- Sections of planning document that needs an update are:
 - a) Understanding the population type
 - b) Emergency medical center's locations for both general public, and critical population
 - c) Construction codes
 - d) Special insurance policy for the buildings in the estimated zone of natural event
 - e) Calculating the estimate loss by natural event by calculating the property value in the hazard zone
 - f) Special arrangements like, early evacuation facility, food supply, medical care, etc. for critical section of population
- Missing sections of planning documents:
 - a) Evaluation of percentage of critical population within the hazard zone
 - b) Mapping the major concentration (hot-spot) of economic center
 - c) Emergency medical center's locations for both general public, and critical population
 - d) Back-up plans for the emergency supply in the medical centers
 - e) Education and outreach program for both general public and critical population
 - f) Location of evacuation shelters for the local population
 - g) Child care facility
 - h) Animal rescue center
 - i) Special evacuation plan for tourist (if that is one of the major economic source for the cities, and county)
 - j) Relocation plan for critical infrastructures
 - k) Special arrangements like, early evacuation facility, food supply, medical care, etc. for critical section of population.
 - l) Special insurance program for the critical section of population during the recovery process

2) Resilience of Physical Infrastructure:

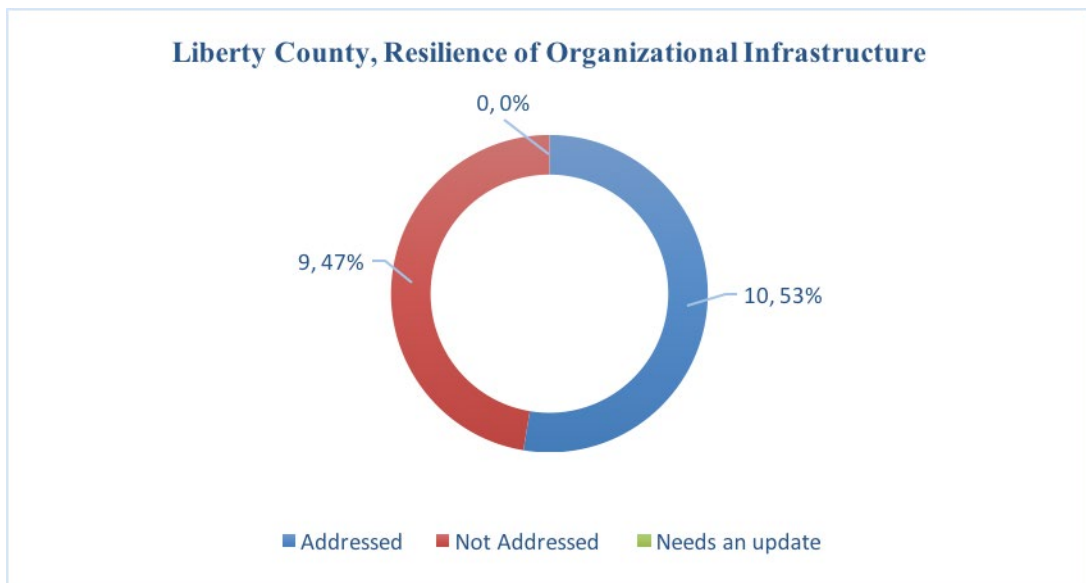


Note: The total number of issues identifies for resiliency of physical infrastructure are 17

- Sections of planning document that needs an update are:
 - a) Understanding the zone of impact of natural disaster

- Missing sections of planning documents:
 - a) Identification of frequently used infrastructure
 - b) Validating the identified critical infrastructure identified for the city with the standard list of documents provided by Federal or national agencies
 - c) Mapping the identified critical infrastructure in the hazard impact zone
 - d) Evaluate the physical condition of critical infrastructure
 - e) Special insurance policies for the critical infrastructure under the Hazard zone
 - f) Identification of group of people associated with the critical infrastructure
 - g) Special health care facility for the population group associated with the critical infrastructure

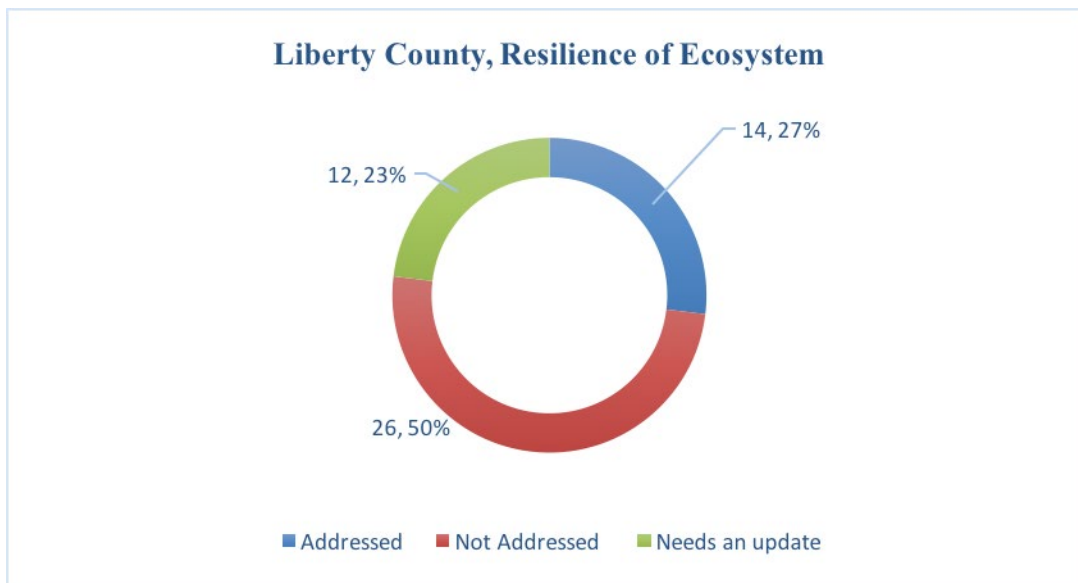
3) Resilience of Organizational Infrastructure:



Note: The total number of issues identifies for resiliency of organizational infrastructure is 19

- Missing sections of planning documents:
 - a) Social impact of the disaster event
 - b) Identification of critical infrastructure
 - c) Awareness, supply management, and public outreach programs
 - d) Partnership with the response team to assist during the disaster
 - e) Temporary shelter, and health care facility for the local population during the disaster
 - f) Child care facility
 - g) Post-disaster cleanup program
 - h) Post-disaster recovery program

4) Resiliency of ecosystem:



Note: The total number of issues identifies for resiliency of ecosystem is 52.

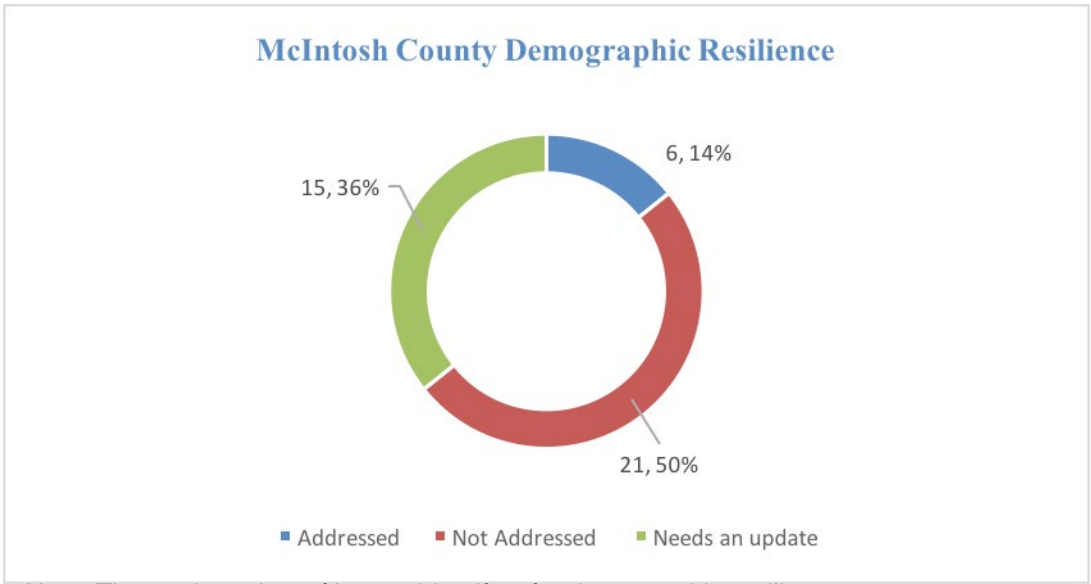
Thus the final resilience score of the Liberty County (based on the available documents for review) is:

- Total no of issues: 130
- Addressed: 45 (1 point each) = 45 points
- Needs and update: 22 (0.5 points each) = 11 points

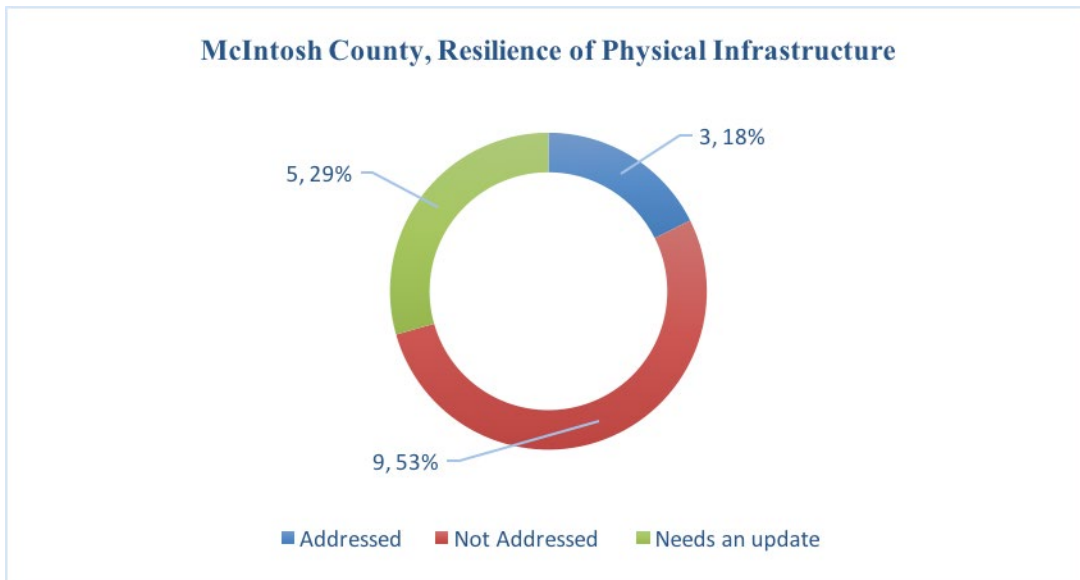
Resilience score of Liberty County, GA = 56 points

McIntosh County Summary Report

1) Demographic Resilience

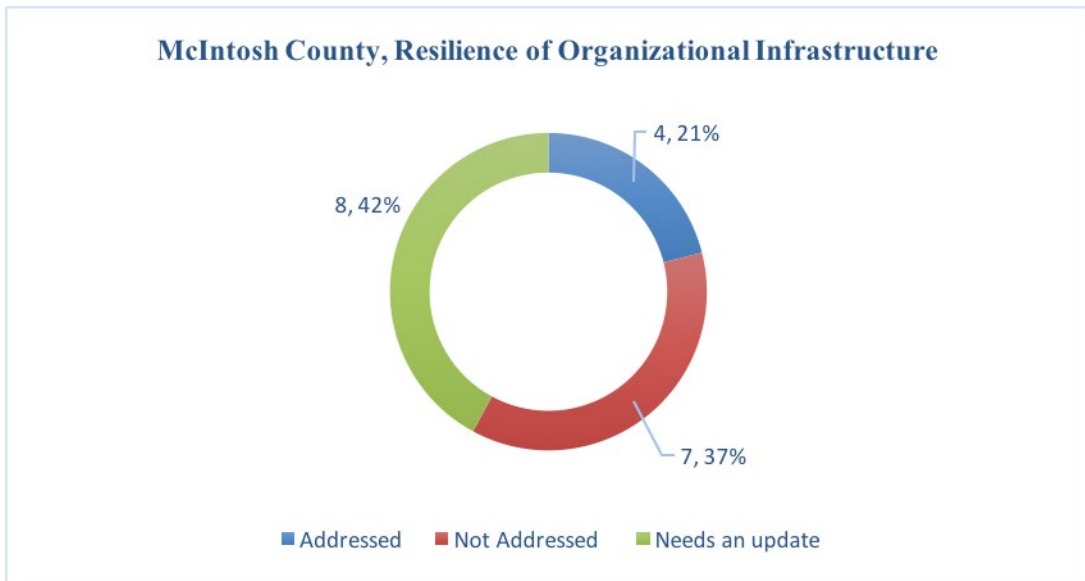


2) Resilience of Physical Infrastructure:



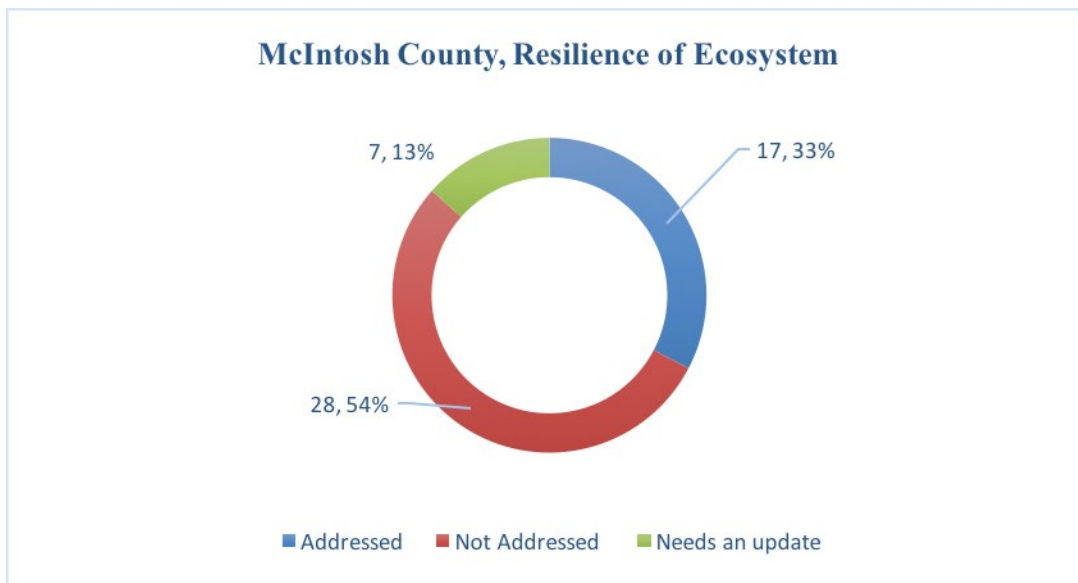
Note: The total number of issues identifies for resiliency of physical infrastructure are 17

3) Resilience of Organizational Infrastructure:



Note: The total number of issues identifies for resiliency of organizational infrastructure is 19

4) Resiliency of ecosystem:



Note: The total number of issues identifies for resiliency of ecosystem is 52.

The final resilience score of the McIntosh County (based on the available documents for review) is:

Total no of issues: 130

- Addressed: 30 (1 point each) = 45 points
- Needs and update: 35 (0.5 points each) = 17.5 points

Resilience score of McIntosh county, GA = 61.5 points

Data Report Pursuant to Chapter 110-12-6-.07

Population

Total Population

From 2000 to 2010 the region's population grew by 15%. All of the counties gained population except Screven County. Bryan, Bulloch, Effingham, Long, and McIntosh Counties all grew more than the regional average. All counties are projected to grow between the 2000 census and 2030, with a projected regional growth rate of 42%. Bryan, Bulloch, Camden, Effingham, and McIntosh Counties are projected to grow faster than the regional average. See Table 1.

Table 1 – Population Growth Within the Coastal Region

Table 1 Population Growth and Projected Growth by County							
County	2000	2010	% Change 2000-2010	annualized	2020	2030	% Change 2000-2030
Bryan	23,417	30,233	23%	2.25%	45,272	59,534	61%
Bulloch	55,983	70,217	20%	2.03%	88,071	109,034	49%
Camden	43,664	50,513	14%	1.36%	70,548	96,743	55%
Chatham	232,048	265,128	12%	1.25%	290,615	324,098	28%
Effingham	37,535	52,250	28%	2.82%	80,563	112,062	67%
Glynn	67,568	79,626	15%	1.51%	93,461	109,771	38%
Liberty	61,610	63,453	3%	0.29%	78,740	93,821	34%
Long	10,304	14,464	29%	2.88%	14,386	17,171	40%
McIntosh	10,847	14,333	24%	2.43%	16,039	20,686	48%
Screven	15,374	14,593	-5%	-0.54%	17,819	20,036	23%
CRC Region	560,350	656,820	15%	1.47%	797,534	964,986	42%
Source: U. S. Census, GA Office of Planning & Budget							

In addition to looking at the population data for the Coastal Region's counties, we also examined the population for all twelve Regional Commissions within the state. From 2000 to 2010, the Coastal Region ranked third in population and sixth in population growth. Based upon population projections by the Georgia Office of Planning & Budget, the Coastal Region will rank 5th in population and remain at 6th in projected population growth. See Table 2.

Table 2 – Population Growth in Georgia by Region

Table 2 Population Growth and Projected Growth by Region							
County	2000	2010	% Change 2000-2010	annualized	2020	2030	% Change 2000-2030
Coastal Georgia	558,350	654,810	15%	1.47%	795,514	962,956	42%
Northwest Georgia	697,410	873,296	20%	2.01%	1,085,667	1,348,614	48%
Georgia Mountains	455,342	646,300	30%	2.95%	867,596	1,158,531	61%
Atlanta Region	3,429,379	4,402,352	22%	2.21%	5,286,948	6,313,176	46%
Northeast Georgia	438,300	607,030	28%	2.78%	796,704	1,043,762	58%
Three Rivers	403,944	509,199	21%	2.07%	644,868	807,012	50%
Middle Georgia	440,121	489,491	10%	1.01%	560,713	635,838	31%
Central Savannah River	419,634	450,292	7%	0.68%	515,785	582,973	28%
River Valley	353,274	365,648	3%	0.34%	418,200	471,121	25%
Heart of GA Altamaha	272,894	299,874	9%	0.90%	337,026	375,230	27%
Southwest Georgia	341,910	364,697	6%	0.62%	409,456	455,882	25%
Southern Georgia	173,780	187,717	7%	0.74%	215,873	245,033	29%
Georgia	7,984,338	9,850,706	19%	1.89%	11,934,350	14,400,128	45%
CRC Ranking	3	3	6	6	5	5	6

Source: U. S. Census, GA Office of Planning & Budget

Age Distribution

In the Regional Assessment, we looked at two vulnerable populations, the very young (under 5) and the elderly (65 and over) in our discussion of Resiliency. The following data demonstrates the shift in ages by county and by the region as a whole.

From 2000 to 2010, the regional average of the median age changed by 2.6 years from 31.8 years old to 34.4 years old, an 8% increase. Not all counties shifted in the same direction however; Bulloch and Chatham Counties now have lower median ages by nearly 1%, while the median ages in Camden, Liberty, Long, and McIntosh Counties were moving higher than the 8% average for the region. McIntosh County now has the highest median age in the region, 44.4 years old, representing an increase of 20%. See Table 3 below.

Table 3 – Shift in Median Age

Table 3 Shift in Median Age – 2000 to 2010				
County	Median Age 2000	Median Age 2010	Change	Percent Change
Bryan	33.3	35.7	2.4	7.21%
Bulloch	26.1	25.9	-0.2	-0.77%
Camden	28.2	31.3	3.1	10.99%
Chatham	34.4	34	-0.4	-1.16%
Effingham	33.6	35.1	1.5	4.46%
Glynn	37.9	39.4	1.5	3.96%
Liberty	25	27.9	2.9	11.60%
Long	26.5	30.6	4.1	15.47%
McIntosh	37	44.4	7.4	20.00%
Screven	36.2	39.5	3.3	9.12%
Regional Average	31.8	34.4	2.6	8.05%
Source: U. S. Census and CRC				

In addition to changes in the median age, the adult population (ages 18+) has grown by 85,500, nearly 21%, in the region from 2000 to 2010. Several counties grew at a much faster rate, with Effingham, Long, and McIntosh Counties all gaining more than 40% in adult population during the decade. Only Screven County saw its adult population drop. See Table 4 below.

Table 4 – Shift in Population Ages 18+

Table 4				
Shift in Population Ages 18+ – 2000 to 2010				
County	Ages 18+ 2000	Ages 18+ 2010	Change	Percent Change
Bryan	16,128	21,376	5,248	32.54%
Bulloch	43,503	55,824	12,321	28.32%
Camden	29,832	36,861	7,029	23.56%
Chatham	173,965	205,121	31,156	17.91%
Effingham	26,301	37,344	11,043	41.99%
Glynn	50,460	60,395	9,935	19.69%
Liberty	41,916	44,262	2,346	5.60%
Long	6,893	10,045	3,152	45.73%
McIntosh	7,805	11,255	3,450	44.20%
Screven	11,083	10,903	-180	-1.62%
Regional Total	407,886	493,386	85,500	20.96%
Source: U. S. Census and CRC				

Nationally, one of the fastest growing populations is the group known as the Baby Boomers. These are people born between 1945 and 1964. This group reached age 65 just in time for the 2010 census. Reported below is the change in population for ages 65 and older. Regionally this age cohort grew by 14,758, just over 25%. In some counties, notably Camden and McIntosh, the 65+ population doubled. Bryan, Effingham, Liberty, and Long Counties all show very robust growth in the 65+ population. See Table 5 below.

Table 5 - Shift in Population Ages 65+

Table 5				
Shift in Population Ages 65+ – 2000 to 2010				
County	Ages 65+ 2000	Ages 65+ 2010	Change	Percent Change
Bryan	1,703	2,715	1,012	59.42%
Bulloch	5,207	6,401	1,194	22.93%
Camden	2,277	4,556	2,279	100.09%
Chatham	29,770	32,864	3,094	10.39%
Effingham	3,016	4,763	1,747	57.92%
Glynn	9,761	11,976	2,215	22.69%
Liberty	2,432	3,971	1,539	63.28%
Long	594	1,055	461	77.61%
McIntosh	1,280	2,478	1,198	93.59%
Screven	2,155	2,174	19	0.88%
Regional Total	58,195	72,953	14,758	25.36%
Source: U. S. Census and CRC				

Race and Ethnicity

Examining the region as a whole, the racial and ethnic composition has remained very similar between 2000 and 2010 when looking at race or ethnicity as a percentage of the whole population. The percentage of the population reporting as “One race,” “White,” or “Black or African-American” have decreased by approximately one percent, while the percentage of the population reporting as “Some other race” or “Two or more races” has gone up by a similar amount. The most significant increase is the percentage of the population reporting as “Hispanic or Latino” which has grown by 2.37% from 3.08% to 5.45% of the regional population. When you look at the actual numerical growth of some populations, the percentage seems much more dramatic. For example the number of Asians has grown by 65%, Native Hawaiian and other Pacific Islanders has grown by 77%, and Hispanics or Latinos has grown by 108%. However, these groups, even when combined, represent less than 10% of the total population. See Table 6 below.

Table 6 – Trends in Race and Ethnicity

Table 6 Trends in Race and Ethnicity 2000 to 2010						
Coastal Region	2000	Percent Total Population	2010	Percent Total Population	Numerical Change	Percent Change
Total Population	558,350	100.00%	654,810	100.00%	96,460	17%
One race	550,240	98.55%	639,459	97.66%	89,219	16%
White	349,086	62.52%	401,724	61.35%	52,638	15%
Black or African American	184,767	33.09%	209,579	32.01%	24,812	13%
American Indian and Alaska Native	1,698	0.30%	2,167	0.33%	469	28%
Asian	6,887	1.23%	11,353	1.73%	4,466	65%
Native Hawaiian and Other Pacific Islander	564	0.10%	999	0.15%	435	77%
Some other race	7,238	1.30%	13,637	2.08%	6,399	88%
Two or more races	8,110	1.45%	15,351	2.34%	7,241	89%
Total Population	558,350	100.00%	654,810	100.00%	96,460	17%
Hispanic or Latino (of any race)	17,193	3.08%	35,706	5.45%	18,513	108%
Not Hispanic or Latino	541,157	96.92%	619,104	94.55%	77,947	14%
Source: U. S. Census and CRC						

When we compare the Coastal Georgia region to the United States and to the State of Georgia, we find that the region has a significantly higher percentage of Blacks or African- Americans than the country as a whole and a slightly higher percentage than the state. The region’s Asian and Hispanic or Latino populations are significantly lower than the country or the state.

- Black or African-American – United States (12.6%), Georgia (30.7%), Coastal Georgia (32.01%);
- Hispanic or Latino – United State (16.6%), Georgia (8.9%), Coastal Georgia (5.45%); and
- Asian – United States (4.9%), Georgia (3.4%), Coastal Georgia (1.73%).

The Race and Ethnicity data for the ten counties with the Coastal Region is reported below. Much like the region as a whole the shifts in demographics have been subtle and incremental. See Tables 7.1 through 7.10 below. The top three counties for representative minority populations are:

- Black or African American – Screven (43.29%), Liberty (42.24%), and Chatham(40.13%);
- Hispanic or Latino – Long (12.29%), Liberty (9.71%), and Glynn (6.44%); and
- Asian – Chatham (2.38%), Liberty (1.97%), and Bryan (1.61%).

Tables 7.1 – 7.10 Race and Ethnicity by County

Table 7.1 Bryan County	2000	Percent Total Population	2010	Percent Total Population	Numerical Change	Percent
Total Population	23,417	100.00%	30,233	100.00%	6,816	29%
One race	23,103	98.66%	29,475	97.49%	6,372	28%
White	19,386	82.79%	24,254	80.22%	4,868	25%
Black or African American	3,311	14.14%	4,286	14.18%	975	29%
American Indian and Alaska Native	74	0.32%	98	0.32%	24	32%
Asian	181	0.77%	486	1.61%	305	169%
Native Hawaiian and Other Pacific Islander	16	0.07%	25	0.08%	9	56%
Some other race	135	0.58%	326	1.08%	191	141%
Two or more races	314	1.34%	758	2.51%	444	141%
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Total Population	23,417	100.00%	30,233	100.00%	6,816	29%
Hispanic or Latino (of any race)	465	1.99%	1,336	4.42%	871	187%
Not Hispanic or Latino	22,952	98.01%	28,897	95.58%	5,945	26%
Source: U. S. Census and CRC						

Table 7.2 Bulloch County	2000	Percent Total Population	2010	Percent Total Population	Numerical Change	Percent
Total Population	55,983	100.00%	70,217	100.00%	14,234	25%
One race	55,555	99.24%	69,056	98.35%	13,501	24%
White	38,460	68.70%	47,215	67.24%	8,755	23%
Black or African American	16,101	28.76%	19,409	27.64%	3,308	21%
American Indian and Alaska Native	72	0.13%	183	0.26%	111	154%
Asian	461	0.82%	1,020	1.45%	559	121%
Native Hawaiian and Other Pacific Islander	15	0.03%	64	0.09%	49	327%
Some other race	446	0.80%	1,165	1.66%	719	161%
Two or more races	428	0.76%	1,161	1.65%	733	171%
Total Population	55,983	100.00%	70,217	100.00%	14,234	25%
Hispanic or Latino (of any race)	1,052	1.88%	2,439	3.47%	1,387	132%
Not Hispanic or Latino	54,931	98.12%	67,778	96.53%	12,847	23%
Source: U. S. Census and CRC						

Table 7.3 Camden County	2000	Percent Total Population	2010	Percent Total Population	Numerical Change	Percent
Total Population	43,664	100.00%	50,513	100.00%	6,849	16%
One race	42,841	98.12%	48,982	96.97%	6,141	14%
White	32,765	75.04%	37,557	74.35%	4,792	15%
Black or African American	8,783	20.11%	9,799	19.40%	1,016	12%
American Indian and Alaska Native	216	0.49%	259	0.51%	43	20%
Asian	441	1.01%	724	1.43%	283	64%
Native Hawaiian and Other Pacific Islander	37	0.08%	76	0.15%	39	105%
Some other race	599	1.37%	567	1.12%	-32	-5%
Two or more races	823	1.88%	1,531	3.03%	708	86%
Total Population	43,664	100.00%	50,513	100.00%	6,849	16%
Hispanic or Latino (of any race)	1,585	3.63%	2,590	5.13%	1,005	63%
Not Hispanic or Latino	42,079	96.37%	47,923	94.87%	5,844	14%
Source: U. S. Census and CRC						

Table 7.4 Chatham County	2000	Percent Total Population	2010	Percent Total Population	Numerical Change	Percent
Total Population	232,048	100.00%	265,128	100.00%	33,080	14%
One race	229,067	98.72%	259,429	97.85%	30,362	13%
White	128,279	55.28%	140,010	52.81%	11,731	9%
Black or African American	93,971	40.50%	106,392	40.13%	12,421	13%
American Indian and Alaska Native	580	0.25%	691	0.26%	111	19%
Asian	4,013	1.73%	6,311	2.38%	2,298	57%
Native Hawaiian and Other Pacific Islander	151	0.07%	254	0.10%	103	68%
Some other race	2,073	0.89%	5,771	2.18%	3,698	178%
Two or more races	2,981	1.28%	5,699	2.15%	2,718	91%
Total Population	232,048	100.00%	265,128	100.00%	33,080	14%
Hispanic or Latino (of any race)	5,403	2.33%	14,370	5.42%	8,967	166%
Not Hispanic or Latino	226,645	97.67%	250,758	94.58%	24,113	11%
Source: U. S. Census and CRC						

Table 7.5 Effingham County	2000	Percent Total Population	2010	Percent Total Population	Numerical Change	Percent
Total Population	37,535	100.00%	52,250	100.00%	14,715	39%
One race	37,145	98.96%	51,270	98.12%	14,125	38%
White	31,776	84.66%	43,182	82.64%	11,406	36%
Black or African American	4,876	12.99%	7,048	13.49%	2,172	45%
American Indian and Alaska Native	119	0.32%	156	0.30%	37	31%
Asian	170	0.45%	427	0.82%	257	151%
Native Hawaiian and Other Pacific Islander	9	0.02%	26	0.05%	17	189%
Some other race	195	0.52%	431	0.82%	236	121%
Two or more races	390	1.04%	980	1.88%	590	151%
Total Population	37,535	100.00%	52,250	100.00%	14,715	39%
Hispanic or Latino (of any race)	531	1.41%	1,501	2.87%	970	183%
Not Hispanic or Latino	37,004	98.59%	50,749	97.13%	13,745	37%
Source: U. S. Census and CRC						

Table 7.6 Glynn County	2000	Percent Total Population	2010	Percent Total Population	Numerical Change	Percent
Total Population	67,568	100.00%	79,626	100.00%	12,058	18%
One race	66,832	98.91%	78,196	98.20%	11,364	17%
White	47,746	70.66%	53,823	67.59%	6,077	13%
Black or African American	17,874	26.45%	20,726	26.03%	2,852	16%
American Indian and Alaska Native	177	0.26%	232	0.29%	55	31%
Asian	408	0.60%	921	1.16%	513	126%
Native Hawaiian and Other Pacific Islander	32	0.05%	95	0.12%	63	197%
Some other race	595	0.88%	2,399	3.01%	1,804	303%
Two or more races	736	1.09%	1,430	1.80%	694	94%
Total Population	67,568	100.00%	79,626	100.00%	12,058	18%
Hispanic or Latino (of any race)	2,019	2.99%	5,126	6.44%	3,107	154%
Not Hispanic or Latino	65,549	97.01%	74,500	93.56%	8,951	14%
Source: U. S. Census and CRC						

Table 7.7 Liberty County	2000	Percent Total Population	2010	Percent Total Population	Numerical Change	Percent
Total Population	61,610	100.00%	63,453	100.00%	1,843	3%
One race	59,535	96.63%	60,493	95.34%	958	2%
White	28,737	46.64%	29,881	47.09%	1,144	4%
Black or African American	26,396	42.84%	26,805	42.24%	409	2%
American Indian and Alaska Native	322	0.52%	358	0.56%	36	11%
Asian	1,082	1.76%	1,247	1.97%	165	15%
Native Hawaiian and Other Pacific Islander	266	0.43%	392	0.62%	126	47%
Some other race	2,732	4.43%	1,810	2.85%	-922	-34%
Two or more races	2,075	3.37%	2,960	4.66%	885	43%
Total Population	61,610	100.00%	63,453	100.00%	1,843	3%
Hispanic or Latino (of any race)	5,022	8.15%	6,159	9.71%	1,137	23%
Not Hispanic or Latino	56,588	91.85%	57,294	90.29%	706	1%
Source: U. S. Census and CRC						

Table 7.8 Long County	2000	Percent Total Population	2010	Percent Total Population	Numerical Change	Percent
Total Population	10,304	100.00%	14,464	100.00%	4,160	40%
One race	10,111	98.13%	13,974	96.61%	3,863	38%
White	7,049	68.41%	9,026	62.40%	1,977	28%
Black or African American	2,499	24.25%	3,647	25.21%	1,148	46%
American Indian and Alaska Native	75	0.73%	91	0.63%	16	21%
Asian	59	0.57%	115	0.80%	56	95%
Native Hawaiian and Other Pacific Islander	26	0.25%	56	0.39%	30	115%
Some other race	403	3.91%	1,039	7.18%	636	158%
Two or more races	193	1.87%	490	3.39%	297	154%
Total Population	10,304	100.00%	14,464	100.00%	4,160	40%
Hispanic or Latino (of any race)	870	8.44%	1,778	12.29%	908	104%
Not Hispanic or Latino	9,434	91.56%	12,686	87.71%	3,252	34%
Source: U. S. Census and CRC						

Table 7.9 McIntosh County	2000	Percent Total Population	2010	Percent Total Population	Numerical Change	Percent
Total Population	10,847	100.00%	14,333	100.00%	3,486	32%
One race	10,753	99.13%	14,156	98.77%	3,403	32%
White	6,654	61.34%	8,811	61.47%	2,157	32%
Black or African American	3,993	36.81%	5,149	35.92%	1,156	29%
American Indian and Alaska Native	41	0.38%	53	0.37%	12	29%
Asian	32	0.30%	45	0.31%	13	41%
Native Hawaiian and Other Pacific Islander	4	0.04%	10	0.07%	6	150%
Some other race	29	0.27%	88	0.61%	59	203%
Two or more races	94	0.87%	177	1.23%	83	88%
Total Population	10,847	100.00%	14,333	100.00%	3,486	32%
Hispanic or Latino (of any race)	99	0.91%	227	1.58%	128	129%
Not Hispanic or Latino	10,748	99.09%	14,106	98.42%	3,358	31%
Source: U. S. Census and CRC						

Table 7.10 Screven County	2000	Percent Total Population	2010	Percent Total Population	Numerical Change	Percent
Total Population	15,374	100.00%	14,593	100.00%	-781	-5%
One race	15,298	99.51%	14,428	98.87%	-870	-6%
White	8,234	53.56%	7,965	54.58%	-269	-3%
Black or African American	6,963	45.29%	6,318	43.29%	-645	-9%
American Indian and Alaska Native	22	0.14%	46	0.32%	24	109%
Asian	40	0.26%	57	0.39%	17	43%
Native Hawaiian and Other Pacific Islander	8	0.05%	1	0.01%	-7	-88%
Some other race	31	0.20%	41	0.28%	10	32%
Two or more races	76	0.49%	165	1.13%	89	117%
Total Population	15,374	100.00%	14,593	100.00%	-781	-5%
Hispanic or Latino (of any race)	147	0.96%	180	1.23%	33	22%
Not Hispanic or Latino	15,227	99.04%	14,413	98.77%	-814	-5%
Source: U. S. Census and CRC						

Income

Poverty Rate

This section evaluates income levels, income distribution and poverty levels in the region and compares them to the State of Georgia and national data. The poverty rate for families in Coastal Georgia ranges from a low of 7.9% in Effingham County to a high of 21% in Screven County. The poverty rate for persons in Coastal Georgia ranges from a low of 11.2% in Effingham County to a high of 31.3% in Bulloch County. The poverty rate for persons in the State of Georgia is 18.2% and in the United States it is 15.4%. Bulloch, Chatham, Glynn, Liberty, Long, and Screven Counties all have a poverty rate higher than the State of Georgia. Additionally, Camden County has a poverty rate higher than the national rate. Only Bryan, Effingham, and McIntosh Counties have poverty rates lower than both the state and national rates. See Table 8 below.

Table 8 – Poverty Rate by county

Table 8		
Poverty Rate for Families and Persons by County		
County	Families	Persons
Bryan	8.60%	11.70%
Bulloch	16.30%	31.30%
Camden	13.70%	15.50%
Chatham	13.50%	19.10%
Effingham	7.90%	11.20%
Glynn	15.30%	19.20%
Liberty	15.60%	18.70%
Long	17.00%	19.20%
McIntosh	10.50%	14.90%
Screven	21.00%	27.00%
CRC Average	19.94%	18.78%
State of Georgia		18.20%
United States		15.40%
Source: American Community Survey 2013 - Economic Characteristics		

Median Family Income

Median Family Income (MFI) is that mid-point where half of family incomes are higher and half of family incomes are lower than that particular figure. Many social programs, especially state and federal housing and community development programs use the figure for median income for a family of four as the starting point to establish income limits that qualify families for various types of assistance based upon need. These figures are adjusted upward and downward depending on family size. The U. S. Department of Housing and Urban Development (HUD) publishes tables on an annual basis listing the MFI for every Metropolitan Statistical Area (MSA), HUD Metro Fair Market Rent Area (HMFA), and rural county by state. These tables also show the Low- and Moderate-Income (LMI) thresholds for each area, along with calculations for Very-Low Income (VLI) and Extremely-Low Income (ELI); with low-income being 80% of MFI, very-low income being 50% of MFI and extremely-low income being 30% of MFI.

MFI ranges from \$48,700 in Liberty County to \$65,400 in Camden County. By comparison, MFI for the State of Georgia is \$58,755 and for the United States it is \$64,719. See Table 9 below.

Table 9 – Median Family Income by MSA and/or County

Table 9 Median Family Income			
MSA, HMFA, or Rural	County	MFI	L/M Threshold
Savannah, GA MSA	Bryan	\$61,300	\$49,040
Savannah, GA MSA	Chatham	\$61,300	\$49,040
Savannah, GA MSA	Effingham	\$61,300	\$49,040
Brunswick, GA MSA	Glynn	\$55,300	\$44,240
Brunswick, GA MSA	McIntosh	\$55,300	\$44,240
Hinesville-Ft. Stewart, GA HMFA	Liberty	\$48,700	\$38,960
Long County, GA HMFA	Long	\$51,000	\$40,800
Rural	Bulloch	\$51,700	\$41,360
Rural	Camden	\$65,400	\$52,320
Rural	Screven	\$50,900	\$40,720
Source: huduser.org and U.S. Census			

Housing

Use the following factors to evaluate the adequacy and suitability of existing housing stock to serve current and future regional needs.

Housing Types & Mix

Coastal Georgia was one of the original thirteen colonies. It's not surprising to find a rich mix of housing and significant historic housing. As the region has grown, the development of housing stock over the decades has kept pace with population growth, and regionally more homes have been built in every subsequent decade than were built in the previous decade. See Table 10 below.

The single exception to that trend has been the dramatic drop in housing construction since 2010. During this short time frame, the annualized rate of home building declined between 47% and 95% among the counties and declined 85% for the region as a whole. This information clearly shows the long lasting effects of the economic decline caused by the recent recession. See Table 13.

Table 10 – Age of Housing Stock

Table 10					
Age of Housing Stock					
County	Total Units	Built 2010 or later	Built 2000 to 2009	Built 1990 to 1999	Built 1980 to 1989
Bryan	12,132	134	4,075	3,163	1,732
Bulloch	29,026	234	8,864	5,947	4,645
Camden	21,174	221	5,444	5,965	4,898
Chatham	120,146	1,321	25,540	16,230	17,257
Effingham	19,919	206	7,074	5,223	3,342
Glynn	40,872	152	9,795	6,983	6,554
Liberty	26,762	327	6,684	7,126	5,708
Long	5,979	239	1,517	1,847	1,159
McIntosh	9,171	52	2,294	2,649	1,387
Screven	6,706	42	778	1,204	1,174
CRC Region	291,887	2,928	72,065	56,337	47,856
Source: U. S. Census Bureau, American Community Survey - Housing Characteristics 2009-2013 5-Yr. Estimate					

Table 10 - continued Age of Housing Stock					
County	Built 1970 to 1979	Built 1960 to 1969	Built 1950 to 1959	Built 1940 to 1949	Built 1939 or earlier
Bryan	1,395	472	287	514	360
Bulloch	3,671	2,347	1,505	448	1,365
Camden	1,741	947	946	479	533
Chatham	16,734	12,493	12,305	6,422	11,844
Effingham	1,591	853	577	258	795
Glynn	6,070	4,172	3,410	1,991	1,745
Liberty	3,395	1,503	1,029	490	500
Long	569	212	216	152	68
McIntosh	1,295	590	179	347	378
Screven	1,204	702	549	313	740
CRC Region	37,665	24,291	21,003	11,414	18,328
Source: U. S. Census Bureau, American Community Survey - Housing Characteristics 2009-2013 5-Yr. Estimate					

Table 11 – Annualized Rate of Construction

Table 11 Annualized Rate of Construction										
	2010+	2000- 2009	1990- 1999	1980- 1989	1970- 1979	1960- 1969	1950- 1959	1940- 1949	1939 or earlier	Decline in bldg. rate from 2000 to 2010
Bryan	45	408	316	173	140	47	29	51	36	89%
Bulloch	78	886	595	465	367	235	151	45	137	91%
Camden	74	544	597	490	174	95	95	48	53	86%
Chatham	440	2554	1623	1726	1673	1249	1231	642	1184	83%
Effingham	69	707	522	334	159	85	58	26	80	90%
Glynn	51	980	698	655	607	417	341	199	175	95%
Liberty	109	668	713	571	340	150	103	49	50	84%
Long	80	152	185	116	57	21	22	15	7	47%
McIntosh	17	229	265	139	130	59	18	35	38	92%
Screven	14	78	120	117	120	70	55	31	74	82%
CRC Region	976	7207	5634	4786	3767	2429	2100	1141	1833	86%
Source: U. S. Census Bureau, American Community Survey - Housing Characteristics 2009-2013 5-Yr. Estimate										

Condition and Occupancy

Housing tenure is the term used to describe whether home occupants are renters or homeowners. It has been federal public policy for more than a decade to increase the rate of home ownership. It is felt that home ownership creates community stability, and importantly, allows home owners to build up equity in their homes and pass this equity along to subsequent generations. The creation of generational equity provides capital for future generations to afford homes of their own, and it also allows them to higher education. From a public policy perspective, this creates a more stable middle class, and more ready workforce, and stable communities.

The rate of homeownership in Coastal Georgia ranges from a low of 51% in Bulloch County to a high of 82% in McIntosh County. This compares to a statewide rate of 65.1% and a national rate of 64.9%.

Table 12 Housing Tenure					
County	Occupied Housing Units	Owner Occupied	Percent	Renter Occupied	Percent
Bryan	11,230	7,880	70%	3,350	30%
Bulloch	25,254	12,852	51%	12,402	49%
Camden	18,386	11,594	63%	6,792	37%
Chatham	102,484	58,886	57%	43,598	43%
Effingham	17,830	13,666	77%	4,164	23%
Glynn	31,457	19,530	62%	12,017	38%
Liberty	23,046	11,773	51%	11,273	49%
Long	4,841	3,009	62%	1,832	38%
McIntosh	4,993	4,071	82%	922	18%
Screven	5,165	3,656	71%	1,509	29%
CRC Region	244,686	146,917	60%	97,859	40%
Georgia			65.1		34.9
United States			64.9		35.1
Source: U. S. Census Bureau, American Community Survey - Housing Characteristics 2009-2013 5-Yr. Estimate					

Another data set that we report on, that was included in our discussion of resilient communities, is the percentage of mobile homes, by county. As can be seen in Table 13 below, the highest percentage of families living in mobile homes is Long County at 49.2% and the lowest percentage is Chatham County at 4.6%.

Table 13 – Percentage of Mobile Homes

Table 13 Percentage Living in Mobile Homes	
County	Percent Mobile Home
Bryan	13.90%
Bulloch	18.30%
Camden	14.20%
Chatham	4.60%
Effingham	24.00%
Glynn	12.70%
Liberty	18.50%
Long	49.20%
McIntosh	39.60%
Screven	34.00%
Source: U. S. Census Bureau, American Community Survey - Housing Characteristics 2009-2013 5-Yr. Estimate	

One of the many things that the U. S. Census gathers data on is the condition of housing. The government defines substandard housing as housing units that lack one or more of the following items: complete plumbing facilities, complete kitchen facilities, no telephone service available, and overcrowding, defined as 1.5 or more persons per room. Since it is quite possible that a housing unit may have one or more of these conditions, but perhaps not all of these conditions, it is difficult to get an accurate total of the number of substandard units. The totals reflected below in Table 14 probably skew towards the high side, but it is still a valid indicator of housing needs in the community.

Table 14 – Substandard Units

Table 14 Substandard Units							
County	Total Units	Lacking complete plumbing facilities	Lacking complete kitchen facilities	No telephone service available	1.5 or more persons per room	Total Substandard Units	Percent Substandard Units
Bryan	13,132	90	70	275	20	455	3.5%
Bulloch	25,254	90	147	907	215	1,359	5.4%
Camden	18,386	123	157	474	76	830	4.5%
Chatham	102,484	279	499	2,226	339	3,343	3.3%
Effingham	17,830	53	111	283	112	559	3.1%
Glynn	31,547	388	384	1,047	156	1,975	6.3%
Liberty	23,046	51		9	359	69	488
Long	4,841	21		5	134	26	186
McIntosh	4,993	67	47	245	0	359	7.2%
Screven	5,165	12	87	189	0	288	5.6%
CRC Region	246,678	1,174	1,516	6,139	1,013	9,842	4.0%
Source: U. S. Census Bureau, American Community Survey - Housing Characteristics 2009-2013 5-Yr. Estimate							

Cost of Housing

The cost of housing in the region, both for owners and renters, in terms of affordability is evaluated based upon the percentage of gross family income that must be set aside for housing. For home owners, housing cost is the sum of principal, interest, taxes, and insurance (PITA). For renters, housing cost is the sum of rent paid plus utilities.

Cost-Burdened Households

Evaluate the needs of households that are cost-burdened (paying 30% or more of net income on total housing costs) and severely cost-burdened (paying 50% or more of net income on total housing costs). Also evaluate the relationship of local housing costs and availability to the socioeconomic characteristics of these households, including income, income from social security or public assistance, employment status, occupation, household type, age of householder, household size, race, and unit type.

Table 15.1					
Housing Cost Burden – Owner-Occupied Housing Units with a Mortgage					
County	Housing Units with a mortgage	Monthly Costs 30.0-34.9%	Percent	Monthly Costs 35%+	Percent
Bryan	5,843	679	12%	1,123	19%
Bulloch	7,799	694	9%	1,705	22%
Camden	7,892	727	9%	2,336	30%
Chatham	38,791	2,892	7%	12,008	31%
Effingham	9,692	788	8%	1,918	20%
Glynn	12,147	783	6%	3,581	29%
Liberty	8,376	703	8%	2,351	28%
Long	1,934	149	8%	476	25%
McIntosh	2,037	115	6%	772	38%
Screven	1,812	133	7%	502	28%
CRC Region	96,323	7,663	8%	26,772	28%

Source: U. S. Census Bureau, American Community Survey - Housing Characteristics 2009-2013 5-Yr. Estimate

Table 15.2					
Housing Cost Burden – Owner-Occupied Housing Units without a Mortgage					
County	Housing Units without a mortgage	Monthly Costs 30.0-34.9%	Percent	Monthly Costs 35%+	Percent
Bryan	2,026	8	0.4%	284	14%
Bulloch	4,847	207	4.3%	382	8%
Camden	3,568	90	2.5%	467	13%
Chatham	19,470	529	2.7%	2,426	12%
Effingham	3,886	50	1.3%	274	7%
Glynn	7,259	195	2.7%	756	10%
Liberty	3,248	114	3.5%	360	11%
Long	1,053	0	0.0%	79	8%
McIntosh	2,034	55	2.7%	243	12%
Screven	1,804	55	3.0%	203	11%
CRC Region	49,195	1,303	2.6%	5,474	11%

Source: U. S. Census Bureau, American Community Survey - Housing Characteristics 2009-2013 5-Yr. Estimate

**Table 15.3
Housing Cost Burden – Renter-Occupied Housing Units**

County	Housing Units paying rent	Monthly Costs 30.0-34.9%	Percent	Monthly Costs 35%+	Percent
Bryan	2,971	358	12%	978	33%
Bulloch	11,107	793	7%	5,724	52%
Camden	6,354	635	10%	2,356	37%
Chatham	39,968	3,901	10%	18,867	47%
Effingham	3,775	372	10%	1,326	35%
Glynn	11,180	926	8%	4,963	44%
Liberty	10,253	1,080	11%	4,102	40%
Long	1,717	80	5%	679	40%
McIntosh	725	31	4%	315	43%
Screven	1,082	81	7%	498	46%
CRC Region	89,132	8,257	9%	39,808	45%

Source: U. S. Census Bureau, American Community Survey - Housing Characteristics 2009-2013 5-Yr. Estimate

Special Housing Needs

Evaluate special housing needs in the region (e.g., housing needs of residents who are elderly; homeless; victims of domestic violence; migrant farm workers; persons with mental, physical, or developmental disabilities; persons with HIV/AIDS; and persons recovering from substance abuse) using information obtained from local service providers on caseloads, waiting lists, etc.

Jobs-Housing Balance

Evaluate housing costs compared to wages and household incomes of the resident and nonresident workforce to determine whether sufficient affordable housing is available and appropriately distributed within the region to allow people to live near where they work. Data on the commuting patterns of the resident and nonresident workforce may assist in determining whether there is a jobs-housing balance issue in the region. Also evaluate any barriers that may prevent a significant proportion of the region's nonresident workforce from residing in the jurisdiction, such as a lack of suitable or affordable housing, suitably zoned land, etc.

Economic Development

The Coastal Regional Commission serves as the regional planning agency for the ten counties in Coastal Georgia: Bryan County, Bulloch County, Camden County, Chatham County, Effingham County, Glynn County, Liberty County, Long County, McIntosh County, and Screven County. These counties are bounded together as a region by their geography, their key manufacturing sectors, two major ports, a robust transportation network, a significant military presence, and most importantly – a regional commitment to economic development.

We have identified the following trends and issues relating to the economic characteristics of the region, including the region’s economic base, its labor force, regional economic resources, and ongoing economic trends within the region.

Economic Base

Overview

Through the Coastal Regional Commission’s empirical observations, the Aerospace Product and Parts Manufacturing Sector (NAICS Code 3364) is an extremely strong sector of the regional economy and one with great potential for continued growth. Quantitative data is difficult to obtain for this sector making the Location Quotient non-reportable; however, Gulfstream Aerospace alone employs 65% of the Manufacturing Sector of the Chatham County economy. Gulfstream Aerospace and Stambaugh Aviation both have a significant presence in Brunswick, GA located in Glynn County towards the southern end of the region.

Coastal Georgia has the good fortune to have a diversified economy that provides economic resilience should there be a downturn in one particular sector of the economy. We are strong in non-manufacturing sectors of the economy, particularly Tourism and Hospitality, Higher Education, and Healthcare. The film and studio production industry has just established a significant presence in Effingham County. The Georgia Ports Authority operates the Port of Savannah and the Port of Brunswick. The Port of Savannah is the second busiest port on the Eastern Seaboard and is the largest single container terminal in North America. The Port of Brunswick is the largest automobile facility in North America. Strategically located with easy connectivity to air, ground, and rail transportation, Coastal Georgia can provide the logistics for getting goods to and from the global market; with the development of the Georgia Spaceport on the horizon in Camden County, the old saying “the sky’s the limit” may no longer apply to Coastal Georgia.

Coastal Georgia understands a manufacturing economy is a strong economy. While we are strategically growing our aerospace industry and preparing for a strong tomorrow, we have solid fundamentals for today's economy. We meet or exceed the thresholds for top- third ranked location quotients in several sectors across the region; including Sugar and Confectionery, Petroleum and Coal, Cement and Concrete, and Lime and Gypsum in Chatham County, Cement and Concrete in Effingham County, and Nonmetallic Mineral Product Manufacturing in Bryan, Bulloch, Chatham, Effingham, and Liberty Counties. See Table 18 below.

Table 16 – Top-Third Ranked Manufacturing Industries

Table 16					
Top-Third Ranked Manufacturing Industries in Coastal Georgia					
NAICS Code	NAICS Title	Jurisdiction	Location Quotient	Establishment LQ Cutoff	Difference
3113	Sugar and Confectionary	Chatham County	6.23	1.30	4.93
3241	Petroleum and Coal	Chatham County	1.83	1.32	0.51
3273	Cement and Concrete	Chatham County	1.56	1.38	0.18
3274	Lime and Gypsum	Chatham County	9.35	1.26	8.09
3273	Cement and Concrete	Effingham County	8.10	1.38	6.72
327	Nonmetallic Mineral	Bryan	2.36	n/a	n/a
327	Product Manufacturing	Bulloch	4.41	n/a	n/a
327	Nonmetallic Mineral	Chatham	1.17	n/a	n/a
327	Product Manufacturing	Effingham	3.64	n/a	n/a
327	Nonmetallic Mineral	Liberty	2.79	n/a	n/a
Source: U.S. Census Bureau of Labor Statistics, 2014					

Although small businesses and family owned concerns are found throughout the manufacturing sector in Coastal Georgia, we are also home to 39 companies with 100 employees or more, three of these employ 1,000 or more, and Gulfstream Aerospace is the clear industry leader with more than 15,000 employees, a workforce greater than the entire population of some of our rural counties. See Table 17 below.

Table 17 - Major Manufacturing Employers in Coastal Georgia				
Location	Employer	NAICS Code	NAICS Title	Employees
Bryan County	Daniel Defense	332994	Small arms	250
	Hobart Corporation	333241	Food product machinery	113
	Oracal USA	326113	Unlaminated plastics	128
Bulloch County	Briggs & Stratton	333618	Lawnmower engines	550
	Viracon Georgia	327211	Flat glass	402
	VF Jeanswear	315240	Women's apparel	400
Camden County	Lockheed Martin	334511	Search & nav. Equip	531
	MeadWestvaco	322130	Paperboard	234
Chatham County	Arizona Chemical	324110	Petroleum	133
	Ash Shipping	311340	Confectionery	200
	Building Materials Corp.	321219	Reconstituted wood	150
	EMD Millipore	325180	Inorganic chemicals	180
	GE Aviation	488190	Aviation support	150
	GA Dept. of Def.	488119	Airport operations	200
	Georgia Pacific	327420	Gypsum products	150
	Great Dane	336212	Truck trailer manuf.	1,000
	Gulfstream Aerospace	336411	Aircraft manufacturing	15,657
	Honeywell International	334511	Search & nav. Equip.	543
	Imperial Savannah	311314	Cane sugar refining	125
	International Paper	322121	Paper mills	637
	Lummus Corp.	333517	Machine tool manuf.	160
	Netjets International	481219	Non-sched. Air trans.	665
	Owens Corning	327993	Mineral wool	140
	Peter Brasseler	339114	Dental equipment	225
	Rocktenn	322130	Paperboard	520
	Roger Wood Foods	311612	Meat processing	250
	Standard Concrete	327390	Concrete products	100
	Talaria	336612	Boatbuilding	154
Effingham County	EFACEC Group	334111	Elec. Computer manuf.	105
	Georgia Pacific	322121	Paper mills	1,500
	Southern Sample	327120	Structural clay	134
Glynn County	Brunswick Cellulose	322110	Pulp mills	650
	Georgia Pacific	327420	Gypsum products	292
	Jered LLC	335314	Relays & Ind. Controls	100
	Rich Products Corp.	311710	Seafood product	301
Liberty County	Coca-Cola	312111	Soft drink manuf.	116
	International Greetings	322220	Paper bag products	170
Screven County	King American	313210	Broadwoven fabrics	390
	Koyo Bearings	332991	Ball and roller bearings	320

Source: Georgia Department of Economic Development 2014

Labor Force

The following section discusses the region's labor force by county, including employment status, occupations, leading industries, personal income, wages, and commuting patterns. Data is derived from the Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2012 Annual Average, the Georgia Department of Economic Development 2014, and Coastal Regional Commission, Economic Development Department analysis performed in 2014.

Bryan County

Bryan County has 30 businesses participating in the manufacturing industries. Major employers include Daniel Defense, a small arms manufacturer (149 employees), Hobart Corporation, a manufacturer of food product machinery (113 employees), and Oracal USA a manufacturer of unlaminated plastic products (128 employees).

Bryan County has a labor force of 15,816, of these 14,880 are employed with an effective unemployment rate of 5.9% as of December 2013. There are 4,439 workers employed in industry, 2,111 employed by the major employers within the county; and the county's most significant industry by Location Quotient (LQ) is nonmetallic mineral product manufacturing with a 2.36 LQ.

Bulloch County

Bulloch County has nearly 100 businesses participating in the manufacturing industries. These include six corporations in the Nonmetallic Mineral Product Manufacturing sector, three corporations in avionics and aviation operations, and two corporations that manufacture engines or transmissions. Major employers include Briggs & Stratton (550 employees), Viracon Georgia, Inc. (402 employees), and VF Jeanswear (400 employees).

In Statesboro, the county seat of Bulloch County, Georgia Southern University has created City Campus a joint city and university facility in downtown Statesboro developed to serve as a catalyst for regional economic development. The mission of the City Campus is to increase the economic competitiveness of southeast Georgia by offering programs that lead to new businesses being formed and jobs being created.

City Campus sponsors three programs:

- The Bureau of Business Research & Economic Development (BBRED) – the economic outreach are of the College of Business Administration (COBA) at Georgia Southern conducting applied research on community and business development in Statesboro and the region of southeast Georgia;
- The Center for Entrepreneurial Learning and Leadership (CELL) – a center for entrepreneurship that “seeks to contribute to the economic and social well-being of Statesboro and surrounding counties through entrepreneurship education and venture creation;” and
- Georgia's Enterprise Network for Innovation Entrepreneurship (GENIE) – a virtual incubator linking businesses in economically challenged counties in rural Georgia to the resources available through COBA whose major goal is to create and/or retain jobs in Georgia through mentoring, connecting, and training programs.

Camden County

Camden County has nearly 50 businesses participating in the manufacturing industries. These include companies engaged in millwork, boatbuilding and repair, shipbuilding and repair, industrial machinery, construction machinery, aviation manufacturing, aviation operations, search, detection, navigation, guidance, and aeronautics manufacturing, and guided missile and space vehicle manufacturing. Major employers include Lockheed Martin (531 employees) and MeadWestvaco Corporation (234 employees). Camden County is home to the only Navy base in Georgia (NSB Kings Bay), the homeport to East Coast Trident Submarine Fleet. Camden County is actively pursuing another component of the aerospace industry by seeking an Opportunity Zone designation from the Georgia Department of Community Affairs (DCA) to develop an 11,800 acre site as the Georgia Spaceport. Successful development of this site, the influx of cutting edge technology, and the demand for a highly skilled workforce, will compliment Gulfstream's long history in the region and provide regional economic growth.

Chatham County

Chatham County has nearly 500 businesses in a very diverse manufacturing sector. Representative industries include aircraft manufacturing, air transportation support, airport operations, aviation and aeronautics, boat-building and repairing, candy and confectionery, cane sugar refining, cement and cement products, concrete products, dental equipment and supplies, gypsum products, industrial inorganic chemicals, machine tool manufacturing, mineral wool, nonscheduled air transportation, paper mills, paperboard mills, petroleum refineries, reconstituted wood products, sausages and other prepared meats, search and navigation equipment, and truck trailer manufacturing.

Major employers in Chatham County include Arizona Chemical Company (133 employees), Ash Shipping (200 employees), Building Materials Corporation of America (150 employees), EMD Millipore Corporation (180 employees), GE Aviation Systems (150 employees), Georgia Department of Defense (200 employees), Georgia-Pacific (150 employees), Great Dane (1,000 employees), Gulfstream Aerospace Corporation (15,657 employees), Honeywell International (543 employees), Imperial Savannah (125 employees), International Paper Company (637 employees), Lummus Corporation (160 employees), Netjets International, Inc. (665 employees), Owens Corning (140 employees), Peter Brasseler Holdings (225 employees), Rocktenn (520 employees), Roger Wood Foods, Inc. (250 employees), Standard Concrete Products (100 employees), and The Talaria Company (154 employees).

The Savannah area, located in coastal Chatham County, Georgia, boasts a flourishing economy balanced on a strong foundation that includes a thriving port, increasing tourism, a stabilizing manufacturing sector and significant military presence. We are proud of our major employers, and the numbers speak for themselves – Manufacturing Employers have a workforce of 14,406. Although the total numbers for the Aerospace Product and Parts Manufacturing Sector are not disclosed making it difficult to compute the Location Quotient for this sector of the economy, Gulfstream Aerospace alone employs 65% of the Manufacturing Sector of the Chatham County economy.

Other significant manufacturing industries for which Location Quotient data are available in Chatham County are Sugar and Confectionery (LQ 6.23), Petroleum and Coal (LQ 1.83), Basic Chemical (LQ 2.88), Cement and Concrete (LQ 1.56), and Lime and Gypsum (LQ 9.35).

We are also home to the Georgia Port Authority-Port of Savannah, the largest single container terminal in North America with over four million square feet of warehouse space, immediate access to two major interstates, 9,700 feet of contiguous berth space, a four- hour drive to major markets: Atlanta, Orlando and Charlotte, and the largest concentration of import distribution centers on the East Coast. The Savannah/Chatham metro area is the hub of an 11-county labor draw area with a population of over 700,000 and a labor pool of nearly 350,000.

Effingham County

Traditional industry is still a major presence in Effingham County with the Georgia Pacific paper mill (1,500 employees) being the largest employer; however, new technologies including aircraft parts and equipment and electronic computers are being developed. The largest manufacturing employers in Effingham County are EFACEC Group (105 employees), Georgia Pacific (1,500 employees), and Southern Sample Company (134 employees).

The Effingham County Industrial Park became the site of EFACEC Group, a Portuguese- based transformer manufacturer for their North and Central America operations. The U.S. factory is located in Rincon, GA and produces both core and shell technology power transformers. Its first plant and the only one of its kind in the U.S. EFACEC Group, one of the world's leading manufacturers of power substations, is investing \$130 million in the new facility and will create up to 700 jobs.

According to research from the Georgia Department of Economic Development (GDEcD), EFACEC's Effingham County facility could generate more than 1,500 direct and indirect jobs in the region by 2017.

Glynn County

Glynn County has a diverse manufacturing base with a strong presence in aviation and related services, fresh or frozen packaged fish, paper products, and relays and industrial controls. Major manufacturing employers include Brunswick Cellulose, Inc. (650 employees), Georgia Pacific (292 employees), Jered LLC (100 employees), and Rich Products Corporation (301 employees).

Liberty County

Liberty County's top manufacturing employers include Coca-Cola (116 employees) and International Greetings USA, Inc. (170 employees).

Screven County

Screven County's two largest manufacturing employers are King American Finishing, a fabric mill with 390 employees and Koyo Bearings USA whose 320 employees produce ball and roller bearings. Screven County's economy is represented by a diverse mix of manufacturing, machining, and food processing. Equally as important as diversity is longevity of success. Many of our businesses boast record performances dating back a quarter century, some more than 50 years. Faced with the high-pressure demands of a global market Screven's long-standing industry has capitalized on new opportunities, relying on a nimble can-do workforce, supportive community leadership and great location advantages. In fact, the long-term prosperity of Screven operations is actually only natural: For today's industry, it's all about quality and speed to market, and those have always been Screven's strengths.

Economic Resources

Evaluate the development agencies, programs, tools, education, training and other economic resources available to the region's businesses and residents.

Coastal Regional Commission of Georgia

The Coastal Regional Commission facilitates a monthly council meeting with all of the cities, counties, and development authorities listed below. Each jurisdiction is represented by elected and non-elected officials and prescribed by Georgia law. In addition to the monthly council meetings, the commission's staff works in close collaboration with each jurisdiction to meet their economic development needs, to explore and develop funding opportunities, and to provide regional comprehensive planning. Beginning in July 2014, the Coastal Regional Commission has conducted regional manufacturing round tables to encourage dialogue and best practices.

Bryan County:

Pembroke, Richmond Hill, and the Development Authority of Bryan County.

Bulloch County:

Brooklet, Portal, Register, Statesboro, and the Development Authority of Bulloch County and Chamber of Commerce.

Camden County:

Kingsland, St. Marys, Woodbine, the Chamber of Commerce, and the Joint Development Authority.

Chatham County:

Bloomington, Garden City, Pooler, Port Wentworth, Savannah, Thunderbolt, Tybee Island, Vernonburg, the Savannah Economic Development Authority, and the Chamber of Commerce.

Effingham County:

Guyton, Rincon, Springfield, and the Chamber of Commerce and Development Authority.

Glynn County:

Brunswick, the County Development Authority, and the Chamber of Commerce.

Liberty County:

Allenhurst, Flemington, Gumbranch, Hinesville, Midway, Riceboro, Walthourville, the Industrial Authority, and the Chamber of Commerce.

Long County:

Ludowici, the County Development Authority, and the Chamber of Commerce.

McIntosh County:

Darien, the County Development Authority, and the Chamber of Commerce.

Screven County:

Hiltonia, Newington, Oliver, Rocky Ford, Sylvania, the Industrial Development Authority, and the Chamber of Commerce.

Higher Education:

Altamaha Technical college, Armstrong Atlantic State University, Coastal College of Georgia, Georgia Southern University, Georgia Technical Aviation Program, Ogeechee Technical College, Savannah College of Art & Design, Savannah State University, and Savannah Technical College.

Economic Trends

The two projects with the greatest potential for economic impact in the region are the Savannah Harbor Expansion Project (SHEP) and the development of Spaceport Camden.

With SHEP, the Port of Savannah, operated by the Georgia Port Authority, will be able to accommodate the newer vessels being made possible by the Panama Canal expansion. These ships will be longer, have broader beams, and deeper drafts than those previously visiting the port. This will lead to an exponential increase in the tonnage arriving and departing from the port. Port expansion will create a ripple effect throughout the region in the areas of freight logistics, storage, and distribution; there will also be subsequent demands on infrastructure, including rail, highway, water, and power.

The Camden Spaceport represents a truly 21st Century realm of economic development. Although private space operations currently exist, at this point in time, private corporations must share site space and launch times with government facilities. Spaceport will be an exclusively private commercial operation and will have significant impact on the economy of Coastal Georgia and North Florida as it is developed over the next several years.

Comprehensive Economic Development Strategy

The Comprehensive Economic Development Strategy (CEDS) document submitted to EDA by the Coastal Regional Commission in 2012 identifies economic development projects throughout the region.

The following is a synopsis of information on potential projects.

Regional Projects

- Continuation of a Coastal Georgia Economic Development forum to identify and engage in projects of regional collaboration and to serve as a liaison to State legislators in Atlanta.
- Promote coordination of business retention and expansion programs for existing industries in cooperation with respective county economic development organizations and the GA Department of Economic Development.
- Identify and promote the opportunities to gain access to capital that will leverage private investments and create sustained employment.

Bryan County

- New interchange on I-95 and Belfast Keller Road and Belfast Commerce Centre Industrial Park.
- Phase II development of Interstate Centre industrial park.
- Fully developed industrial parks on I-16 and I-95.

Bulloch County

- The Development Authority of Bulloch County owns approximately 200 acres at the Interstate 16/ Highway 301 interchange, most likely to be the focus of industrial development. Bulloch County is working towards master planning of the larger interchange area.
- Gateway Regional Industrial Park- Phase II of the park includes an additional 160 acres for development.

Camden County

- Development of a countywide implementation strategy addressing specific economic development actions for each city.
- Implement recommendations from the Camden County Economic Diversification study.
- Acquisition of 100 acres of land for development of a business park and installation of infrastructure with 200,000 square foot speculative building with the ability to expand.
- Infrastructure for Kingsland Commerce Park industrial site to include a water tank for fire flow.
- Design and construction of expanded rail access to connect Kingsland with CSX mainline north of Folkston in Charlton County.

Chatham County

- Improvements necessary to help locate an industry on the megasite.
- Identification and development of more industrial sites.
- Port deepening in Savannah Harbor.
- Improvements necessary to attract more aerospace and advanced manufacturing opportunities.
- Develop the Savannah region as a center for materials research and development and build on capabilities including SCAD's industrial design program and HERTY Advanced Materials Development Center.

Effingham County

- Interstate 16 Industrial Tracts: Infrastructure development (water, wastewater treatment, and road work).

Glynn County

- Additional rail capabilities.
- Existing manufacturing expansions for industries such as Georgia Pacific.
- Pad ready industrial site improvements at Tradewinds.
- The Manufacturers Round Table – once per quarter, around 30 of the areas manufacturers get together to discuss how they can pool their resources to make a positive impact on the area's business climate. As a group, they have decided to focus on working with the local education system to introduce students to modern manufacturing.

Liberty County

- Tradeport West Business Center infrastructure to include provision of road, water, sewer, drainage systems and rail improvements to service.
- Tradeport East water reclamation facility; road, water and sewer extensions; grading improvements; and an elevated water tank.
- Hinesville Technology Park: road, water, sewer extensions, and grading improvements.
- Midway Industrial Park Phase 3: road, water, sewer, drainage, and grading improvements.

Long County

- Industrial park improvements and infrastructure.

McIntosh County

- Continue to promote the McIntosh County industrial park and construct necessary infrastructure for industry expansion.
- Rail line reactivation/rail bridge/spur: Tie Ports of Savannah and Brunswick by reactivating the abandoned CSX line from Richmond Hill - Riceboro - Everett

Screven County

- Attract tenant to pad-ready site.
- Complete GRAD certification for industrial park and construct infrastructure (rail, gas, etc.) that will help attract industry.
- Acquire a rail-served site and prepare it for development.
- Assist existing industry with capital projects to facilitate expansion.

Guiding Principles: Business and Industry

The Regional Plan defines a vision to develop and facilitate the implementation of successful strategies that leverage existing regional economic engines, regional resources, state and federal government guidance and create a quality of life to attract compatible and strategic business opportunities, high wage jobs and investment to Georgia's coastal communities. Our goal is that the entire region shares in jobs and investment created through an integrated balance of sustainable economic development initiatives.

Strategies

- Promote strategic distributions of business and industry across the region consistent with natural, cultural, historic and industrial resource strategies and encourage partnerships and collaboration between economic development agencies.
- Investigate ways to share costs and benefits across jurisdictional lines for both regional marketing and project support.
- Incorporate community plans for the strategic use of land for manufacturing, distribution, etc., while recognizing and respecting natural resources and the unique differences between communities.
- Coordinate with the Georgia Ports Authority (GPA) to identify their needs and identify mechanisms for the economic development industry to strengthen the GPA and its presence in logistics, distribution, and workforce development.
- Leverage and incorporate the region's military installations (Fort Stewart Army Base, Hunter Army Airfield and Kings Bay Naval Base) and the Federal Law Enforcement Training Center to recruit economic development projects.
- Incorporate HERTY Advanced Materials Development Center's experience and position as a development center for the commercialization of materials and create incentives to retain a portion of pilot plant opportunities as new Georgia industries and to assist development authorities in increasing recruitment win rates.
- Coordinate federal, State and local economic development funding programs and initiatives that affect the coast.
- Enhance workforce development by collaborating with business, industry, and planning of educational entities that provide necessary workforce skills.
- Increase existing industry retention and expansion rates.
- Incorporate current and future needs for housing, infrastructure, and natural resource protection into economic development initiatives.
- Encourage international economic developments that support strategic industry sectors.

Community Facilities and Services

Water Supply and Treatment

The supply of water is a major issue along the coast, and new restrictions on municipal and private use of the Floridan Aquifer are imminent. This could limit development in general, and will probably restrict large-scale manufacturing in particular. Average per capita water use in the region is significantly lower than the state average, but industrial and recreational uses still consume a large portion of the permitted capacity drawn from the aquifer.

The most comprehensive public water supply and treatment facilities are in Chatham, Glynn and Liberty counties. In Chatham County, water is provided by the City of Savannah and other municipal and privately-owned systems. The Brunswick-Glynn County Joint Water & Sewer Commission provides water to the City of Brunswick, Saint Simons Island, and much of the unincorporated area of Glynn County. The Jekyll Island Authority serves the island. In Liberty County, the Development Authority and the City of Midway have worked to coordinate water service delivery to new commercial development, the City of Hinesville serves the adjacent city of Flemington, the City of Allenhurst is served by Walthourville, and Riceboro maintains its own facilities. McIntosh County, the City of Darien, and the McIntosh Industrial Development Authority provide water service in McIntosh County. Bryan County has an agreement with the City of Savannah to provide water in selected unincorporated areas, and the cities of Pembroke and Richmond Hill both provide water within their boundaries and to some unincorporated areas. In Camden County, public water service is limited to the municipalities, while the unincorporated areas rely on private systems and wells.

Due to the 2006 Coastal Georgia Water and Wastewater Permitting Plan for Managing Salt Water Intrusion, coastal counties and cities are faced with the need to identify alternative sources for potable water and landscape irrigation. One promising approach is “purple pipe” systems, which promote conservation by utilizing treated recycled water for various outdoor uses, including irrigation.

Sewer Service

Chatham and Glynn counties operate sewer systems that serve portions of each county. In Chatham County sewage treatment is also provided by several municipal and private systems. Glynn County is also served by municipal and private systems. In Liberty County, the City of Hinesville serves Walthourville, Allenhurst and Flemington.

Table 19 – Acreage Suitable for Septic Systems

Table 18 Water & Sewer Service Delivery	
Bryan	Provided by Bryan County and the City of Richmond Hill
Bulloch	Provided by Bulloch County, City of Statesboro, Town of Brooklet, Town of Portal, and Town of Register
Camden	Provided by Camden County, City of Kingsland, City of St. Marys, and City of Woodbine
Chatham	The City of Savannah provides water to the City of Pooler, Bloomingdale, Thunderbolt, Vernonburg, and to the City of Garden City under the terms of water supply agreements. The remaining communities, Port Wentworth and Tybee Island, and unincorporated Chatham County have their own sources.
Effingham	Provided by Effingham County, City of Guyton, City of Rincon, and City of Springfield
Glynn	Provided by the Brunswick-Glynn Joint Water & Sewer Commission
Liberty	Liberty County water service area serves an unincorporated area; Hinesville includes all of Flemington, part of Allenhurst, and some unincorporated county; Midway includes some unincorporated county; Riceboro includes some unincorporated county, Walthourville includes part of Allenhurst and some unincorporated county, and Liberty County Development Authority includes some of Midway but mostly unincorporated county.
Long	Provided by City of Ludowici and City of Walthourville (315 residents)
McIntosh	Provided by City of Darien, McIntosh County, McIntosh County Industrial Development Authority
Screven	Provided by Screven County, City of Sylvania, City of Oliver, Town of Newington, Town of Hiltonia, Town of Rocky Ford
Source: GA Department of Community Affairs, http://www.dca.state.ga.us/development/planningqualitygrowth/PAGES/Regional/VerifiedServiceDeliveryStrategies.asp	

Table 19 – Acreage Suitable for Septic Systems

Table 19 Acreage Suitable for Septic Systems											
	Bryan & Chatham		Non-Urban	Liberty & Long		Non-Urban	McIntosh		Camden & Glynn		Non-Urban
	Acres	%	&	Acres	%	%	Acres	%	Acres	%	%
Conventional	34,464	6.3	7.7	69,805	11.9	11.9	16,470.00	6.1	20,098.00	2.9	3.0
Drip	39,173	7.1	8.7	114,311	19.5	19.6	28,102.50	10.3	49,566.25	7.3	7.3
Mound	118,538	21.5	26.4	39,961	6.8	6.8	18,418.50	6.8	123,134.10	18.1	18.1
Unsuitable	256,799	46.7	57.2	360,534	61.5	61.7	208,789.00	76.8	487,066.40	71.4	71.6
Urban	101,257	18.4	----	1,373	0.2	----	----	----	1,991.25	0.3	
Total	550,230	100	100	585,984	100	100	271,780.00	100	681,856.00	100	100

Source: Department of Crop and Soil Science, University of Georgia

Solid Waste Collection and Disposal

Solid waste disposal in the coastal region is proportional to that of the state. Table D-1 shows the current waste reduction goals by waste category. This approach is expected to allow local governments to target their recycling efforts more effectively.

Table 20 – Per Capita Waste Disposal

Table 20 Per Capita Municipal Solid Waste (MSW) Disposal					
Commodity	Actual 2004 Lbs/Person	Projected 2012 Lbs/Person	Projected % 2012	Projected 2017 Lbs/Person	Projected % 2017
Glass	0.153	0.140	8%	0.140	8%
Paper	1.181	1.000	15%	0.850	15%
Metal	0.228	0.198	13%	0.186	18%
Plastic	0.663	0.560	16%	0.530	20%
TOTAL	2.23	1.99	11%	1.71	23%

Source: DCA Office of Environmental Management

Regionally Significant Recreational Facilities

The coastal region is home to several state and federal parks, numerous historic sites, and beaches, which provide miles of scenic public recreation. In addition, the extensive river network that empties into the Atlantic provides inland water-related recreational opportunities.

Ultimately, outdoor recreation has an enormous economic impact in Georgia—and particularly on the coast. Anglers, boaters, beach-goers and those visiting historic and cultural sites all contribute to local economy, while the presence of significant outdoor resources (i.e., parks and other natural resources) can have a positive impact on property values and local revenue.

Regionally Significant Educational Facilities

Growth in the region has caused overcrowding and other problems in the public schools. Some local governments have adopted special purpose local option sales taxes for education, or “E- SPLOSTs”.

The region is making efforts to keep up with rising student numbers (see Tables 21 and 22) The higher figure for the state’s funding per student is perhaps partly due to the distorting statistical effect of the Atlanta area, but it also reflects the need for coastal local governments to dedicate more resources to their schools. Many areas receive high growth because of their low taxes and natural resources. However, new residents put new strains on community facilities in general—and schools in particular-- and thus create a need for higher taxes in the long.

The coastal region, at present, is adequately served by several institutions of higher education. Savannah is home to Savannah State University, Savannah Technical College (STC), Savannah College of Art and Design, and Armstrong State University (ASU). STC has an additional campus in Liberty County near Hinesville. The Coastal Georgia Community College (CGCC) is a two-year college based in Brunswick, with a smaller satellite campus known as the Camden Residence Center located in Kingsland. The Brunswick Center of CGCC is a collaborative effort between CGCC, Georgia Southern University and ASU; it offers several bachelors and master’s degrees.

Table 21 – Student Teacher Ratio

Table 21 Student Teacher Ratio	
	Student-Teacher Ratio
Bryan	17.95
Bulloch	16.72
Camden	15.98
Chatham	14.52
Effingham	16.05
Glynn	16.05
Liberty	15.86
Long	17.43
McIntosh	15.22
Screven	14.55
Coastal Region Average	16.03
State	15
Sources: NCES/CCD, 2014-15 data, http://nces.ed.gov/ccd/districtsearch/	

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Coastal Region Average	16.03
State	15
Sources: NCES/CCD, 2014-15 data, http://nces.ed.gov/ccd/districtsearch/	

Table 22 – FY2015 Spending Per Student

Table 22 FY2015 Spending per Student	
	Per FTE Instruction
Bryan	\$4,658
Bulloch	\$5,228
Camden	\$5,577
Chatham	\$6,458
Effingham	\$5,634
Glynn	\$6,447
Liberty	\$5,486
Long	\$4,791
McIntosh	\$5,565
Screven	\$5,584
Coastal Region Average	\$5,543
Sources: GA Department of Education, 2015 Expenditure Report	

Regionally Significant Libraries and Cultural Facilities

Existing library facilities are adequate to meet the present needs of the region, though future growth may strain their capabilities. Within the six coastal counties—with the exception of the Savannah area—there are few cultural facilities for theater, ballet, concerts, lectures, art galleries and museums. Georgia Southern University offers a full season at its Performing Arts Center, which draws attendees from a wide area, including coastal Georgia and South Carolina. Many of the coastal counties' comprehensive plans state the need for an auditorium to hold cultural and civic events. The cost of constructing and managing an auditorium has presumably prevented most of these local governments from meeting this need, so perhaps there is an opportunity to create regional facilities for this purpose.

Transportation

Road Network and Highway Corridors

There has been a substantial expansion of the road network in coastal Georgia, beyond what most other parts of the state have experienced. Statewide, the average number of road miles per county increased by 22 miles between 1994 and 2003. The increase in total road miles per coastal county was closer to 89 miles, with the majority of the region's new roads in recently- built subdivisions. Costs for road maintenance put a substantial burden on local governments.

There are two major highways in the coastal region, Interstates 16 and 95. Of the two, I-95 has the greater impact, passing as it does through all six counties and ultimately connecting the entire East Coast.

Public Transportation

The largest provider of public transportation in the region is the Chatham Area Transit (CAT) authority, which runs buses and shuttle services throughout that county. Public transportation is available in all ten counties served by the Coastal Regional Commission. Currently, two of the three urban areas as designated by the Georgia Department of Community Affairs, provide a public transportation service via a fixed –route system. The Metropolitan Planning Organizations (MPO'S) of Chatham County and Hinesville operate public transportation services within their geographic boundaries while the City of Brunswick opted not to operate a public transportation service. These three municipal entities are the current urban areas that can provide transportation services under the auspices of the Federal Transit Administration. The balance of the region's public transportation needs is currently provided by the Coastal Regional Commission and their Transportation Department. The regional transit system operates a demand –response format with the use of 65 buses that are all handicapped accessible. The Coastal Regional Commission's public transportation system is designed to provide transit services for the rural areas and operates Monday through Friday from 7:00 A.M. to 5:00 P.M. To establish a comprehensive approach to a full service public transportation system, the CRC provides connectivity to urban areas as long as one leg of the trip originates or ends in a rural area thereby providing public transportation to anyone, for any purpose and to any destination in the region.

In addition to the general public transportation services, the CRC also operates under contract with the Georgia Department of Human Services to provide transit services throughout the coastal counties for the elderly and other clientele under the purview of the Department's various programs.

Airports

The region is currently served by seven airports that provide a variety of private and commercial aviation services. The Savannah-Hilton Head International Airport is the area's major airport, and is served by national and regional carriers. Brunswick Golden Isles Airport in Brunswick is served by Delta, and offers daily service to Atlanta. Jacksonville International Airport, though outside the region, is close enough to be used frequently.

Ports

The Georgia Ports Authority (GPA) operates facilities at Savannah and Brunswick. The Port of Savannah, by far the larger of the two, focuses on container shipping and is now one of the major ports of the East Coast. The Port of Brunswick concentrates on automobiles and wood products. Both have grown rapidly over the years, thanks to investments such as replacement of the Talmadge Bridge (Savannah) and Sidney Lanier Bridge (Brunswick), extensive modernizing efforts, and the continuing expansion of global trade networks. The success of the ports has inevitably placed additional stress on the region's roads and railroads.

Atlantic Intracoastal Waterway

The mainland areas of the six coastal counties are bordered on the east by the Atlantic Intracoastal Waterway (ICW). The ICW serves as an inland water route and a connector to the Atlantic Ocean for recreational and commercial boaters and fishermen, commercial barge traffic, ferry operations, military boats and submarines. Running between Port Royal Sound, South Carolina, and Fernandina Beach, Florida, the ICW provides for a channel twelve feet deep at mean low water mark, and a bottom width of at least ninety feet. There are numerous tributary channels to the ocean. Anchorages and facilities exist along the waterway at wharves operated by the GPA and other terminal operators.

Railways

All of the coastal counties, except McIntosh, have access to freight rail. Railways in coastal Georgia are closely networked to ports and military installations. The region is served by the CSX (Seaboard Coastline), Norfolk Southern and Central of Georgia Railroads. Several small railways link industrial facilities to major railroads; these include the St. Marys Railroad connecting the Durango Paper Company (Gilman) site to the CSX corridor, and the Colonel's Island Railway connecting the Port of Brunswick to the CSX railway. With regard to passenger rail, Amtrak only provides service within the six counties to Savannah. However, there is an Amtrak station at Jesup in nearby Wayne County that is convenient to Glynn.

Evacuation

The Georgia Emergency Management Agency (GEMA) has primary responsibility for planning and coordinating an evacuation in the event of a major storm or hurricane (see Map F-8), and local government officials hold both the authority to order an evacuation and the responsibility for carrying it out. In the event of a major storm or hurricane, GEMA is to work with other state agencies, and with Federal Emergency Management Agency (FEMA), in the overall coordination and oversight of the evacuation. Local government officials hold both the authority to order an evacuation and the responsibility for carrying it out.

Three interstate highways have lane-reversal plans: I-95, I-75 and I-16. The lane reversal on I-16 expedites the evacuation of the Georgia coast, while the northbound interstates will support evacuations from Florida. The lane reversals on I-16 run from milepost 162 near downtown Savannah to milepost 52 in Dublin, a distance of 125 miles.

Sidewalks and Bike Lanes

The coastal region is sorely lacking in sidewalks, bike lanes and jogging paths. As such, residents and visitors are forced to use cars for even short trips. The resulting traffic congestion has a negative effect on public health, and reduces transportation and recreation options. The Coastal Regional Bike and Pedestrian Plan identifies potential routes, and advocates for the Coastal Georgia Greenway have garnered support for a bike path spanning the coastal counties from Savannah to St. Marys. With the success of many such bike trails nationwide and in Georgia—in particular the Silver Comet Trail in northwest Georgia—the economic tourism-related potential of such a route has become evident. The Coastal Georgia Greenway would tie into local paths as well (see Map E-1).

Natural Resources

Climate

The coastal region is classified as subtropical. It is favored by both latitude and proximity to the Atlantic Ocean, resulting in a moderate climate, though summer days can be extremely hot and humid. Winter temperatures are in the 50s during the day and the 40s at night, while summer temperatures are usually in the 80s - 90s during the day and the 70s at night. The temperature exceeds 90 degrees about 75 days a year, while freezing temperatures occur about 20 days a year and last only a few hours. Humidity is high, generally between 60% and 75%. Conditions are more moderate closer to the ocean—slightly cooler in summer and warmer in winter.

Annual rainfall is 50 inches, with slightly higher levels inland. Snow is rare and short-lived, although hail and freezing rain are not uncommon. Seasonally, rainfall is greatest between June and September, and as a result of this pattern there is a seasonally high water table in October, when the surficial aquifer is at its highest level. Surficial aquifers are recharged locally as the water-table fluctuates in response to drought or rainfall. There are about 75 days a year in which more than one-tenth of an inch of rain falls in the coastal counties.

Due to the contours of its shoreline, Georgia is relatively protected from the open ocean and has recently experienced less hurricane impacts than many other coastal areas. However, global climate change may increase the frequency and violence of storms and hurricanes. In addition, melting polar icecaps and sea level rise will have an impact on Georgia's forested coastal wetlands, due to the inland movement of salt water. The conversion of coastal forested areas to salt marsh would mean the loss of the pollutant filtering and fisheries-support currently provided by these areas. Most significantly, coastal forested wetlands reduce the energy of hurricane winds and wave action that damage both marsh systems and inland development.

Geology & Topography

The geological history of the region has created the string of ocean barrier islands, and marsh hammock islands (see Map F-3). The region is very flat, with minor exceptions, having the typical topography of the coastal plain found throughout the southeastern United States. The only notable exceptions are the dune ridges and river bluffs, where elevations may reach thirty feet or more above mean sea level. Elevations gradually increase inland, and the only natural contours are the remnants of prehistoric sea levels and associated movement of materials caused by ice formation and thawing. Due to the area's relative flatness, its rivers tend to meander, with many miles of bending and winding ox-bows.

Barrier Islands and Coastal Resources

All 100 miles of Georgia’s ocean beaches are on the seaward faces of barrier islands; Table 25 lists the approximate acreage and beach length of the largest islands. Given their attraction for commercial and residential uses, it is fortunate that ten of the eighteen major barrier islands are in public ownership. Except for Jekyll Island in Glynn County, none of these publicly owned islands are accessible by car from the mainland. Jekyll Island is owned by the State of Georgia, and is operated as a state park. By law, 65% of the island shall remain in its natural and undeveloped state, and accessible to all Georgians. The remaining undeveloped islands are designated for wildlife management, environmental research, and/or undeveloped recreational uses. Of the total land area of the fifteen largest barrier islands, about 65% is in public ownership (36% state and 29% federal).

Table 22 – FY2015 Spending Per Student

Table 23 Barrier Islands		
Island	Acreage	Approximate Miles of Beach
Tybee	1,500	3.4
Little Tybee	1,600	3.0
Wassaw	2,500	6.0
Ossabaw	11,800	9.5
St. Catherine’s	7,200	11.0
Wolf Island + (Egg and Little Egg)	5,126	-
Blackbeard	3,900	7.5
Sapelo	10,900	5.6
Little St. Simons	2,300	6.5
Sea Island	1,200	3.8
St. Simons	12,300	3.8
Jekyll	4,400	8.0
Little Cumberland	1,600	2.4
Cumberland	15,100	16.9
Total	81,426	88.3
Source: Coastal Zone Management Program		

Floodplains

Most of the coastal land area is within the 100-year floodplain, as determined by FEMA (see Map F-1) and depicted on the Flood Insurance Rate Maps (FIRMs). Most coastal jurisdictions participate in FEMA's National Flood Insurance Program (NFIP). The cities of Pembroke in Bryan County, and Gum Branch and Walthourville in Liberty County are currently not participating in the NFIP and have not had areas of Special Flood Hazard identified.

GDNR/EPD - Water Supply and Treatment

The 2006 Coastal Georgia Water and Wastewater Permitting Plan for Managing Salt Water Intrusion was developed by the Environmental Protection Division (GDNR/EPD). The plan emphasizes water conservation, water reclamation and reuse, and wastewater management, and will continue to guide the GDNR/EPD water management strategy until the adoption of the Comprehensive Statewide Water Management Plan. Implementation of the plan means that local governments must require all new all new developments to incorporate reuse water lines ("purple pipe"). The Cities of Hinesville and Midway have already implemented this requirement.

Soils

Most of the region's soils have been sampled, analyzed, and classified by the U.S. Department of Agriculture's Natural Resource Conservation Service (NRCS). According to NRCS findings, the majority of the coastal area is either poorly-suited or only marginally-suited for development, due to the drainage characteristics of soil types. Recent research at the University of Georgia's Department of Crop and Soil Science on the extent of soils suitable for septic systems is illustrated in Table F-2, with additional information in Maps F-6 and F-7.

Plant and Animal Habitat

The coastal region has an abundant marsh, estuarine, riverine and forest habitat that is home to diverse flora and fauna. A number of the region's native plants and animals are endangered or threatened at the state and/or federal levels. Table F-3 shows the U.S. Fish and Wildlife Service's current list of threatened and endangered species in Georgia.

Federally Threatened and Endangered Species

Table 24 – Federally Endangered Species

U.S. Fish & Wildlife Service	Bryan	Bulloch	Camden	Chatham	Effingham	Glynn	Liberty	Long	McIntosh	Screven
Mammal										
Northern Right whale (<i>Eubalaena glacialis</i>) E/E	X		X	X					X	
Humpback whale (<i>Megaptera novaeangliae</i>) E/E	X		X	X		X	X		X	
West Indian manatee (<i>Trichechus manatus</i>) E/E	X		X	X		X	X		X	
Bird										
Wood stork (<i>Mycteria americana</i>) E/E	X		X	X		X	X		X	
Piping plover (<i>Charadrius melodus</i>) T/T	X		X	X		X	X		X	
Red cockaded woodpecker (<i>Picoides borealis</i>) E/E	X		X	X		X	X		X	
Kirtland's Warbler (<i>Dendroica kirtlandii</i>) E/E						X				
Invertebrate										
Altamah spiny mussel (<i>Elliptio spinosa</i>) #/E									X	
Reptile										
Eastern indigo snake (<i>Drymarchon corais couperi</i>) T/T	X		X	X		X	X		X	
Loggerhead sea turtle (<i>Caretta caretta</i>) T/T	X		X	X		X	X		X	
Hawksbill Sea Turtle (<i>Eremochelys imbricate</i>) E/ E	X		X	X		X			X	
Kemp's Ridley sea turtle (<i>Lepidochelys kempii</i>) E/E	X		X	X		X	X		X	
Green Sea Turtle (<i>Chelonia mydas</i>) T	X		X	X		X	X		X	
Leatherback sea turtle (<i>Dermochelys coriacea</i>) E/E	X		X	X		X	X		X	
Gopher tortoise (<i>Gopherus polyphemus</i>) */T	X		X	X		X	X		X	
Amphibian										
Frosted Flatwoods Salamander (<i>Ambystoma cingulatum</i>) T/T	X	X	X	X	X	X	X	X	X	X
Fish										
Shortnose sturgeon (<i>Acipenser brevirostrum</i>) E/ E	X		X	X		X	X		X	
Plant										
Pondberry (<i>Lindera melissifolia</i>) E				X						
Canby's dropwort (<i>Oxypolis canbyi</i>) E	X	X	X	X	X	X	X	X	X	X
American Chaff-seed (<i>Schwalbea Americana</i>) E	X	X	X	X	X	X	X	X	X	X
Fringed campion (<i>Silene polypetala</i>) E	X	X	X	X	X	X	X	X	X	X
Relict trillium (<i>Trillium reliquum</i>) E	X	X	X	X	X	X	X	X	X	X

Source: U.S. Fish and Wildlife Service, Georgia Ecological Services Field Office, <http://www.fws.gov/athens/endangered.html>
 E - Endangered List; T - Threatened List

Scenic Areas, Major Parks, and Recreation Areas

There are many areas in the coastal region that contain important natural resources or scenic beauty and therefore have been protected in some fashion. Map F-4 shows the location of major conservation areas, and Table F-4 identifies the Heritage Trust Preserves, the State Wildlife Management Areas and State and Federal Parks and Historic Sites.

Table 25 – Preserves, WMAs, and State and Federal Sites

Table 25 Preserves, WMAs and State and Federal Sites	
Heritage Trust Preserve	Location
Ossabaw Island	Chatham County
Richmond Hill Wildlife Management Area	Liberty, Bryan and McIntosh counties
Wormsloe Historic Site	Chatham County
Little Tybee Island/Cabbage Island	Chatham County
Altamaha River Corridor	McIntosh, Wayne and Long counties
Wildlife Management Areas	Location
Altamaha WMA	McIntosh County
Richard J. Reynolds WMA	McIntosh County
Ossabaw Island WMA	Chatham County
Paulk's Pasture WMA	Glynn County
Richmond Hill WMA	Bryan and McIntosh counties
Sansavilla WMA	Glynn County, also Wayne County
State / Federal Parks and Historic Sites	Location
Crooked River State Park	Camden County
Fort McAllister Historic Site	Bryan County
Skidaway Island State Park	Chatham County
Fort King George Historic Site	McIntosh County
Hofwyl-Broadfield Plantation Historic Site	Glynn County
Fort Morris Historic Site	Liberty County
Richmond Hill State Park & Fort McAllister State Historic Site	Bryan County
Mansion	McIntosh County
Cumberland Island National Seashore	Camden County
Fort Pulaski National Monument	Chatham County
Fort Frederica National Monument	Glynn County
Sources: NCES/CCD, 2014-15 data, http://nces.ed.gov/ccd/districtsearch/	

Agriculture

Prime agricultural land has always been a scarce commodity in the coastal region, as the high water table and wetlands that exist in so many areas are not conducive to farming. Table F-5 shows the changes in the number of farms over time in the coastal counties, while Table F-6 shows changes in the acreage devoted to farming in the coastal counties.

A sharp decline in the number of farms is noted in all six coastal counties during the years 1978 to 1987, with a slight upswing during the period 1987 to 1997. This may be due to the 1991 introduction of the Georgia Conservation Use Assessment program (see Supporting Data: Reference, CUA), which provided a tax incentive for the retention of farmland. Another drop in the number of farms is evident during the period 1997 to 2002 for Camden (-24.19%) and Bryan (-17.72%) counties. This is in stark contrast to increases in Chatham (16%), Glynn (9.26%), Liberty (19.30%) and McIntosh (18.18%) counties. Over the same period, the number of farms in the state decreased by 0.06%.

Table 26 – Number of Farms

Table 26 Number of Farms				
County	# of Farms, 2002	# of Farms, 2007	# of Farms, 2012	# of Farms, % Change 2007 - 2012
Bryan	65	77	60	-22.1
Bulloch	641	669	544	-18.7
Camden	47	57	69	21.1
Chatham	58	33	35	6.1
Effingham	206	203	186	-8.4
Glynn	59	50	53	6.0
Liberty	68	62	46	-25.8
Long	76	73	67	-8.2
McIntosh	39	58	56	-3.4
Screven	347	419	344	-17.9
Coastal Region	1606	1701	1460	-14.1

Source: University of Georgia - Georgia Statistics - <http://www.georgiastats.uga.edu/crossection.html>, "Agriculture, Farm Characteristics"

Forestry

Coastal Georgia has an enormous area of land used for commercial forests. Much of the region is ideal for forestry for the very reason it is not suitable for farming: high water levels. Table F-7 shows the acreage of timberland in major landowner categories for each coastal county and for the state in 2004. Bryan, Camden and Liberty counties are the leaders in terms of acreage, but it is actually Bryan County that has the highest percentage of its land dedicated to forestry. Only Chatham has less than 50% forested. Over one third of the forested land in Bryan County is federally-owned, while the remainder is in private hands. However, in the remaining counties, private ownership is by far the largest category. In addition to all of this commercial timberland, local governments and the state and federal government hold 13% of the land and 23% of forested land in the coastal counties.

Table F-8 shows the change over time (1989-2004) of the percent of forested land in the coastal counties and the state. There has been a slow decline in timber acreage during the study period. The coastal counties' acreage devoted to timber and forestland constitutes just 4.6% of the state's total.

Table 27 – Forest Land Ownership

Table 27 Forest Land and Ownership, 2013			
County	Major Land Use Area, Acres (000), 2013	Forestland, Acres (000), 2013	Forestland, % of Land Use Area, 2013
Bryan	258.7	199.0	77.0
Bulloch	437.1	296.3	67.8
Camden	491.7	280.8	57.1
Chatham	421.8	91.8	21.8
Effingham	311.8	235.8	75.6
Glynn	377.9	148.0	39.1
Liberty	419.2	232.4	55.4
Long	247.5	230.0	92.9
McIntosh	344.6	164.1	47.6
Screven	420.2	329.4	78.4
Coastal Region	3730.5	2207.6	59.2
Source: University of Georgia - Georgia Statistics - http://www.georgiastats.uga.edu/crosssection.html , "Natural Resources", "Land Area, Forestland"			

Impact of Hazardous and Toxic Waste

Table F-9 shows the volume of toxic chemicals released, as well as the proportionate share by population of the number of coastal county sites listed on the GDNR/EPD Hazardous Site Inventory. The region's share of the state's total environmental burden, when measured in terms of the release of toxic chemicals compared to population, is almost two times its share of the population. In terms of the number of sites, the region has more than two times the number of sites compared to its share of the state population (see Table F-10).

Impact of Hazardous and Toxic Waste

Table 28 shows the volume of toxic chemicals released, as well as the proportionate share by population of the number of coastal county sites listed on the GDNR/EPD Hazardous Site Inventory. The region's share of the state's total environmental burden, when measured in terms of the release of toxic chemicals compared to population, is almost two times its share of the population. In terms of the number of sites, the region has more than two times the number of sites compared to its share of the state population.

Table 28 – Hazardous Waste Sites, 2004

Table 27 Hazardous Waste Sites			
County	Hazardous Site	Toxic Chemicals	Population
Bryan	1	63	29,648
Bulloch	2	161,884	45,118
Camden	43	7,084,636	241,411
Chatham	15	2,363,605	73,630
Effingham	3	711,584	62,571
Glynn	2	498	11,248
Liberty			
Long			
McIntosh			
Screven			
Region	66	10,322,270	463,626
State	454	118,864,819	9,363,941
Region's % Share	8.59%	8.68%	4.95%

Source: Adapted from CGRDC Regional Plan Update 204. 1-2006 EPD Hazardous Site Inventory; 2 - The 206 Georgia County Guide; 3 - U.S. Census, 2006 Estimates.

Table 29 – Hazardous Site Inventory

Table 29 - Hazardous Site Inventory (HSI), July 2007	
HSI ID SITE and NAME	
Bryan	
10646 – US 280 Mill Creek MSWLF	
Bulloch	
10391 – Statesboro/Bulloch County Lakeview Road Landfill	
10573 – Louisiana Pacific Corp. – Statesboro	
10739 – Daniel Measurement and Control	
Camden	
10093 – U.S. Naval Submarine Base, Kings Bay	
10647 – Camden County Vacuna Road LF	
Chatham	
10003 CSX Transportation - Savannah (Tremont Road)	10415 Savannah Electric - Plant Kraft
10018 Atlantic Wood Industries	
10045 Colonial Terminals, Plant #1	10440 Blue Ribbon Dry Cleaners
10091 Travis Field/Savannah International Airport	10464 Vopak Terminal Savannah
10095 Central of GA RR/Bernuth-Lembcke Site	10497 Southeastern Family Homes, Inc.
10098 Colonial Terminals, Plant #2	10521 Hunter Army Airfield - MCA Barracks
10101 CSX Transportation - Powell Duffryn	10553 Georgia Air National Guard/Savannah/Site 8
10114 Union Camp Corp - Former Amoco Property	10579 Abercorn & Largo Development
10128 Atlanta Gas Light Company - Savannah MGP Site	10590 Central of Georgia Railroad Company - Battlefield Park
10162 Ashland Chemical Company	10591 Southern Motors of Savannah, Inc.
10179 Kerr McGee - Deptford Tract	
10208 139 Brampton Road	10611 CSXT Depriest Signal Shop
10241 Union Camp Corp - Allen Blvd Landfill	10641 Kerr McGee Pigments, Inc.
	10649 Chatham County Landfill
10351 ARAMARK Uniform Services	10696 Hercules, Inc.
	10698 Natrochem, Inc. - Central of Georgia
10371 Southern States Phosphate & Fertilizer Co.	10764 Martha's Dry Cleaner
10372 Truman Parkway, Phase II	10788 Southside Cleaners
10395 Hunter Army Airfield, Fire Training Area	10789 Dry Clean, USA
10406 McKenzie Tank Lines, Inc.	
Effingham	
10713 Effingham County – SR 17 MSWLF	

Table 29 - Hazardous Site Inventory (HSI), July 2007 - continued	
Glynn	
10006 Hercules 009 Landfill - NPL Site	10251 Chemresol
10028 Escambia Treating Company - Brunswick	10282 4th Street Landfill (Brunswick Airport)
10058 Hercules Inc.	10317 T Street Dump
10069 Atlanta Gas Light Company - Brunswick MGP Site	10587 STSE, Inc.
10144 LCP Chemicals - NPL Site	
10156 Federal Law Enforcement Training Center	10665 Glynn Co. - Cate Road C&D MSWLF
10242 Terry Creek Dredge Spoil Area	10769 Lanier Shopping Plaza
	10804 Cork's Fabricare
10885 Plant McManus Substation Glynn	10909 Cotton Court Property (Lot 28)
Liberty	
	10708 Busby Cleaners
10672 Liberty County - Limerick Road MSWLF	10921 Lee's Shopping Center/ Joy Dry Cleaners
McIntosh	
10325 Butler Island	10675 McIntosh County - King Road MSWLF
Screven	
10016 Ingersoll-Rand Sylvania Remediation (fka Torrington/Timken)	10390 Screven County Municipal Solid Waste Landfill
10827 Statesboro Highway Creosote Site	
Source: http://epd.georgia.gov/sites/epd.georgia.gov/files/2015hsi_Complete/HSI%20list%20by%20County.pdf	

Impact of Solid Waste

Efforts to reduce the risk of ground water contamination by landfills are supported by "Subtitle D" regulations implementing the Federal Resource Conservation and Recovery Act (RCRA). The risks from solid waste are especially troubling in the coastal region, where high water tables, vast areas of wetlands interlacing uplands, and numerous abandoned wells create a potential for contamination of both ground and surface water. As shown by Table 30, solid waste generation has risen significantly in the region, more or less in parallel with population growth. This will probably continue, though recycling may mitigate the situation somewhat. Table 31 lists currently operating landfills in the coastal counties, Table 33 shows closed landfills and Table 32 shows Inert Landfills operating in the coastal counties.

Table 30 – Solid Waste Generation

Table 30 Solid Waste Generation 1992-2002 (Tons per Year)							
County	1992	1994	1996	1998	2000	2002	Increase
Bryan	12,046	12,548	13,043	13,544	14,046	14,675	21.8%
Bulloch							
Camden	30,603	32,453	34,727	36,135	36,823	37,336	22.1%
Chatham	401,748	416,478	431,304	460,163	460,990	475,874	18.5%
Effingham							
Glynn	66,280	73,577	78,592	81,325	84,058	86,384	30.3%
Liberty	29,452	34,071	36,381	38,690	41,000	43,310	47.1%
Long							
McIntosh	11,291	1,135	11,657	11,779	11,900	12,162	7.7%
Screven							
Region	551,420	570,262	605,704	641,636	648,817	669,741	21.5%

Adapted from CGRDC Regional Plan Update 2004. Original source was Coastal Georgia Regional Solid Waste management Plan (1994)

Table 31 – Landfills in Coastal Counties

Table 31 - Landfills operating in Coastal Counties (FY 2006)						
	Facility Name	Dominion	(CY)	Average Daily Tons	Rate of Fill (CYD)	Years Remaining
Camden	Camden Co-SR110 MSWL	P	1,761,903	223	447	14.0
	Camden Co - S.R. 110 C/D/I Waste Landfill	P	23,031,586	666	740	100.0
Chatham	Savannah-Dean Forest Rd (SL)	P	2,121,158	352	704	10.0
	Chatham Co-Thomas Ave (L)	P				
	Superior Landfill & Recycling Center	PC	3,959,727	1220	1627	9.0
	Savannah Regional Industrial Landfill, Inc	CI	3,423,179	876	1298	9.0
Glynn		PC	78,358	13	27	9.0
Liberty	Eller-Whitlock Ave (L)	P	862,832	47	94	33.0
	US Army - Ft Stewart Main Cantonment (SL)	P	117,728	0	0	1,280.0
McIntosh	US Army-Ft Stewart Main Cantonment (L)	P	669,281	53	106	20.0

Source: DCA Office of Environmental Management. P - Public; PC - Private Commercial; CI - Commercial Industrial

Table 32 – Inert Landfills

Table 32 Inert Landfills	
Permit Number	Facility Name
Bryan	
PBR-015-08IL	R. B. Baker Construction, Inc
PBR-015-01IL	Charles L. Stafford Us17/Ga144
PBR-015-04IL	Bryan Co Commission Board
PBR-015-05IL	R.B. Baker Construction, Inc. #1
PBR-015-06IL	R. B. Baker Construction Inc
PBR-015-07IL	Raybon Kangeter, Private II
PBR-015-03IL	Bryan County Board Of Commissioners
Camden	
PBR-020-01IL	Naval Submarine Base
PBR-020-03IL	City Of Kingsland Refuse Rd./Louis Williams Ave.
PBR-020-04IL	Luther Marion Lambert Old Jefferson Road
PBR-020-06IL	Timothy Norton
PBR-020-02IL	Rhone-Poulene Ag Company
Chatham	
PBR-025-33IL	Wilson Machinery
PBR-025-12IL	Devory Dowdy Staley Avenue
PBR-025-13IL	Neal A. Wittkamp Rose Dhu Road
PBR-025-14IL	Joe Rowland/Clark Hughes
PBR-025-15IL	Millard And/Or Jewel Wheeler
PBR-025-18IL	Jewell G. Wheeler
PBR-025-19IL	Simon Holdings, Inc.
PBR-025-23IL	City Of Tybee Island
PBR-025-11IL	A.L. Wilkes Mohawk Street
PBR-025-34IL	R.B. Baker Construction, Inc.
PBR-025-32IL	Norfolk-Southern Corp.-Real Estate Development
PBR-025-43COL	Windsor Forest Wastewater Treatment Plant
PBR-025-36IL	Quick Lock Center
PBR-025-27IL	Harry L. King
PBR-025-24IL	City Of Tybee Island Inert Landfill-Walter Brown
PBR-025-28IL	Lackerson
PBR-025-31IL	Theodore Gordon
PBR-025-39IL	Skidaway Island State Park
PBR-025-35IL	Porter Contracting Co. Inc
PBR-025-02IL	City Of Tybee Island - Robinson Ave.
025-056D(L)	Chatham Co Thomas Ave
025-051D(SL)	City Of Savannah Dean Forest Road
PBR-025-45IL	Hunter Army Airfield
PBR-025-04IL	W.J. Bremer, Jr. East President Street
PBR-025-05IL	James H. Wrenn GA Highway 204
PBR-025-06IL	APAC Georgia, Inc. SR204
PBR-025-07IL	Shuman Construction Co., Inc. US 17 S
PBR-025-08IL	The Branigar Organization, Inc.
PBR-025-09IL	Georgia Ports Authority Hutchinson Island Inert
PBR-025-10IL	David C. Mark East 64th Street

Glynn	
PBR-063-231IL	Daniels Construction And Demolition, Inc.
PBR-063-22IL	Vernon D. Taylor
PBR-063-32IL	Jekyll Island Authority #1
PBR-063-31IL	Jekyll Island Authority #2
PBR-063-26IL	Quality Development & Rentals Co. Inc.
PBR-063-20IL	Oyster Shell Construction
PBR-063-16IL	Dan O'Quinn
PBR-063-30IL	Drigger's Construction Company
PBR-063-03IL	Calsilite Manufacturing Corp., Inc. Line St.
PBR-063-20IL-A	Bert Branson
PBR-063-06IL	Glynn Co-Glynco Jetport
PBR-063-04IL	Glynn Co-Anderson
PBR-063-02IL	Daniels Construction & Demo
PBR-063-07IL	Anderson
PBR-063-08IL	Glynn Co-Brunswick
PBR-063-09IL	Glynn Co-Merritt
PBR-063-10IL	Glynn Co-Sears, SR 27 (L)
PBR-063-11IL	Campbell's Clearing And Equipment Co.
PBR-063-15IL	Seaboard Construction Company
PBR-063-05IL	Brunswick Pulp & Paper
Liberty	
PBR-089-03IL-A	GA Power Co/Operating Dept
PBR-089-13IL	R. B. Baker Construction, Inc.
PBR-069-33IL	Margaret Road
PBR-089-16IL	Fort Stewart Rubble
PBR-089-15IL	Fort Stewart Yard Waste
PBR-089-12IL	Midway Equipment Rental (Coastal Excavators, Inc.)
PBR-089-10 OSTT	Interstate Paper LLC
PBR-089-09IL	David McDonald Rentals
PBR-089-04IL	Paul Krebs Construction Co. SR 119
PBR-089-02IL	B M & J Contractors -Shaw Road
PBR-089-05IL	Jack P. Morgan-Hornes Subdivision
PBR-089-03IL	Fort Stewart
PBR-089-32IL	Fort Stewart 3rd Infantry Division
McIntosh	
PBR-098-03IL	Rowe's Land Clearing And Paving
PBR-098-01IL	McIntosh Co-King Rd
098-011(L)	McIntosh Commission Board King Road
Source: DCA Office of Environmental Management.	

Table 33 Closed Landfills

Facility Name	Date Ceased Accepting Waste
Bryan	
Bryan Co - US 280/Mill Creek (SL)	04-Apr-94
Bryan Co - SR 144 Spur Ph 2 (L)	13-Oct-95
Bulloch	
Statesboro – Lakeview Rd. (SL)	31-May-97
Camden	
Chatham Co - SR 367 Wilmington Island Ph 2 (L)	08-Apr-94
Chatham Co - I 16 Bloomingdale (L)	08-Apr-94
Centerpoint Garden City, LLC Landfill	13-Aug-10
GPA-Hutchinson Island (L)	13-Aug-10
Superior Sanitation - Little Neck Rd (SL)	09-Jun-95
Clifton Equipment Rental Company, Inc.	30-Sep-98
Chatham Co - Chevis Rd (L)	13-Sep-00
Chatham Co - Sharon Park (L)	20-Apr-99
Chatham Co - SR 367 Wilmington Island Ph 2 (L)	08-Apr-94
Effingham	
No data available	
Glynn	
Glynn Co - Cate Rd (L)	07-Nov-97
Paulk - S Harrington Rd SSI (L)	06-Dec-90
Glynn Co - Cate Rd (SL)	07-Nov-97
Jekyll Island Auth - Old Plantation Rd (L)	01-Jul-91
Liberty	
Liberty Co - Limerick Rd (L)	23-Dec-98
Liberty Co - Limerick Rd (SL)	30-Sep-93
Long	
No data available	
McIntosh	
No data available	
Screven	
Screven Co - Rocky Ford Rd (SL)	13-Nov-94
King America Finishing Ash Monofill	14-Sep-12
Source: https://epd.georgia.gov/permitted-solid-waste-facilities - Revised Jan 2014.	

Impact of Port and Channel Maintenance

Shipping channels and harbors serving the world-class ports in Savannah and Brunswick require extensive dredging in order to achieve the depths required to accommodate increasingly large oceangoing vessels. The millions of cubic yards of material removed in these operations are placed in spoil areas approved by the U.S. Army Corps of Engineers.

Dredging and the depositing of discarded dredge materials have raised concerns about various environmental consequences, especially because of toxic industrial pollutants that are sometimes found in the dredged sediments. Another concern is the effect that significantly deepened channels have on conditions in adjacent shore and water-bottom areas. Changes in the hydraulics of water movement created by dredging are alleged to cause significant increases in the scouring effects that produce erosion of both shorelines and the bottoms of nearby rivers and creeks. These changes in water movement and salinity can also affect marine and estuarine habitat.

Impact of Water Access, Boating and Commercial Fishing

The recreational use of coastal waters for boating and fishing appears to be increasing at a much faster rate than population growth. There are many ways that these activities cause harm to environmental resources, including contamination from motor lubricants, increased shoreline erosion caused by vessels, and damage to marine or estuarine habitat due to the construction and use of dock facilities.

Commercial fishing activities, primarily shrimping, disturb water bottoms in near-shore areas through the use of trawl nets that destroy vegetation and increase turbulence. These effects are considerably less significant, however, than those caused by port and channel dredging and maintenance.

Coastal Management Program

The Georgia Coastal Zone Management Program (CZMP) is a coordinated framework to address environmental issues in the coastal region. In general it does not consist of additional regulations, but rather seeks to provide technical assistance, public education and monitoring. The state joined the Federal Coastal Zone Management Program in 1998, thus the Georgia CZMP is federally-approved, enabling it to qualify for certain grants and other funding. This also allows the program to administer certain projects, officially monitor particular conditions, and carry out some regulations. The program applies to eleven coastal counties (the six that this document addresses, and also Brantley, Charlton, Effingham, Long and Wayne) and is administered by the DNR/CRD.

The Georgia CZMP is engaged in several activities at present: water quality monitoring (including the National Shellfish Sanitation Program for the state), technical assistance to local governments and other entities (including information on Best Management Practices), carrying out the Coastal Incentive Grant (CIG) program, reviewing federal permits, licenses and projects, issuing marsh permits and shore permits, executing leases for state-owned water bottoms, supporting the control of nonpoint source pollution (as part of the federal Coastal Nonpoint Source Program), and engaging in general outreach and education.

Historic Resources

The historic and cultural resources along the coast reflect the almost 300 years of growth and development since the first settlement. In November 1732, Oglethorpe and 114 men, women and children boarded the good ship Anne for their voyage to the new world. After brief stops in Charleston and southern South Carolina, Oglethorpe and his followers landed at Yamacraw Bluff on February 12, 1733, and there established their new town. The General had laid this town out with precision, in a pattern of streets interspersed with public squares. Savannah thus became the first planned community in Georgia, if not the nation.

The influence of Oglethorpe and the Trustees waned over the next few years, and by 1750, they returned their charter to the King, making Georgia a royal colony, under the rule of the King, until the colony declared its independence along with its 12 sister colonies at the beginning of the Revolution in 1775. Georgia's coastal communities have played important roles throughout not only the State's history, but also nationally as reflected by the many historic and cultural resources that are to be found in all six counties. Tables G-1, G-2, G-3 and G-4, as well as Map F-5, all show historic resources across the region.

It is these resources, plus the many others that have not yet received any sort of designation, that are vital pieces of the region's history and that create the strong heritage tourism industry along the Georgia Coast. As a group, they provide the basis for a region-wide tourism program within several historic contexts: from Colonial times through early settlements, and into the 19th and 20th centuries. Heritage tourism provides a large part of the economic base of each of the counties and the region as a whole, particularly in Chatham and Glynn counties. By marketing these resources, whether in historic downtowns or neighborhoods and house museums or landscapes, communities can enhance their appeal to tourists.

Table 34 - Coastal Georgia National Register of Historic Places Listings

Resource Name	Address	Listed
Bryan		
Bryan County Courthouse	College St., Pembroke	6/14/1995
Fort McAllister	10 mi. E of Richmond Hill via GA 67	5/13/1970
Glen Echo	2 mi. (3.2 km) E of Ellabelle on GA 204	1/9/1978
Kilkenny	E of Richmond Hill on Kilkenny Rd.	2/14/1979
Old Fort Argyle Site	Address Restricted (Savannah)	3/31/1975
Pembroke Historic District	Centered on US 280 and Main St., Pembroke	12/8/2004
Richmond Hill Plantation	E of Richmond Hill on Ford Neck Rd.	1/30/1978
Seven Mile Bend	Address Restricted (Richmond Hill)	4/11/1972
Strathy Hall	SE of Richmond Hill	1/21/1979
Camden		
Camden County Courthouse	4th and Camden Aves., Woodbine	9/18/1980
Crooked River Site (9CAM118)	Address Restricted, St. Marys	12/23/1985
Duck House	Cumberland Island, St. Marys	2/13/1984
Dungeness Historic District	Address Restricted, St. Marys	2/13/1984
Greyfield	Cumberland Island, Camden County	7/24/2003
High Point-Half Moon Bluff Historic District	NE of St. Marys on Cumberland Island, St. Marys	12/22/1978
Kingsland Commercial Historic District	Area surrounding S. Lee St., between King and William Sts., Kingsland	3/17/1994
Little Cumberland Island Lighthouse	N end of Little Cumberland Island, St. Marys	8/28/1989
Main Road	Cumberland Island, St. Marys	2/13/1984
McIntosh, John Houstoun, Sugarhouse	Ga. Spur 40, 6 mi. N of St. Marys	4/2/1992
Orange Hall	311 Osborne, St. Marys	5/7/1973
Plum Orchard Historic District	Address restricted, St. Marys	11/23/1984
Rayfield Archeological District	Address Restricted, St. Marys	2/13/1984
St. Marys Historic District	Roughly bounded by Waterfront Rd., Norris, Alexander, and Oak Grove Cemetery, St. Marys	5/13/1976
Stafford Plantation Historic District	Address Restricted, St. Marys	11/23/1984
Table Point Archeological District	Address Restricted, St. Marys	11/23/1984
Woodbine Historic District	Jct. of Bedell Ave. and 3rd and 4th Sts., Woodbine	5/12/1999
Chatham		
Ardsley Park-Chatham Crescent Historic District	Roughly bounded by Ardsley Pk., Chatham Crescent, Bull St., Baldwin Pk. and Ardmore, Savannah	8/15/1985
Bonaventure Cemetery	Bonaventure Rd., 1 mi. N of US 80, Savannah	2/2/2001
Central of Georgia Depot and Trainshed	W. Broad and Liberty Sts., Savannah	12/8/1976
Central of Georgia Railroad: Savannah Shops and Terminal Facilities	W. Broad St. and Railroad Ave., Savannah	6/2/1978
Central of Georgia Railway Company Shop Property	Between W. Jones St. and Louisville Rd., Savannah	3/5/1970
Charity Hospital	644 W. 36th St., Savannah	5/2/1985
CSS GEORGIA (ironclad)	Address Restricted, Savannah	2/10/1987
Cuyler--Brownville Historic District	Roughly bounded by Anderson Ln., W. 31st St., Montgomery St., Victory Dr., Ogeechee Rd., and Hopkins St., Savannah	2/13/1998

Table 34 - Coastal Georgia National Register of Historic Places Listings

Resource Name	Address	Listed
Daffin Park--Parkside Place Historic District	Bounded by Victory Dr., Waters Ave., Bee St. and 51st Street Ln., Savannah	5/12/1999
Davenport, Isaiah, House	324 E. State St., Savannah	9/22/1972
Drouillard--Maupas House	2422 Abercorn St., Savannah	5/13/1991
Eastside Historic District	Roughly bounded by E. Broad, Cedar, Gwinnett and Anderson Sts., Savannah	11/7/2002
Federal Building and U.S. Courthouse	Wright Sq., Savannah	6/7/1974
First Bryan Baptist Church	575 W. Bryan St., Savannah	5/22/1978
Lebanon Plantation	SW of Savannah	11/29/1979
Fort Pulaski National Monument	17 mi. W of Savannah, Cockspur Island	10/15/1966
Fort Screven Historic District	Tilton, Butler, Van Horn, Railroad and Alger Aves., and Pulaski Rd., Tybee Island	5/25/1982
Gordonston Historic District	Roughly bounded by Skidaway Rd., Goebel Ave., Gwinnett St., and Pennsylvania Ave., Savannah	10/11/2001
Green-Meldrim House	Macon and Bull Sts., Savannah	1/21/1974
Hill Hall at Savannah State College	Savannah State College campus, Thunderbolt	3/25/1977
Isle of Hope Historic District	Roughly bounded by Skidaway River, Parkersburg Rd., Island, Cornus, and Noble Glen Drs., Savannah	9/7/1984
Laurel Grove-North Cemetery	W. Anderson St., Savannah	8/4/1983
Laurel Grove-South Cemetery	37th St., Savannah	9/6/1978
Savannah Victorian Historic District	Roughly bounded by Gwinnett, Price, Anderson, and Montgomery Sts.	12/11/1974
Low, Juliette Gordon, Historic District	10 Oglethorpe Ave., E., 330 Drayton St., 329 Abercorn St., Savannah	10/15/1966
Massie Common School House	207 E. Gordon St., Savannah	4/13/1977
Mulberry Grove Site	Address Restricted, Port Wentworth	7/17/1975
New Ogeechee Missionary Baptist Church	751 Chevis Rd., Savannah	8/8/2001
Nicholsonville Baptist Church	White Bluff Rd.	5/22/1978
Ossabaw Island	7 mi. S of Savannah, bounded by the Atlantic Ocean, Bear R., Ogeechee R., and St. Catherine's Sound, Savannah	5/6/1996
Owens-Thomas House	124 Abercorn St., Savannah	5/11/1976
Savannah and Ogeechee Canal	Roughly along I-95, between the Savannah and Ogeechee Rivers	8/11/1997
Savannah Historic District	Bounded by E. Broad, Gwinnett, and W. Broad Sts. and the Savannah River	11/13/1966
Savannah Victorian Historic District (Boundary Increase)	Bounded by Gwinnett, Anderson and 31st Sts., Savannah	5/20/1982
Scarbrough, William, House	41 W. Broad St.	6/22/1970
Sea View Apartments	7 18th St., Tybee Island	4/22/2003
Slotin Building	101 W. Broad St., Savannah	3/24/1983
St. Bartholomew's Church	Cheves Rd., Chatham	6/17/1982
St. Philip AME Church	613 W. Broad St., Savannah	8/2/1984
Sturges, Oliver, House	27 Abercorn St., Savannah	7/14/1971
Telfair Academy	121 Barnard St., Savannah	5/11/1976
Thomas Square Streetcar Historic District	Roughly bounded by Anderson Ln., 42nd St., Victory Dr., E. Broad St., and Martin Luther King, Jr. Blvd., Savannah	7/29/1997

Table 34 - Coastal Georgia National Register of Historic Places Listings

Resource Name	Address	Listed
Two Pierpont Circle	2 Pierpont Cir., Savannah	4/4/1990
Tybee Island Back River Historic District	Along Chatham Ave., from Tybee River to Venetian Dr., Tybee Island	8/5/1999
Tybee Island Strand Cottages Historic District	Along Butler Ave., between 12 St. and 14th St., Tybee Island	4/2/1999
U.S. Customhouse	1--3 E. Bay St., Savannah	5/29/1974
Vernonburg Historic District	Dancy Ave., Rockwell Ave. and S. Rockwell Ave., Vernonburg	6/22/2000
Wild Heron	15 mi. SW of Savannah off U.S. 17, Savannah	12/16/1977
Wormsloe Plantation	Isle of Hope and Long Island, Savannah	4/26/1973
Glynn		
Ballard School	323 Old Jesup Hwy., Brunswick	10/27/2004
Brunswick Old Town Historic District	Roughly bounded by 1st, Bay, New Bay, H and Cochran Sts., Brunswick	4/26/1979
Colored Memorial School and Risley High School	1800 Albany St., Brunswick	11/7/2002
Faith Chapel	Old Plantation Rd., Jekyll Island	7/14/1971
Fort Frederica National Monument	12 mi. N of Brunswick	10/15/1966
Hamilton Plantation Slave Cabins	Address Restricted, St. Simons Island	6/30/1988
Hofwyl-Broadfield Plantation	N of Brunswick on U.S. 17	7/12/1976
Horton-duBignon House, Brewery Ruins, duBignon Cemetery	Riverview Dr., Jekyll Island	9/28/1971
Jekyll Island Club	Between Riverview Dr. and Old Village Blvd., Jekyll Island	1/20/1972
King and Prince Hotel	201 Arnold Rd., St. Simons Island	1/12/2005
Needwood Baptist Church and School	US 17, 1 mi. S of Hofwyl- Broadfield Plantation State Historic Site., Brunswick	12/17/1998
Rockefeller Cottage	331 Riverview Dr., Jekyll Island	7/14/1971
St. Simons Lighthouse and Lighthouse Keepers' Building	600 Beachview Dr., St. Simons Island	4/13/1972
Strachan House Garage	414 1/2 Butler Ave., Glynn	7/3/1997
US Coast Guard Station--St. Simons Island	4201 First St., St. Simons Island	4/1/1998
Liberty		
Bacon-Fraser House	208 E. Court St., Hinesville	4/18/1985
Bowens, Eddie, Farm	660 Trade Hill Rd., Seabrook	10/25/2004
Cassel's Store	Off U.S. 82, McIntosh	8/5/1983
Dorchester Academy Boys' Dormitory	8787 East Oglethorpe Highway (US 84), Midway	6/23/1986
Flemington Presbyterian Church	Off Old Sunbury Rd., Flemington	6/17/1982
Fort Morris	Address Restricted, Midway	5/13/1970
Liberty County Courthouse	Courthouse Sq., Hinesville	9/18/1980
Liberty County Jail	302 S. Main St., Hinesville	8/18/1992
Midway Historic District	Jct. U.S. 17 and GA 38, Midway	3/1/1973
Ripley, Sam, Farm	1337 Dorchester Village Rd., Midway	10/27/2004
St. Catherine's Island	10 mi. off the GA coast between St. Catherines Sound and Sapelo Sound, South Newport	12/16/1969
Woodmanston Site	SW of Riceboro off Barrington Rd., Riceboro	6/18/1973
McIntosh		
Behavior Cemetery	S end of Sapelo Island, 1.25 mi W of Hog Hammock	8/22/1996
D'Antignac House	Address Restricted, Crescent	12/16/1977

Table 34 - Coastal Georgia National Register of Historic Places Listings		
Resource Name	Address	Listed
Fort King George	E of U.S. 17, Darien	12/9/1971
Hog Hammock Historic District	E side of Sapelo Island, Hog Hammock	9/6/1996
Ridge, The	Old Shell Rd. GA 99, Ridgeville	4/18/1985
Sapelo Island Lighthouse	S end of Sapelo Island, S of University of Georgia Marine Institute	8/26/1997
Vernon Square-Columbus Square Historic District	Roughly bounded by Market, Trumbull, Rittenhouse and Ft. King George Dr., Darien	3/14/1985
West Darien Historic District	Bounded by 8th St., US 17, Darien River, and Cathead Creek,	9/17/2001

Table 35 – National Historic Landmarks

Table 35 - Listing of National Historic Landmarks in Coastal Counties	
Landmarks	Location
Central Of Georgia Railroad Shops/Terminal	Savannah, Chatham County
Dorchester Academy Boys' Dormitory	Midway, Liberty County
Fort James Jackson	Savannah, Chatham County
Green- Meldrim House	Savannah, Chatham County
Jekyll Island	Jekyll Island, Glynn County
Low, Juliette Gordon, Historic District	Savannah, Chatham County
Owens Thomas House	Savannah, Chatham County
St. Catherine's Island	Liberty County
Savannah Historic District	Savannah, Chatham County
Scarbrough, William, house	Savannah, Chatham County
Telfair Academy Of Arts And Sciences	Savannah, Chatham County

Table 36 – National Register Listings with National Significance

Table 36 - National Register Listings with National Significance	
Site	Period of Significance
Woodmanston Site at the LeConte Plantation Riceboro;	(1750 to 1824)
Fort Barrington in McIntosh County	(1750 to 1874 with particular significance during the War of 1812)
Old Fort Argyle Site	(c1700 until 1749)
CSS Georgia	Ironclad used during the War Between the States.

Table 37 – Historic Properties

Table 37 - National Register Listings with National Significance	
State owned historic sites in region	Fort King George- Darien (SP)
	Fort McAllister- Richmond Hill (SP)
	Fort Morris- Midway (SP)
	Hofwyl-Broadfield Plantation- Brunswick (SP)
	Wormsloe – Savannah
	Sapelo Island Reserve and Reynolds Mansion
Federal historic properties	Cumberland Island National Seashore
	Fort Pulaski National Monument
	Fort Frederica National Monument
State parks with historic associations	Fort King George- Darien
	Fort McAllister- Richmond Hill

Tourism and Coastal Resources

Tourism creates a powerful incentive to protect and maintain the natural and historic resource of the coast, for it is these resources that draw visitors to the region in the first place. Tourism is a vital component of the coastal economy, and therefore one should not perceive environmental protection and economic development as inevitably being in conflict. Rather, in this case they are mutually supporting; if the region’s vibrant natural and historic resources were to be damaged or diminished, tourism would be reduced dramatically. This linkage between resources and tourism has always existed, but at present it is even more pronounced because popular awareness of the environment has grown. Special niches such as “eco-tourism” and “heritage tourism” now also exist. See Table 38.

Table 38 – Coastal Resources

Table 38 Coastal Resources	
Location	Description
Jekyll Island	A state-owned and managed by the Jekyll Island Authority. It is the sixth largest of Georgia's barrier islands. With about 4,400 acres of uplands, the island is maintained and protected from development by state legislation passed in 1950. State law requires that it be maintained as 35% developed and 65% undeveloped. The island is used for a variety of active, passive, residential, recreational and educational purposes. In 1978, the Jekyll Island Club Historic District was designated a National Historic Landmark
Gray's Reef	The Sanctuary is a seventeen square (nautical) mile section of Gray's Reef. Established under Title III of the Marine Protection, Research, and Sanctuaries Act of 1972, it was designated a National Marine Sanctuary in January 1981. Gray's Reef lies 35 miles northeast of Brunswick in waters ranging from 50 to 72 feet deep. It is one of the largest, near shore, live- bottom reefs on the nation's east coast, with an unusual mixture of tropical and temperate species. The reef serves research, educational, and recreational fishing functions
The Sapelo Island National Estuarine Research Reserve	Created in 1972 and received its designation in 1976, the second in the nation. Approximately 6,000 acres in area, the reserve occupies almost one-third of the island, which is the fourth largest of Georgia's barrier islands and one the most pristine. The reserve includes unspoiled coastal salt marsh, maritime forest, tidal creeks, beach and dunes within the Duplin River estuary. The property is used for basic research as well as public education and compatible low-impact recreation. The University of Georgia's Marine Institute operates a major research center open to qualified scientists from throughout the world who study both biological and geological processes.
Altamaha River, a Nature Conservancy, "bio-reserve" project	This entails detailed study, inventory and assessment of resources, land ownership and activities. The efforts of the Nature Conservancy will result in a management plan and a conservation program, with special attention to the most important and/or threatened resources within the corridor. The organization is working with landowners to implement improved methods for resource management, including the protection of land through conservation easements.

Land Use Patterns

Bryan County

Much of Bryan County's recent growth is a result of migration from Chatham County. Bryan County does not have any barrier islands, and thus lacks true oceanfront beaches. The county is physically divided by the property of Fort Stewart. The northwestern part of the county, centered on the county seat of Pembroke, is growing slowly. The southeastern portion, centered on Richmond Hill, has largely become a "bedroom community" for people who work in Chatham County. The industrial park at Pembroke is a relatively small site, while the much larger Interstate Centre, straddling I-16 is home to large manufacturing and warehousing concerns. Richmond Hill also receives some tourism, as a result of its location near Fort McAllister and historic resources related to Henry Ford. In addition, the city enjoys the benefit of its location on I-95 and U.S. 17; the former is, of course, the more important transportation corridor, but a portion of the latter was recently widened to four lanes. Land use in the coastal counties is illustrated in Maps G-2 and G-3.

Bulloch County

[Bulloch County, Brooklet, Portal, Register](#)

Residential

Single-family residences are located throughout Bulloch County, scattered along both major and minor roads. Dense concentrations of subdivisions and individually built homes can be found in municipal areas, in historic community areas and in more modern subdivisions throughout the county. Outside of the immediate surroundings of Georgia Southern University, unincorporated Bulloch County contains very few multi-family residences. In comparison with the small amount of multi-family units in unincorporated Bulloch County, there is a significant number of manufactured homes. There are manufactured and mobile home parks and scattered individual mobile homes throughout the county. Manufactured housing offers a viable affordable housing option to many Bulloch County residents. Lower income groups, young adults, and retirees are typically sectors of the population seeking rental or low maintenance residences. As these sectors continue to grow, balanced housing opportunities need to be included in the County's long range plans. There has been a growth in Bulloch County of small-scale residential developments. Smaller subdivision development is taking place in areas outside of the Statesboro bypass and in areas south of Brooklet, within reach of I-16.

Commercial

Commercial land uses are found in many areas of Bulloch County, but the most intense commercial areas are concentrated in the Statesboro region. Outside of the City of Statesboro, significant commercial areas are located along U.S. 301, U.S. 80, SR 24 and SR 25. The most recent major commercial development in Bulloch County has occurred near the bypass and Northside Drive at the eastern edge of Statesboro. The U.S. 301 corridor between SR 46 and Statesboro is an intensely developed commercial strip corridor. This corridor includes a mixture of newer and older commercial properties, and portions of the corridor have aged to the point of needing redevelopment. The municipalities of Brooklet, Portal and Register each have traditional downtown business districts with a mixture of retail, industry and office uses. Additionally, some Bulloch County unincorporated communities such as Denmark include quaint, village-like retail shops and antique stores. Other scattered commercial properties, such as corner gas stations at intersections of county roads, serve the needs of rural residents and the agricultural community. These community commercial centers are important to the character and quality of life of the county.

Industrial

The largest amount of industrial land use in Bulloch County is located along U.S. 301, both north and south of Statesboro. Industries south of Statesboro, including a major Wal-Mart distribution facility, benefit from the proximity to I-16 while those on the north, such as Briggs and Stratton, are located near the airport. Industries in both of these areas also have access to rail. Smaller industries are located in various parts of Bulloch County. While Register has a minimal amount of industrial activity, Brooklet and Portal both have active industries that employ residents.

Agriculture

Traditionally a rural county, the amount of land occupied by agricultural uses still accounts for a high percentage of the total land in Bulloch County. Agriculture land throughout the County makes up the majority of this land use category, though forestry accommodates a large amount as well. Agricultural land is used to grow harvest crops such as peanuts, corn, wheat, tobacco, cotton and soybeans. Livestock are also raised in Bulloch County.

As suburban residential development continues, more and more farmland properties will be converted to housing subdivisions. These properties, many of which are classified as prime agricultural land, represent a great natural resource to the County that should be preserved.

Public/Institutional

Churches and educational facilities are the primary institutional uses in unincorporated Bulloch County. Most government facilities and many schools are located in Statesboro, Brooklet, Portal, and Register. Because of the great area of Bulloch County and its growing population, additional government and school sites should be identified to insure adequate delivery of services and educational facilities. Due to the importance of municipalities, new public and institutional buildings should be located in municipal centers when possible.

Parks/Recreation/Conservation

Bulloch County is recognized as having high quality recreation facilities such as baseball/softball field complexes. Georgia Southern University also provides significant recreational facilities to students and the public. Aside from parks for active recreation, however, there are few public parks in the county. Future parks development should include facilities and lands for passive recreation. The acquisition of land for public parks should also achieve environmental preservation purposes.

Statesboro

The city is primarily urban / suburban, with the dominant land use of single-family residential (30.4%). Undeveloped / Vacant Land is the second largest land use (at 25.7%), although it should be noted that some of this land includes undevelopable areas, such as wetlands. These areas are not classified as conservation, however, unless the land is permanently protected from development. Public / Institutional uses, which account for 14.9% of total land, are comprised primarily of higher education (GSU), followed by governmental services, public schools, and health care. Commercial uses (12.3%) are predominant along highway corridors and downtown. Agricultural land uses (2.2%) such as farming, livestock grazing and silvaculture, once provided the traditional way of life and land use in the city and surrounding areas, but is today no longer a dominant land use within the jurisdiction. Industrial and commercial land uses account for 2.4% of the total area. As new industries locate in Bulloch County and Statesboro and attract more workers, new services and other businesses will begin to cater to the growing population.

With Statesboro as the economic engine of the region, existing lands that fall under the Industrial and Commercial use categories are likely to infill or redevelop, possibly with adjacent uses expanding to include Industrial and Commercial. Careful consideration will need to be given to the balance of development that is industrial or commercial in nature, especially as it relates to surrounding land uses and available transportation networks. Mixed uses, such as commercial use on the ground floor and residential above, were once more prevalent in downtown Statesboro. During a period of decline and disinvestment in the last half of the 20th century, there has been a recent resurgence of mixed uses downtown, with new residential units appearing above storefronts in several of the city's historic buildings. The amount of mixed use compared to total area is negligible (less than 0.1%), but there is potential that these uses will continue to spread throughout the city in appropriate areas. GSU has also recognized the importance of mixed use development and is including commercial uses within some of its new dormitory buildings. More than 2,200 acres are currently classified as Undeveloped / Vacant, with much of this property located adjacent to existing residential subdivisions and commercial areas at the periphery of the jurisdiction. These currently undeveloped lands are likely to face development pressure from both residential and commercial interests in the near future. Other undeveloped lands located in or near the core of the city provide opportunities for more intense levels of commercial activity. Some of these properties may also be suited for mixed use developments, in continuance with historic development patterns downtown.

Camden County

Camden County is undergoing rapid residential development, mainly due to the Kings Bay Naval Submarine Base. The three cities of St. Marys, Kingsland and Woodbine have been expanding their boundaries through annexation. Spillover growth from the Jacksonville metropolitan area, just over the border in Florida and accessible via I-95, is also a factor. In recent years, the county learned a lesson on the importance of economic diversification when Durango Paper Company (formerly known as Gilman Paper Company), once the county's largest employer, ended its operations. This unexpected event left many local residents seeking employment elsewhere in the county and beyond. Nevertheless, growth continues largely unabated; in fact, the county was for a brief period one of the fastest growing counties in the nation. In a proactive planning effort, several Camden County organizations commissioned an Economic Diversification Study - Infrastructure Management Report that reviewed the county's infrastructure, with particular emphasis on water/wastewater, transportation and stormwater.

The report emphasizes the importance of considering countywide needs and the cumulative effects of planning decisions on infrastructure (see Supporting Data: References, Economics).

Chatham County

Chatham County is, by most measures, the most important county in the coastal region. The City of Savannah, the dominant metropolis of the Georgia coast, is primarily urban; while the county's other municipalities are essentially suburban. The county is the most highly populated of the coastal counties, and it is also the largest in terms of land area. Much of Chatham County's importance is due to excellent transportation facilities such as I-95 and I-16, Savannah International Airport, the Georgia Ports Authority, and freight and passenger rail services. The county also possesses higher educational institutions such as Savannah State University, Savannah College of Art and Design and Armstrong Atlantic State University. Savannah is justly renowned for its historic and cultural character, but it also uses aggressive economic development incentives to attract business and industry. These factors have dictated much of the land use in the county.

Effingham County

Effingham County is primarily rural, with the dominant land use being agricultural (65% of total land), and conservation/recreation areas being the second largest land use (at 15%). Agricultural land uses, such as farming and livestock, have provided the traditional way of life in the County, although rapid growth in residential development in recent years has contributed to a shift in the character of the community. The County will need to consider how to balance the need for new housing with conservation of working farms and agricultural lands. Industrial and commercial land uses account for 3% of the total area. Proximity to the Ports of Savannah and Interstates 95 and 16 will prompt further industrial growth; as new industries locate in the County and new services and other businesses open to cater to the growing population, these industrial/commercial land uses will greatly expand. Five percent of the land is classified as undeveloped, and much of this property is adjacent to existing residential developments suggesting that currently undeveloped land will become later phases of a subdivision. Other undeveloped land is adjacent to existing commercial or industrial land uses and provide opportunities for infill in the future.

Glynn County

Glynn County is the second-largest of the six coastal counties in terms of population, and possesses a strong tourism, manufacturing and industrial base. The county has a Chamber of Commerce, Convention & Visitors Bureau, and Development Authority. A strong economic factor in the county is the tourism industry, driven primarily by Jekyll Island, St. Simons Island and Sea Island. The county has two large industrial parks: Colonel's Island Industrial Park, the primary activity of which is automobile processing, is a 6,500 acre facility served by rail and shipping and is immediately adjacent to I-95; and Naval Air Station (NAS) Glynco, which is home to high tech industries and the Federal Law Enforcement Training Center (FLETC), which is the largest such training center in the U.S. Brunswick, the county's only city, is home to a growing port, which is operated by the Georgia Ports Authority.

Liberty County

Liberty County, and its county seat of Hinesville, has seen rapid growth due to the expansion of the 3rd Infantry Division (Mechanized) at Fort Stewart. The fort consists of approximately 275,000 acres and is the largest military base east of the Mississippi River in terms of land area. The population of Hinesville is about 31,000, making it the second largest city in the region after Savannah. Of the county's other municipalities, Midway, Riceboro and Walthourville are growing at a modest rate, while Allenhurst, Flemington and Gum Branch remain steady. The land use and development patterns of Midway and Riceboro are influenced by their proximity to I-95, while Walthourville has grown by providing affordable housing to Fort Stewart enlistees. The Liberty County-Hinesville Chamber of Commerce and the Industrial Development Authority have done an excellent job of recruiting industry and business, including warehouse and distribution centers, diversifying the economic base of the community so that it does not rely entirely on the military base.

Long County

Traditional neighborhood development can be found in the City of Ludowici. Long County has a rural a development pattern with large lots. This continues to be the primary development pattern within the County since there are no community water or sewer systems outside of Ludowici. One residential development crosses the Long County-Liberty County line, and is serviced by the City of Walthourville water supply system. Opportunity exists within the City of Ludowici for infill development. Long County continues to experience a rural development pattern though much of the development is occurring in the north central part of the County near Walthourville, and adjacent to Ludowici. Long County and the City of Ludowici adopted a joint Land Development Code in November of 2008. Adoption of the Land Development Code gives the County and City the basic tools to direct development within their jurisdictions. Long County and the City of Ludowici share the characteristics of rural counties and small rural cities found in southeastern Georgia. The County–City Land Development Code provides for the regulation of aesthetics such as signage, landscaping and building height. Ludowici does have a historic preservation ordinance, but still needs to establish a historic district and historic preservation commission. A survey of historic and cultural resources would provide the County and the City with a basis of information to establish a program for protection of these resources.

McIntosh County

McIntosh County is experiencing growth and development, particularly around the outlet shopping mall at Hwy 251 and I-95. The fishing industry, which has historically been a mainstay in McIntosh County, also generates income and employment. Due to the seasonal nature of the fishing industry, however, the shrimp fleet out of Darien does not offer high-paying long-term employment. Many county residents are employed by business and manufacturing facilities located in Glynn County. Recently the areas in and around Darien have become a “bedroom community” to some extent, due to the city’s unique image as a small fishing village and its convenient access to I-95 and U.S. 17.

Screven County

Existing development patterns have a direct impact on determining future growth. The largest land use in Screven County is Agriculture/Forestry (80.0 percent); followed by Commercial (7.9 percent) and Residential (5.7 percent). The Residential category is predominately detached single-family structures. Since the area occupied by the Towns of Hiltonia, Newington and Rocky Ford, and the City of Oliver are small in comparison to the county overall, they are included in the overall land use calculation and this discussion combines the county, towns, and city (excluding the City of Sylvania). At present, very little new development is occurring in Screven County. In order to promote quality community growth, a mixed balance of land use should be maintained to provide for the cost effective delivery of services and infrastructure. Commercial and industrial land uses remain very low in comparison to other categories. Primarily, these areas are scattered along major roads such as U.S. Highway 301, Georgia State Routes 21 and 17, and include both commercial and light to medium industries.

Screven County contains 10,227 acres of parks, recreation, and conservation land uses. The Tuckahoe Wildlife Management Area borders the Savannah River and contains 15,100 acres. The WMA is included in the Public Institutional land use category. However, neither Parks/Recreation/Conservation nor Public Institutional completely account for the total acreage of the WMA.

Screven County is predominately an agricultural county with 80 percent of its land in Agriculture/Forest designation. Many of the land tracts in the county are of significant size and may be available in the future for development of all types, or retained in agriculture and other rural residential land uses.

Regionally Significant Developments

There are a substantial number of regionally significant residential and industrial developments currently projected or underway in the coastal area. These will put further stress on the environmental resources, transportation networks, and community facilities of the counties where they are located. Such projects are known as Developments of Regional Impact (DRI), a technical term for projects above a certain size for which a regional review is conducted (see Table H-1 and Map G-1).

Conversion of Forest Land to Residential, Commercial and Industrial Uses

Over half of the coastal region is classified as commercial forestland (see Table F-7). Some of this land is held by small private landowners who sell their timber to pulp and paper companies, while vast acreage is owned by major paper manufacturers. Much of the land is being converted to other uses (usually residential but also commercial and industrial), which is a major shift in the existing patterns of land use.

Public Ownership of Coastal Lands

With two military bases, several wildlife management areas, a National Seashore and vast areas of state-managed tidal wetlands, public areas constitute approximately 34% of the region's total land area. The proportion varies significantly from county to county.

Development Constraints on Barrier Islands

Only three of Georgia's eight largest barrier islands are accessible by land via causeways. The remaining five islands are either publicly owned or are managed by various public agencies while remaining privately owned. State and national research and wildlife protection being carried out on these islands make them unique and significant, with an active constituency among naturalists, environmentalists and university research proponents, as well as their counterparts in state and federal agencies. Furthermore, federal law now discourages further development of barrier islands by restricting the use of federal subsidies (grants, loans and flood insurance protection) for the construction of roads, bridges and residential and commercial buildings on previously undeveloped islands.

Housing Quality

Many newer residential developments, especially in areas adjacent to Richmond Hill, Savannah and Brunswick, are targeted to the retirement and second-home markets. Much of the older housing, meanwhile, is in need of repair or simply substandard; this is especially the case in rural unincorporated areas. Many low-to-moderate income households are unable to acquire or retain ownership in conventional housing, and thus are turning to the manufactured housing market, particularly in McIntosh County. Some such households alternately choose to deal with the issue by moving further inland, resulting in longer commutes and greater congestion.

Development of Land Closer to Industrial Uses

As available buildable land becomes more scarce, marginal industrial land—areas that builders, developers and consumers previously avoided—tends to be developed. This has already occurred in Chatham County, where prime buildable land is in short supply and development is taking place on the western edge of the metropolitan area, formerly considered too close to industry for other uses.

Sprawl and “Leap-Frog” Development in Metropolitan Areas

Land development for non-industrial uses near metropolitan areas sometimes fails to happen on large buildable parcels that are ideal for the purpose, because they are being held for price speculation or because of exclusionary zoning. Extending public water supply, sewerage systems, and other public services to the more distant sites is often difficult and expensive. When private systems are substituted, their operating standards may not match the higher standards of public systems, and community health and environmental quality often suffer.

Smaller Lot Sizes and Fewer Amenities

The proliferation of residential DRIs is an indication of not only the desirability of the coastal region, but also of an expansion of moderately-priced, workforce housing. These developments are mainly located in close proximity to the Savannah job market (Pooler, Port Wentworth, South Effingham County and Richmond Hill), and often feature smaller lot sizes and fewer amenities. The result has been the development of a variety of lower-cost housing types built at a higher density, such as townhouses, patio homes, and zero-lot line houses. These styles are also popular with many seniors and second-home owners.

Mobile Homes and Manufactured Homes

A large segment of the region’s housing stock is mobile or manufactured homes (see Table C-1 and C-6). However, resistance to these housing types is increasing. Reasons for this include the limited property taxes they generate and the negative image many people have of them. Since manufactured homes are the most affordable option in the region, such resistance to them may help push the coast’s workforce housing further inland.

More Large-Scale Mixed-Use Developments

As real estate values and building costs continue to rise, the economies of scale for large land developments become more evident, and it is in the best interests of the community for such projects to be mixed-use. These usually have a positive effect on local infrastructure. An increasing number are planned to allow for public amenities such as schools and recreation. In addition, the placement of commercial uses close to residential dwellings can decrease traffic congestion and promote walking or biking. As with the workforce housing, these developments are often located in close proximity to Savannah (New Hampstead), Hinesville (Independence) and Richmond Hill (Genesis Pointe).

Resort-Style Development

Affluent retirees and second-home owners are increasingly coming to the Georgia coast. Resort-style developments have capitalized on that demand, but these often have a negative impact on the environment. In addition, the rising demand has reduced the affordability of housing in the region, driving out some longtime residents and making the economic situation more difficult for those that remain.

Intergovernmental Coordination

There are certain problems and issues confronting the coastal region that can best be dealt with in a coordinated manner, rather than by individual governments or entities acting in isolation. By the same token, many opportunities exist that can best be grasped by cooperative action as opposed to separate efforts. In some cases, local governments already work together, either on an informal basis or through jointly-controlled agencies. In other cases, the state or federal government formulates regulations and standards, which may be recommended or mandatory depending on the situation. In addition, there are many governmental agencies and authorities that act on a region wide basis. All of these approaches fall under the broad category of intergovernmental coordination.

“Leap-Frog” Growth

“Leap-frog” development is often caused by the differing policies of various local governments; as suburbs close to a city choose to restrict growth while those further out seek to encourage it. The result is often an illogical pattern of development that causes environmental harm and traffic congestion. A more consistent approach, in which local government policies work in harmony throughout an entire region or metropolitan area, can yield better results.

Protection of the Environment

Environmental problems are another challenge that often requires regional action to be dealt with successfully. Otherwise polluters or noxious land uses will migrate to those areas where standards are lowest. Because ecosystems such as watersheds do not respect local government borders, the need for coordination is especially acute.

Coastal Management Program

The Georgia Coastal Management Program is administered by the GDNR/CRD. It is a coordinated effort to deal with environmental issues in the coastal region, and thus works extensively with local governments, other local actors, various state agencies, and the federal government. Among other activities, the program provides technical assistance, engages in outreach and education, performs monitoring, and administers federal grants.

Economic Development

Cooperation is also important in promoting economic development. Local governments often lack the resources to promote their economic potential on a nationwide or global basis, but a larger entity can do so. Tourism is the most relevant example of this for the coastal region. Local governments can also partner effectively so as to create the framework for economic development, such as by building a business park or improving an educational institution. Acting alone, small local governments generally lack the resources to carry out such projects. All six of the counties’ development authorities participate in joint development authorities (JDA):

Chatham, Bryan and Liberty counties are members of the 16-county Middle Coastal Unified Development Authority (MCUDA). Camden, Glynn and McIntosh counties are members of the 6-county Southeast Georgia JDA.

Coastal Georgia Greenway

Coordination is vital in planning, developing and maintaining community facilities that serve the residents of more than just one locality. The Coastal Georgia Greenway will stretch along the entire Georgia coast, linking to networks in Florida and South Carolina. Obviously such a challenge can only be met by a tremendous amount of local cooperation, action at the regional level, and coordination between local and regional actors.

Hurricane Evacuation

In the event of a hurricane or major storm, significant intergovernmental coordination is necessary. GEMA has the main responsibility for planning and coordinating evacuations, but local governments must handle most of the actual work. Federal, state, and local agencies coordinate through all phases of the evacuation process. The Federal Highway Administration works regionally with GDOT, GEMA, and their counterparts in other affected states as the Evacuation Liaison Team (ELT). This work is disseminated to local jurisdictions through conference calls. The State Operations Center decides when to deploy the Evacuation and Re-entry Branch (ERB), which is composed of representatives of a number of state agencies. The ERB coordinator works with the local Emergency Operations Centers.

Ports

The investment required for operations, maintenance and expansion of the ports of Savannah and Brunswick is tremendous, and necessitates an overarching Port Authority. The orchestration of port-related activity requires a regional approach, in which the authority, as well as the state and local agencies, have common goals. Indeed, intergovernmental coordination can cross state lines. In March of 2007, the governors of Georgia and South Carolina jointly announced the plan to form a bi-state port authority that would build a port just north of Savannah, in Jasper County, South Carolina.

Military Bases

There are two important military bases in the coastal region, Fort Stewart/HAAF and Kings Bay Naval Submarine Base, both of which have a tremendous impact on land use, economics, transportation and demographics in the entire region. Local governments and the military must make extra efforts to work together, because the issues they face are often interlinked and decisions made by one group can have a large effect on the other. Implementation of the JLUS by affected local governments is just one way of strengthening the relationship.

Service Delivery Strategy

The service delivery strategy is a document that all the local governments of a particular county must agree upon. The strategy simply specifies how certain services and related facilities are provided over the entire area of the county, including both incorporated and unincorporated areas. Services that are commonly included in the strategy include water, sewer, solid waste, road maintenance, jails, police, fire, E-911, EMS, economic development, animal control, etc. The strategy is where intergovernmental coordination and cooperation—whether formal or informal—is often specified and described.

Conclusion

Next Step Regional Agenda

The CRC is armed with the data, maps, and checklists that evaluate the performance of planning documents specifically for managing the conditions generated by the impact of a natural event. The identified missing portions of documents and the **Resiliency Matrix Tool** are a straightforward framework for evaluating the performance of planning documents. Although the State of Georgia has a statewide hazard mitigation element it is not adopted by cities in their comprehensive plan. The matrix can both be easily used for evaluation of planning documents and be updated depending upon the type of natural event. Additionally, the Assessment and matrix can be used in conjunction with the Georgia Department of Community Affairs (DCA) **2014 Best Practice Guidebook: Community Disaster Resilience**. This guidebook was created to assist Georgia counties and cities with preparedness for natural hazards and disaster resiliency. DCA studied 20 Georgia counties that were impacted by flooding, severe storms and tornadoes in 2008, and the report describes recommended strategies for coordinating land use planning with hazard mitigation planning. According to DCA, these best practices can be incorporated into planning activities and include specific actions to implement plans and policies.

GA DCA and the CRC Council recognize the benefits and opportunities of integrating hazard mitigation into planning through updates of comprehensive plans, as it promotes consistency between plans; increases the visibility of mitigation goals, objectives and policies; properly guides future development and land use; and, improves coordination between planners and emergency managers.

One of the CRC Planning & Government Services Department aim is to continue to provide access to GIS data and spatial tools to each jurisdiction. This vision puts the data and tools in the hands of economic developers, planners, elected officials, emergency management to better facilitate access in real time. Providing tools and access to GIS data and spatial tools helps stakeholders make better informed decisions. The following categories can be included as part of the resilient community's discussion:

Re-Entry Analysis

- Decision Making
- Communication Process
- Storm Damage Impact Analysis
- Roadway Network

Business Mitigation & Recovery Analysis

- Impact Assessment
- Mitigation Assessment
- Economic Impact Study
- Recovery Analysis
- Redevelopment Planning

Community Storm Impact Analysis

- Coastal Erosion Mapping
- Inland Flood Analysis
- Critical Facility and Utility

Recovery Analysis

- Debris Management Planning
- Public Health
- Temporary Housing

Communication Assessment

- Public Information Process Analysis
- Interoperability Communications Planning Analysis

Technology Analysis

- GIS Applications
- Enhanced Decision Tool Updates

Disaster Mitigation Analysis

- Building Code Impact Analysis
- Zoning Analysis
- Community Rating System Analysis
- HAZUS Implementation
- Public Education and Outreach

The CRC's Regional Assessment is an evidence-based and peer reviewed planning process with clear methodology from a vigorous science basis. The University of Georgia College of Environment + Design presented initial findings at the American Planning Association (APA) GA Chapter State Conference on Jekyll Island. The CRC Regional Assessment, the Resiliency Matrix Tool, DCA's Best Practices, FEMA's Comprehensive Hurricane Emergency Management Strategies, and access to data and GIS applications, together can assist groups, stakeholders, policy makers, state and federal agencies in crafting appropriate guiding principles, effective work programs and operative performance standards in the Regional Plan Update to reduce risk to citizens, account for the long-term health of the ecosystems and ensure the continued delivery of services.