Marine Extension and Georgia Sea Grant
UNIVERSITY OF GEORGIA

Sea Grant

Strategic Plan 2018-2023

"Science Serving Georgia's Coast"

Our Vision

We envision a coastal Georgia where healthy coastal ecosystems and natural resources maximize the resilience and economic vitality of communities.

Our Mission

To support research, education, and outreach activities that promote environmental and economic health in coastal Georgia by helping improve public resource policy, encouraging far-sighted economic and fisheries decisions, building resilience, and educating citizens to be wise stewards of the coastal environment.

Our Core Values

- *Promote scientific excellence and knowledge-sharing*: We recognize that the full spectrum of benefits and impacts of our programs can only be achieved through a foundation of cutting-edge scientific research and the translation of research results into the communities that we serve.
- *Be objective and transparent*: We uphold the principles of objectivity and transparency by maintaining the highest standards of quality and integrity in our research, providing impartial and timely service through education and outreach, and encouraging broad public engagement.
- *Develop and sustain meaningful partnerships*: In collaboration with our partners, we develop strategic actions to achieve our common goals effectively and efficiently.
- *Stay relevant and impactful:* To anticipate future challenges and seize opportunities, we strive to stay nimble, relevant, and outcome-focused.
- *Champion diversity, equity and inclusion:* Service to our stakeholders is at the heart of our mission. We believe that developing sustainable solutions to Georgia's most pressing environmental issues can only be achieved by engaging a diversity of people who bring a range of tools, resources and perspectives to our program.

Who we are and how do we work?

Administered by the National Oceanic and Atmospheric Administration (NOAA), Sea Grant is a national network of thirty-three university-based programs in each of the coastal U.S. states, Great Lakes region, Puerto Rico and Guam. For 50 years, Marine Extension and Georgia Sea Grant has been serving the state of Georgia by providing integrated research, extension, education, legal, and communication programs to foster the responsible use of Georgia's marine, ocean, and coastal resources by individuals, decision-makers and management agencies. The primary focus of our

programmatic areas is along Georgia's coast, while recognizing the interconnectedness of the mountains, piedmont, and coastal plain of Georgia.

Our essential federal-state partnership requires us to align our strategic plan with the National Sea Grant Office (NSGO), the University System of Georgia (USG), the University of Georgia, and other NOAA partners in our region. What follows is a brief outline of our programmatic areas, the importance of our work in the state of Georgia, and our 2018-2023 priorities and goals that we developed in collaboration with our partners.

Research

Marine Extension and Georgia Sea Grant are built on the fundamental principle that a prosperous Georgia coast requires the full spectrum of basic, problem-oriented and applied research. We consistently engage our stakeholders, including the scientific community, to help us identify emerging opportunities and threats, and assist us in making optimal investments of the state and federal resources entrusted to us. Through competitive grant programs, fellowships, and scholarships, Georgia Sea Grant makes strategic investments in use-inspired[1] research related to Georgia's coastal, ocean, and marine environment. We sponsor research not only in traditional academic fields of oceanography, marine science, geology, and geophysics, but also disciplines such as engineering, fisheries, marine technology, economics, sociology, planning, law, international affairs, and public administration. Some problems are best addressed through regional level collaboration, so wherever appropriate we collaborate with our partners to make regional research investments. By serving as a sustained contact and source of federal funds between federal agencies with ocean responsibilities and universities in the state, we support the generation of knowledge with societal benefits, and deliver credible and timely information to those who need it, in ways that are accessible and effective.

Extension

Integral to our mission is the idea that knowledge should be co-produced, widely shared and used. The primary focus of our extension program is to work with the people in coastal communities to facilitate change in a complex social and economic environment. We achieve this by helping people gain relevant knowledge and confidence to support behavior change and provide the support necessary for change to occur effectively. By coordinating the efforts of scientists, local officials, industry partners, and civic groups, we assist coastal communities in addressing risks and capture opportunities related to coastal, ocean, and marine resources using sustainable and practical science-based solutions. Our extension specialists have long, trusted relationships with the communities that they serve, and connect university resources and knowledge with local needs by partnering with marine industries, local governments, students, teachers, design professionals,

[1] Stokes, D. E. (2011). *Pasteur's quadrant: Basic science and technological innovation*. Brookings Institution Press.

and other groups to sustain healthy ecosystems and marine resources, as well as maximize resilience and economic vitality of coastal communities.

Education

Marine Extension and Georgia Sea Grant advance environmental literacy and workforce development by nurturing the next cadre of young investigators through research, scholarship, and creative learning activities in coastal, ocean, and marine science. Our Marine Education Center and Aquarium leads educational programming in several areas of marine science and coastal ecology, and provides training to pre-K-12, collegiate, and adult groups. Internships supported by Georgia Sea Grant immerse post baccalaureate students in a year-long experience that introduces them to Georgia's unique coastal environment and the professional field of marine education. Interns learn and teach others through field trips, summer camps, workshops, public programs, and more. Additionally, Sea Grant offers a number of educational and professional development opportunities for graduate students. These include Georgia Sea Grant's Research Traineeship, Sea Grant State Fellowship, Coastal Management Fellowship, and John A. Knauss Marine Policy Fellowship.

Law and Policy

Established in 2014, the Georgia Sea Grant Legal Program provides law and policy analysis of coastal, environmental, and land use issues affecting the state's coastal resources. Our legal experts provide objective legal information and analysis to assist extension professionals, state and local government decision-makers, coastal residents, and business owners in their understanding and navigation of complex legal and policy issues that impact the environment surrounding coastal communities. Experts also provide mentorship to students on a variety of law and policy concerns confronting coastal Georgia.

Communications

Our communications department works to support the implementation of our mission and programs through effective internal and external communications mechanisms. Communications staff strive to advance our brand identity, broaden awareness of our organization and its priorities, and increase the visibility of our programs. They accomplish this by building media relations and sharing activities and accomplishments with target audiences through various communications outlets, including a newsletters, website, and social media platforms. Our communications staff also helps disseminate results of Georgia Sea Grant-supported research projects through messaging and products to ensure that our stakeholders are provided with all pertinent scientific information required to make informed decisions.

Why does our work matter?

Marine Extension and Georgia Sea Grant bring together diverse experts from various disciplines, practitioners, and stakeholders to capitalize on advances in science and technology, develop shared goals, promote meaningful dialogues, seek common ground, and where appropriate, catalyze action on a range of coastal, ocean, and marine priorities in Georgia. This combination of strong research capabilities, local knowledge, and on-the-ground workforce provides us with an unmatched capability to rapidly identify issues, capitalize on opportunities, and to generate timely, practical solutions to real problems using science and technology.

What makes us unique?

What sets us apart is our place-based and trans-disciplinary approach to problem-solving that combines research, education, outreach, and communications to address risks and uncertainties, provide solutions, and capture opportunities related to Georgia's coastal, ocean, and marine environment. Partnerships between scientists and our stakeholders are the cornerstone of our success.

2018-2023 Strategic Planning Process

Every four years, Marine Extension and Georgia Sea Grant develop an agile and comprehensive strategic plan that establishes the direction that the program will pursue to address the risks and capture opportunities related to Georgia's changing social, environmental, technological, economic and political trends. Our strategic plan allows us to establish a culture of openness, transparency, accountability and commitment to ongoing dialogue with our partners, stakeholders and staff.

The strategic planning process takes place over multiple months, engaging a wide variety of stakeholders including representatives from colleges and universities, government agencies, businesses and industry, community organizations, non-profits and residents of Georgia. Several data collection strategies, such as surveys; focus groups; and interviews, allow us to engage not only those who have worked with us for years, but also those whom we have never worked with in the past. Stakeholder engagement is incredibly important in the development of our strategic plan as it provides insights into the emerging trends, needs, growth opportunities, and guides a vision of our program's future. These insights translate into our organizational goals, create the basis of effective strategy development, and produce measurable outcomes. Carefully designed performance measures and metrics help us measure the success and overall performance of our strategic plan. The four-year strategic plan is further aligned with the National Sea Grant strategic plan as well as the strategic plan for the University System of Georgia (USG).

Appendix 3 provides a summary of results from our 2018-2021 strategic planning process.

In 2020, the National Sea Grant Office (NSGO) issued a guidance to allow state Sea Grant programs to extend or update their 2018-2021 strategic plans through 2023. More information about the strategic planning guidance can be found in the following document -- https://seagrant.noaa.gov/Portals/1/Guidance/Strategic%20Planning%20Guidance%202022-23.pdf. In accordance with this guidance, we updated our current strategic plan with input from our advisory board, funded researchers and staff.

Programmatic Focus Areas

The strategic plan outlines goals, strategies, outcomes, and corresponding performance measures organized under our four national focus areas, namely,

1. Healthy Coastal Ecosystems
2. Sustainable Fisheries and Aquaculture
3. Resilient Communities and Economies
4. Environmental Literacy and Workforce Development

These focus areas mirror the National Sea Grant Program's 2018-2023 Strategic Plan and reflect America's most urgent coastal needs, NOAA's goals and Sea Grant's strengths and core values.

Outcomes are categorized as *learning*, *action*, and *consequence*

- Learning outcomes lead to increased awareness, knowledge and skills, and changes in attitudes, opinions, aspirations or motivations through research and/or constituent engagement.
- Action outcomes lead to behavior change, social action, adoption of information, changes in practices, improved decision-making or changes in policies.
- Consequence outcomes in most cases require focused efforts over multiple strategic planning cycles. Consequence outcomes in a four-year strategic plan serve as reference points toward reaching focus area goals between the current and future strategic plans.

There are two types of performance measures identified in this plan:

- Performance measures that are closely linked to a single focus area.
- Crosscutting performance measures of progress towards goals for all four focus areas.

Healthy Coastal Ecosystems

***Situation*:** Healthy Coastal Ecosystems are critical to Georgia. They have intrinsic ecological, cultural and aesthetic value, and are essential for sustaining the diversity of coastal and marine life that draws people to the coast of Georgia and supports many coastal communities. The health of Georgia's coastal ecosystems is impacted by various stressors, many of which are of anthropogenic origin. When drought, upstream water withdrawal, pollution or other conditions stress the ecosystem, water resources decline, and both economic and environmental prosperity suffers. Economic growth must be balanced with environmental conservation in a way that meets present needs without compromising quality of life for future generations.

Goal 1: Ecosystems and the services they provide are preserved and/or improved by sustaining the biodiversity and abundance of living resources in order to support communities and economies.

Strategy 1a: Support research, outreach and educational activities to demonstrate the value and function of healthy ecosystems, as well as the factors and practices that affect them.

Learning Outcomes

- Scientific understanding of ecosystem processes and responses is improved.
- Natural resource managers, coastal and watershed stakeholders, and the general public recognize the value and function of species biodiversity, productive habitats and healthy ecosystems.

Action Outcome

- Communities demonstrate actions and plans that utilize the benefits of natural resource-based land management concepts and practices to support biodiversity, habitats, and ecosystems.

Consequence Outcome

- The value and function of healthy ecosystems, as well as the factors and practices that sustain them, are supported and factored into economic development and environmental planning processes.

Strategy 1b: Provide research-based information that explains to all stakeholders the economic and ecological importance of sustaining critical habitats, biodiversity, ecosystem services, and wildlife corridors.

Learning Outcome

- Increased body of knowledge on the importance of sustaining diverse and abundant living resources to benefit healthy ecosystems, and the utilization of the information by natural resource managers, planners, regulatory entities, coastal and watershed stakeholders and residents.

Action Outcome

- Apply research-based information to make informed decisions on sustaining diverse and abundant habitats and living resources to benefit healthy ecosystems.

Consequence Outcome

- The application of ecosystem-based management approaches results in the balanced use and conservation of critical habitats, species richness and ecosystems.

Goal 2: Land, water, and living resources are managed by applying sound science, tools and services to sustain ecosystems.

Strategy 2a: Support research and outreach to enhance public policy dialogue, support private sector models, and launch initiatives to inform sustainable management of land, water and living resources.

Learning Outcomes

- Resource managers, regulatory entities, coastal and watershed stakeholders, and the general public recognize the impacts of habitat alteration and loss of ecosystem function in coastal environments and watersheds.
- Baseline data, standards, methodologies, and indicators are developed or used to assess the health of Georgia's coastal ecosystems and watersheds.

Action Outcomes

- Communities engage in planning efforts to protect water supplies and improve water quality.
- Coastal and watershed stakeholders act and plan for the impacts of human development on coastal ecosystems.

- Residents, resource managers, and businesses integrate best available knowledge and understanding to manage Georgia's coastal resources, and work with all sectors in the decision-making processes.

Consequence Outcomes

- Georgia's land, water, and living resources are managed using ecosystem-based approaches.

Strategy 2b: Support social, economic, and environmental research to demonstrate the importance of healthy coastal ecosystems.

Learning Outcome

- Coastal and watershed stakeholders can identify and access data, methodologies, and best management practices to balance the use and conservation of natural resources and coastal Georgia's ecological systems.

Action Outcomes

- Coastal and watershed stakeholders apply scientific information and tools provided by Marine Extension and Georgia Sea Grant to enhance, preserve, and protect coastal Georgia's ecological systems.
- Coastal communities work with Marine Extension and Georgia Sea Grant to compare and evaluate best management practices.

Consequence Outcome

- Coastal and watershed stakeholders take into account the importance of proactive and comprehensive land use planning to guide management decisions, minimize user conflicts, and improve natural resource conservation efforts.

Strategy 2c: Provide outreach and education to coastal communities on the best available resources, technology-based tools, legal and policy tools, and best management practices that protect and sustain coastal ecosystems on a regional and local levels.

Learning Outcome

- Coastal and watershed stakeholders can identify and access information and tools that facilitate the compatible, efficient and flexible management of multiple uses of Georgia's natural resources and critical habitats.

Action Outcomes

- Georgia resource managers, decision-makers, and general public utilize best available scientific knowledge and understanding to support ecosystem-based management.
- Coastal and watershed stakeholders choose and utilize tools, resources, and training that supports ecosystem-based planning and management approaches, through research, outreach and education.

Consequence Outcome

- Communities adopt current, science-based, sustainable land use, and water resource tools and best management practices and policies.

Strategy 2d: Enable industry to grow economically and sustainably with management efforts to protect resources and enhance or restore ecosystems.

Learning Outcome

- Industry and management are aware of the importance of proactive and comprehensive natural resource-based land use practices to guide management decisions, minimize user conflicts, and improve resource conservation efforts while enhancing economic growth.

Action Outcome

- Industry and resource managers cooperate to obtain economic growth while protecting, enhancing, and restoring ecosystems.

Consequence Outcome

- The application of collaborative industrial and managerial economic approaches results in the protection, enhancement and restoration of ecosystems.

Goal 3: Ecosystems and their habitats are protected, enhanced or restored to support communities and economies.

Strategy 3a: Develop and share scientific understanding, decision-support tools, technologies, and approaches to protect and restore ecosystems.

*Learning Outcome*s

- Georgia residents, resource managers, and businesses understand the importance of the benefits provided by preserving non-degraded ecosystems.
- Georgia residents, resource managers, and businesses understand the science behind the threats to ecosystems and the consequences of degraded ecosystems.

Action Outcome

- Scientists develop technologies and approaches to restore degraded ecosystems along Georgia's coast and in contributing watersheds.

Consequence Outcome

- Resource managers set realistic and prioritized goals and policies to protect, enhance, and restore habitats along Georgia's coast and in contributing watersheds by incorporating ecosystem-based scientific information and public input.

Strategy 3b: Support research, outreach, and education activities to improve the effectiveness of remediation and restoration of impaired habitats and identify new restoration approaches and technologies.

Learning Outcome

- Coastal and watershed stakeholders are aware of critical scientific, management and restoration needs' and strategies for Georgia's ecological systems.

Action Outcome

- Tools and technologies are developed that can be utilized by resource managers and landowners to enhance or rehabilitate degraded habitats.

Consequence Outcome

- Resource managers, businesses, and residents adopt innovative strategies and technologies to maintain or improve the function of ecosystems along Georgia's coast and in contributing watersheds.

Sustainable Fisheries and Aquaculture

***Situation*:** Historically, the most important components of Georgia's commercial fisheries have been shrimp and blue crab. While these sectors remain culturally and economically important to local communities, they face multiple challenges such as an aging workforce, competition from imported products, and changing environmental conditions. Georgia's marine recreational and for-hire sectors also contribute significantly to the state's economy and depend on sustainable harvesting practices and informed management decisions to remain viable.

Developments in aquaculture, particularly in shellfish such as oysters and clams, present great opportunities for expansion and diversification for Georgia's seafood industry. In addition, demand for locally sourced, safe and sustainable seafood as well as innovative marketing strategies hold continued promise for supporting these traditional and expanding industry sectors in the short and long-term future.

Goal 1: Provide a safe, secure, and sustainable supply of seafood to meet current and future public needs.

***Strategy 1a**:* Provide training and technical assistance for Georgia's seafood industry to ensure products are properly and safely handled.

Learning Outcome

- Georgia seafood industry knows how to apply science-based methods to safely handle and produce seafood.

Action Outcome

- Georgia seafood industry adopts approved handling and processing practices to supply safe and healthful seafood to consumers.

Consequence Outcome

- Georgia seafood is sustainably managed and safely produced.

Strategy 1b: Collaborate with Georgia's fishing and aquaculture industries to identify and respond to emerging issues that threaten the health and sustainability of their seafood supply.

Learning Outcome

- Fishing and aquaculture industries are knowledgeable about emerging issues that threaten the health and sustainability of its seafood supply.

Action Outcomes

- Fishing and aquaculture industries participate in efforts that help identify and track changing conditions that affect the health and sustainability of its seafood supply.
- Managers can make more informed decisions about managing Georgia's fishing and aquaculture industries.

Consequence Outcome

- Fishing industry is more resilient to changing environmental conditions.

Strategy 1c: Participate in extension and research efforts to help Georgia's seafood industries market their products and maximize profits[2]

Learning Outcome

- Georgia's seafood industry is knowledgeable about established and innovative technologies, strategies, legal and policy frameworks, and/or resources that add value to and increase profitability for their products.

Action Outcome

- Georgia's seafood industry utilize technologies, strategies, and/or resources that add value to and increase profitability for their products.

Consequence Outcome

- Commercial seafood industry remains economically and socially viable.

Strategy 1d: Educate chefs, retailers, and consumers about how Georgia seafood is harvested, handled, and marketed, including sustainable fisheries and aquaculture issues and safe consumption practices.

Learning Outcomes

- Seafood consumers are informed about the health, safety, and sustainability of Georgia seafood.
- Seafood consumers have the knowledge to evaluate sustainable seafood choices.

Action Outcome

- Seafood consumers make informed choices about the seafood they purchase/catch and consume.

Consequence Outcome

- Consumers improve their health through increased consumption of safe and sustainable seafood products.

Goal 2: Fishing and aquaculture industries and the communities that depend on them enhance their productivity and sustainability.

Strategy 2a: Facilitate the expansion and diversification of Georgia's molluscan shellfish aquaculture industry[3].

Learning Outcome

- The Georgia shellfish aquaculture industry is knowledgeable about grow out and processing techniques, technologies, and/or law and policies for established and potential species.

Action Outcomes

- Georgia's shellfish industry applies techniques and approaches to new production and grow out technologies to maximize efficiency and productivity.
- Resource managers establish policies and regulations that balance economic benefit and conservation goals.

Consequence Outcome

- Georgia expands its sustainable domestic aquaculture industries.

[2] Aligns with Southeast Geographic Strategic Plan 2020-2023. Strategic Goal 1: Amplify the economic value of commercial and recreational fisheries while ensuring their sustainability, Key Strategy: 1.2 increase U.S. marine aquaculture production

[3] Aligns with Southeast Geographic Strategic Plan 2020-2023. Strategic Goal 1: Amplify the economic value of commercial and recreational fisheries while ensuring their sustainability, Key Strategy: 1.2 Increase U.S. marine aquaculture

Strategy 2b: Work with Georgia's aquaculture and commercial and recreational fishing industries to promote safe and sustainable harvesting practices and informed management decisions[4]

Learning Outcomes

- Fishers and growers are informed about safe and sustainable harvesting practices relevant to their industries.
- Fishers and growers are knowledgeable about regulations and policies relevant to their industries.

Action Outcome

- Fishers and growers adopt innovative technologies and techniques that minimize negative environmental, economic, and/or social impact associated with their industries.

Consequence Outcomes

- Georgia's fishing and aquaculture industries are sustainably managed.
- Georgia's fishing and aquaculture industries remains socially and economically viable.

Strategy 2c: Support research and extension efforts that support sustainable and resilient working waterfronts and marine-dependent businesses.

Learning Outcomes

- Communities know about the important linkages between economic health and vitality of natural and cultural systems.
- Communities have access to information needed to understand the value of waterfront- and tourism-related economic activities.

Action Outcomes

- Communities engage in economic development initiatives that capitalize on the value of their natural and cultural resources while balancing resource conservation and economic growth.
- Resource managers and decision-makers and/or businesses use research-based information to support the development of sustainable and resilient working waterfronts and marine-dependent businesses.

Consequence Outcomes

- Working waterfronts are part of a diverse and healthy economy.
- Georgia's working waterfronts and marine-dependent businesses are economically and socially viable.

Resilient Communities and Economies

Situation: Living and conducting business in Georgia's coastal zone means increased exposure to extreme weather events and climate-related risks. Short-term hazards such as coastal storms and flooding can quickly threaten property and people. In addition, coastal citizens also must consider the longer-term effects of sea level rise and drought. To ensure human safety, economic vitality and the environmental health of coastal habitats, federal, state and local governments, agencies

[4] Aligns with Southeast Geographic Strategic Plan 2020-2023. Strategic Goal 2: Conserve and recover protected species while supporting responsible fishing and resource development, Key Strategy 2.3 Minimize bycatch and entanglement of protected species while supporting fisheries

and organizations must work together to develop plans to recover from and adapt to the challenges nature presents.

Goal 1: **Coastal communities use their knowledge of changing conditions and risks to become resilient to extreme events, economic disruptions and other threats to community well-being.**

Strategy 1a: Increase awareness and improve communication of weather and climate risks in order to enhance the capacity of Georgia citizens to mitigate, prepare for, respond to and recover from coastal hazards.

Learning Outcomes

- Identify gaps in current knowledge and practice that inhibit the ability to coastal communities in sharing and using emergency communications are identified.
- Residents and decision-makers in coastal Georgia communities understand the processes that produce hazards and climate change and the implications of those processes on Georgia's coastal communities.
- Communities have access to maps, visualizations and other communication strategies that effectively disclose the risks of weather-related disasters and climate events.

Action Outcomes

- Coordination and collaboration networks are developed to share information and best practices across sectors and regions to build coastal resilience.
- Georgia's coastal communities use climate and weather data, tools and technologies for management, policy and safety decisions.

Consequence Outcome

- Communities are able to leverage digital and social support networks to respond, recover, and become resilient to disasters.
- Communities experience minimum disruption to life and economy following hazardous events.

Strategy 1b: Support research, education, and outreach that helps communities assess and reduce their vulnerability to climate and weather-related hazards.

Learning Outcomes

- Residents and decision-makers along Georgia's coast understand how to use hazard- and climate-related data, resources and information to assess and reduce vulnerability and build resilience.
- Decision-makers in Georgia understand the legal and regulatory regimes informing adaptation and climate resilience measures, including coastal and riparian property rights, disaster relief, and insurance issues.

Action Outcomes

- Residents and decision-makers use their knowledge of weather and climate information to plan and implement adaptation and mitigation actions that build resilience.
- Communities strengthen coastal resilience by enhancing floodplain management and implementing flood adaptation measures, such as expanding flood insurance coverage,

participating in the Community Rating System (CRS) Program, and improving CRS ratings.

Consequence Outcome

- Communities are more resilient in the face of extreme events, economic disruptions, and other threats to community well-being.

Strategy 1c: Broaden participation in research, outreach, and education to ensure that vulnerable and at-risk communities are resilient to changing conditions and can improve their overall community well-being.

Learning Outcomes

- Researchers, practitioners, and decision makers develop a better understanding of community needs as well as the gender, racial, and equity dimensions of coastal hazards and disasters.
- Vulnerable and at-risk communities understand climate and weather risks and can access information and resources to improve the physical, behavioral, social, economic and environmental health of their community.

Action Outcomes

- Vulnerable and at-risk communities are engaged in building environmental, economic and social resilience, and their knowledge, values and concerns are recognized and incorporated into research, outreach and education efforts.
- Communities develop and adopt community-driven hazard mitigation and adaptation strategies suited to local needs.
- Communities adopt outreach and communication strategies for hazardous events that increase the safety and resilience of all coastal residents, including the most socially vulnerable.

Consequence Outcome

- Communities reduce weather and climate risks while balancing economic, environmental and social goals.

Goal 2: **Water resources are sustained and protected to meet emerging needs of the communities, economies and ecosystems that depend on them.**

Strategy 2a: Support research and engagement activities on population growth, land use changes, and climate change to inform water use governance and water resources management.

Learning Outcomes

- Communities are educated about the quantitative and qualitative impact of human activities on water resources.
- Communities can explain the value of clean water, adequate supplies, and healthy watersheds.
- Communities understand the rationale behind riparian water rights and policies affecting the use and allocation of water resources.

Action Outcomes

- Communities engage in planning efforts to explore alternatives in coastal development, protect water supply, and improve water quality.
- Communities adopt mitigation measures, best management practices, and improved site designs in local policies and ordinances to address water supplies and water quality for all living resources.

Consequence Outcomes

- Enhanced sustainability of Georgia's water supply.
- Water quality in Georgia is protected and improved.
- Residents and decision-makers work together to implement plans for the future and to balance multiple uses of coastal areas.

Goal 3: **Coastal business and industries strengthen local economies by implementing sustainable practices becoming resilient to changing weather and climate conditions.**

Strategy 3a: Assist businesses and keystone industries in building economic resilience and taking advantage of emergent opportunities associated with climate change.

Learning Outcome

- Coastal businesses can access information, tools, and networks to better prepare, respond, and recover from weather and climate disasters.
- Georgia's private sector has increased awareness of emerging fields, services, and markets associated with a changing climate.

Action Outcome

- Public-private partnerships are developed to build resilient coastal communities and economies.
- Coastal businesses develop resilience and disaster plans, considering future threats and opportunities while recognizing the connection between economic growth and resource protection.

Consequence Outcome

- Quality of life in Georgia's coastal communities, as measured by economic and social well-being, improves without adversely affecting environmental conditions.
- Vulnerable and at-risk coastal communities in Georgia are able to diversify livelihoods and engage in emerging professions, such as related to green infrastructure and renewable energy.

Strategy 3b: Facilitate planning for coastal tourism to enable economic development, support of healthy coastal ecosystems and sustainable use of natural resources.

Learning Outcomes

- Communities understand the important linkages between environmental and economic health of natural and cultural systems.
- Communities have access to information needed to understand the value of waterfront- and tourism-related economic activities.
- Communities can develop sustainable tourism strategies and action plans.

Action Outcomes

- Communities implement sustainable tourism action plans that are built on the principles of being region specific, conserving specific coastal landscapes and habitats, maximizing local revenues from tourism investments, and enabling self-determined cultural development in the region.
- Communities lead initiatives that capitalize on the value of their natural and cultural resources while balancing resource conservation and economic development.

Consequence Outcome

- Communities maximize the economic, environmental, and socio-cultural benefits of sustainable coastal tourism.

Environment Literacy and Workforce Development

Situation: Education is a component in every state's Sea Grant program, but it is especially important in Georgia, where many people live far from the coast. Many inland citizens do not recognize how deeply intertwined their lives are with coastal resources and communities. There is further a misconception that the Georgia coast is somehow less vulnerable than those of neighboring states to climate threats, such as hurricanes and storm surge. In order to correct misunderstanding and foster stewardship, it is critical that Marine Extension and Georgia Sea Grant increase the basic understanding of coastal and ocean environments. Education imparts knowledge and values that lead to better choices.

Goal 1: An environmentally literate public that is informed by a continuum of lifelong formal and informal engagement opportunities that reflect the range of diversity of our communities.

Strategy 1a: Increase effective environmental and ocean literacy instruction for K-12 students by formal and informal educators.

Learning Outcomes

- Teachers and students are aware of opportunities to engage in STEM programs and can employ their knowledge to support sustainable practices.
- Formal and informal educators understand ocean literacy principles.
- Lifelong learners are able to engage in informal science education opportunities on coastal topics.

Action Outcomes

- Outreach and engagement professional use ocean literacy principles in their programs.
- Extension and free-choice learning programs are developed and refined using the best available scientific research on the effectiveness of environmental and science education.

- Formal and informal educators, students, and/or the public collect and use coastal data in inquiry and evidence-based activities.
- Formal and informal educators collaborate with Marine Extension and Sea Grant to develop grant proposals and implement education activities.

Consequence Outcome

- Georgians incorporate broad understanding of their actions on the environment into personal decision-making.

Strategy 1b: Increase effective environmental literacy communication to stakeholders, including how ecosystem change affects economic, social, and cultural values, as well as implications for conservation and management.

Learning Outcomes

- Residents and decision-makers develop a thorough understanding of how ecosystem change affects economic, social, and cultural values, as well as implications for conservation and management.

Action Outcomes

- Residents and decision-makers make choices and decisions based on information learned through informal science education opportunities.
- Communities implement sustainable strategies when managing natural resources and make decisions based on information acquired through informal science education.

Consequence Outcome

- Residents and decision-makers become wise and responsible stewards of Georgia's coastal environment.

Goal 2: A diverse and skilled workforce participates in addressing critical local, regional, and national needs.

Strategy 1a: Prepare a responsive and diverse workforce to participate in and benefit from the nation's marine resource sectors (e.g. industry, research, government, etc.), and to adapt and thrive in changing conditions.

Learning Outcome

- There is increased awareness of maritime occupations and career pathways among residents of Georgia.

Action Outcome

- Innovative new models of education are launched to engage wide variety of students.

Consequence Outcomes

- Employment in all sectors of the US marine resource enterprise expands and diversifies.
- The existing and future workforce is able to adapt and thrive in changing environmental, social, and economic conditions.

Strategy 1b: Increase opportunities for undergraduate and graduate students to gain knowledge and experience in the science and management of watershed, coastal, and marine resources.

Learning Outcome

- College level courses and internships provide increased literacy, experience, and preparedness in areas of watershed, coastal, and marine ecosystems for all students particularly those from underrepresented groups.

Action Outcome

- Undergraduate and graduate students particularly those from underrepresented groups, are supported and have access to formal and experiential learning, training, and research experiences.

Consequence Outcome

- Undergraduate and graduate students acquire skills and training beyond academia by engaging in internship and experiential learning initiatives.

Performance Measures and Six-Year Targets

- Number of resource managers who use ecosystem-based approaches in the management of land, water, and living resources as a result of Sea Grant activities: (20)
- Number of acres of coastal habitat protected, enhanced, or restored as a result of Sea Grant activities. (15)
- Number of fishers, seafood processing and aquaculture industry personnel who modify their practices using knowledge gained in fisheries sustainability and seafood safety as a result of Sea Grant activities. (400)
- Number of communities that implemented sustainable economic and environmental development practices and policies as a result of Sea Grant activities. (10)
- Number of communities that implemented hazard resiliency practices to prepare for, respond to, or minimize coastal hazardous events as a result of Sea Grant activities. (10)
- Number of Sea Grant products that are used to advance environmental literacy and workforce development. (10)
- Number of people engaged in Sea Grant-supported informal education programs. (2500)
- Number of Sea Grant supported graduate students who become employed in a job related to their degree within two years of graduation. (40)
- Number of Sea Grant tools, technologies and information services that are used by our partners/customers to improve ecosystem-based management. (10)
- Economic (market and non-market; jobs and businesses created or sustained) impacts derived from Sea Grant activities. ($10,000)
- Core Funding Proposals (40)
- Hazard Analysis and Critical Control Points (HACCP) certifications (120)
- Number of peer-reviewed publications produced by the Sea Grant network (20)
- Sea Grant supported students (Undergraduate, Graduate) (120)
- Number of P-12 Students Reached Through Sea Grant-Trained Educators or Directly through Sea Grant Education Programs. (4000)
- Number of P-12 Educators who participated in Sea Grant education programs (500)
- Volunteer Hours (1000)
- SG-Sponsored/Organized Events (20)
- Attendees at SG-Sponsored/Organized Events (2000)
- Public or Professional Presentations (50)
- Attendees at Public or Professional Presentations (2000)
- New best management green infrastructure low impact development, beneficial habitats, and coastal resilient practices (BMPs) adopted/installed/implemented (10)
- Number of individuals engaged in protection, enhancement or restoration activities (100)
- New partnerships (20)
- Number of trainings/workshops/programs held for coastal and watershed stakeholders (50)

- Number of ecosystem-based approaches used to manage land, water and living resources in coastal areas as a result of Sea Grant activities (5)
- Leveraged Funding (100,000)
- Number of visitors to UGA Aquarium (10,000)
- Number of virtual programs / resources developed or offered (40)

Administration and Management Principles

Successful implementation of Marine Extension and Georgia Sea Grant programmatic focus areas requires deliberate coordination, management, and planning. We enlist an advisory board to provide non-binding strategic advice, unbiased insights, ideas, and recommendations from an external point-of-view. The advisory board (appendix 4) comprises key stakeholders and representatives from all aspects of our state's constituency.

To achieve the highest standard for excellence in administration and management, we strive to lead on the following principles.

- Organizational alignment
- Financial and administrative accountability
- Human capital
- Resource allocation
- Award management and oversight
- Knowledge management
- Stakeholder engagement
- Collaborative program activities

Organizational Alignment

Marine Extension and Georgia Sea Grant strive to create a management and organization structure that ensures that the organization can function in a viable and productive manner. Currently, federal support from NOAA is matched by state support from the Vice President of Research and Vice President of Public Service and Outreach at The University of Georgia.

The increasingly multifaceted and multidisciplinary mission may reveal organizational alignment opportunities that will improve the effectiveness and efficiency of our core business processes. Opportunities revealed will be examined for mission-focused, value-added alignment in terms of quality of results, customer service, and efficiency. To demonstrate our statewide engagement, we aim to maintain a diversity of matching support beyond the institution where the Sea Grant program is housed.

Fiscal Transparency and Administrative Accountability

Fiscal transparency and administrative accountability is integral to highlight our efforts to manage taxpayers dollars responsibly while maintaining our core values. We are already sharing our data, our successes, and our setbacks with the public. Regular program assessment and reporting includes internal reviews, audits, program assessment, yearly financial statements, and four-year

site review. Through our fiscal transparency and administrative accountability, we maintain our commitment to taxpayers to be responsible stewards of the resources entrusted to us.

Human Capital

Marine Extension and Georgia Sea Grant aim to recruit, manage, and retain a diverse, agile, competitive workforce that is committed to advance our organization's mission and continuously expand their capabilities to shape our future. To expand our innovation perspective and stimulate investments that may not occur otherwise, we plan to develop strategic positions and recruit the best talent through targeted outreach to scientists, engineers, coastal managers, and students. Leadership and succession planning will be built into career development providing all employees the opportunity to gain the skills and knowledge necessary to compete for leadership and management roles. In addition to offering a range of strategic learning and career development programs, we aim to develop a comprehensive system of awards and incentives that motivate improved performance, including monetary awards, recognition ceremonies, awards celebrating collaborative group achievements, and promotion opportunities.

Resource Allocation

Marine Extension and Georgia Sea Grant provide solutions to coastal issues in Georgia by making investments in people, ideas, and tools. As the demand for funds continues to increase, the organization continues to develop priorities based on coastal community needs and impacts on our operations. Faculty at Marine Extension and Georgia Sea Grant will continue to obtain extramural funding in support of our programs and activities that benefit the citizens and communities in Georgia. Unlike any other Sea Grant program in the nation, state appropriations provide a separate line of funding exclusively for marine extension and education activities in Georgia. This structure provides us with a great opportunity to leverage federal funding from NOAA to expand our research portfolio beyond the 40% federal requirement, launch new initiatives, and provide solutions to coastal issues in Georgia.

Award Management and Oversight

To manage and assess the contribution that individual projects make to advance knowledge and provide solutions to coastal issues in our state, Marine Extension and Georgia Sea Grant will develop more formal policies and procedures for award management and oversight. The electronic Sea Grant (eSG) system will be used to improve management and reporting of awards.

Knowledge Management

Marine Extension and Georgia Sea Grant strive to provide information that addresses existing and emerging coastal needs in Georgia. This information will include a comprehensive set of

information management and communication activities that capture, synthesize, and highlight knowledge generated by Georgia Sea Grant-funded research, and engagement activities led by Marine Extension. Management of knowledge will not only provide all our stakeholders critical information related to our organization's priorities, contributions, and achievements, but also help us seize opportunities related to "big and open data revolution."

Stakeholder Engagement

We rely on our stakeholders as strategic partners in addressing pressing coastal needs in Georgia. We will leverage more public-private partnerships, and harness the creativity and ingenuity of our state and regional partners to achieve our mission. Additionally, we will expand our partnerships outside the traditional federal partners to share knowledge and expertise in areas such as manufacturing, information technology, and resource management.

Collaborative Programmatic Activities

For 50 years, Georgia Sea Grant has successfully applied its unique capability to combine coastal and marine research, extension, outreach and education to benefit the communities, industries, and people of Georgia. Georgia Sea Grant has collaborated and continues to collaborate, with many state agencies to administer research programs of mutual interest that are designed to meet specific state priorities using designated funds. In addition to regional Sea Grant programs (FLSG, NCSG, SCSG), we collaborate with other NOAA agencies, including Sapelo Island National Estuarine Research Reserve (SINEER), Gray's Reef National Marine Sanctuary (GRNMS), Office of Coastal Management (OCM), National Weather Service (NWS), Department of Natural Resources (DNR), to name a few.

Appendix 1: A Brief History of Marine Extension and Georgia Sea Grant

The University of Georgia's (UGA) Sea Grant College Program evolved over a period of time from an initial grant in 1971 for marsh ecosystems research, marine extension service and related marine activities, through several distinct programmatic levels until 1980, when UGA was recognized as the nation's fifteenth Sea Grant College. Private ownership along with federal and state protection of much of the Georgia's coast provided for a relatively pristine and therefore ideal location for two world-class marine research institutions, the University of Georgia's Marine Institute (UGAMI) on Sapelo Island and the Skidaway Institute of Oceanography (SkIO), founded in 1953 and 1968, respectively.

In 1970 Dr. Edward Chin was hired and charged with developing the University's coastal research and extension programs. Chin's leadership over the next twenty-four years would lead to the establishment of Georgia Sea Grant College Program, the Marine Extension Service, and ultimately, the creation of the School of Marine Programs at UGA. In 1971, Chin appointed Dr. David Menzel to head both UGAMI and SkIO and to establish distinct missions for both facilities. SkIO's research concentrated on the oceanography of the continental shelf in the South Atlantic Bight (Cape Hatteras to Cape Canaveral), while UGAMI on Sapelo continued to study salt marshes and estuarine ecosystems. With the research programs underway, Chin next turned to his third major responsibility: the development of a marine extension program to increase the efficiency and effectiveness of the state's seafood industry. UGA has a strong tradition of public service, and its VP for Public Services at the time, J.W. Fanning, had long advocated the creation of a marine extension service to assist Georgia's seafood industry and promote coastal economic growth. At the same time, new federal programs were underway to also promote development of coastal resources. Beginning in 1970, Fanning authorized funds to start up a marine extension service, which was a first step in matching federally available funds through the nascent Sea Grant program, which required matching state funds and the integration of university research with both education and marine extension services. In 1971, with federal funding a marine education center was opened at the extension facility on Skidaway Island and in 1972 a federal grant was secured for the addition of dormitory and cafeteria facilities to accommodate overnight visitors. The Marine Education Center and Aquarium serves as the educational component of Georgia's extension program and when established, completed the elements required for UGA to become a Sea Grant institution. In 1971, Chin submitted a proposal to the National Sea Grant Program seeking support for marsh ecosystems research, marine extension outreach and related marine activities. Chin's proposal was accepted, and the University of Georgia received a Sea Grant award at the Coherent Program level, the first step to being designated a Sea Grant College. Demonstrated progress resulted in UGA taking the second step, earning Sea Grant Institution status, in 1974. Finally, in 1980, on the basis of its accomplishments in marine research, education and extension services UGA was designated the nation's fifteenth Sea Grant College.

In 1972, Skidaway's Marine Extension campus added a shellfish research laboratory adjacent to the education facility and in soon after, Marine Extension opened its first office in Brunswick, the center of Georgia's coastal fisheries. Housed originally at Brunswick Junior College, a permanent home was built in 1980 on three acres of waterfront property in the heart of Brunswick's seafood industry. The Marine Extension Service Fisheries Station assisted fishers with gear R&D and offered seafood technology and safety expertise to area harvesters and packers. An additional wing was added to the facility in 1991. UGA also purchased and staffed a 73- foot research vessel, the R/V GEORGIA BULLDOG, to augment fisheries research, training, education and technology transfer.

Reporting lines for Georgia Sea Grant and the Marine Extension Service have changed over time. Through the 70's and 80's, Ed Chin was director of both Sea Grant and Marine Extension and he reported to the Vice Presidents of Research, Academic Affairs, and Services. Upon Chin's retirement, Dr. Mac Rawson and Mr. Fred Lyda were appointed as directors of Georgia Sea grant and Marine Extension respectively. In the late 1990's, Dr. Charles Hopkinson and Dr. Randy Walker assumed leadership as directors of the two units respectively. In 2012 Georgia Sea Grant was transferred to the Vice President of Public Service and Outreach alongside Marine Extension. Dr. Mark Risse was appointed head of both Marine Extension and Georgia Sea Grant soon thereafter. The Strategic Plan of 2014–2018 became the first plan to serve as the combined plan of both Sea Grant and the Marine Extension Service.

Fisheries technology and seafood safety are just two areas in which Georgia Sea Grant has had an impact on our coastal communities. To assist shrimpers in developing more efficient net designs that increased catch levels and fuel efficiency, MAREX agents helped usher in the twin trawl net system, which dramatically accelerated landings. Georgia Sea Grant and MAREX gained a reputation for listening to their client base – fishers – and using their feedback to design innovative gear. By the 1990's the fishing industry was facing numerous new challenges – species decline, increased environmental regulations, rising overhead costs in fuel and insurance and fierce international competition for seafood markets. Endangered species regulations, including those focused on sea turtles, required shrimpers to install turtle excluder devices (TEDs) in their nets. Sea Grant and MAREX responded by collaborating with Georgia fishers to design and produce inexpensive and effective TEDs. As bycatch regulation became more common, Sea Grant-supported MAREX agents helped create new bycatch reduction devices (BRDs) that were used throughout the industry. In the new millennium, seafood safety has assumed growing importance. With the passage of the nation's first seafood safety law – the Hazard Analysis Critical Control Point (HACCP) – seafood suppliers must comply with federal guidelines. Marine Extension and Georgia Sea Grant is a leaders in nationwide HACCP training.
As commercial fishing has declined, Sea Grant and MAREX have begun to address new coastal concerns. Today's most pressing issues involve water quality – is it safe? is it potable?; water

quantity – is there enough to meet municipal, agricultural, industrial and ecosystem needs? can salt water intrusion be prevented?; sustainable development – how can we protect our coastal resources while accommodating smart growth?; land use change and climate adaptation – what steps can coastal communities take to minimize their vulnerability to storm surge and rising sea levels? Sea Grant, working with MAREX, continues to bring university-based knowledge to bear on real world problems. Working with clients, user groups and our advisory panel, we stay abreast of new developments and anticipate ways in which Sea Grant and MAREX can be effective and relevant in today's coastal Georgia.

Appendix 2: Georgia's Changing Coastal Environment

Introduction to Georgia's Coast

Nothing conveys the dynamism of Georgia's coastal zone more convincingly than its tremendous tides. The difference between high and low tide in Georgia (6-10 feet) is the second greatest range on the United States (US) eastern seaboard. Twice a day, the tides completely submerge and expose Georgia's 378,000 acres of expansive salt marshes, which constitute more than one quarter of the remaining salt marshes on the US east coast. In so doing, they nourish and sustain one of the most biologically productive ecosystems on earth. Georgia's salt marshes vary from 4-6 miles in width and lie between the mainland and a series of eight barrier island complexes containing 14 barrier islands. Like all barrier islands, they protect the coastline from storm surges and tidal action. However, unlike other barrier island complexes in the US, Georgia's are largely undeveloped. At the end of the 19th Century, a number of wealthy northern industrial families, among them the Carnegies, Vanderbilts, and Rockefellers, purchased Georgia's 'Golden Isles' as private hunting and recreation retreats. Jekyll, Cumberland, Ossabaw, Sea, Sapelo, St. Catherine's and Wassaw Islands were all privately owned until the middle of the 20th century. Having these critical barrier islands in the hands of wealthy families for so long kept them from being developed, which in turn kept much of the salt marsh and estuarine waters they shelter relatively undisturbed. The 1970 Coastal Marshlands Protection Act, often heralded as one of the most progressive in the nation, has led to continued protection and maintenance of our tidal wetlands. Dynamism also characterizes social aspects of Georgia's coastal zone. Unlike most coastal regions in the eastern US, Georgia's coast did not become accessible to most of the population until late in the 20th Century, after the completion of Interstates 95 and 16. Population increased from about 280,000 people in 1970 to over a half a million in 2010. In the first decade of the new millennium, population increased up to 32% in some counties and averaged 22% across all 11 coastal counties.

Georgia's Changing Coast

Georgia's increasing population, shifting demographics, finite resources, fragile coastal ecosystems, urbanization, building and maintenance of local infrastructure are all pressing issues that demand careful consideration and informed decision-making. The immediate and long-term challenge is to balance economic vitality, ecological integrity, and social responsibility. This includes maintaining abundant clean water, ensuring the availability of clean beaches, maintaining easy access to waterways, preserving the vast acres of tidal marsh that provide valuable nursery habitat for fish and shellfish, and protecting urban areas from the ravages of sea level rise and storm surge. A discussion of some key drivers of change follows.

Fragile Ecosystems and Water Demand

Most coastal communities depend on healthy ecosystems for their economic survival. Economic growth must be balanced with environmental conservation in a way that meets present needs without compromising quality of life for future generations. Georgia's barrier island and salt marsh complex are one of the most productive ecosystems on earth. The health of Georgia's coast depends on the daily mixing of freshwater from the state's rivers and streams with the tidal pulse of saltwater from the Atlantic Ocean.

The coast is dependent on two major sources of water – surface water and groundwater – each with different contributing watersheds. Watershed effects are cumulative. Changes higher up in the watershed affect health, habitat, and supply downstream. Georgia has 14 river basins, eight of which drain to the Georgia Coast. Groundwater meets over 60% of the municipal, industrial, and agricultural needs of coastal Georgia. Groundwater in Georgia comes from the Upper Floridan Aquifer. The Floridan is one of the most productive aquifers in the world and it underlies Florida and parts of Georgia, South Carolina, and Alabama. The southeastern states are vested in its management, particularly since the Floridan provides much of the drinking water for Florida and Georgia.

When drought, upstream water withdrawal, contamination or other conditions stress the system, however, fisheries and tourism decline, and both economic and environmental prosperity suffers. Although there is some uncertainty regarding how climate change is increasing the number of extreme weather events such as drought or heavy rainfall, variability in river flow is likely to increase. In some years, evaporative losses may increase, leading to less streamflow and groundwater recharge. In other years, extreme precipitation events may have an impact. Rapid runoff of rainwater from impervious areas, for example, contributes to variability in river flow, with increases in water quantity (flooding) and decreased water quality. Impervious areas also prevent groundwater recharge, which can lead to decreased instream flow during droughts and saltwater intrusion of surficial aquifers. Meanwhile, rising populations coupled with increasing per capita water consumption is likely to create substantially greater demand for water in coastal Georgia.

Fisheries and Aquaculture

While recreational fishing and eco-tourism are on the rise, Georgia's seafood industry struggles to maintain its presence on our coast after decades of setbacks. Continued environmental challenges include the effects of drought on shellfish populations, habitat loss due to sea level rise and coastal armoring, wetland loss from development, and the hard-to-document impacts of pollution and nonpoint source runoff in the coastal zone. Faced with increasing competition from imports and farm-raised products, regulatory requirements, an aging workforce and increased overhead costs, many of Georgia's shrimpers, crabbers, and fishers struggle to compete in a global marketplace. According to a recent study, more than 90% of all seafood in the US is imported and more than

one-third of all fish are mislabeled. However, Georgia's commercial fishers harvest a high-quality product in a sustainable manner. The hope is to capitalize on recent demand for locally sourced seafood by forming links to local restaurants and markets throughout the state.

Oystering was once a way of life for many coastal Georgians, but died out by the mid 1900's due to overfishing and/or disease and changes in market demands. Today wild populations have rebounded and new methods developed by Georgia and National Sea Grant-funded research are bringing the oyster industry back to our coast and promoting a new shellfish industry – oyster farming. In addition to these efforts, Georgia needs new strategies for distributing the seafood it produces, protections for the infrastructure that supports those fisheries, and assurances that the state's waterways remain easily accessible for recreation and commercial fishing. Fishers must also adopt safe and sustainable fishing practices to ensure Georgia's fisheries remain sustainable and well managed.

Population Growth, Shifting Demographics

The coastal zone is the second fastest growing region in Georgia, just behind metropolitan Atlanta. Population projections forecast a 46% increase, from 10.1 to 14.7 million -- in Georgia's population from 2010 to 2030. While most of Georgia's coastal population lives on the mainland, population growth will place great pressures at the margins of these areas and on the marine and coastal environment. Savannah in Chatham County and Brunswick in Glynn County constitute 69% of the total coastal population. The shift towards more urbanization is likely to have has profound environmental, economic, social, and technological implications for these communities as well as the entire Georgia coast. Managing growth will be critical for ensuring that changes in land use and resource demands do not adversely impact coastal resources and diminish quality of life. While population growth is projected for much of Georgia's coast, the coast also has counties with declining populations and some that are well below state averages in average income. These counties are in critical need of new economic development opportunities.

Georgia's demographic future is likely to look very different from the 1950s. Shifting demographic trends include rising proportions of older people (over the age of 60), young adults (people between 15 and 24 years of age), and falling youth dependency (the ratio of children under 15 to the working-age population, 15 to 64). Like the US as a whole, Georgia is experiencing substantial racial and ethnic shifts. The white share of population is declining as Hispanic, Asian, and black populations continue to grow.

Climate Change and Sea Level Rise

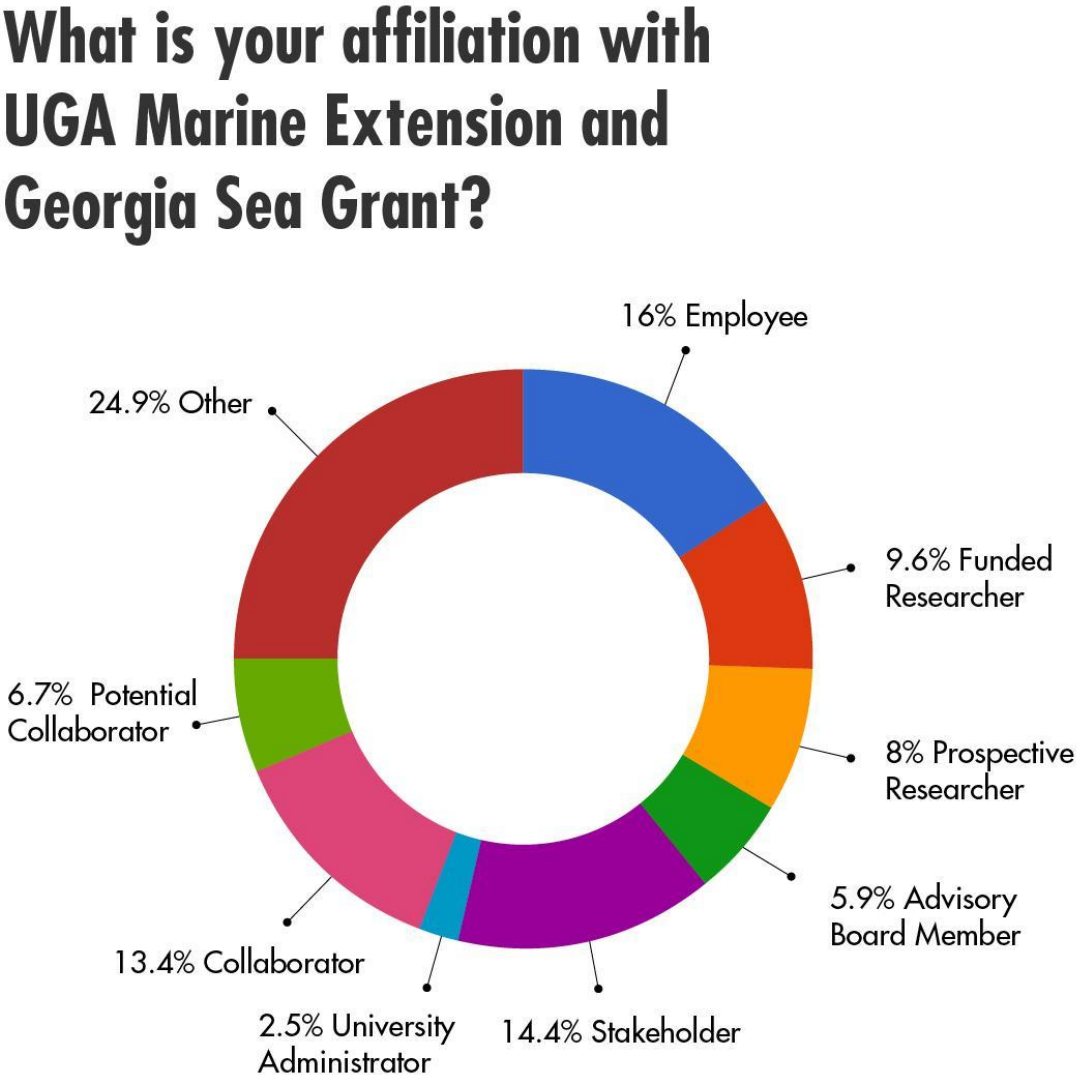
Today, the planet is estimated to be 1℃ warmer, on average, than it was half a century ago -- and warming trends are predicted to continue. Coastal hazards such as flooding, storm surge, drought, and saltwater intrusion are likely to be exacerbated due to climate variability and change. Georgia's coastal zone is extremely low in elevation, rendering it especially vulnerable to flooding and storm

surge. More intense rainfall, coupled with increasing impervious surfaces, will increase the risk of riverine flooding in low-lying areas. Rising seas are likely to affect agriculture/residential/commercial/industrial land uses through higher storm surges, saltwater intrusion, and impacts on freshwater supplies. Sea level rise is projected to rise by 6 to 24 inches by 2050. As sea level rises, storm surge from tropical cyclones, coastal erosion, and other extreme events will likely increase in magnitude. Hurricane Matthew in 2016 created a record highest observed tide (12.5 feet) at Ft. Pulaski in Savannah, and other natural disaster events such as wildfires and coastal flooding that inflict great damage and incur high costs are on the rise. Accommodating these changes and addressing these challenges will require broad stakeholder education and engagement efforts, careful planning, and innovative engineering and design. It will also require additional commitment to hazard mitigation planning and increased disaster management. In light of these projected changes, increasing the resilience of socially vulnerable populations such as the elderly, disabled, and the poor will be critically important.

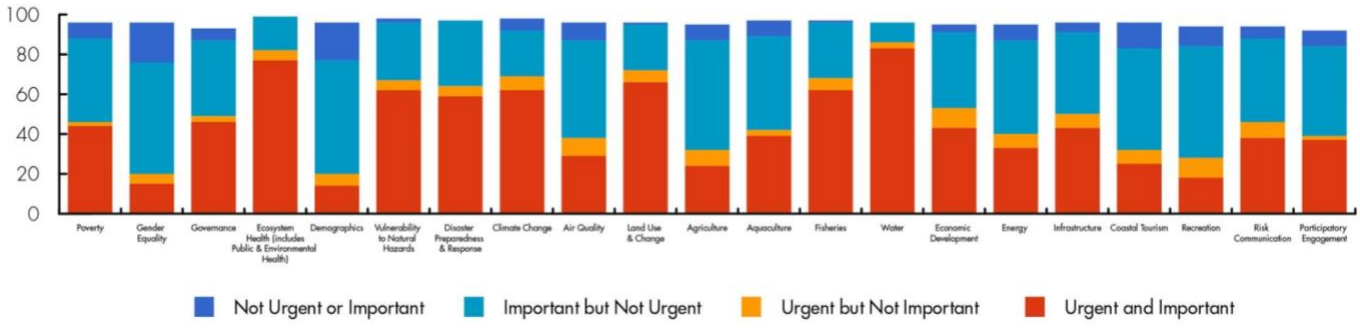
Economic Changes

The economy of Georgia continues to change. The ports of Savannah and Brunswick contributed $33.2 billion to the state's economy in 2014, 7.2 percent of Georgia's total GDP. Three major military installations, Fort Stewart, Hunter Army Airfield, and Kings Bay Submarine Base, have a combined $3 billion economic impact on the coastal Georgia economy. The jobs associated with these areas help support coastal economic growth, the production of goods and services, and revenue collections for government, but few of the jobs are highly skilled positions with commensurate pay. Likewise, Georgia's thriving tourist and recreational fishing industries are major economic contributors. Georgia's seafood industry has experienced major changes over the past several years, but is still an important economic engine contributing nearly $1.9 billion in-state sales impact, $425 million in income, and supporting 13,000 jobs. A balanced economy requires a more diverse commercial landscape with more manufacturing, transportation, skilled trades, and well-paid labor positions. Meanwhile, rising sea levels could impact on major ports, fishing sites, and tourism, causing economic disruption.

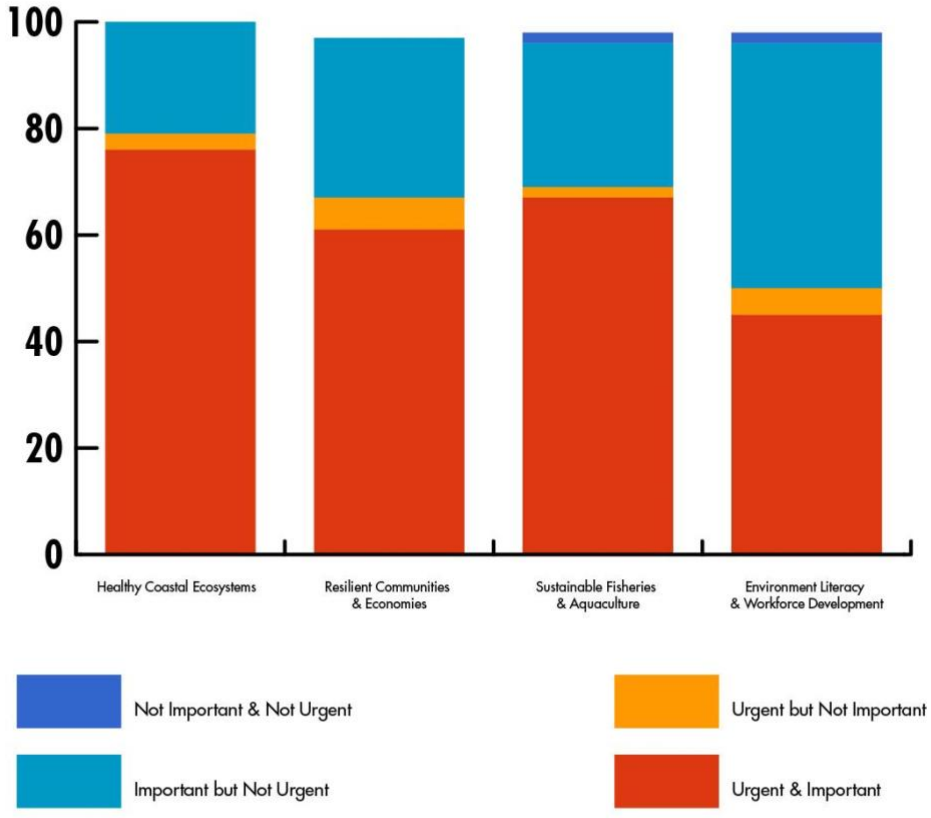
Appendix 3: 2018-2021 Strategic Planning Survey Results



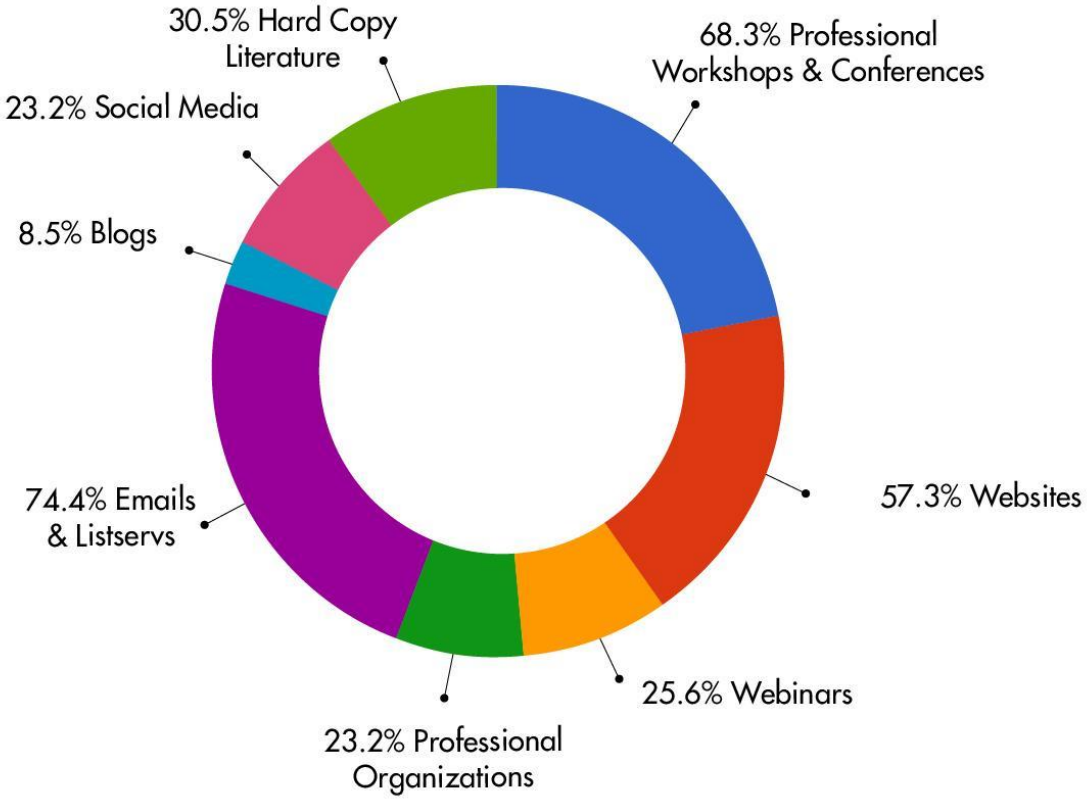
Crosscutting Themes Ranked in Importance & Urgency to Georgia's Coast



Focus Areas Ranked in Importance & Urgency



What are your preferred sources for receiving coastal information?



Appendix 4: Definitions

Vision: The vision provides a description of a future state. The vision explains the basis for developing other aspects of a strategic plan.

Diversity: A collection of individual attributes that together help an organization pursue objectives effectively and efficiently.
Coastal communities: Marine, coastal, and Great Lakes communities served by Marine Extension and Georgia Sea Grant.

Core values: Values that guide behavior and actions of the Sea Grant program.

Crosscutting Principles: Principles that Marine Extension and Georgia Sea Grant will strive to implement the strategic plan by embracing principles that will strengthen the organization.

Focus Areas: Focus areas are intersections where Sea Grant's key components are shaped to address the nation's most urgent ocean, coastal, and Great Lakes' needs. Key components of Sea Grant College Program include:

- The mission, vision, core values and goals which inspire and motivate the organization.
- The promise of value Sea Grant delivers to the Nation.
- The distinctive (unique) competency of Sea Grant – what the organization is best at delivering.

Goals: Describe the desired long-term direction for each focus area.

Strategies: Approaches deployed by Marine Extension and Georgia Sea Grant to achieve the goals.

Outcomes: Benchmarks that the organization uses to track progress toward achieving each goal.

Performance measures: Quantitative ways of measuring outcomes.

Ecosystem: A dynamic and complex association of plant, animal, and human communities and the non-living physical components interacting as a functional unit

Resilience: The ability to adapt to changing conditions and withstand—and rapidly recover from—disruption due to emergencies (e.g. storm events).

Appendix 5: Advisory Board Charter

Marine Extension and Georgia Sea Grant work together to create research, outreach and education programs that promote the economic, cultural and environmental health of Georgia's coast. Together, the program encourages citizens throughout the state to become good stewards of coastal and watershed resources.

Role of the Advisory Board

To ground coastal decision-making in the best available scientific knowledge and understanding, Marine Extension and Georgia Sea Grant must draw upon Georgians for knowledge, advice and guidance. Our best source for this guidance is an active, well-informed and committed advisory board that:

- provides input on emerging research needs, opportunities and priorities in coastal Georgia,
- provides advice on strategic planning process,
- helps create new connections, collaborations and partnerships, and provides outreach to organizations with similar interests and goals.
- educates and informs local, state and national decision-makers on the importance and relevance of Marine Extension and Georgia Sea Grant.

Composition of the Advisory Board

The Advisory Board consists of no fewer than 18 and no more than 25 members drawn from marine business, local government, schools and other educational facilities, non-governmental organizations, the planning and development community and state management agencies. The board has one face-to-face meeting per year. However, additional meetings are convened as needed for other emerging issues. Individual members or smaller groups of members are often consulted to give advice in their area of expertise.

Advisory Board members are divided into two categories—representative and institutional. Representative members are drawn from a broad range of coastal and inland stakeholders with knowledge and experience on topics like education, local governments, seafood and aquaculture, weather and climate, healthy coastal ecosystems, etc. Institutional members represent institutions of higher education and local, state and federal institutional partners. Institutional members are permanent seats on the board and include representatives from NOAA line offices in Georgia, including Grays Reef National Marine Sanctuary, Sapelo Island National Estuarine Research Reserve, Georgia Department of Natural Resources, and National Weather Service. Other institutional members include representatives from UGA Office of Research, UGA Cooperative Extension, and Historically-Black College and University.

Advisory board members are selected to serve a term of four years. Members may serve up to two four-year terms. Membership is staggered to allow the integration of new perspectives whilst ensuring institutional history. Shorter or longer terms may be used infrequently to maintain balance within the committee.

Responsibilities of the Advisory Board Members

Members of the advisory board use their experience and knowledge for the benefit of Georgia's coast by providing timely and relevant information to Marine Extension and Georgia Sea Grant. Member responsibilities are as follows:

- Participate in-person in an annual meeting.
- Participate in teleconferences, plus any special meetings that may convene as needs emerge.
- Participate in standing and ad-hoc committees, as needed.
- Participate in merit review process related to various research and student competitions.
- Advise director, as need be.
- Inform and educate stakeholders about Marine Extension and Georgia Sea Grant, as appropriate.
- Assist in outreach to organizations and people with similar and related interests.

Advisory Board Operating Procedures

The following rules govern the operations of the advisory board.

- The board elects a chair who works with the director to ensure that the business of the committee is conducted smoothly. Tasks include: providing timely advice, information and assistance to the director throughout the year; advising on the agenda and conduct of annual meetings and advising the director on the need, tasks and membership for subcommittees. The chair serves for a term of two years, and may be re-appointed for a second term.
- The board also elects a vice chair who provides assistance with the tasks assigned to the chair, presides at meetings in the absence of the chair and fulfills the duties of the chair in the event the chair is vacated. The vice chair shall be the chairman of the Nominating Committee. The vice chair serves for a term of two years, and may be reappointed for a second term.
- The chair and vice-chair work with director and associate director to provide an orientation for new members, including a discussion of the charter, and the roles and responsibilities of board members.
- New members are provided with a list of members (with a short biography), a copy of the Charter, a copy of the most recent site review briefing book and the site review recommendations, and any published material citing recent projects, impacts and accomplishments.
- The advisory board is encouraged to reach agreement on recommendations to Marine Extension and Georgia Sea Grant, but consensus is not required. Diverse input is

encouraged, and all recommendations and advice from the committee are given careful consideration.

- The board is not required to vote on most issues. Where a vote is required, a quorum is a simple majority of the current membership. Changes to this charter require a two-thirds majority of those present. All other matters require a simple majority of those present.
- Standing or ad hoc subcommittees may be formed by the chair and members to assist with planning and review functions, special initiatives or any other business requested by the director or deemed necessary by the advisory board.