

Charting Seas of Change

S.C. Sea Grant Consortium Strategic Plan 2024-2027

About the S.C. Sea Grant Consortium

The S.C. Sea Grant Consortium (Consortium) was created in 1978 as an independent state agency through Act No. 643 of South Carolina's Code of Laws. The Consortium is a member of a nationwide network of 34 Sea Grant College Programs that are certified by the National Sea Grant College Program, which is located within the National Oceanic and Atmospheric Administration, U.S. Department of Commerce. The Consortium is charged with managing and administering the Sea Grant program for the State of South Carolina and regionally.

The Consortium member institutions are Clemson University, Coastal Carolina University, College of Charleston, Francis Marion University, Medical University of South Carolina, S.C. Department of Natural Resources, S.C. State University, The Citadel, and University of South Carolina. The Consortium is well-served by the collaboration of our member institutions who are our partners in research and outreach. An executive officer from each institution comprises our [Board of Directors](#).

Our mission is to generate and provide science-based information on issues and opportunities to improve the social and economic well-being of coastal residents while ensuring the optimal use and conservation of marine and coastal natural resources.

Planning Process for FY24-27

The goal of the S.C. Sea Grant 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 in South Carolina. The strategic planning process began in December 2021 by the Consortium's [Program Advisory Board](#) (PAB).

The 25-member group represents academic, non-profit, municipal, state, federal, and community organizations. The group reviewed the current strategic plan program sections and quickly worked through an exercise to identify what progress looks like (by 2028) in each of our focus areas. Many groups also were able to prioritize through assessment of importance and feasibility of items. Program specialists shared the current plan and the work of the PAB with each of their six [advisory committees](#).

Advisory committee membership is as diverse as the PAB but focused on the issues and opportunities in program areas. Each group discussed and identified changes for the FY 2024-2027 strategic plan. The executive director of the Consortium attended meetings with federal and state leaders in natural resource management and public health, as well as leaders of non-profit organizations active in coastal management to identify their priority issues and opportunities. These organizations included leadership from National Estuarine Research Reserves, the state Coastal Program, and Southeast Coastal Ocean Observing Regional Association.

Using this information, in addition to information collected over the past year during programs and meetings, the staff crafted the strategic plan. Additional information collected during these meetings will be utilized in program planning while implementing the plan. The PAB met to review a draft strategic plan in June 2022.

The draft strategic plan will be delivered to the National Sea Grant Office (NSGO) in August 2022 for review. After receiving the NSGO strategic plan, there may be further revisions. The Consortium's Board of Directors will meet in mid-October to finalize and approve the plan before final submission to the NSGO on October 26, 2022 for implementation on February 1, 2024.

Mission and Vision

MISSION

The S.C. Sea Grant Consortium generates and provides science-based information on issues and opportunities to improve the social and economic well-being of coastal residents while ensuring the optimal use and conservation of marine and coastal natural resources.

We accomplish this through development of a strategic plan guided by the research and information needs of all of our residents, businesses, visitors, local and state governments, and other organizations.

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 watershed interrelationships throughout South Carolina.

VISION FOR THE CONSORTIUM

To lead residents of and visitors to South Carolina in becoming more resilient and science-literate through delivering impactful science-based information.

VISION FOR THE COAST

The S.C. Sea Grant Consortium envisions a thriving South Carolina where the following statements are true:

1. Coastal and marine resources are healthy and abundant.
2. Access to natural resources and sustainable economic opportunity is equitable, inclusive, and just.
3. Decision-makers are incorporating sound scientific information into their choices about coastal population growth, sustainable development, ecosystem health, and public safety.
4. Communities manage the impacts of coastal population growth and climate change to support a vigorous and inclusive economy and high quality of life for all citizens.
5. Youth are knowledgeable about the importance of coastal and marine resources, as well as the challenges these resources face.
6. A diverse workforce is well-informed regarding the environmental issues pertinent to their personal and professional lives and have equal access to the "blue workforce."
7. People across the state and region are informed about coastal and marine resource issues and practice good stewardship of resources.
8. Individuals, businesses, and governments fully understand and anticipate the coastal risks that confront them, planning and adapting to reduce those risks.

Core Values

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

- 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 Service to our stakeholders throughout the state, region, and nation.
- Inclusion of diverse perspectives in an intentional and impactful way.

Diversity, Equity, and Inclusion

The Consortium's [commitment to diversity, equity, and inclusion](#) (DEI) creates a culture of belonging where all people are treated with dignity and respect, and have equitable access to resources, opportunities, and outcomes.

How We Work

We accomplish our program goals through applied scientific research that answers priority questions, extension of research results to stakeholders and end-users of information and engagement of researchers in solving community issues, providing marine science education-focused curricula, and communication through multiple mediums including reports, fact sheets, infographics, magazines, websites, and social media.

RESEARCH

Stakeholder-driven and needs-based applied research is a core component of our Sea Grant program. We work with researchers across universities in South Carolina and across all scientific disciplines to answer priority questions of our stakeholders in each of our focus areas. Often, answering priority questions necessitates interdisciplinary collaboration, an area where the Consortium excels due to our wide reach across our member institutions and partners.

EXTENSION

Once research is completed, our extension team translates the science in an objective and comprehensible fashion so that end users are able to make optimal decisions based on research findings. This takes many forms including one-on-one interaction, fact sheets, infographics, presentations, technology transfer, training, tool development,

demonstrations, and workshops. The goal of our extension program is to take complex scientific information and show people how to use it to solve problems.

EDUCATION AND WORKFORCE DEVELOPMENT

Through our marine science education program, the Consortium fosters K-12 student and teacher engagement through hands-on learning experiences, supports professional development of teachers through continuing education programs, and works with schools to incorporate environmental science into the classroom. By engaging youth in marine topics and environmental science, the Consortium seeks to build a diverse pipeline of scientifically informed students who have equitable access to careers in marine-related fields. Fellowship, scholar, and intern programs for undergraduate and graduate students provide experience and opportunities directly related to jobs in South Carolina.

COMMUNICATIONS

Our Sea Grant program serves as a broker of neutral, objective, science-based information provided in user-friendly formats to coastal resource managers, policymakers, business and industry groups, educators, and the public so they have a better understanding of coastal and marine ecosystems and processes, the human impacts upon coastal and marine resources, and are able to appreciate, care about, and manage these resources. This information is produced and disseminated in a variety of formats, including regularly published magazines, e-newsletters, brochures, fact sheets, reports, press releases, and online content via the Consortium website, subsites, and social media platforms.

ADMINISTRATION AND MANAGEMENT

Unique to Sea Grant College Programs, administration, extension, communications, and education staff are located in an independent state agency that administers the S.C. Sea Grant Consortium. The Consortium includes Clemson University, Coastal Carolina University, College of Charleston, Francis Marion University, Medical University of South Carolina, S.C. Department of Natural Resources, S.C. State University, The Citadel, and University of South Carolina. The administration oversees all operations of the agency, including staff support, grants programs, fellowships, internships, and scholars programs.

Cross-Cutting Principles

Some principles are inherent to all the core programs of the Consortium. For example, you will not find separate sections for Resilience and DEI or for programs that include

internships, fellowships, and scholars. Each topic area includes the cross-cutting principles. The Consortium achieves excellence in its mission by adhering to the following cross-cutting principles:

1. People are our greatest asset.
2. Stakeholder input drives programs and activities.
3. Diversity, equity, and inclusion principles are a core component of everything we do across research, extension, education, communication, training, and stakeholder engagement.
4. Environmental justice principles through the fair treatment and meaningful involvement of all people regardless of race, color, religion, national origin, gender, sexual orientation, gender identity, age, physical or mental disability, or genetic factors with respect to the development and implementation of environmental policies are encouraged for all activities.
5. The value of working with partners from all sectors and across the southeastern U.S. region is critical to our success.
6. Consortium programs embrace interdisciplinary and collaborative approaches that incorporate research, extension, education, communication, training, stakeholder engagement, and workforce development.
7. The impacts of climate change are assessed through all of our focus areas. Resiliency and adaptation are addressed in all areas.
8. Integrity, accuracy, accountability, and transparency are key components of the agency's ethical standards, performance, and achievement of results.
9. Agility, flexibility, and entrepreneurship create strategic opportunities for addressing emerging and contemporary issues important to South Carolina and the region.
10. Developing cohorts of well-trained and diverse students across multiple scientific disciplines helps develop the next generation of experts on coastal topics.
11. Quality of work is assured through a competitive peer-review process for selection of activities and review of results.
12. Science-based information is expressed in an objective fashion and delivered in formats and terms suitable for diverse audiences.

13. Results are evaluated to assure relevancy and success in meeting program objectives and constituent needs.
14. Consortium staff seek active roles in local, state, regional, and national partnerships and collaborations.

Consortium Administration and Management

In order to achieve success at the highest level, S.C. Sea Grant Consortium's program administration ensures our internal and external customers' needs are fulfilled through attentive and responsible management of resources, expedient communication, collaborative coordination, and reliable planning and forecasting.

ABOUT ADMINISTRATION

To ensure the predicted results are achieved, the Consortium's management team utilizes resources such as those provided by the State of South Carolina that include custom-tailored SAP-based financial and human resources business solutions, access to routine financial and procedural audit teams, information technologies including security platforms and solution, discounted procurement contracts, and various other support systems that make certain day-to-day operations remain continuous. In addition to these operational resources, the S.C. Sea Grant Consortium also utilizes stakeholder- and constituent-driven groups (e.g., Board of Directors, Program Advisory Boards, Extension and Education Program Specialist Advisory Committees, subject matter experts at member institutions, etc.) to develop and implement the initiatives within this strategic plan and ensure state and federal resources are maximized to the fullest extent.

ORGANIZATIONAL STRUCTURE

The S.C. Sea Grant Consortium is one of the uniquely managed Sea Grant programs in the network. Established as an independent state agency in 1978, the Consortium is the only state agency (out of 34 programs) and one of only a handful of programs that implements a consortium-based partnership with higher education learning institutions and one other state agency.

This arrangement allows the Consortium to utilize various different strategies to achieve our goals and objectives. Access to numerous resources, including an annual appropriation of state funds, allows the Consortium to maximize our efficiencies internally while utilizing a vast research and outreach network at our member institutions. In addition to these advantages, the Consortium has access to executive officers at each

of our member institutions who serve as our Board of Directors, as well as a Program Advisory Board consisting of constituents and stakeholders from academic institutes, government agencies, municipalities, businesses, and other public interest organizations across South Carolina and adjacent coastal states.

RESEARCH ALLOCATION AND OVERSIGHT

Biennial Research Program

The S.C. Sea Grant Consortium's Biennial Research Program is administered every other year. This begins with concept letters outlining proposed research, education, and extension activities in priority areas identified by the Consortium, as well as input from our external customers, constituents, and stakeholders through guidance via the National Sea Grant College Program Strategic Plan and their office staff. Principal Investigators (PI) with highly rated concept letters are encouraged to submit full proposals for consideration; however, any PI who submits a concept letter is permitted to submit a full proposal for review. Full proposals are subjected to rigorous written peer reviews, as well as an external technical review panel which offers its recommendations for funding. This information is then reviewed and summarized by Consortium staff and is used by the Consortium Executive Director to make final funding decisions.

Selected projects are subject to the reporting requirements as dictated by Consortium terms and conditions provided within our internal award documentation that directly mirrors the federal terms and conditions provided by the National Sea Grant College Program.

Program Development and Study Group Projects

In addition to the Biennial Research Program, the Consortium offers Program Development Grants and Study Group Grants. There are times when potential or immediate needs requiring project support cannot be anticipated or faculty have new ideas that need piloting. Such opportunities or needs may be met with short-term, low-budget Program Development (seed) Grants. Other times, the Consortium has specific smaller, usually community-based questions that require a response. The Consortium shares a request for proposals to meet that need. Study Group projects always involve a student, faculty member, and Sea Grant employee in the project team. Both Program Development and Study Group Grants are supported with federal Sea Grant funds and are provided only to those projects that are consistent with the goals and objectives of the Consortium's current Strategic Plan.

FISCAL TRANSPARENCY AND RESPONSIBILITY

Fiscal transparency is essential to providing citizens with access to details about government financial matters, including details on how tax dollars are spent. Currently, federal support from the National Oceanic and Atmospheric Administration is matched by state support from the South Carolina legislature, resources provided from S.C. Sea Grant Consortium member institutions for research funding, as well as other non-federal grant opportunities. To ensure these resources are expended in accordance with public needs and in a high-quality manner, the Consortium receives annual financial audits and reviews of processes from the State of South Carolina in addition to comprehensive reviews of fiscal activities associated with all federal funds received.

To maintain fiscal compliance, the Consortium submits various comprehensive annual financial reports (CAFR) to the [State of South Carolina Comptroller General](#). In addition to these CAFR requirements, the Consortium receives an annual agreed-upon procedures (AUP) audit as well as inclusion within the [State Auditor's Single Audit](#) submitted to the federal clearinghouse. Consortium administration also ensures all federal grant reporting requirements are submitted accurately and timely as detailed within the associated terms and conditions and conducts annual transaction audits on resources allocated to subrecipients in accordance with the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (2 CFR Part 200) as directed by the Office of Management and Budget (OMB) Guidance for Grants and Agreements. Through utilization of these regular program assessments and reporting engagements, the Consortium maintains its program as responsible stewards of the public resources entrusted to us.

ADMINISTRATIVE ACCOUNTABILITY

As both a state agency and federal program, the S.C. Sea Grant Consortium must manage its program in accordance with state laws and mandates while also adhering to the regulations and requirements of our federal grants. Therefore, the Consortium maintains accountability to both the State of South Carolina as well as the National Sea Grant College Program through 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 review processes.

State law requires the Consortium to submit an annual accountability report to the Governor and General Assembly that must contain the agency's mission, objectives to accomplish the mission, and performance measures that show the degree to which

objectives are being met. The information contained in each agency's report is used to aid decision-makers in their analysis of each agency's budget. To meet these requirements, the Consortium tracks a [set of management performance measures](#) which have been monitored and reported annually since 2003.

To ensure accountability with federal requirements, the Consortium follows this strategic plan to ensure resources provide tactical initiatives for research, extension, education, and communications relating to activities that address priority coastal and ocean natural resources-related issues. As part of this review process, the Consortium is subject to annual reporting requirements from the National Sea Grant College Program Office that include impacts and accomplishments achieved as well as a metrics-driven evaluation. In addition to these annual submissions, the Consortium is formally evaluated through the Program Implementation and Evaluation process every four years to determine if the program meets the Standards of Excellence requirements needed to maintain certification as a Sea Grant College Program.

Successful implementation of our programmatic activities depends upon the agency's ability to implement and continuously improve procedures and processes to ensure efficient strategic, effective, and inclusive planning, program management, and overall performance. These results are achieved through the Consortium's ability to create a management and organization structure that ensures that the organization can function in a viable and productive manner.

HUMAN RESOURCES

The S.C. Sea Grant 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 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 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 through creative ideas and budgeting in challenging resource environments. The Consortium is working to diversify the science staff by increasing the methods and outlets for advertising positions as well as creating a path for the positions that allow the Executive Director to hire staff in earlier stages of education and providing the remainder of education to meet the needs of the Consortium. Also, a career website introduces people of all ages to the wide variety of work needed to implement a Sea Grant Program and provides mentor contacts for students. 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.

DATA SHARING AND INFORMATION SECURITY

Data and information collected and/or created under National Oceanic and Atmospheric Administration grants and cooperative agreements must be made visible, accessible, and independently understandable to general users, free of charge or at minimal cost, in a timely manner (typically no later than two years after the data are collected or created), except where limited by law, regulation, policy, or security requirements. The requirement has two basic parts: (1) environmental data generated by a grant project must be made available after a reasonable period of exclusive use, and (2) the grant application must describe the plan to make the data available by principal investigators. To ensure compliance with this data sharing directive policy, all full proposal submissions must include a [data management plan form](#). Questions should be directed to the S.C. Sea Grant Consortium's Research and Fellowships Manager.

The importance of protecting and validating data has never been more critical to ensuring business operations remain stable and secure. Over the past couple of years, the Consortium, along with guidance from the State of South Carolina's Division of Information Security, has developed and implemented various facets to ensure our data is not only accurate but protected from corruption and potential loss. Through the use of newly implemented policies and planning documentation in addition to redundant systems both internal and external, the Consortium ensures operations remain constant and consistent throughout situations that would otherwise cause massive losses in productivity. These new initiatives provide our internal staff as well as external customers reassurance their work is validated and protected to the best of our abilities.

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 to our constituents. This two-way exchange of information 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 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.

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.

Strategic Plan: A Framework for Action

The S.C. Sea Grant Consortium has developed its FY2024-27 strategic plan to address contemporary coastal and marine resource issues facing South Carolina. These goals and objectives serve as a guide and filter for Sea Grant programmatic activities that the Consortium will undertake over the next four years, 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 outcomes for the Consortium's five Programmatic Focus Areas. Each Focus Area includes a Vision and Goals. For each Goal, one to three Objectives are identified; for each Objective, a set of Outcomes, and Performance Measures and Targets are provided.

These are defined as:

- *Vision* – the overall result desired within each Focus Area.
- *Goals* – the specific target or end result desired within each Focus Area.
- *Objectives* – specific program/management areas of emphasis that will be addressed.
- *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 four-year period.

Programmatic Focus Areas

Five programmatic areas have been identified by the S.C. Sea Grant Consortium and are consistent with the National Sea Grant Office's four goals. The Consortium creates a separate focus area for Weather and Climate Resilience.

- [Healthy Coastal Ecosystems](#) 🌿
- [Sustainable Coastal Development and Economy](#) 🏢
- [Weather and Climate Resilience](#) ☁️
- [Sustainable Fisheries and Aquaculture](#) 🐟
- [Scientific Literacy and Workforce Development](#) 🎓

Programmatic areas outlined in this plan will not necessarily be completed within the four-year time frame, but rather reflect research, extension, 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 priorities that will be pursued will be determined in part by those proposals received and favorably considered, through the agency's rigorous peer review process.

Within the strategic plan the goals and objectives are listed within their primary focus area. However, they also may be appropriate to other strategic focus areas which are represented by the icons at the end of objectives.

Healthy Coastal Ecosystems

VISION

The changing ecological, social, economic, and cultural values of coastal and ocean ecosystem functions are documented and resultant information and tools are delivered to state and local decision-makers, resource managers, and the interested public for ecosystem-based planning.

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.

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 coastal and ocean environmental health, and understand the best management practices for maintaining and/or enhancing the health of coastal natural resources 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.

GOAL 1

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

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

Objective 1.2: Develop and assess practical and realistic models and tools that predict water quality and water quantity impacts and inform management, including climate change impact forecasts, pollutant transport, and land use change impacts on coastal watersheds. 🏠 ☁️

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. 🏠

Goal 1 Anticipated Outcomes:

- South Carolinians are more knowledgeable about the natural and anthropogenic processes that influence the health of South Carolina's estuaries and coastal ocean waters.
- Residents and natural-resource managers are more likely to adopt protection and enhancement methods and holistic watershed-scale management planning for the conservation and improvement of South Carolina's coastal habitats.
- Science-based information is provided to natural-resource managers and decision-makers to support national, regional, state, and local resource-management objectives.

GOAL 2

Productivity and function of coastal and ocean ecosystems are improved through restoration of function and enhancement.

Objective 2.1: Support preservation, enhancement, restoration, and outreach education of coastal and marine habitats, such as oyster and salt marsh habitats. ↘️

Objective 2.2: Develop and provide new information, methods, and technologies on shifting ranges of flora and fauna species; in particular, to help minimize the introduction,

spread, and negative impacts of coastal and ocean invasive species. 🏠

Objective 2.3: Support efforts that mitigate the impacts of pollution on natural resources and coastal communities. 🏠

Goal 2 Anticipated Outcomes:

- Oyster and salt marsh ecosystems are enhanced and restored through research and outreach programming.
- The identification of and changes in species ranges are documented, and invasive species mitigation measures are developed and implemented as applicable.
- Coastal and marine ecosystems are less impacted by pollution.

PERFORMANCE MEASURES AND FOUR-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] 4
- Number of acres of coastal habitat protected, enhanced, or restored as a result of Sea Grant activities. [NSGO Measure] 2
- Number of tools and technologies developed with Consortium support and used in ecosystem-based management, habitat restoration, and valuation. [NSGO Cross-Cut Measure] 12
- 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. 18
- Attendance at Consortium-sponsored/co-sponsored ecosystems and resource management workshops and information events. 1,400

Sustainable Coastal Development and Economy 🏠

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.

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 33 newcomers moving to the Charleston area daily (Charleston Metro Chamber of Commerce, 2016) and even more to the north coast. 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. 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. South Carolina coastal planners, resource managers, developers, and those involved in commerce, industry, recreation, and tourism continue to face challenges associated with coastal resource management and economic development issues.

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. Prominent discussions have been directed towards the development of wind energy. The private energy sector is engaged in discussions about the potential for onshore and 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. 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.

GOAL 1

Healthy and viable coastal communities and economies include economic opportunity and equity in 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, energy, and port development) while sustaining the health of the coastal environment and cultural identity. 🐟 🌊

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. 🌿

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

Goal 1 Anticipated Outcomes:

- Working waterfront uses and shoreline access become a prominent subject in the public dialogue on waterfront development.
- Increased participation in low-impact nature-based tourism activities.
- Enhanced economic opportunity for rural, coastal small businesses.

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, social science studies, and other techniques that will enable communities to develop in environmentally and socially sound ways. 🌿 📄

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

Objective 2.3: Identify, test, and deliver local and regional information on the cost-effectiveness, efficiency, and durability of watershed planning and management techniques (e.g., low impact development, green infrastructure) in controlling non-point source pollution and in managing stormwater runoff. 🏠

Goal 2 Anticipated Outcomes:

- Existing population growth and land-use change models are refined and improved.
- Science-informed land-use practices are utilized to enhance community well-being.
- South Carolina decision-makers understand the impacts of development on coastal and ocean resources and develop strategies to address them.

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 environment of the state and Southeast region.

Objective 3.1: Document the ecological, economic, policy, and societal implications of offshore energy development on the South Carolina coastal landscape. 🏠🔍

Objective 3.2: Support regional coastal and ocean planning, management, and observational activities by proactively engaging stakeholders/constituents. 🔍

Goal 3 Anticipated Outcomes:

- 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.
- State and local decision-makers possess the tools necessary to manage emerging uses and optimize economic and environmental sustainability.

PERFORMANCE MEASURES AND FOUR-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] 16

- 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. 2
- 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. 40
- Attendance at Consortium-sponsored/co-sponsored sustainable coastal development and economy workshops and information events. 1,600

Weather and Climate Resilience

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.

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 chronic 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 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, requiring attention to both the natural environment and human infrastructure. Enhancing resilience by communities must include assessing risk and understanding vulnerability as well as developing and implementing response and adaptation strategies. With the explosion of population growth along the South Carolina coast, and the allure of coastal communities to tourism, many residents and visitors alike are unfamiliar with the hazards 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 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.

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: Assess and estimate short-term weather and long-term climate change impacts and the associated risks for citizens, industries, built and natural environments, economies, and cultural resources to support optimal decision-making. 🏠📊

Objective 1.2: Evaluate and tailor weather and climate mitigation planning and adaptation tools for coastal communities in South Carolina by conducting and conveying results from case studies and community-scale vulnerability analyses. 🏠📊

Objective 1.3: Provide science-based information to resource management agencies, policy-makers, and local governments, through newly established and maintained partnerships, to improve community capacity to prepare for, adapt to, mitigate, and recover from weather and climate hazards. 🏠📊

Objective 1.4: Engage in meaningful information exchange and knowledge co-production with historically and currently underserved communities and neighborhoods in order to support science-based and place-based adaptation actions that enhance community resilience to climate change. 📊

Objective 1.5: Implement public education programs on short- and long-term climate variability and long-term hazards (e.g., sea-level rise, high-tide flooding). 📌

Goal 1 Anticipated Outcomes:

- Coastal communities are engaged in solution-oriented planning to adapt to and mitigate climate change impacts.
- Mitigation and adaptation techniques and planning tools 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, emergency management, and response efforts.

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 long-term and episodic trends of hazards on beachfront, estuarine, and tidal marsh shorelines, including the impacts from nourishment and hardened structures and the ability for green infrastructure and nature-based solutions to benefit human and wildlife communities. 🏠🌿

Objective 2.2: 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 including rural, island, and underserved communities. 📌

Objective 2.3: Identify and convey information to coastal communities on beachfront, marsh, and estuarine shoreline protection options, including permitting and funding recommendations, particularly for nature-based solutions and water storage. 🌿📌

Goal 2 Anticipated Outcomes:

- State and federal resource management agencies in South Carolina are utilizing shoreline change information in management and policy decision-making.
- As communities are engaged, there is an understanding of the sea-level rise impacts to vulnerable marsh and estuarine shorelines and natural/green

restoration and protection methods are widely implemented by communities.

PERFORMANCE MEASURES AND FOUR-YEAR TARGETS

- Number of communities that adopt/implement hazard resiliency practices to prepare for and respond to/minimize coastal hazardous events. [NSGO Measure] 6
- 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 scientific, technical, and educational products produced by the Consortium and its partners that address issues and opportunities related to climate hazards, adaptation, and resilience. 30
- Attendance at Consortium-sponsored/co-sponsored weather and climate resilience workshops and information events. 1,000

Sustainable Fisheries and Aquaculture

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.

BACKGROUND

In South Carolina, seafood is tied closely to the state's cultural heritage. South Carolina fishers and aquaculturists 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. Despite significant challenges, our oyster mariculture industry has adopted off-bottom techniques and continues to grow.

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. 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.

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 practices in South Carolina, including those focused on commercial, recreational, cultural, and subsistence uses. 🏠

Objective 1.2: Enhance the seafood industry (wild caught fisheries and aquaculture) through translational research and technology transfer aimed at increasing sustainability, production, profitability, and symbiosis with social perceptions and other uses of waterways. 🏠

Objective 1.3: Foster enhanced communications and information exchange among the

fisheries and aquaculture industry, resource management agencies, representatives of diverse and underserved communities, and the public regarding living marine resource management and policy in South Carolina. 🗺️📌

Objective 1.4: Support the seafood industry through development of applied programs to provide technical training, experiential learning, and relevant science that enhances an ecosystem approach to fishing and harvesting practices and lessens barriers to industry entrance in South Carolina. 🗺️📌📌

Goal 1 Anticipated Outcomes:

- The seafood community has an increased understanding of fisheries ecology, fisheries management strategies, and the regulatory process.
- The seafood 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, aquaculturists, managers, and scientists.
- A greater understanding of the status and trends regarding currently vulnerable and data-poor fisheries.
- Maritime cultural heritage is preserved in South Carolina, and awareness is amplified.
- The aquaculture industry is part of an integrated approach focused on healthy, sustainably harvested populations that support important coastal habitat and ecosystem benefits.
- Relevant science, resources, and technical training enhances support for current and prospective aquaculture industry members.

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. 🗺️

Objective 2.2: Document impacts from climate change and

shifting weather patterns on marine ecology, including expected changes in distribution of fish and shellfish species, and potential implications for wild caught fisheries and aquaculture. ☁

Goal 2 Anticipated Outcomes:

- Seafood industry stakeholder understanding of regulatory processes is enhanced and engagement in management-related activities increases.
- Fishing and aquaculture 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 while pursuing innovation.
- Increased workforce development opportunities for seafood industry stakeholders.
- New methods for environmentally friendly seafood production are pursued.

PERFORMANCE MEASURES AND FOUR-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] 35
- Number of seafood industry members that receive technical assistance from S.C. Sea Grant Extension Program. 60
- 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. 250

Environmental Literacy and Workforce Development ↴

VISION

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

BACKGROUND

The scientific literacy program component of this focus area provides high-quality coastal and marine information and opportunities that are reflective of the Consortium's current research priorities, aligned with the South Carolina College- and Career-Ready Science Standards, representative of environmental education best practices, and designed to be inclusive for the diverse ages, abilities, and communities of the state. Through professional development programs for formal and nonformal educators, community-action stewardship projects, and robust classroom lessons and resources, the Consortium provides training that facilitates the incorporation of marine, coastal, and natural resources information into science learning and also highlights pathways for pursuing ocean science and/or STEM (science-technology-engineering-math)-based careers. A crucial component of the Consortium's statewide effort to foster scientific literacy across all ages, stages, and abilities is the exceptional network of partnerships with nonformal education organizations, 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 toward providing research and training opportunities for undergraduate and graduate students through Consortium-funded research projects, fellowships, internships, and scholars programs. Because of the lack of diversity in ocean- and coastal-related jobs, specific attention will be given to recruiting students from historically marginalized communities and populations.

Note: Many environmental literacy and workforce development objectives are secondarily related to the other focus areas so we have not marked them with icons.

GOAL 1

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

Objective 1.1: Design, implement, and enhance K-12 student marine education and stewardship programs that incorporate the Consortium's priority research topic areas, are accessible and equitable throughout the diverse communities of the state, and align with the South Carolina College- and Career-Ready State Science Standards.

Objective 1.2: Design, implement, and enhance professional development opportunities for formal and nonformal educators that provide content and resources for incorporating ocean sciences concepts into their place of instruction.

Objective 1.3: Design, implement, and/or enhance environmental stewardship-focused programs that incorporate citizen and/or community science and are inclusive for youth and adults across a range of ages and abilities.

Goal 1 Anticipated Outcomes:

- 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

The next generation of coastal and ocean professionals is diverse and has the scientific and technical skills needed to solve complex resource problems and support a robust coastal economy.

Objective 2.1: Train the future workforce to meet workforce needs in ocean sciences fields.

Objective 2.2: Support the development of a diverse workforce.

Goal 2 Anticipated Outcomes:

- Cultivation and engagement of new faculty are supported through the Consortium.
- Post-secondary student training continues to be a priority for Consortium-supported research projects.

- Opportunities for interdisciplinary fellowships, internships, and research experiences for undergraduate and graduate students are expanded as a result of partnerships with diverse institutions and organizations.
- Culturally diverse undergraduate and graduate students pursuing ocean science careers.

GOAL 3

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

Objective 3.1: Provide engagement opportunities for the interested public.

Objective 3.2: Enhance the level of environmental health literacy, especially in high-exposure communities, to determine effective strategies in raising awareness of the connection between a healthy environment and human well-being.

Objective 3.3: Ensure that Consortium communications and education programs are effective in providing science-based information that is delivered to target audiences in a timely fashion and in appropriate formats.

Goal 3 Anticipated Outcomes:

- 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.
- 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 FOUR-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. 30,000

