Sea Grant
S.C. SEA GRANT CONSORTIUM
Coastal Science Serving South Carolina

SOUTH CAROLINA SEA GRANT CONSORTIUM

The Changing Face of Coastal South Carolina: Building a Resilient Future

STRATEGIC PLAN
FY2018–FY2023

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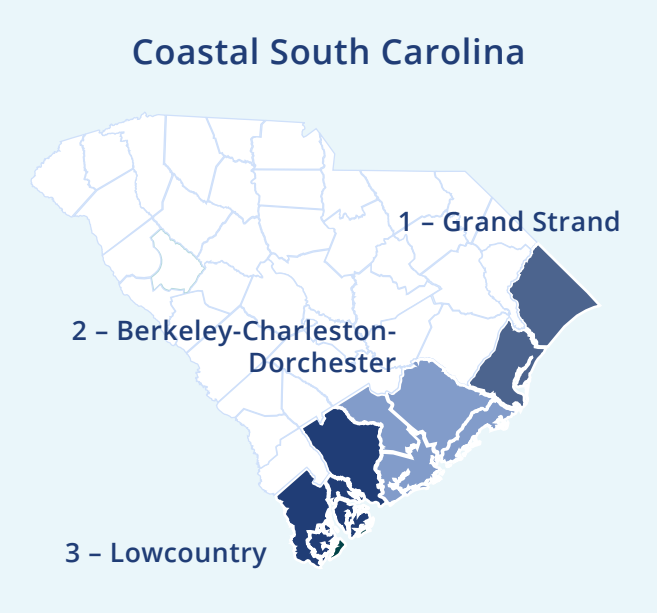
THE CHANGING FACE OF COASTAL SOUTH CAROLINA: BUILDING A RESILIENT FUTURE

STRATEGIC PLAN 2018-2023

SETTING

The Changing Face of Coastal South Carolina

South Carolina's coast is one of the state's most valuable assets, featuring 2,876 miles of tidal shoreline, 165 linear miles of beaches, over 504,000 acres of salt marsh (20 percent of the East Coast's total), 500,000 acres of tidal bottomlands, five major estuarine systems encompassing 68.2 square miles, 40 barrier and sea islands, and 10,000 square miles of continental shelf. The coast can be divided into three regions: (1) The "Grand Strand," an area which contains few barrier islands and riverine systems, and includes Horry and Georgetown counties, (2) The Berkeley-Charleston-Dorchester county region, which includes the Charleston peninsula and outlying barrier and sea islands, and is a region of rapid economic growth and change, and (3) The "Lowcountry," which includes Colleton, Beaufort, and Jasper counties, the majority of the state's barrier and sea islands, and vibrant tourism and retirement communities and amenities.



This complex natural network of coastal uplands, near-shore islands, riverine watershed and waterways, beaches, and wetlands which constitute coastal South Carolina supports a wide range of ecosystem types and coastal and marine species. It also serves as the resource foundation for the needs of our ever-growing and diversifying coastal population, increasing numbers of national and international visitors, a burgeoning marine transportation and shipping complex anchored by the Port of Charleston, a multi-billion dollar and diverse recreation and tourism industry, stable commercial and recreational fishing businesses, an explosion in manufacturing industries fueled by the arrival of Boeing, Daimler, and Volvo (just in the Charleston region), and the concomitant explosion in residential and commercial development.

South Carolina's people are as diverse as the natural resources upon which they depend. They come from many places and varied backgrounds; their place in today's environment has been particularly influenced by their place in the state's rich and troubled heritage and culture. Indeed, the Consortium has always held the strong position that where we are today as a people in South Carolina is a function of our history, culture, and heritage, and these roots will continue to affect and shape our paths to the future. There is an ever-increasing need to reach diverse audiences in an equitable way through inclusive programs and activities.

People are increasingly drawn to the South Carolina coast and enjoy the often pleasant climate and overall high quality of life while taking advantage of the opportunities that the state's natural and cultural resources provide. More than 29 percent of the state's 5.15 million residents live in the eight coastal counties. From 1980 to 2019, the coastal county population of South Carolina increased by 116 percent, and is expected to increase to over 2 million people by the year 2025. In addition, more than 20 million tourists visit coastal South Carolina each year. Indeed, during this decade, Charleston, S.C. has been identified multiple times by Condé Nast Traveler as the number one tourist destination in the United States, and in 2019, number one in the world.

Population growth and increasing tourism are, however, placing greater pressure on the state's natural resources, coastal infrastructure, and the state's culture, heritage, and history, especially at the ever-widening margins of our urbanized areas. The arrival of Boeing, Daimler, and Volvo to the Charleston tri-county area has exacerbated the rate of growth, which will depend on high quality natural resources, resilient infrastructure, and the social welfare and well-being of the South Carolina coast and its people. Where we put people and how we accommodate their needs for critical infrastructure, transportation, jobs, and quality of life are questions facing South Carolina decision-makers along the coast and inland, and indeed across the southeastern U.S.

So, how do we accommodate all of the new arrivals to the coast and all of the visitors who will come and go, and how do we do so while maintaining the environmental, cultural, and historical resource qualities that continue to draw people here? The southeastern United States coast is the last region of the country where its natural resource base is relatively unharmed and unthreatened, and where anthropogenic impacts have been relatively minor. But this is rapidly changing as the state and the region have indeed been discovered. Back in 2010, the Charleston Metro Chamber of Commerce Legislative Agenda included growth management as one of its top issues and legislative priorities. Recent and rapid patterns of growth are resulting in changes in land use and an increased demand on both land and water resources. Pollution, erosion, shoreline change, sea level rise, nuisance flooding, resource consumption, and hastily planned developments are beginning to leave their marks.

The economy of coastal South Carolina is dramatically changing. Although it represents a decreasing portion of the state's economy, the commercial fishing industry (fish, oysters, clams, shrimp, and crabs) remains an important component of our local waterfronts, coastal economies, and ways of life. The state's commercial fisheries generated $118 million (ex-vessel value) and provided 1,478 jobs (NOAA, 2011); there are some 2,200 commercial saltwater and wholesale seafood dealer licenses. South Carolina's shellfish aquaculture industry is made up of established clam growers and new oyster farmers, a sector that has increased by 3,326% from 2012-2019 in wholesale value, reaching almost $1 million in 2019 (SCDNR, 2020). Recreational fishing and boating make an even larger contribution to the state's economy, generating a total economic contribution of over $910 million in sales and supported 10,043 jobs in South Carolina (NOAA, 2018). As of June 30, 2018, more than 3.64 million individual saltwater stamps and licenses have been sold to marine recreational anglers since the state started issuing them back in 1992 (SCDNR, 2019). In addition, tourism expenditures in the state reached $14.4 billion in 2018, with the eight coastal counties accounting for approximately 65 percent of that total, and supporting more than 90,000 jobs. Three of the eight coastal counties led all of South Carolina's 46 counties in domestic travel expenditures in 2018.

The Port of Charleston is one of the busiest and fastest growing container ports on the East and Gulf coasts, and in 2019 ranked thirteenth in the nation for dollar value of imports and exports, with cargo valued at more than $90 billion (US Census Bureau, 2020). The South Carolina State Ports Authority (SPA) served over 1,800 vessels and had total operating revenues of $164 million in 2014. The SPA also supports nearly 225,000 jobs across the state, providing a total economic contribution of over $63 billion in sales in 2018 (Von Nessen, 2019). In December 2016, the U.S. Congress authorized the Charleston Harbor deepening project to 52 feet, which will be the deepest port in

the southeastern United States, and the Port of Charleston is currently deepening its channels to accommodate the larger Panamax ships that will increasingly make up the maritime fleet.

As in other coastal states from Texas to Maine, coastal erosion threatens homes, businesses, and infrastructure built along our shoreline. If scenarios of sea level rise play out as predicted, these impacts will be exacerbated in the future. The winds, surges, and floods associated with frequent episodic hazard events, such as hurricanes, tropical storms, and nor'easters, and longer-term phenomena related to climate change, will continue to threaten these highly developed and exposed portions of our coast. Historically, major tropical storms have struck the South Carolina coast every seven-to-eight years. Many long-range climate forecasters claim that we are now entering a cycle of more severe coastal storms. More recently, severe "rain bombs" have resulted in extensive damage and some deaths in South Carolina (the October 2015 flood and Hurricane Matthew in October 2016); such events are occurring more frequently throughout the United States. Increased vulnerability of humans, businesses and industry, and our natural resources to these natural hazards makes learning to understand, prepare for, and adapt to these risks a societal imperative.

Also inherently important to the resilience of coastal communities in South Carolina is the presence and health of coastal habitats, such as wetlands, that provide valuable storm damage reduction ecosystem service benefits. According to Sun and Carson (2020), wetlands in South Carolina are estimated to be worth $15-$170 per square kilometer in coastal protection benefits, depending on the county. When multiplied by the area of wetlands in the coastal counties (672,035 hectares) per the National Wetlands Inventory (USFWS, 2018), wetlands in the state are estimated to provide over $3.9 billion per year in coastal protection benefits.

The issues and opportunities South Carolina is facing are not unique to this state. State boundaries are political boundaries; however, rivers, watersheds, and the movement of water and all that it contains and transports are not restricted to individual states. Current issues include oil and gas exploration, offshore wind energy production, and sand and gravel mining. Of particular importance is the generation of information on the nature and extent of these resources, as well as the impacts both from and to ongoing human activity, which will require state and region-wide planning in the coastal ocean off the southeastern U.S. coast.

As our state continues to grow in population, industry, and tourism, there is an ever-growing need to provide venues for scientific literacy along the K-Gray and social spectrums and facilitate opportunities in workforce development. Job opportunities, especially in South Carolina, increasingly rely on a diverse workforce skilled in the natural, physical, and social sciences. To meet this challenge, it is imperative that students (K-12), teachers, undergraduates, and graduates have robust and meaningful learning experiences in order to be competitive in the job market. Scientific literacy, in general, provides a basis for sound decision-making among South Carolina's population, specifically in balancing economic prosperity with natural resource conservation, responding to natural disasters (e.g., hurricanes), and preparing for significant changes in our natural, societal, and technological future. A scientifically literate population positions our state to achieve economic prosperity, increase stewardship of our coastal resources, enhance diversity and inclusiveness, and raise the quality of life for all of our citizens.

Accommodating the various needs of those who use and enjoy coastal and marine resources presents an enormous challenge. The S.C. Sea Grant Consortium is committed to optimizing the balance among the economic, social, and environmental potential of the state's coastal and marine resources through the support of integrated research, education, extension, training, and communication programs. It does so by engaging the talents and expertise found at South Carolina's leading university and research institutions to increase our knowledge about the natural, cultural, and social environments of South Carolina and the region, and employing the skills and

efforts of its program and outreach staff to package and disseminate this knowledge to the many communities and constituencies we serve.

Mission

The S.C. Sea Grant Consortium's mission statement is:

"South Carolina Sea Grant Consortium generates and provides science-based information to enhance the practical use and conservation of coastal and marine resources that foster a sustainable economy and environment for the state of South Carolina and its citizens."

Motto

"Coastal Science Serving South Carolina"

While the focus of the S.C. Sea Grant Consortium is on coastal and ocean resources and communities, we are mindful of the interrelationships between the mountains, piedmont, and coastal plain of South Carolina. Therefore, our work has impact throughout the state.

Vision for the Coast

Looking toward the future (next 25 years), the Consortium envisions a thriving South Carolina where the following statements are true:

1. Communities are employing strategies to manage growth associated with coastal population growth and diversification in ways that conserve coastal and marine resources, support a vigorous and inclusive economy, and preserve a high quality of life for all citizens.
2. Decision-makers are incorporating scientific information as they make choices about coastal growth, ecosystem health, and public safety.
3. Coastal and marine resources are healthy, vital, and abundant.
4. Children (our leaders and workforce of the future) are knowledgeable about the importance and limitations of coastal and ocean resources.
5. People across the state and region are informed about coastal and marine resource issues, and practice good stewardship of resources.
6. Individuals, businesses, and governments fully understand and anticipate the coastal risks that confront them and act responsibly to reduce those risks.

Vision for the Consortium

The South Carolina Sea Grant Consortium is:

- The best Sea Grant College Program in the Nation.
- One of the most efficiently and effectively managed State (South Carolina) agencies.

Core Values

The S.C. Sea Grant Consortium operates on a core set of values that are essential for successful performance.

The Consortium values:

- *Trust*, *Honesty*, and *Respect* in our professional interactions.
- *Integrity* and *Objectivity* of program activities.
- *Partnerships* and *Teamwork* critical to meet increasing demands for products and services.
- *Excellence* in quality of work by staff and partners.
- *Public Servic*e to our stakeholders throughout the state, region, and nation.
- *Diversity* and *Inclusiveness* in all we do.

Operational Principles

The S.C. Sea Grant Consortium achieves excellence in its mission by adhering to the following operational principles:

1. People are our greatest asset.
2. Stakeholder input drives programs and activities.
3. The value of working with partners from all sectors and across the southeastern U.S. region is critical to our success.
4. Consortium programs reflect an integration of research, extension, education, training, and stakeholder engagement.
5. Accountability and transparency are key components of the agency's performance and achievement of results.
6. Equal access to opportunities will be afforded to all constituencies.
7. Agility, flexibility, and entrepreneurship create strategic opportunities for addressing emerging and contemporary issues important to South Carolina and the region.
8. Quality of work is assured through a competitive peer-review process for selection of activities and review of results.
9. Science-based information is expressed in an objective fashion and delivered in formats and terms suitable for diverse audiences.
10. Results are evaluated to assure relevancy and success in meeting program objectives and constituent needs.
11. Consortium staff seek active roles in local, state, regional, and national partnerships and collaborations.

Cross-Cutting Drivers

The S.C. Sea Grant Consortium acknowledges that it can be successful in pursuing its mission, goals, and objectives only if it considers and incorporates (where possible) the following cross-cutting drivers in its work:

1. Population growth in coastal South Carolina and the Southeast region will continue at a rapid pace.
2. The South Carolina coastal population is becoming more diverse and requires situational attention to culture and heritage.
3. Ecosystems are in a continuous state of change, due in part to the forces of climate and weather, requiring ongoing study for understanding, frequent adjustments to policy, and continual adaptive management approaches.

4. Communities are beginning to recognize these changes and to engage in efforts to enhance their resilience.

5. Changing climate and weather throughout South Carolina and the southeastern United States is reshaping the natural, physical, and social world around us.

Planning Process for FY18-21

The goal of the Consortium's strategic planning process is to optimize the ability of the agency's research, education, and outreach programs to address the coastal resource needs of South Carolina.

Our 2018-21 strategic planning effort engaged our constituents and collaborators beginning in the summer of 2015 through the winter of 2016/2017. As part of the Consortium's visioning process, we convened a series of visioning discussions starting in July of 2015. The first five discussion groups were day-long events each corresponding to a Consortium Focus Area. Each group of approximately 25 participants offered and discussed their views of our coastal and ocean community 30 years in the future and how the Consortium can best contribute to that vision. Participants in these groups represented a variety of constituencies and communities, and were selected from recommendations provided by both our Extension Advisory Committee members and Consortium staff. Later in 2015 and in early 2016, additional discussions were held in small groups with John A. Knauss Marine Policy Sea Grant fellows and with graduate students representing the University of South Carolina, The Citadel, the Medical University of South Carolina, and the College of Charleston.

General topics resulting from the visioning discussions which have influenced our plan include:

- Understanding climate change impacts and planning for resiliency.
- Building an understanding and sense of place through environmental literacy.
- Developing and providing technical assistance and supporting entrepreneurial solutions for our constituents.
- Enhancing efforts to achieve greater diversity and inclusion across communities.
- Facilitating sustainable seafood and agriculture.
- Protecting water resources, including water quantity and quality.
- Maintaining access to coastal waters.
- Managing our priorities and focusing our efforts.

During winter 2016, annual meetings of each of the Consortium's Extension Advisory Committees were held in part to identify priorities for the upcoming strategic planning cycle. At these meetings, activities and accomplishments of the previous year, as well as priorities for the upcoming year, were presented and current and emerging issues were discussed. Information gleaned from these discussions was then captured in the initial version of the Consortium's FY2018-21 plan.

In August 2016, the Consortium's 30-member Program Advisory Board (PAB) was convened to discuss agency issues, focus, and niche.

The following notions from that discussion have shaped the nature of this strategic plan:

- Given limited resources (staff and funding), focus in on key coastal and ocean issues on which the Consortium can make significant contributions.
- Continue to foster partnerships and leverage resources.
- Identify key strategic issues which cut across agency Focus Areas.
- Focus on a project-level planning horizon of two years to be able to more accurately identify the work to be

done and achieve the outcomes desired.

- Ensure that all Consortium projects reflect an integrated research-outreach-engagement (i.e., Study Group) approach.

The Consortium has been working to add a more diverse set of members to the PAB, and the August 2016 agenda included a very frank discussion session on diversity and inclusiveness.

Of the messages that came out of this discussion, the following were particularly noteworthy:

- We have to acknowledge the past, by asking for trust, faith, and belief in the present and future.
- When dealing with communities, we need to value their issues.
- We need to bring ALL leaders to the table to foster diversity and inclusiveness in training our future workforce and establishing opportunities for ALL.
- We need to reach ALL students in middle school to let them know that there are opportunities out there - for them - to pursue, and to encourage them to do so.

As a complement to our interactive process, and to engage a wider group of stakeholders, the Consortium developed and conducted a survey based on our current strategic goals, objectives, and strategies. The survey asked respondents whether the agency's information and outreach priorities are (1) important to them and (2) whether they should be a priority for Consortium efforts. Additionally, respondents were asked to identify additional goals and objectives the Consortium should consider. Although there was general support for all areas included in our then-current FY14-17 Strategic Plan, the differing levels of validation have informed our priority-setting for our FY18-21 plan. Not surprisingly, addressing impacts to communities, economies, biodiversity, and public health due to changes in climate and weather was suggested as an additional priority for the Consortium to include in its new plan. Suggestions were also made for the need to improve benchmarks and evaluation efforts.

Armed with this constituent input, and using the structure and organizational elements of our existing strategic plan, the Consortium programmatic staff held a series of working sessions from September 2016 through January 2017 to complete work on the FY18-21 plan.

The Consortium Executive Director presented the Consortium's revised final draft of its 2018-21 strategic plan to the agency's Program Advisory Board on January 20, 2017 for review and endorsement, and the final draft document was reviewed and approved by the Consortium's Board of Directors on January 30, 2017.

Process for Extending Plan through FY22-23

The S.C. Sea Grant Consortium staff have been working to update the agency's current FY18-21 strategic plan based on guidance received from the NOAA National Sea Grant Office (NSGO), which allows state Sea Grant College programs to extend their strategic plans for two years through FY23. This will allow both the NSGO and state programs, including the Consortium, to evaluate the strategic impact of the work being done on a longer timescale and also the rationale for the current timeframe for this process.

With input from the Consortium Program Advisory Board and the Consortium's program specialist advisory committees, agency staff have reviewed the current document and have provided initial updates and input for incorporation into the "extended" strategic plan. The Consortium Program Advisory Board reviewed the revised FY18-23 plan in mid-September 2020 and endorsed it for review and approval by the Consortium's Board of Directors, which approved the revised plan at its meeting on September 30, 2020.

Structure and Organization of Plan

The structure and organization of the FY2018-21 plan's programmatic content represents a "refresh" of the agency's FY2014-17 plan. We have relabeled our first Programmatic Focus Area, changing it from "Coastal and Ocean Landscape" to "Healthy Coastal Ecosystems" to better sync with the National Plan, and we renamed our "Hazard Resilience in Coastal Communities" Focus Area to "Weather and Climate Resilience" to better reflect our primary resilience focus for the next four years. Further, the background statements, issues, goals, objectives, and strategies sections for each of our Focus Areas have been modified in response to stakeholder input, for further clarity, a narrower direction, and based on National Sea Grant College Program office feedback. In addition, outcomes and associated national and program-specific performance measures and program metrics are integrated within each Focus Area.

Implementation of this plan will be partially achieved through the Consortium's biennial Sea Grant Omnibus proposal solicitation and review process. To assist the agency in identifying specific projects and activities that it will pursue over the next two biennia, the Consortium will convene engagement groups consisting of representatives of a diversity of public and private sector interests. These engagement groups will help Consortium staff identify the specific issues and opportunities, based on this strategic plan, which will serve as the basis for the Consortium's efforts through FY23.

Strategic Plan: A Framework for Action

The S.C. Sea Grant Consortium has developed and amended its FY2018-23 strategic plan to address contemporary coastal and marine resource issues facing South Carolina. These goals and objectives serve as a guide and filter for programmatic activities that the S.C. Sea Grant Consortium will undertake through FY23, which include the Consortium's plans for integrated research, education, extension, communications, and training activities.

The strategic plan includes an overall vision, goals, objectives, and strategies for the Consortium's five Programmatic Focus Areas. Each Focus Area includes a Background Statement, identification of Key Issues and Opportunities, a Vision statement, and Goals. For each Goal, one to three Objectives are identified; for each Objective, a set of Strategies, Outcomes, and Performance Measures and Targets are provided.

The purposes for each are as follows:

- *Background Statement* - context and historical information for each Strategic Area.
- *Issues* - the underlying justification for the identification of activities to be undertaken for each Strategic Area.
- *Vision* - the overall anticipated outcome for each Strategic Area.
- *Goals* - the overall anticipated results within each Strategic Area.

For each Goal, a set of objectives and strategies, intended outcomes, performance measures, and targets are listed, and are defined as follows:

- *Objectives* - specific program/management areas of emphasis that will be addressed.
- *Strategies* - activities to be conducted to achieve the objective.
- *Outcomes* - the end results or consequences of the strategies employed.
- *Performance Measures* - the measures to be used to evaluate success in achieving objectives.
- *Targets* - the predicted level of each performance measure over the six-year period.

The S.C. Sea Grant Consortium's 2018-23 strategic plan may serve as the template for future Sea Grant strategic

plans. The strategic areas, goals, and objectives are expected to continue to be relevant for a number of years to come. The strategies the Consortium utilizes to achieve these goals and objectives are expected to be re-evaluated during each subsequent revision of the plan. New strategies will be included as current strategies are addressed and new issues arise. The outcomes and performance measures will be assessed on two-year cycles.

Definitions

Within this document there are several terms that are used repeatedly that encompass greater meaning than may be immediately apparent. For this reason, we will provide our definitions for these terms here.

1. **Community** is a term of reference used in the broadest, small "c", sense to include: people, neighborhoods, local governments, organizations, associations, businesses, etc.; indeed, our stakeholders and constituencies. For example, the community of Charleston, the environmental community, the commercial fishing community, etc. We use the general term communities to avoid unnecessary repetition, and are confident that for most people the context in which the term is used will sufficiently identify the referenced community.

2. **Decision-maker** is a term of reference used to include anyone who makes decisions at any level. This would include home/property owners, community groups/organizations, local/state/federal government, business/ industry, etc. For our purposes, decision-maker is synonymous with stakeholder and constituent. Our rationale for the broad use of decision-maker is again, to avoid repetition. More importantly, our intent is to emphasize that everyone is a decision-maker. We all make choices about what we do, how we vote, what we manage, what we study, what we value, and what laws we enact. One of the most important roles of Sea Grant is to inform the decision-making process at any and all levels with science-based information.

3. **Sustainability** is defined as meeting the needs of the present generation without compromising the ability of future generations to meet their own needs. Sustainability has three equally weighted components: economic, environmental, and societal.

4. **Resilience** – individual, community, and national – is defined here as the ability to prepare and plan for, absorb, respond to, recover from, and more successfully adapt to adverse events. This definition is taken from the National Academies of Sciences, Engineering, and Medicine.

5. **Diversity** is a term used in this plan to describe the cultural, racial, ethnic, physical, emotional, gender, and economic differences which exist among the people of this state.

PLAN OF ACTION

Programmatic Focus Areas

Five programmatic areas have been identified by the Consortium:

1. Healthy Coastal Ecosystems
2. Sustainable Coastal Development and Economy
3. Weather and Climate Resilience
4. Sustainable Fisheries and Aquaculture
5. Scientific Literacy and Workforce Development

Programmatic areas outlined in this plan will not necessarily be completed within the six-year time frame, but rather reflect research, education, communications, and training priorities that the Consortium will use to take advantage of opportunities. For example, the Consortium will issue requests for proposals related to the Programmatic Focus Areas; however, the strategies that will be pursued will be determined in part by those proposals received and favorably considered, through the agency's rigorous peer review process.

I. HEALTHY COASTAL ECOSYSTEMS

Background

The natural features of the State of South Carolina are diverse and striking. South Carolina contains 2,876 miles of tidal shoreline, 500,000 acres of tidal bottoms, 504,450 acres of salt marsh, (representing 20 percent of the East Coast total), some 4.5 million acres of freshwater wetlands (covering about 24 percent of the land area of the state), and 10,000 square miles of coastal ocean. The South Carolina coastline is characterized by more than 165 linear miles of beaches and dotted with more than 40 barrier and sea islands. Five major estuaries drain major watersheds originating from as far away as western North Carolina. Due largely to private-public-government partnerships, plantation lands and managed wetlands, remnants of the once flourishing rice culture industry of the late 18th and 19th centuries, remain remarkably intact today; many form the basis for significant refuge holdings and hunting and agricultural pursuits, while others have provided the "raw material" for resort development and tourism. Collectively, these lands represent the importance of the state's coastal heritage in shaping growth and development along the coast.

The coastal and marine resources of South Carolina are directly affected by (1) human influences throughout the watersheds in the coastal zone, (2) physical and natural processes of the state's adjacent coastal ocean, and (3) changes in climate and weather patterns. The focus of this program area is to support research and outreach efforts to assess and document natural coastal and oceanographic processes and the valuation of resources (and the services they provide) in response to the needs of targeted constituencies and decision-makers. Consortium stakeholders identified an improved understanding of natural processes, coastal and ocean ecosystem health, influences of climate and weather, additional landscape features such as stormwater ponds and other added natural or built infrastructure, and long-term conservation of natural and cultural resources as high priority areas for maintaining resilience, health, and well-being of our coastal communities. In addition, they suggested that the development of predictive tools for coastal ocean processes and estuarine water quality events, as well as determination of the economic and social value of resources and management tradeoffs, should be priority areas. Generating new baseline information is critically important in order to gain a better understanding of the effects

and impacts that natural and anthropogenic influences are having on how our coastal and ocean environments function.

Issues and Opportunities

- The South Carolina coastal landscape is rapidly changing due to natural and anthropogenic forces, with potential for significant alterations in the structure and function of the natural environment. To measure the effects of these changes, the physical, chemical, geological, biological, and socio-demographic environment influencing South Carolina's coastal region must be documented.
- In the course of history, humans have impacted natural environments and, as a result, fisheries, associated habitats, water quality, and community resilience may experience negative impacts (e.g., decline in fisheries, impaired hydrology). Restoration efforts are critical to offset these impacts.
- Upland watershed processes drive estuarine and coastal ocean ecosystems through freshwater input and groundwater discharge. These may be changing due to changes in weather and climate patterns. Issues of scaling and variability must be taken into account in addition to understanding the impacts of green and gray infrastructure embedded in the environment.
- The economic and societal value of South Carolina's coastal resources and the benefits and functions they provide are not well-documented. This information is critical if appropriate use and protection of these resources and services are to continue.

Vision

The ecological, social, and economic value of coastal and ocean ecosystem functions are documented and resultant information and tools are delivered to state and local decision-makers, resource managers, and interested public.

Goal 1

Sound scientific information is available to support ecosystem-based approaches to land use and resource management decision-making throughout the coastal and ocean environment.

Objective 1.1: Generate and deliver information on changes to ecosystem condition and health due to natural and anthropogenic forces, including climate change, and communicate this information to coastal decision-makers.

Strategies:

- Identify the ecological relationships of upland watershed ecosystems and changing climate and weather patterns to estuarine and coastal ocean productivity (e.g., changes in flow dynamics).
- Assess and develop practical and realistic models that predict and forecast the impacts of land-use change and practices on coastal watersheds (e.g., rivers, estuaries, salt marsh, tidal creeks) and the resources therein.
- Assess and develop practical and realistic models that predict and forecast the impacts of climate change on water quality.
- Assess the effects on ecosystem and living marine resource condition of changes in biogeochemical processes (source, transport, fate, exposure, and effects of materials and mixtures) due to population growth, tourism development, and urbanization.
- Examine the ecological relationships between living marine resource production in estuaries and tidal creeks and the availability and vulnerability of critical habitat areas.

Objective 1.2: Generate and deliver science-based information on the effects of changes in water quality and quantity on coastal and ocean ecosystems and communities to support land, water, and living resources management decision-making.

Strategies:

- Assess and model pathways and mechanisms for transport of key pollutants from the landscape into coastal waters to inform water quality management efforts.
- Construct and evaluate the effectiveness of models of coastal ocean processes (e.g., upwelling) and water quality events (e.g., hypoxia) to assist resource planning and management decision-makers.
- Assess the impacts of reduced water quality and quantity on coastal ecosystem biodiversity and identify means to mitigate these impacts.
- Characterize impacts of additional freshwater or saltwater intrusion on coastal habitats and communities.
- Identify the causes of and develop mitigation strategies for aquatic biotoxin production and exposure.

Objective 1.3: Integrate baseline data, standards, and key indicators to support ecosystem management decision-making affecting land, water, coastal and ocean resources, and public health.

Strategies:

- Identify relevant ecological, social, economic and cultural baseline data, standards, and indicators of land, coastal, and ocean resources for use in ecosystem management and public health decision-making.
- Determine the socio-economic value of coastal and marine resources and ecosystem benefits (e.g., value of coastal wetlands in supporting fisheries and barrier islands in buffering storm hazards).
- Identify needs for allocation of water downstream as part of the state's water plan.
- Establish partnerships at the local, state, regional, and federal levels to foster information exchange and make information accessible to a broader population of users.

Goal 2

Restored and enhanced function and productivity of coastal and ocean ecosystems.

Objective 2.1: Support preservation, enhancement, and restoration of oyster and salt marsh ecosystems.

Strategies:

- Foster effective protection and restoration of oyster and salt marsh habitats through the development of demonstration projects, use of new approaches and technologies, and incorporation of evaluation methods through the comparison of metrics across habitats.
- Facilitate stakeholder-driven and community-based approaches to habitat enhancement and restoration.
- Support research, education, and outreach programs that seek to prevent, remove, repurpose, and dispose of marine debris.

Objective 2.2: Develop and provide new information, methods, and technologies that help minimize the introduction, spread, and negative impacts of coastal and ocean invasive species.

Strategy:

- Working collaboratively with state and regional partners, assess and mitigate the impacts of invasive species on coastal ecosystems and human communities.

Anticipated Outcomes

Goal 1:

- South Carolinians are more knowledgeable about the natural processes that influence South Carolina's estuaries and coastal ocean waters.
- Science-based information is provided to natural-resource managers and decision-makers to support national, regional, state, and local resource-management objectives.

Goal 2:

- Oyster and salt marsh ecosystems are enhanced and restored through research and outreach programming.
- The identification and spread of invasive species are documented, and mitigation measures are developed and implemented.

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. [NSGO Measure]
  - 10
- Number of acres of coastal habitat protected, enhanced, or restored as a result of Sea Grant activities. [NSGO Measure]
  - 11,000
- Number of tools and technologies developed with Consortium support and used in ecosystem-based management, habitat restoration, and valuation. [NSGO Cross-Cut Measure]
  - 25/16
- Number of scientific, technical, and educational products produced by the Consortium and its partners that describe ecosystem processes, foster healthy coastal ecosystems, and address issues related to aquatic invasive species.
  - 20
- Attendance at Consortium-sponsored/co-sponsored ecosystems and resource management workshops and information events.
  - 1,400

II. SUSTAINABLE COASTAL DEVELOPMENT AND ECONOMY

Background

Population growth along the South Carolina coast is increasing at a rapid rate, with more than 300,000 new residents expected to move to coastal South Carolina by 2030. This growth has continued at a brisk pace putting the state among the country's top 10 fastest-growing states in both the pace of growth (ranked 6th) and actual number of new residents (ranked 9th) for 2018-19. According to the U.S. Census Bureau, a significant percentage of that growth is concentrated along the coast, particularly in the Myrtle Beach, Hilton Head, and Charleston metro areas, and showing no signs of slowing with an estimated 35 newcomers moving to the Charleston area daily (Charleston Metro Chamber of Commerce, 2016). This has and will continue to result in an explosion of residential and commercial development and concomitant pressures on the state's coastal and marine resources. Several examples

of this growth highlight the magnitude of change that will occur in coastal South Carolina. Some 135,000 housing units are planned and will be constructed in the Charleston metropolitan region. Trends indicate that between 2018 and 2019, Jasper, Berkeley, and Horry counties were among the fastest-growing in the state (1st, 3rd, and 4th respectively).

Coastal resource management and economic development issues in South Carolina continue to challenge coastal zoning planners, resource managers, developers, and those involved in commerce, industry, recreation, and tourism. The Consortium plans to continue to examine coastal development and management issues and explore sustainable economic development opportunities in cooperation with state and local management agencies and coastal resource users. In this way, the needs of the state and region will be served simultaneously in terms of decision-making, planning, and assessment related to all facets of coastal development. The coastal-dependent economy in South Carolina encompasses a wide variety of businesses, including commercial fishing, recreational fishing, aquaculture, tourism, and future endeavors such as energy development.

Traditional, water-dependent uses of coastal waterfront property are drastically changing as more of the U.S. population moves to the coast, and pressure for "highest and best use" development increases. For example, commercial fishermen are finding it more difficult to find and afford docking space, fuel, and ice. Sustaining traditional working waterfronts and balancing the changing needs of coastal communities is a challenge for individual property owners, commercial and recreational fishermen, developers, and resource managers. Solutions are needed to help preserve the historical and diverse profiles of coastal communities while allowing for community-driven economic development.

Offshore energy development is a consistent topic of discussion. Two of the prominent discussions have been directed towards the development of wind energy and oil and gas exploration. The private energy sector is engaged in discussions about the potential for offshore wind energy development in the coastal ocean of South Carolina, and yet we have little foundational information about the environmental and societal issues that may arise as this potential is realized. Additionally, for years, the information available stated that the South Carolina coastal ocean was not suitable for gas or oil extraction; however, new information has indicated that it may have significant natural gas reserves. In addition, the ability to extract these resources has been limited by Federal policies which are currently being re-evaluated. Therefore, the prospect for gas and oil exploration and eventual extraction are raising expectations and related questions regarding coastal access and support and economic and environmental sustainability.

The focus of this program area is to provide information through the Consortium's research and outreach programs that document the impacts of land use change and coastal and ocean resource development on marine and coastal resources, and address production and resource economics, policy, law, regulation, preservation, and development of coastal resources in support of a balanced and equitable resource–based economy, environment, and society.

Issues and Opportunities

- The effects of ever-increasing coastal development and related pressures on the state's coastal and marine resources and its aging infrastructure remain poorly understood, and thus challenge communities as they cope with population growth and land-use planning decisions.
- The lack of direct cause-and-effect information on how marine ecosystems may be affected by human activities restricts the use of science in decision-making processes.
- Traditional uses of coastal waterfront property are drastically changing as more of the U.S. population moves to the coast. Sustaining traditional working waterfronts and practices along with balancing the changing needs of

coastal communities is a challenge for those communities and decision-makers.

- User conflicts over public access to beaches and waterfront areas are increasing as more property is privately developed. There are policy implications related to the private use of public trust resources and user conflicts.
- The need to accommodate a robust coastal recreation and tourism industry within a healthy coastal ecosystem is a challenge for coastal communities.
- Interest in the potential for energy development (e.g., oil, gas, wind, wave, and current) offshore of South Carolina among many sectors has raised a series of environmental, economic, and land use questions.

Vision

Decision-makers apply science-based information and tools to manage increased population growth and development resulting in sustainable and diverse communities, thriving economies, and healthy natural resources.

Goal 1

Healthy and viable coastal communities and economies include robust traditional and non-traditional working waterfronts, abundant recreation and tourism opportunities, and coastal access.

Objective 1.1: Provide information and tools to coastal communities to enhance waterfront-related economic opportunities (e.g., commercial and recreational fishing, aquaculture, and energy and port development) without diminishing the long-term health of the coastal environment and the fabric of the local demography.

Strategies:

- Characterize the social, economic, cultural, and demographic factors that impact South Carolina's traditional water dependent activities and identify options for sustaining these uses.
- Review existing and evaluate needs to develop and apply models in collaboration with decision-makers of how climate variability and change may affect working waterfronts.
- Identify the potential economic, societal, and environmental effects of expanding and new uses of the nearshore and offshore ocean environment on coastal waterfront communities and consider effects on preserving heritage and history.

Objective 1.2: Inform and assist coastal tourism and recreation businesses to foster a balance between the vitality and abundance of South Carolina's coastal and marine resources and the economic health of the tourism industry that depends on them.

Strategies:

- Generate and distribute information, management tools, and technologies on beach, marsh, and dune systems that can help communities manage coastal environments for recreation, tourism, maritime heritage, and cultural history.
- Identify avenues for rural, island, and small-town coastal communities to engage in the tourism economy in sustainable economic, environmental, and culturally diverse ways.
- Foster an increased interest in resource conservation and operational and program quality control for recreation and tourism organizations, including the S.C. Nature-Based Tourism Association, African-American Tourism Advisory Council (businesses), S.C. Travel and Tourism Coalition, S.C. Parks, Recreation and Tourism (industry and government), and S.C. African American Heritage Commission.

- Use ethnography and storytelling to characterize maritime cultural heritage and environmental sustainability in South Carolina.

Objective 1.3: Support local, state, regional, and national efforts to preserve and increase public access to South Carolina's beaches, waterfronts, and waterways.

Strategies:

- Evaluate impacts of public access on coastal habitats.
- Develop and/or provide coastal communities with planning and policy tools to evaluate current and future needs for sustainable coastal access.
- Foster information exchange with regard to coastal access and working waterfront issues and initiatives.
- Assess the need for enhanced services at coastal beaches, waterfronts, and waterways.

Goal 2

Coastal communities manage and conserve the resources needed to sustain their diversity and quality of life in light of rapid population growth, land-use change, and variations in climate and weather.

Objective 2.1: Work with federal, state, and local partners to develop and disseminate assessment tools, model plans and ordinances, best management practices, alternative development approaches, and other techniques that will enable communities to develop in environmentally and socially sound ways.

Strategies:

- Assess, evaluate, and compile existing assessment tools, plans, and ordinances and provide access to these resources.
- Develop tools that illustrate possible changes in land use and land cover in response to projected population growth and changing climate and weather patterns.
- Generate and communicate research and information related to land-use change and population growth impacts on coastal and ocean ecosystems to coastal communities to support decision-making.
- Identify and evaluate regionalized approaches to land use, watershed, and coastal ocean planning to support integrated community and economic development projects.
- Identify, test, and deliver local and regional information on the cost-effectiveness, efficiency, and durability of watershed planning and management techniques (e.g., LID, Green Infrastructure) to control non-point source pollution.

Objective 2.2: Communicate research and information related to the effects of land-use change, population growth, and climate and weather patterns on coastal and ocean ecosystems to coastal communities to support decision-making.

Strategies:

- Evaluate the effectiveness, efficiency, and durability of water and stormwater management techniques, including existing and sustainable development practices, and inform target audiences, such as individual landowners, of the results.
- Inform community leaders, decision-makers, consultants, and non-profits about land use planning and non-point source pollution control alternatives that address impacts on coastal and marine resources.

Goal 3

State and local decision-makers possess the knowledge about the complex inter-relationships among the social, economic, cultural, and environmental characteristics of the coastal ocean (offshore) environment of the state and Southeast region, and the tools necessary to manage emerging uses and optimize economic and environmental sustainability.

Objective 3.1: Document the ecological, economic, policy, and societal implications of offshore energy development (e.g., oil, gas, and wind) on the South Carolina coastal landscape.

Strategies:

- Identify offshore energy issues, policies, technologies, infrastructure needs, costs and benefits, and impacts.
- Communicate science-based information and foster information exchange with communities and stakeholders on offshore energy development to communities in South Carolina.
- Work with the S.C. Task Force on Clean Coastal Energy to foster a policy and regulatory environment conducive to the sustainable development of traditional and alternative sources of offshore energy.

Objective 3.2: Support regional coastal and ocean planning, management, and observational activities.

Strategy:

- Support the efforts of regional coastal and ocean organizations as they engage stakeholders and constituents on issues and opportunities of mutual interest across the southeastern United States.

Anticipated Outcomes

Goal 1:

- Traditional working waterfront uses become a prominent subject in the public dialogue on waterfront development.

Goal 2:

- Existing population growth and land-use change models are refined and improved.
- South Carolina decision-makers understand the impacts of development on coastal and ocean resources and develop strategies to address them.

Goal 3:

- Regional approaches are incorporated into coastal land-use and watershed planning efforts by local governments.
- Decisions related to offshore energy and ocean uses and planning are addressed at a regional scale using science-based information.

Performance Measures and Six-Year Targets

- Number of communities that adopt/ implement sustainable economic and environmental development practices and policies as a result of Sea Grant activities. [NSGO Measure]
    - 25

- Number of coastal communities engaged in planning and development activities that address the needs of working waterfront communities and economic and environmental sustainability.
    - 12
- Number of coastal communities who have used Consortium and partner-generated science-based information related to offshore energy and ocean uses.
    - 3
- Number of scientific, technical, and educational products produced by the Consortium and its partners that focus on issues of importance to sustainable coastal communities and economic development.
    - 22
- Attendance at Consortium-sponsored/co-sponsored sustainable coastal development and economy workshops and information events.
    - 1,800

III. WEATHER AND CLIMATE RESILIENCE

Background

The South Carolina coast is vulnerable to most known natural hazards, including hurricanes and coastal storms, flooding, rip currents, tornadoes, fires, drought, heat waves, shoreline change, and earthquakes, each of which has the potential to cause loss of life and/or substantial damage to the residential, economic, and natural fabric of the state's coastal landscape. Many of these hazards are also becoming exacerbated due to changes in our weather and climate; most notably, the impacts of sea level rise and nuisance flooding along our low-lying coastline. These impacts include increased vulnerability to coastal storms, more frequent and severe flooding, accelerated erosion of ocean and waterfront areas, saltwater intrusion of surface and groundwater supplies, marsh inundation, and habitat alteration. While these impacts are already evident, many opportunities exist to plan and prepare for, minimize, and mitigate exposure to damages and facilitate recovery processes.

Planning for coastal hazards ranges from the short-term impacts to long-term pervasive issues. Attention to both the natural environment and human infrastructure is required, and enhancing resilience by communities must include assessing risk and understanding vulnerability, and developing and implementing response and adaptation strategies. With the explosion of population growth along the South Carolina coast, and the allure of Charleston and surrounding coastal communities to tourism, many residents and visitors alike are unfamiliar with the challenges posed by this unique environment, adding an additional challenge to a community's resilience.

The focus of this program area is to provide science-based information through research, outreach, and educational programs which documents our changing coastal weather and climate environment and the possible risks and effects on the natural environment, physical infrastructure, society, and people. This includes episodic hazards as well as impacts from long-term climate change. The Consortium will also work with the public and private sectors to assess vulnerability to the diverse hazards along the coast and develop appropriate methods for response, recovery, and adaptation, with a goal of enhancing coastal resilience in South Carolina and the region.

Issues and Opportunities

- Episodic and chronic weather and climate events along the South Carolina coast create substantial risk to the state's natural resources, public health and safety, critical infrastructure, private property, and business and industry.
- Tropical Storm Irma in 2017, Hurricane Florence in 2018, and Hurricane Dorian in 2019 continue to raise public awareness to the devastation of flooding, but people who live, work, and play along the coast have short memories, and the booming population in our coastal counties along with increasing development will continue to challenge the vulnerability of our coastline to future storms.
- Sea level along the South Carolina coast has risen about one foot in the past 100 years and is anticipated to rise at a faster rate in the future. Impacts of a rising sea are already being felt through increasing tidal and nuisance flooding.
- There is a continuing need for weather and climate research to inform those who are in the business of storm prediction and forecasting, planning, response, and mitigation, and those who design, build, insure, and regulate coastal development and its corresponding infrastructure.
- Tropical Storm Irma in 2017, Hurricane Florence in 2018, and Hurricane Dorian in 2019 underscore the continuing need to provide science-based information to aid policy and decision-makers at all levels to enhance public awareness, safety, and health.

Vision

Coastal communities, residents, and businesses understand the risks and vulnerabilities associated with chronic and episodic weather and climate events, and are prepared for and able to recover from and adapt to these hazards with minimal disruption to social, economic, and natural systems.

Goal 1

Widespread community understanding of the risks associated with living, working, and doing business along the South Carolina coast encourages public and private decision-makers to create and adopt policies, plans, and ordinances to reduce risks, manage weather and climate events, and speed recovery.

Objective 1.1: Increase the base of scientific knowledge regarding weather and climate and the associated risks and impacts for citizens, industries, and decision-makers in coastal communities in South Carolina.

Strategies:

- Assess the effects of the interaction of short-term weather and long-term climate change on urban and rural communities, the critical infrastructure, built and natural environment, cultural resources, and economies of South Carolina's diverse coastal communities.
- Assess risk perception of key audiences to weather and climate in South Carolina to inform response and improve communication.
- Assess and tailor weather and climate mitigation planning and adaptation tools for coastal communities in South Carolina.
- Conduct case studies to examine climate hazard and adaptation scenarios within estuarine and shoreline environments.
- Generate and convey scenarios for hazard preparation, adaptation, mitigation, and recovery to reduce negative impacts and increase benefits to communities.

Objective 1.2: Provide science-based information to improve community capacity to prepare for, adapt to, mitigate, and recover from weather and climate hazards.

Strategies:

- Convey science-based information to resource management agencies, policy makers, local governments, and the public to increase understanding of weather and climate impacts.
- Conduct and convey results from community-scale vulnerability analyses of South Carolina's infrastructure, resources, and people to weather and climate scenarios.
- Convey risk-perception and risk-communication research and best practices to improve response and communication about risk before, during, and after a weather or climate event.
- Implement public education programs on short- and long-term climate variability and long-term hazards (e.g., sea level rise).

Objective 1.3: Facilitate the use of science-based research resource sharing and collaboration in the implementation of adaptive weather and climate management at varying governmental levels.

Strategies:

- Establish and maintain partnerships to develop and identify effective and collaborative standards and metrics for assessing weather and climate resiliency.
- Develop interdisciplinary approaches to weather and climate hazards that integrate findings from social and natural science to support effective policy and management decisions at all levels of government.
- Develop new or adapt existing mitigation and adaptation planning tools for public officials.
- Develop and apply decision-support tools that enhance local community awareness, mitigation, and adaptation planning.

Goal 2

Generate and distribute information, management tools, and technologies on beach, marsh, and dune systems that can help communities prepare for and mitigate the impacts of shoreline changes.

Objective 2.1: Evaluate the effects of hazards on beachfront, estuarine, and tidal marsh shorelines, including the impacts from hardened structures.

Strategies:

- Assess and predict long-term and episodic trends in beachfronts and tidal marsh shorelines accounting for anthropogenic responses (e.g., nourishment, hard structures, and dune alterations).
- Establish and evaluate model criteria necessary to determine the efficacy of beach nourishment programs.
- Generate and deliver information materials on the risks of chronic and episodic events such as rip currents, beach hazards, and flooding to tourists, residents, and communities.
- Identify and convey information to coastal communities about beach nourishment and estuarine shoreline protection options, including permitting and funding issues.

Anticipated Outcomes

Goal 1:

- Coastal communities increase their awareness of socio-economic, structural, and natural resource impacts of

changing weather and climate.

- Mitigation and adaptation techniques are developed and used in response to changing conditions in vulnerable areas.
- Data visualization and decision-support tools provide communities with pertinent, comprehensive, and timely information for planning and response.
- Coastal decision-makers have the capacity to incorporate science-based data and information in hazard planning, preparation, response, emergency management, and response efforts.
- Widespread community understanding of the risks associated with living, working, and doing business along the South Carolina coast encourages public and private decision-makers to create and adopt policies, plans, and ordinances to reduce risks, manage weather and climate events, and speed recovery.

Goal 2:

- State and federal resource management agencies in South Carolina are utilizing shoreline change information in management and policy decision-making.

Performance Measures and Six-Year Targets

- Number of communities that adopt/implement hazard resiliency practices to prepare for and respond to/ minimize coastal hazardous events. [NSGO Measure]
  - 8
- Number of hazard resiliency training/technical assistance provided to coastal communities in climate adaptation and hazard resiliency, adaptation tools, techniques, and best practices. [NSGO Measure]
  - 60
- Number of communities where hazard resiliency has improved. [NSGO Measure]
  - 8
- Number of tools and technologies developed with Consortium support for use in short-term hazards and long-term climate change applications.
  - 2
- Number of scientific, technical, and educational products produced by the Consortium and its partners related to weather and climate adaptation and resiliency in coastal communities.
  - 16
- Attendance at Consortium-sponsored/co-sponsored weather and climate resilience workshops and information events.
  - 600

IV. SUSTAINABLE FISHERIES AND AQUACULTURE

Background

In South Carolina, seafood is synonymous with hospitality. It is our link to the past and to our natural environment; our conversation starter. South Carolinians harbor a strong connection to the waters which support the production of world-class seafood. Expansive salt marshes support our state's leading fisheries: shrimp, crab, and oysters. Our shellfish aquaculture industry is expanding to capitalize on market demand for premium single oysters and is

reliant on those same marshes to sustain success.

South Carolina fishers and shellfish growers are employed in producing a large variety of products. Shrimp, blue crab, and oysters are our top products, but clams and a variety of finfish are near the top of the list as well. Our state is home to some of the largest soft shell crab shedding operations in the region, and several smaller shedding houses provide an economic jolt for crab fishermen in the spring of the year. The state's fishery for horseshoe crabs is unique in that horseshoe crabs can only be collected for biomedical purposes, meaning they are blood donors which are returned to the sea after being bled. This is a significant contributor to our fishery, and the lab that bleeds crabs is a major employer in Charleston. Our state is home to roughly 30 shellfish growers and two shellfish hatcheries. Despite significant challenges in the past seven years, our oyster mariculture industry has adopted off-bottom techniques and continues to grow.

Increasingly, culinary professionals (chefs, food stylists, writers, grocers, etc.) are playing an important role in our seafood industry. They are educating consumers about production methods and raising the profile of South Carolina seafood. Small-scale, family-operated businesses employing boutique marketing techniques are becoming more common on the South Carolina coast. Wholesale seafood businesses remain strong, but production is more sporadic than in years past, requiring diversification of revenue streams or taking additional steps to justify a higher product price to remain profitable.

Demand for South Carolina seafood is high. If one produces a quality product, it can be sold, which is good news for producers, but it means they need access to the technology and infrastructure to support production. Wild caught fisheries in our state, namely shrimp and finfish, are challenged by dwindling access to waterfront property to allow them to efficiently land and process their catch as well as maintain their boats. Expansion of shellfish aquaculture has the potential to provide significant environmental and economic benefits to the state. Perceptions of waterfront property owners to fisheries and aquaculture activities within their viewshed are generally positive, but vary along the coast. As more people take up residence along our coast, our seafood industry will be challenged with maintaining its position in both urban and rural settings. A modern, professional, competitive, and well-organized industry can face the challenges that lie ahead.

The focus of this program area is to generate and disseminate information through translational research, technology transfer, and extension and education on the development of sustainability in the fisheries and aquaculture sectors, in particular, the development of viable, sustainable marine fisheries technologies and practices.

Issues and Opportunities

- The status and viability of the state's coastal and marine fisheries resources, and the ecosystems and habitats on which they depend, are constantly being impacted from a variety of natural and anthropogenic drivers.
- The seafood industry is faced with short- and long-term economic and environmental threats due to increasing population, land-use changes, loss of traditional waterfronts, and other socio-economic pressures.
- Lack of long-term access to waterfront infrastructure to support fisheries activities continues to hinder the development of seafood businesses; including commercial fishery needs in waterfront development planning is critical to the longevity of seafood production and to seizing business development opportunities in this sector.
- Coastal residents and tourists, generally speaking, have positive perceptions of marine aquaculture and fisheries activities in coastal communities; however, achieving and sustaining the support of coastal property owners for presence of fisheries and aquaculture activities within their viewshed will be critical to industry growth and diversification going forward.

- Demand for shellfish seed continues to increase along the entire East Coast. Entrepreneurship in shellfish aquaculture in the Southeast will require continued technology transfer efforts aimed at enhancing growers' production at all stages. To support commerce while also protecting marine resources, there will need to be increased focus on science-based decision making on seed transfers.
- Although strong in the past, seafood industry associations, regardless of sector, are challenged with diminished participation and operational difficulties. If our seafood industry is going to face challenges head on and be proactive, strengthening these associations and uniting producers under common goals is crucial.
- Policy and regulatory processes that impact seafood production are daunting to most people; assisting fishers and aquaculturists to understand and participate in those processes will enhance adoption of practical solutions to marine resource issues.

Vision

Sustainable fisheries and aquaculture in the coastal region are economically vibrant and are compatible with changing demographics, business development, regulatory environments, and long-term conservation of natural and cultural resources.

Goal 1

Sustainable fisheries and aquaculture that balance the long-term ecological health of the resource and the social, economic, and cultural needs of communities.

Objective 1.1: Support the identification and development of innovative management strategies and other approaches through applied research to maximize the long-term sustainability of fisheries and aquaculture enterprises in South Carolina.

Strategies:

- Document the relationships between fisheries production in estuaries and the quality and quantity of available habitat.
- Assess the effects of dynamic short-term and long-term processes related to changes in climate, hydrology, and circulation on fisheries recruitment and migration patterns.
- Disseminate information about natural (e.g., climate change) and human (e.g., encroachment) threats to the long-term viability of wild fish populations and aquaculture species.
- Enhance and facilitate communication and information exchange between fishers and aquaculturists, and state fisheries managers and policymakers, non-governmental conservationists, and fisheries scientists.
- Identify cultural and subsistence fishery practices and assess policy needs to protect traditional uses.

Objective 1.2: Enhance the seafood industry through translational research and technology transfer aimed at increasing sustainability, production, and profitability.

Strategies:

- Develop novel and alternative gear and system designs and materials to support sustainable traditional fisheries industries.
- Evaluate and assess the environmental and economic effectiveness of stock enhancement programs for key commercial and recreational fisheries in South Carolina.
- Support the development of economically viable and environmentally sustainable aquaculture practices

and operations at a variety of scales, with an emphasis on shellfish aquaculture.
- Identify value-added opportunities to diversify revenue streams for fisheries and aquaculture businesses.
- Deliver sustained technology transfer programming to commercial shellfish harvesters and shellfish aquaculture operators to ensure sustainable and economically viable businesses.

Objective 1.3: Foster enhanced communications among the fisheries and aquaculture industry, resource management agencies, and the public regarding living marine resource management and policy in South Carolina.

Strategies:

- Determine the social carrying capacity for fisheries and aquaculture activities within South Carolina's coastal waters.
- Develop cooperative research and citizen science projects to address key data collection, management strategies, and policy issues, including documenting the long-term processes that impact the State's living marine resources.
- Document the status and economic impact of the seafood industry in South Carolina.
- Identify and evaluate access points for commercial, subsistence, and recreational fishing.

Goal 2

A healthy domestic seafood industry that harvests, produces, processes, and markets seafood responsibly and sustainably.

Objective 2.1: Seafood businesses adopt socially and economically viable and sustainable production practices.

Strategies:

- In partnership with the aquaculture industry, resource management agencies, non-profit organizations, and other interested parties, document the existing policy, management, and regulatory environment for marine aquaculture in South Carolina.
- Provide workforce training opportunities to increase industry adoption of practices that allow them to produce, process, harvest, and market seafood in a safe and sustainable manner.

Anticipated Outcomes

Goal 1:

- The fisheries community has an increased understanding of fisheries ecology, fisheries management strategies, and the regulatory process.
- The fisheries community participates in cooperative research leading to a greater awareness of more sustainable fisheries practices.
- Improved communication, understanding, and collaboration are developed among commercial fisheries stakeholders, managers, and scientists.
- State and federal fisheries managers use Consortium-derived information in essential fish habitat and marine protected areas management.
- Innovative shellfish aquaculture practices are evaluated, tested, and implemented.

Goal 2:

- Seafood industry stakeholder understanding of regulatory processes is enhanced and engagement in

management-related activities increases.

- Aquaculture and fishing industries are economically stable, environmentally sustainable, and diverse.
- Seafood harvesters, wholesalers, and distributors adopt safe and responsible practices for harvesting, handling, and marketing their products.

Performance Measures and Six-Year Targets

- Number of fishermen, seafood processing or aquaculture industry personnel who modify their practices using knowledge gained in fisheries sustainability and seafood safety as a result of Sea Grant activities. [NSGO Measure]
  - 100
- Number of seafood industry members that receive technical assistance from S.C. Sea Grant Extension Program.
  - 200
- Number of scientific, technical, and educational products produced by the Consortium and its partners that address issues and opportunities related to safe and sustainable seafood.
  - 20
- Attendance at Consortium-sponsored/co-sponsored sustainable fisheries and aquaculture workshops and information events.
  - 1,000

V. SCIENTIFIC LITERACY AND WORKFORCE DEVELOPMENT

Background

The scientific literacy program component of this Focus Area provides quality coastal and marine information that is reflective of the Consortium's current research priorities and state and national science education benchmarks to K-12 students, informal and formal educators, and the general public. Careers in ocean sciences as well as STEM (science-technology-engineering-math) skills are highlighted during program planning and delivery. Through professional development programs for formal and informal educators, community-action stewardship projects, and robust classroom lessons aligned with South Carolina State Science Standards and the national Ocean Literacy Essential Principles, the Consortium provides access to resources and training that facilitates the inclusion of marine, coastal, and natural resources information into science learning. The delivery of this information is frequently achieved through partnerships with free choice, informal learning centers such as aquariums, science centers, state and county parks, and museums.

A well-informed constituency is essential for balanced coastal and marine resource management and economic growth. Given the continuous influx of new residents and visitors to the South Carolina coast every day, it is imperative that the Consortium continue to serve as the purveyor of marine and environmental science information through programs, trainings, and resources for the state's youth and educators.

The Consortium's workforce development efforts are geared towards providing research and training opportunities for undergraduate and graduate students through Consortium-funded research projects. With a great majority of the marine-related federal work force eligible for retirement within the next five years, the continuing emergence of new marine technologies and discoveries, and the increasing pressures on the nation's coastal and ocean resources due to population growth, the need for highly qualified and adequately trained professionals will continue to

increase. Furthermore, the Consortium will continue to assist with the diversification of the ocean-based work force by promoting ocean- and coastal-related careers to under-represented groups.

Issues and Opportunities

- As South Carolina's coastal population continues to grow, there is a continuous need to build public awareness, understanding, and scientific literacy about the complexities of living, working, and playing in coastal South Carolina.
- Partnerships with a wide range of organizations at the local, state, regional, and federal levels are essential to increase knowledge of coastal and marine issues.
- Ongoing interaction with and engagement of stakeholders is needed to identify priority coastal and marine resource information needs.
- When compared to national scores, South Carolina consistently ranks lower on standardized science test score rankings than other states.
- There is an increasingly high demand for a workforce skilled in STEM disciplines to accommodate the industrial growth of the state.
- As South Carolina continues to diversify, information should be developed and tailored to accommodate the needs of multiple audiences.
- Diverse populations are under-represented in the ocean sciences workforce.
- Within South Carolina, only a few informal organizations focus exclusively on marine and coastal education and have the flexibility to deliver programs for K-12 teachers and students across the state.
- There is a need to engage early career higher education faculty and graduate and undergraduate students in Sea Grant research and fellowship opportunities.
- Students need early exposure to and experience manipulating authentic, large data sets to be able to navigate in the data-rich environments of the ocean sciences workforce.
- Information needs to be delivered using a variety of contemporary platforms, including websites, mobile applications, and social media, in addition to more traditional media such as newspapers, magazines, radio, and television.
- Science should help inform the decision-making process in natural resources policy and everyday life, and the communication of research results in easily understood language is necessary for decision-makers at all levels.
- The future of the conservation and management of our coastal resources depends upon a robust effort to foster stewardship and increase public awareness about the societal value and ecological function of South Carolina's coastal resources.

Vision

A scientifically literate public, at both youth and adult levels, understands the value and vulnerability of coastal and marine resources, makes wise decisions regarding these resources, and supports the development of a well-trained and diverse workforce in coastal- and marine-related careers.

Goal 1

Coastal and ocean K-12 education programs foster scientific literacy, stewardship, and exposure to science-based careers in both formal and informal settings.

Objective 1.1: Design, implement, and enhance K-12 student (formal and informal) marine education and stewardship programs that are interdisciplinary and diverse, and align with South Carolina State Science Standards and Ocean Literacy Essential Principles.

Strategies:

- Deliver existing K-12 marine science educational lessons and program support materials that align with state education standards.
- Leverage existing and develop new educational resources that reflect the current Consortium research and outreach agenda to further the implementation of Sea Grant's K-12 educational programs.
- Introduce K-12 students in diverse urban, suburban, and rural communities to opportunities in higher education, to begin linking early education to workforce development.

Objective 1.2: Design, implement, and enhance professional development opportunities for educators that provide content and resources for incorporating ocean sciences concepts.

Strategies:

- Coordinate professional development opportunities focused on relevant Sea Grant research topics.
- Offer professional development opportunities to incorporate coastal and ocean science topics into the classroom.
- Provide opportunities for scientist-educator collaboration in research and education.
- Incorporate relevant Consortium-funded research and extension topics into professional development for educators.

Objective 1.3: Design, implement, and/or enhance stewardship-focused programs, including student-action and community-action projects.

Strategies:

- Develop community-based, student-action environmental programs that focus on coastal issues and serve the community-at-large.
- Engage the general public and communities with student-action projects.
- Develop public and social media outlets to promote programs and projects.

Goal 2

Coastal and ocean education programs foster the development of a diverse scientifically trained workforce.

Objective 2.1: Undergraduate and graduate students are trained to meet workforce needs in ocean sciences fields.

Strategies:

- Encourage the involvement of new faculty, professional staff, and students in Consortium-supported programs and activities.
- Provide educational and workforce development opportunities in coastal and marine fields of study to a diverse cadre of undergraduate and graduate students at South Carolina universities and colleges through research support and fellowship and internship experiences.

- Assess, predict, and communicate current and potential workforce needs and opportunities in the Southeast.

Objective 2.2: Support the development of a diverse workforce.

Strategy:

- Recruit and retain under-represented and underserved groups into the coastal and ocean sciences at the college/university level.

Goal 3

Improve public understanding about the coastal and marine environment and related community issues.

Objective 3.1: Provide engagement opportunities for the general public.

Strategies:

- Engage the public in local discovery, volunteer, citizen science, and stewardship activities.
- Inform local stakeholders of applicable research relevant to their communities.
- Collaborate with formal and informal educational institutions to develop new or enhanced existing programs, exhibits, and outreach designed for the general public.
- Deliver effective communications and outreach efforts to offer science-based products and programs to target audiences and the general public.

Objective 3.2: Ensure that Consortium communications and education programs are effective in providing the necessary science-based information and that this information is delivered to target audiences in a timely fashion and in appropriate formats.

Strategies:

- Enhance the knowledge and awareness of coastal residents and visitors of the value of coastal and ocean resources.
- Produce and distribute quarterly issues of *Coastal Heritage* magazine, which covers relevant issues pertaining to coastal- and marine-resource policy, science, history, and culture.
- Produce and distribute regular issues of *CoastalScience@Work*, an e-newsletter that reports on the programmatic highlights of the agency, to local, state, regional, and national key decision-makers.
- Engage community volunteers in Consortium outreach activities.
- Publicize Consortium-funded research, education, and outreach through print, broadcast, electronic, and web-based media, including social media.
- Produce and distribute electronic and hard copy publications and products, targeted to constituent needs.
- Regularly maintain and enhance the information on the Consortium website and subsites.
- Translate select publications and web-based content into Spanish.
- Solicit formal evaluations from Consortium conference and workshop participants and readers of Consortium communication products.

Anticipated Outcomes

Goal 1:

- K-12 educational materials, including curricula, are developed by the Consortium and are being used in classrooms and at informal education facilities throughout South Carolina.
- *Coastal Heritage* Curriculum Connection is accessed by formal and informal educators.

Goal 2:

- Cultivation and engagement of young and new faculty are supported through the Consortium.
- Graduate and undergraduate student training continues to be a priority for Consortium-supported research projects.
- South Carolina graduate and undergraduate students successfully compete for national and state fellowship and internship opportunities.
- Cultivation of culturally diverse undergraduate and graduate students to pursue ocean science careers.

Goal 3:

- Volunteers, including formal and informal educators, are engaged in stewardship activities, such as From Seeds to Shoreline® salt marsh restoration and Beach Sweep/River Sweep® litter cleanup.
- The Consortium is partnering with a diverse group of organizations, institutions, and individuals.
- Consortium information is delivered to target audiences and the general public in a timely fashion and user-friendly formats.
- The demand for the Consortium's publications is increased.
- High-quality outreach publications are produced.
- Consortium website continues to be a significant source of coastal and ocean information.
- Volunteers are engaged in Consortium stewardship activities, including Beach Sweep/River Sweep.
- Consortium activities are covered in the traditional mass media and web-based media.
- Public understanding of coastal and ocean issues is increased.

Performance Measures and Six-Year Targets

- Number of P-12 educators who participated in Sea Grant education programs. [NSGO Cross-Cut Output Measure]
    - 800
- Number of P-12 students reached through Sea Grant-trained educators or directly through Sea Grant education programs. [NSGO Cross-Cut Output Measure]
    - 32,000
- Number of Sea Grant products that are used to advance environmental literacy and workforce development. [NSGO Measure]
    - 48
- Number of people engaged in Sea Grant-supported informal education programs. [NSGO Measure]
    - 500

- Number of Sea Grant-supported graduates who become employed in a job related to their degree within two years of graduation. [NSGO Measure]
    - 70
- Number of scientific, technical, and educational products produced by the Consortium and its partners that address issues and opportunities related to environmental literacy and workforce development.
    - 20
- Attendance at Consortium-sponsored/co-sponsored environmental literacy and workforce development workshops and information events.
    - 40,000

PLAN OF ACTION

Management Focus Areas

Three management areas have been identified as priorities for the Consortium and included in the agency's strategic plan:

1. Planning, Program Management, and Overall Performance
2. Connecting with Users
3. Human Resources

To meet the state requirements for South Carolina's accountability reporting, the Consortium tracks a set of management performance measures which have been monitored and reported annually since 2003 (see www.scseagrant.org/performance-and-accountability).

I. PLANNING, PROGRAM MANAGEMENT, AND OVERALL PERFORMANCE

Implementation of our programmatic activities depends upon the agency's ability to implement and continuously improve procedures and processes to ensure efficient and effective planning, program management, and overall performance.

The Consortium identifies priority coastal and marine resource needs through its strategic planning process. These needs are addressed through research, education, extension, communications, and training programs. The strategic plan also provides the justification for agency efforts to solicit and secure funding to support these activities and to generate and provide resultant information to the agency's stakeholders in forms that they can use (covered in the Connecting with Users area). To ensure that Consortium activities are consistent with public needs and are of high quality, the Consortium:

1. Conducts strategic planning every four years and implementation planning every two years,
2. Employs a rigorous peer review and evaluation process of all proposals submitted to the agency for support,
3. Collects and utilizes formative and summative evaluation information for education and outreach programs including meetings, programs, workshops, and conferences.
4. Is formally evaluated by the NOAA National Sea Grant College Program Office through its Program Implementation and Evaluation (PIE) process every four years.

Program management and accountability are important components of the success of the S.C. Sea Grant Consortium. The Consortium must manage its program in accordance with State of South Carolina requirements as well as those of the NOAA National Sea Grant College Program. Therefore, the Consortium is accountable to both programs and receives both internal (state) and external (federal) evaluations of its programs, functions, and finances. Strategic Planning, national Program Assessments, State Accountability reporting, State and Federal audits, and other regular monitoring are all part of these reviews.

Issues and Opportunities

- The Consortium depends on its annual state appropriation to support a significant portion of its operational and management responsibilities; recurring state appropriations also serve as matching funds for the core Sea Grant program. These funds must be justified on an annual basis before the South Carolina General Assembly, and any request for increased funding comes under significant scrutiny.

- Consortium programs are supported through the successful acquisition of competitive grants from federal, state, and other sources of funds (now approximately 87 percent of the agency's total budget). As competition for federal funding (from ever-decreasing federal discretionary funds) continues to increase, the Consortium must expend additional staff time and effort to successfully secure extramural grant funding.
- The importance of strategic planning has become more critical to the Consortium as demands for Consortium program activities and services continue to increase and many constituencies seek agency assistance; however, the resources (human and fiscal) are not there to satisfy all needs for maintaining and expanding agency programs.
- The Consortium's success is predicated on its ability to maintain efficient, timely, and responsive administrative and program management capabilities, including a rigorous peer review process for Consortium proposals and clear and constant communications with its member institutions.
- Competition for federal and state dollars requires strict accountability and performance metrics.
- Partnerships and collaborations are key to the Consortium's success; engagement of communities unfamiliar with the Consortium to create research and partnership opportunities will enhance the agency's impacts.

Vision

The Consortium is the best Sea Grant program in the nation and is the most efficiently and effectively managed state agency in South Carolina.

Goal 1

Effective planning, financing, and performance efforts in support of the mission and programmatic goals of the Consortium.

Objective 1.1: Ensure the programmatic mission of the Consortium is accomplished through planning activities and an efficient administrative and management system which supports effective program implementation.

Strategies:

- Continually update the Consortium's strategic plan (including performance indicators) based on constituent needs; this requires continued engagement of staff in strategic and implementation planning to ensure revisions are made and indicators are tracked.
- Engage the Consortium's Board of Directors and Program Advisory Board in setting overall program priorities and developing strategies for program development.
- Maintain communications with the Consortium's liaisons at the university levels to promote open and viable interaction among university officials, faculty, and Consortium staff.
- Maintain a rigorous technical peer review process for all competitive research, education, and outreach proposals received by the agency.
- Continue the activities of the Consortium ExTeam (executive team) and Core Group (management team) to facilitate communication and information exchange in setting the agency's short- and long-term directions and approaches.

Objective 1.2: Develop, maintain, and enhance the Consortium's funding levels and financial and reporting system to support the programmatic goals of the research, education, extension, communications, and training programs of the Consortium.

Strategies:

- Adhere to Consortium Board of Directors and State leadership directives to maintain, and where possible, enhance state funding.
- Obtain research and outreach funding through National Sea Grant Core and other National Sea Grant competitions.
- Compete for public and private extramural funding in support of Consortium programs and activities to benefit the citizens and state of South Carolina.
- Ensure that Consortium accounting and fiscal management procedures meet or exceed federal, state, and local policies, regulations, and guidelines.
- Implement and continually refine the Consortium's "eSeaGrant" Management Information System (MIS) to conduct proposal solicitation and review, track program progress, and document performance.
- Prepare annual State Accountability and National Sea Grant Annual Reports.
- Ensure that the most current IT software and equipment are used to enhance efficient operations and ensure information security.
- Prepare for external National Sea Grant Program Site Review Visits.

Anticipated Outcomes

- Strong short- and long-term planning is conducted by agency with support of the Consortium Program Advisory Board, extension and education specialists' advisory committees, and other user input, and with approval of the Consortium Board of Directors.
- Viable research and education programs funded and implemented through the Consortium meet priority constituent needs.
- A strong and diverse funding base to support Consortium programs, activities, and administrative needs is established.
- Increased levels of state and non-state financial support secured to address ever-increasing stakeholder needs and reach Consortium program goals.
- Sound fiscal practices are maintained and statewide single-agency audits have no significant findings.
- Annual state and federal accountability reports document the agency's performance.
- The Consortium is rated as one of the highest performing Sea Grant College Programs in the nation.

Performance Measures and Six-Year Targets

- Percentage of Sea Grant core research and education proposals submitted to the Consortium which are funded.
    - 25
- Percentage of extramural proposals prepared and submitted by the Consortium which are funded.
    - 35
- Return on investment of core Sea Grant funding (percentage).
    - 400
- Level of extramural (competitive and otherwise) funding in dollars secured from non-state sources.
    - 14,000,000

- Number of significant findings in statewide single-agency audit.
    - 0

II. CONNECTING WITH USERS

The S.C. Sea Grant Consortium connects with its stakeholders and constituencies by seeking input from them to (1) establish programmatic needs and priorities and (2) deliver results from Consortium efforts back out to our constituents. This two-way communication network is critical to the success of the agency in delivering products and services to the citizens of South Carolina and the Southeast U.S.

The Consortium, by definition, continuously and consistently seeks involvement and input from its constituents, Board of Directors, Program Advisory Board, liaisons at its member institutions, and Sea Grant Extension and Education Program Advisory Committees to help shape Consortium priorities and programs. This ensures that our activities are responsive to the needs of the Consortium's stakeholders and allows us to determine:

1. Priority needs pertaining to coastal and ocean resources use and conservation;
2. Current activities that are underway to address these needs;
3. Priority needs that are not being adequately addressed by current activities; and
4. Most importantly, specific potential actions that the Consortium can take to address these unmet needs.

In addition to obtaining input from its constituents, the Consortium also provides output to our varied constituents in the form of two primary "products" – program support and science-based information. Linking information "generators" with information "consumers" through feedback mechanisms ensures the timely delivery of research information to a variety of user groups. These interactions manifest themselves in several ways. Science-based information is generated by the faculty, staff, and students of the agency's eight member institutions, and serves as the fodder for products and services which the Consortium provides. The Consortium's Extension Program efforts are directed to specific user groups and involve the development and delivery of publications, workshops, and direct contact information. Informal education and awareness efforts are also developed for the general public; vehicles for information transfer include the Consortium website and subsites, booklets, brochures, slide shows, group presentations, media (traditional and social) interaction, and others.

The agency has no resource management or regulatory responsibilities. This allows the Consortium to maintain a non-advocacy role and serve as a neutral third party. The products, activities, and services generated and disseminated by the Consortium are at the request of its constituencies. Consortium funded-research projects also produce quality scientific publications.

Issues and Opportunities

- One of the primary functions of the Consortium is to identify priority coastal and marine resource needs. To do this effectively requires a commitment to ongoing and continual interactions with and engagement of its constituents.
- To function effectively, the Consortium must partner with a diverse group of organizations, institutions, and individuals representing universities; federal, state, and local natural resource and economic development agencies; business and industry; state and local governments; community and cultural groups; non-governmental organizations; K-12 educational institutions; and others.
- Accessibility to information through the Consortium's website and social media platforms is an essential addition to more traditional information media. Keeping up with evolving communications technology for both

internal and external communications is, and will continue to be, a significant challenge in the foreseeable future.

- The Consortium is responding to the changing workplace landscape resulting from COVID-19 impacts. Technological investments in telecommunication services and enhancement of internal equipment and resources will continue to be of the utmost importance as communication demands evolve due to the pandemic.
- The human landscape of the coast is changing. With coastal growth and development also come demographic shifts. For example, 30 years ago the Hispanic population of the coast consisted mainly of migrant farm workers for the spring tomato harvest. Today Hispanics account for a larger segment of the permanent labor force serving the tourism, recreation, landscape, development, and other business and industrial sectors. The Consortium must continue and expand its efforts to address the needs of all coastal stakeholders with its programming.
- Science should and must play a role in informing the decision-making process related to resource use, management, and policy. This requires collaboration among scientists and resources managers in the identification of priority information needs, implementation of relevant scientific investigations, and the effective delivery of research results in forms which can be easily understood and used by decision-makers at all levels.
- To promote enhanced coastal stewardship, there is a need to release more scientific and technical information to the public in digestible formats.
- Due to the limited availability of resources and the increasing need for public awareness and education programs, the engagement of professionals and citizens alike in volunteer activities must be pursued.
- Overall strategic and policy guidance from outside the agency in the development and continual refinement of the agency's strategic plan is a critical need for the Consortium.

Vision

The Consortium is the primary source for applied coastal and ocean resource information in South Carolina.

Goal 1

Needs of the Consortium's diverse constituencies throughout the state and region are well-documented and addressed.

Objective 1.1: Ensure that issues and needs of those who live and work along the coast are accurately identified.

Strategies:

- Periodically engage constituents in the identification of coastal and marine resource issues and needs through a range of activities such as surveys and individual contact.
- Periodically engage the Consortium's Program Advisory Board, as representatives of our constituents, in setting overall program priorities and developing strategies for program development.
- Seek programmatic guidance from extension and education program specialist advisory committees.
- Seek programmatic guidance from *ad hoc* program area advisory groups.
- Maintain and expand partnerships with federal, state, and local governments, business and industry, non-Consortium universities, and NGOs.

Objective 1.2: Bring diverse audiences with broad perspectives and experiences together to facilitate interactions and discourse on critical coastal and ocean issues.

Strategies:

- Periodically engage diverse constituents in discussions of emerging issues affecting coastal South Carolina and the region.
- Coordinate multi-investigator and multi-institutional partnerships working together to address critical resource questions.
- Broker resolutions to resource management issues.
- Provide leadership on committees and other forums that seek to resolve coastal and ocean resource challenges.

Anticipated Outcomes

- The problems and needs of those who live and work along the coast are accurately identified.
- The Consortium partners with a diverse group of organizations, institutions, and individuals.
- The Consortium demonstrates leadership and catalytic roles in addressing and resolving coastal and ocean resource issues.
- Consortium information is delivered to target audiences in a timely fashion and user-friendly formats, including print and web-based products targeted to under-served communities.
- The demand for the Consortium's products and services is increased.

Performance Measures and Six-Year Targets

- Number of committees/workgroups that Consortium staff lead or participate on.
  - 60
- Number of extension workshops and presentations.
  - 700
- Attendance at extension workshops and presentations.
  - 18,600
- Number of professional awards/recognitions for Consortium programs.
  - 15

III. HUMAN RESOURCES

The Consortium staff demonstrate excellence both within the agency and among its various partners. This excellence is achieved through dedication, loyalty, industry, and integrity. The Consortium staff also must demonstrate leadership skills and pursue engagement opportunities with the agency's diverse stakeholder community. One critical way that this is achieved is through its involvement in leadership roles with a number of public, private, and non-governmental organizations. Consortium staff assume key leadership roles in organizations, professional societies, and activities that advance the mission of the Consortium and the visibility of Sea Grant in the state of South Carolina, which enables it to better serve the needs of its constituencies.

The S.C. Sea Grant Consortium's core management team continues to implement proven human resource

management strategies to help the Consortium achieve its mission, goals, and overall success while meeting the needs of employees. The administration provides agency leadership through an efficient, dedicated, and loyal work style to Consortium staff and stakeholders. The management team will continue to pursue and hire high-quality personnel through innovative approaches, utilizing rigorous interview processes involving various methods and panels. Additionally, leadership will strive to retain these individuals though creative ideas and budgeting in challenging resource environments. Through these methods, the Consortium will continue to advance and diversify its personnel needs over the next four years and enable the agency to better serve the needs of its constituents moving forward.

Issues and Opportunities

- The Consortium's success is predicated on its ability to maintain a solid administrative and program management capability. The challenge of recruiting and retaining high caliber staff in an environment of static and uncertain budgets is a significant one that senior management must consistently address.
- Limited financial resources to support both administrative and program staff present a barrier to effective program administration, as well as program delivery. This is a challenge that must be overcome for the Consortium to continue delivering high quality administrative and program services that support its research and outreach programs and meet the ever-increasing demand by stakeholders for agency products and services.
- The Consortium is a relatively small agency with limited staff resources and seemingly unlimited program opportunities. To optimize the potential of the agency, each staff member "wears many hats," and thus each staff member performs multiple tasks that are critically important to the agency's success.
- Highly qualified, trained, experienced, and diverse professional and support staff are essential to maintaining high quality administrative and program performance.
- Rapid changes in technology, accountability, etc. require an increasing commitment to provide training opportunities for staff.
- The COVID-19 pandemic has forever changed the daily workplace and how staff interact. The Consortium will continue to face new challenges and must adapt through creative ideas and transitioning to a different environment as the pandemic takes its course.
- New staff hires must take into account the increasing diversity of the state's populace to be able to both identify their needs and issues and respond with relevant and appropriate information products, advice, and services.

Vision

The Consortium is fully staffed with professionals of diverse backgrounds and skills to effectively serve the varied needs and interests of our constituencies.

Goal 1

A highly qualified, well-trained, and professionally recognized agency staff.

Objective 1.1: Encourage an "environment of excellence" to maintain and hire talented staff and support the development of professional and other skills among the Consortium staff in partnership with other federal, state, and local agencies and professional organizations.

Strategies:

- Hire highly qualified staff through a rigorous recruitment and selection process.

- Seek partnerships with other organizations to jointly support key management and/or programmatic staff.
- Retain extension specialist staff to effectively provide science-based information to agency constituents.
- Enhance and strengthen the agency's core efforts by establishing a set of diversity initiatives to enhance Consortium programs, projects, and communications in order to best serve our stakeholders, constituents, and the public with the understanding that personal experience, values, and worldviews arise from differences in cultures.
- Enhance skills and capabilities (including the possibility of cross-training) of the Consortium staff through professional development opportunities.
- Encourage staff to become actively involved in professional organizations pertinent to their staff positions (e.g., as committee members, elected officers).
- Promote performance excellence through incentive-based efforts and program competition, and encourage staff through staff recognition and awards.

Anticipated Outcomes

- Staff retention rates are high and any turnover periods are brief to reduce the impact of the agency's ability to complete its mission.
- Staff are well-trained and engaged in internal and external agency activities.
- Diversity is cultivated through targeted recruitment, continual learning and training, and outlined measurable objectives and criteria.
- Staff represent a variety of backgrounds and lineages.
- Staff assume leadership roles within relevant professional institutions and organizations.
- Staff are regionally and nationally recognized by peers and professional organizations.

Performance Measures and Six-Year Targets

- Staff retention rates (e.g., FTE/TGE vacancy rate).
    - 90
- Number of staff professional development opportunities.
    - 120
- Number of program-related state, regional, and community-based committees and task forces populated with Consortium staff and extension specialists.
    - 28
- Number of professional awards/recognitions for Consortium staff.
    - 10