

South Carolina Sea Grant Consortium

The Changing Face of Coastal South Carolina: Valuing Resources – Adapting to Change

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STRATEGIC PLAN
2006-2010

Table of Contents

Mission.....	3
Motto.....	3
Vision for the Coast	4
Vision for the Consortium	4
Core Values	4
Operational Principles.....	5
Planning Process for the 2006-2010 Strategic Plan	5
Plan of Action.....	7
Programmatic Areas.....	8
I. Humans and the Coastal Landscape.....	8
II. Humans and the Risks of Coastal Natural Hazards	13
III. Coastal-Dependent Economy	18
IV. Scientific Literacy and Workforce Development	23
Management Areas	27
V. Planning, Program Management, and Overall Performance	27
VI. Connecting with Users	31
VII. Human Resources	35
National Context.....	37
What is the Consortium?	38
Consortium Membership and Interactions	39
Consortium Organization	39

What is the Changing Face of Coastal South Carolina? Every day, more and more people are competing for the use of the coast's natural resources. Now, the state's challenge is to conserve those resources while accommodating growth, economic development, environmental quality, and heritage and quality of life for all of the citizens of South Carolina.

What are the coast's natural resources? There are 2,876 miles of tidal shoreline, 504,450 acres of salt marsh (20 percent of the East Coast's total), 165 linear miles of beaches, 10,000 square miles of continental shelf, more than 40 barrier/sea islands, and 500,000 acres of tidal bottomlands.

This diverse, complex region supports a wide range of living resources and human activity, including shipping, tourism, fishing, manufacturing, residential and commercial development, just to name a few.

But in just one decade – 1990 to 2000 -- South Carolina's coastal population increased by more than 28 percent, and this trend is expected to continue. People are increasingly drawn to the shoreline, placing especially great pressure at the margins of urbanized areas.

Where do we put all of the new arrivals to the coast? And how do we maintain the environmental and cultural qualities that continue drawing people here? In a 2001 survey of business leaders conducted by the Charleston Metro Chamber of Commerce, growth management was ranked second only to public education among the most important issues facing the region.

Recent patterns of growth have resulted in changes in land use and an increased demand on our resources. Already, pollution, erosion, coastal storms, and poorly planned development have left their mark.

The economy of coastal South Carolina continues to change. 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 local economies and way of life. In 2005, 1,500 to 2,000 commercial fishermen harvested 11.2 million pounds of seafood worth about \$17.5 million. Stable aquaculture operations in marine shrimp, crawfish and hard clam culture have already been established. Recreational fishing and boating are making a larger contribution to the state's economy. According to the S.C. Department of Natural Resources, the annual impact of marine recreational fishing in South Carolina significantly exceeds \$300 million. More than 110,000 saltwater fishing licenses were sold in 2006.

In addition, tourism is now a \$16 billion industry, with the eight coastal counties accounting for more than 60 percent of the \$8.5 billion in domestic travel expenditures. Three of the eight coastal counties led all of South Carolina's 46 counties in domestic travel expenditures in 2005. South Carolina State Ports Authority served over 2,000 vessels and had total operating revenue of \$154 million in 2006. The Port of Charleston is one of the busiest container ports on the East and Gulf coasts.

But South Carolina's challenges are not unique. State boundaries are political boundaries; however, rivers, watersheds and the movement of pollutants are not restricted to individual states. One of today's challenges is the potential for oil and gas exploration and eventually the capture of these resources. Therefore, regional planning in the coastal ocean is particularly important.

Like other coastal states from Texas to Maine, naturally occurring coastal erosion threatens homes and businesses built along our shoreline. If scenarios of sea level rise due to global climate change play out as predicted, erosion impacts will be exacerbated in the future. Episodic hazards events, such as wind, surge and flood associated with hurricanes, tropical storms and nor'easters will also continue to threaten developed parts of our coast. Historically, major tropical storms have struck the South Carolina coast every seven to eight years. Many long-range climate forecasters argue that we are now entering a cycle of more severe coastal storms.

Now, accommodating the varied 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 economic, social, and environmental potential of the state's coastal and marine resources through the support of integrated research, education, and extension 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.

Mission

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

Motto

'Science Serving South Carolina's Coast'

Vision for the Coast

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

1. Communities are employing strategies to manage growth associated with coastal population expansion in ways that conserve coastal and marine resources, support a vigorous economy, and preserve a high quality of life for their citizens.
2. Decision-makers are incorporating scientific information as they make choices about coastal growth, coastal health, and public safety.
3. Coastal and marine resources are healthy, vital, and abundant.
4. Children 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 resources stewardship.
6. Individuals, businesses, and governments fully understand and anticipate the coastal risks that confront them and act to reduce those risks.

Vision for the Consortium

1. The S.C. Sea Grant Consortium is the best Sea Grant Program in the Nation.
2. The S.C. Sea Grant Consortium is 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 Service* to our stakeholders throughout the state, region, and nation.

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 is critical to our success.
4. Consortium research, extension, education, and training programs require full integration of resources.
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 and flexibility create strategic opportunities for addressing emerging and contemporary issues.
8. Quality of work is assured through a competitive peer-reviewed process for selection of activities.
9. Science-based information will be expressed in an objective fashion and delivered in formats and terms suitable for diverse audiences.

Planning Process for the 2006-2010 Strategic Plan

The goal of the Consortium's strategic planning process was to 'Maximize the ability of S.C. Sea Grant's research, education, and outreach programs to address the coastal resource needs of South Carolina.' To achieve the Consortium's strategic planning goal, three objectives were developed:

- Receive input from constituents and stakeholders
- Update the existing strategic plan based on the input received, and
- Use the updated strategic plan to guide programs.

In the fall of 2005 the Consortium's management team (Core Group) reviewed the Consortium's 2001-2003 Strategic Plan to determine if it addressed the needs of the State. The Core Group felt that the major program areas identified in the existing plan remained relevant; however, a restructuring of the goals and suggestions of specific action steps were needed for how best to achieve the plan's goals. Therefore, the Core Group conducted a series of activities to write the 2006-2010 Strategic Plan.

Strategic planning efforts of other Sea Grant programs, including those in Alaska, Florida, Maryland, Rhode Island, Delaware, Alabama/Mississippi, and Hawaii, were reviewed to determine how best to restructure and receive

input regarding our new plan. Advice was received on how to maximize the effectiveness of the strategic planning process and successful techniques for soliciting stakeholder input were duplicated. The result was the decision to use an online survey. The survey was designed to request input on the strategic goals, objectives, and strategies as well as on the most pressing issues facing South Carolina. In addition, the survey provided respondents with the opportunity to provide the Consortium with additional priorities and where information was lacking for a given topic. Results of the survey can be found at

http://www.scseagrant.org/oldsite/all_open_ended/SurveySummary.html.

The survey was conducted using the online service Survey Monkey®. Approximately 1100 individuals were requested to conduct the survey with 308 individuals responding to the survey resulting in a 28 % response rate. The goal of the survey was to determine the interest and priorities of various constituents. We did not create the survey to conduct statistical analyses, but instead to evaluate where the Consortium's priorities should be placed. Out of the 308 respondents, 214 were South Carolina residents and the results were very similar when the total population and S.C. only populations were compared. Therefore, only the S.C. data set will be used for this document. The respondents were primarily from state government (27%) and universities (25%) with local government, private business/industry, federal government, NGOs, and K-12 schools each comprising about 6-11%. Over 40% of respondents had worked in their professions for over 20 years.

The survey asked a series of questions regarding the importance of different activities as well as the importance of the goals and objectives identified by Consortium staff. The importance of the programmatic topic areas are highlighted in each section as appropriate. In addition, the survey asked an open-ended question regarding what the major issue facing coastal S.C. today is. Respondents wrote in a series of different answers with approximately 65% of the responses related to land use change and human population growth.

In addition to the online survey, the Consortium also engaged its Program Advisory Board (PAB) for input on the priorities of the agency. The PAB is composed of 30 members representing a variety of stakeholders, including state and federal agencies, business and industry, community leaders, and the external scientific community. The goal of the PAB is to provide the Consortium with input into the development of program priorities and in the review and evaluation of Consortium proposals and programs.

Two PAB meetings were held to discuss the Consortium's Strategic Plan revision. The goal of the first meeting in July 2006 was to discuss the

mission, vision, goals, and objectives. At this meeting, PAB members expressed concern about the rapid pace of change taking place along the South Carolina coast and the broader global issues like climate change that affect this. This gives great urgency to the Consortium's mission to advance understanding of the changing coastal environment and promote actions to manage the change in ways that will be beneficial to South Carolina's citizens, natural resources, and economy. Throughout the day's discussions it was clear that PAB members believe it is very important for the Consortium to use this strategic planning process to set priorities that will ensure that it maximizes its roles as catalyst, educator and champion for wise decision-making, and management of South Carolina's coastal resources and communities. In addition, the PAB highlighted the importance for the Consortium to: (1) develop a plan for the entire Consortium and not just the staff, and (2) be consistent with the National Sea Grant College Program.

The second PAB meeting was held in May 2007 to discuss the survey findings, the Agencies core values and operational principles, and the Plan's strategies, outcomes, and indicators developed for each objective. The PAB provided extensive input on the proposed values and principles as well as the strategies, outcomes, and indicators. The revised plan was greatly improved from their input. The PAB approved the plan for submission to the Board of Directors.

Plan of Action

The S.C. Sea Grant Consortium has identified a plan of action for the next four years to address contemporary coastal and marine resource issues facing South Carolina. These goals and objectives will serve as a guide and filter for the activities that the S.C. Sea Grant Consortium will undertake over the next four years. The plan is divided into two sections: Programmatic and Management. The Programmatic section includes the Consortium's plans for research, education and outreach-based activities. The Management section includes process-based activities which dictate how the Consortium will support its mission, assess customer satisfaction, ensure financial performance, and document human resource activities.

Within each section, the Consortium has identified major Strategic Areas of emphasis. Each Strategic Area includes a background statement, identification of key issues, and a single agency goal. For each goal, one to three objectives are identified; for each objective, a set of strategies, outcomes, and indicators are listed. 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.
- *Goal* - the overall anticipated outcome for each Strategic Area.
- *Objectives* - specific program/management areas of emphasis which will be addressed.
- *Strategies* - activities to be conducted to achieve the objective.
- *Outcomes* - the end results or consequences of the strategies employed.
- *Indicators* - the metrics to be used to measure success in achieving objectives.

This Strategic Plan will serve as the template for future 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 every subsequent revision of the Plan. New strategies will be included as current strategies are addressed and new issues arise. The outcomes and indicators sections will be assessed on two-year cycles; however, there are short-term and long-term indicators included in the plan. These will be further described and detailed in the Consortium's two-year Implementation Plan.

Programmatic Areas

Four programmatic areas have been identified by the Consortium: (1) Humans and the Coastal Landscape, (2) Humans and the Risks of Coastal Natural Hazards, (3) Coastal-Dependent Economy, and (4) 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, education, and outreach priorities that the Consortium will use to take advantage of opportunities. For example, the Consortium will issue requests for proposals related to the Programmatic topic areas; however, the strategies that will be pursued will be determined in part by those proposals received and favorably considered, through its rigorous peer review process.

I. Humans and the Coastal Landscape

Population growth along the South Carolina coast is increasing at a rapid rate, with more than 1 million new residents expected to move to coastal South Carolina over the next few decades. 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 S.C. Some 185,000 housing units are planned and will be constructed in the Charleston metropolitan region. The small Town of Bluffton (current population of 2,000) expects the population to increase to

62,000 based upon the number of planned units. Recent growth projections in Jasper County, based on approved developments, estimate that 31,000 acres will be developed and bring over 160,000 new residents to the county in the next 10 years, a more than six-fold increase over the current population.

The coastal and marine resources of South Carolina are directly affected by both human influences throughout the watersheds in the coastal zone and by the physical and natural processes of the state's adjacent coastal ocean. The focus of this program is to provide research and outreach programs that assess the natural processes and valuation of resources as well as documenting the impacts of land use change on marine and coastal resources. The constituent survey conducted by the Consortium identified coastal growth and land use as the single most pressing issue facing coastal South Carolina. In addition, constituents placed a high priority on understanding natural processes, understanding human impacts on coastal and marine resources, supporting ecosystem health, and defining strategies that are compatible with changing demographic and regulatory environments and long-term conservation of natural and cultural resources. In particular, constituents identified developing predictive tools for coastal ocean and estuarine water quality events, economic and social value of resources, and examining and predicting land use and cumulative impacts on processes and organisms to be priority areas.

Issues

- The explosion of residential and commercial development and concomitant pressures on the state's coastal and marine resources is critical to understand.
- The South Carolina coastal landscape is rapidly changing, with potential for significant alterations in the structure and function of the natural environment. Before the effects of this change can be determined, the physical, chemical, geological, biological, and socio-demographic environment along the South Carolina coast must be documented.
- The lack of direct cause-and-effect information on how marine ecosystems and habitats may be affected by human activities restricts the use of science in decision-making processes.
- The effectiveness of innovative, sustainable best management practices to address potential impacts of growth on coastal and marine ecosystems varies according to the features of the coastal landscape.
- The economic and societal value of South Carolina's coastal resources and the ecosystem services (i.e., their 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.

- Coastal resource management and economic development issues in South Carolina continue to overwhelm coastal zone planners, resource managers, developers, and those involved in commerce, industry, recreation, and tourism.

Goal – The ecological and economic value of coastal and ocean ecosystem processes are documented, the effects of coastal growth on these ecosystem processes are assessed, and state and local decision-makers, resource managers, and interested public have the information and tools to ameliorate these effects.

Objective 1 – Generate information about the function and value of South Carolina's coastal and ocean ecosystems, and communicate this information to decision-makers and the public.

Strategies

- Assess the boundary dynamics and biogeochemical processes that influence the source, transport, fate, exposure, and effects of materials on ecosystem and living marine resource condition.
- Develop models of productivity, effects of estuarine interactions with the shelf system, and sensitivity of the system to climatic and anthropogenic perturbations, which can be used in the development of ecosystem-based approaches to living marine resources management.
- Examine the importance of the ecological interrelationships between coastal terrestrial (riverine) ecosystems and estuarine productivity including developing models of interactions among hydrography, primary and secondary production, and physical material transport and cycling in estuaries and the coastal ocean.
- Examine the relationships between living marine resource production in estuaries and salt marsh-tidal creek complexes and the quality of critical habitat areas.
- Collect and incorporate new data from real-time and near-real-time observing systems into advanced and validated models that support an improved understanding of underlying oceanographic and meteorological processes that typify the coastal ocean of South Carolina and drive ecosystem function.
- Evaluate and construct models of physical ocean processes and water quality events (e.g., groundwater seeps, hypoxia).
- Determine the economic and social value of coastal resources and ecosystem "services" (e.g., value of coastal wetlands and barrier islands in buffering storm surge).

- Communicate natural processes-related research and information to decision-makers and the public.

Outcomes

- Science-based information is provided to natural resource managers and decision-makers to support national, regional, state, and local resource-management objectives.
- A research platform is developed for state management agencies, such as OCRM and DNR, to conduct economic valuation of resources based on priority needs.
- South Carolinians are more knowledgeable about the natural processes that influence S.C.'s estuaries and coastal waters.
- Models are made available to and used by the scientific community and natural resource agencies to assess and predict coastal and ocean processes (e.g., water quality).
- An effective regional association for Integrated Ocean Observing Systems (IOOS) in the Southeast is established.

Indicators

- Number of research studies funded to understand the natural processes of coastal S.C.
- Number of requests by natural resource managers for research results
- Number of models developed to assess and predict the natural functioning of coastal S.C.
- Number of people who attend workshops on the development of economic valuation of coastal resources and ecosystem services
- Evidence Southeast Coastal Ocean Observing Regional Association (SECOORA) is providing data to users and members

Objective 2– Conduct investigations and outreach activities that document and provide science-based information to decision-makers to address the effects of population growth and land use change on coastal and ocean ecosystems.

Strategies

- Identify the ecological relationship between upland watershed ecosystems and estuarine and coastal ocean productivity.
- Define, assess, and model pathways and mechanisms for transport of pollutants from the landscape into coastal waters.
- Assess the cumulative effects on key “indicator” marine organisms of low-level, sub-chronic exposure to chemical contamination and/or physical changes [e.g., low dissolved oxygen (DO)] to the marine ecosystem.

- Assess and develop practical and realistic models that predict and forecast the impacts of land use change and practices on coastal watersheds (rivers, estuaries, salt marsh, tidal creeks) and the resources therein.
- Evaluate the effectiveness, efficiency, and durability of stormwater management techniques, including existing and sustainable development practices, and inform target audiences, including individual landowners, of the results.
- Identify the causes of and develop mitigation strategies for marine biotoxin production and exposure.
- Develop visualization tools that illustrate future changes in population growth, land use, and land cover.
- Communicate research and information related to land use change and population growth impacts on coastal and ocean ecosystems to decision-makers and the public.
- Educate community leaders, decision-makers, and staff about land use planning and nonpoint source pollution control alternatives that address impacts on coastal and marine resources.

Outcomes

- Existing population growth and land use change models are refined and improved.
- Resource management agencies and local governments in S.C. understand the impacts of development on coastal and marine resources and develop strategies to address them.
- South Carolinians and decision-makers are more knowledgeable about the “cause-and-effect” impacts and influences from humans on S.C.’s estuaries and coastal waters.
- The public’s knowledge of land use impacts on the estuarine environment is increased.
- Local officials are educated on non-point source pollution.

Indicators

- Frequency of use (i.e., number of Web site hits) of the population growth and land use change projection models by decision-makers, academic, and management officials
- Number of research studies funded to understand the impacts of development on coastal resources
- Number of elected and appointed officials targeted through workshops (SC NEMO)
- Number of developers, planners, landscape architects, and NGOs targeted through workshops
- Number of municipalities that have incorporated policy changes as a result of Consortium outreach efforts

- Identification of “indicators” used to assess ecosystem health
- Number of models developed to assess the impacts of development on coastal S.C.
- Number of requests by resource managers and local officials for research results

II. Humans and the Risks of Coastal Natural Hazards

Coastal regions of the United States continue to attract residential, commercial, and industrial development. More than half of the country’s population resides within fifty miles of the coastline. Many coastal residents who have moved to the coastal zone have done so within the last three decades and thus are not experienced with either the rapid or subtle changes in climate (and the hazards that result), or the dynamic and ever-changing shoreline due to erosion, accretion, and barrier island migration. Coastal hazards range from the short-term (six to twelve hour) storm surges and wind and erosion events to the slow but pervasive rise in sea level, land subsidence, and resultant shoreline retreat over a period of decades.

South Carolina is vulnerable to most known natural hazards, including hurricanes, flooding, shoreline erosion, and earthquakes, which have the potential to cause substantial damage. Additionally, a modest increase in sea level would have profound impacts on low-lying and minimal-relief landscapes in coastal South Carolina; areas presently subject to short-term storm events and spring tides that significantly affect natural systems. When global phenomena are superimposed, the range of possible impacts is exacerbated and includes 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 destruction, and habitat alteration. While their occurrence cannot be prevented, there is much that can be done to minimize exposure to these damages and facilitate recovery processes.

Numerous agencies have identified hazards as major issues to address in the upcoming years. In 2005, the Subcommittee on Disaster Reduction of the National Science and Technology Council Committee on Environment and Natural Resources issued a report titled, *Grand Challenges for Disaster Reduction* (www.sdr.gov/SDRGrandChallengesforDisasterReduction.pdf), which detailed the deficiencies it perceived in nationwide readiness for disaster, the qualities of hazard resilient communities, and six “grand challenges” to “break the cycle of destruction and recovery by enhancing disaster resilience” in communities nationwide. The Grand Challenges are to: (1) Provide hazard and disaster information where and when it is needed; (2) Understand the natural processes that produce hazards; (3) Develop hazard mitigation strategies and technologies; (4) Recognize and

reduce vulnerability of interdependent critical infrastructure; (5) Assess disaster resilience using standard methods; and (6) Promote risk-wise behavior.

To minimize the exposure and facilitate recovery, attention to both the natural and built environments is required. When hurricanes or other severe storms threaten large portions of the coast, built environments and the individuals, families, communities, and businesses they support suffer severe social and economic disruption. The resultant wide-spread destruction frequently results in severe impacts to the natural environment through the creation of mountains of debris and the release of toxic materials.

The focus of this program is to provide research, technical, and educational programs that examine the forces of climate and hazards and their effects on the built and natural environment and socio-economic impacts. The program will also provide information to the public and private sectors on the nature of hazards and how to plan for and recover from them. The constituent survey found coastal natural hazards to be an important issue facing South Carolinians. Understanding the natural processes and forces related to natural hazards (e.g., hurricanes, flooding, coastal erosion, sea level rise), and community preparedness and information materials for chronic and episodic events to enhance hazard reduction practices were identified as being the most important activities.

Issues

- South Carolina has exposure to most known natural hazards. These hazards, including hurricanes, floods, earthquakes, and sea level rise, have the potential to cause substantial risk to public health, safety, infrastructure, private property, and the economy.
- In 1989, Hurricane Hugo was the last significant hurricane to make landfall in South Carolina and caused approximately \$7 billion in damages. The recent Hurricanes Katrina and Rita that devastated New Orleans and coastal Louisiana, Mississippi, and Alabama, raised awareness in America about the reality of coastal risk and vulnerability, and the need to plan for mitigation of damages, timely response, and speedy recovery.
- As hurricanes from Hugo through Katrina have demonstrated, natural hazard events have a broad impact on every sector of a community – physical, economic, and social. There is a need to broaden the scope of hazards management to engage all these sectors in a community-wide approach to hazards resiliency.
- There is a continuing need for hazards research and outreach to help those who plan for and manage hazardous events as well as those who

design, build, insure, and regulate the construction of buildings and infrastructure, and policy makers at all levels to better understand natural forces of hurricanes and storms, coastal erosion, and sea level rise.

- Many buildings, most especially homes and small commercial structures, continue to be vulnerable to natural hazards, including wind flood, surge, and earthquake. Research is needed to develop and evaluate innovative construction hazards mitigation techniques for residential and commercial structures.
- Efforts to reduce greenhouse gases will not change the global warming trends for at least two decades. We must place equal emphasis on planning for and mitigating against long-term effects of climate change on coastal communities.

Goal– Coastal residents, communities, and businesses understand the risks and vulnerabilities associated with both chronic and episodic coastal natural hazard events; and are prepared for and able to recover from them with minimal disruption to social, economic, and natural systems.

Objective 1 – Generate and deliver information on the natural forces of climate (e.g., sea level rise) and weather (e.g., hurricanes and coastal storms) and their effect on the human, built, and natural environment.

Strategies

- Conduct risk analysis on the vulnerability of hazard events on South Carolina's infrastructure, resources, and people.
- Assess and predict short- and long-term trends in beach erosion and accretion patterns.
- Establish and evaluate model criteria necessary to determine the effectiveness and efficacy of beach nourishment programs.
- Convey science-based information to resource management agencies and the public in support of beachfront management and policy formulation.
- Evaluate the effects of hazards on estuarine and tidal marsh shorelines (non-beachfront), including the impacts from hardened structures.
- Assess and predict the effects of long-term global climate change, including sea level rise, on the coastal zone of South Carolina.
- Enhance awareness, in part through the development of visualization tools, of the issues related to climate change and sea level rise as they might affect South Carolina and the region.
- Partner with Federal agencies, universities, state and local governments, and the private sector on hazard resiliency, including identifying effective standards and metrics for assessing disaster resilience.

Outcomes

- State and federal resource management agencies in S.C. are utilizing shoreline change information in management and policy decision-making.
- Data collection (real-time and near-real time) and interpretation are readily available to and usable by scientists, emergency managers, first responders, citizens, and policy makers.
- New and improved observation and data visualization tools provide pertinent, comprehensive, and timely information for planning and response.
- Communities are able to assess their hazards resiliency in comparison with other communities, providing a catalyst for action to further reduce vulnerability through partnering activities.
- Partnerships are in place to improve communications concerning hazard issues.

Indicators

- Number of research applications and data visualization tools produced.
- Continued generation, use, and refinement of beach monitoring data and models in OCRM's beachfront management program
- Use of NOAA/Sea Grant hazards research by public and private decision makers as evidenced by requests for information and visits to 113 Calhoun Street
- Number of communities that plan for and/or adopt community resilient practices and policies
- Number of partnerships created among hazard mitigation-related service providers
- Demand for outreach and technology transfer on beachfront management as evidenced by requests for and participation in extension programming
- Demand for outreach and technology transfer on chronic and episodic coastal hazards as evidenced by requests for and participation in extension programming
- Number of public presentations made by Consortium staff on coastal hazards topics
- Number/distribution of printed materials, web content, and other extension media

Objective 2 – Develop technology and extend information to at-risk homeowners, businesses, and government agencies to prepare for and mitigate the impacts from chronic and episodic coastal hazards.

Strategies

- Develop, evaluate, and disseminate information on cost-effective and structurally sound hazard mitigation strategies, tools, and techniques related to building design, construction methods, building code standards, infrastructure resiliency, and land use that can be applied to reduce coastal hazard risks.
- Conduct economic analyses of hazard mitigation incentives, including market, insurance, and tax and regulatory incentives, as possible motivators for public and private mitigation measures.
- Generate and deliver information materials on the effects of chronic and episodic events (e.g., rip currents) and hazard reduction practices (e.g., signage) to enhance community preparedness.
- Design and deliver public education programs on planning for short-term and long-term climate variability and long-term hazards (e.g., sea level rise).
- Develop and apply principles of economics and human behavior to enhance communications, trust, and understanding within the community to promote “risk-wise” behavior.
- Develop interdisciplinary approaches so that the findings from social science research and advances in science and technology can be integrated in public policy to produce effective “risk-wise” policy decisions at all levels.
- Develop and deliver public information materials that address coastal storm planning and preparedness, coastal construction techniques, coastal hazard mitigation, and beach safety.
- Continue to support the demonstration and dissemination of research-based hazards information through activities at 113 Calhoun Street.

Outcomes

- Awareness of coastal communities to socio-economic, structural, and natural resource impacts of coastal hazards is raised.
- Communities implement hazard mitigation strategies based on research results (e.g., “Risk-Wise” policies are adopted by coastal communities).
- Hazard mitigation technologies, such as disaster-resilient design and materials, which respond to changing conditions in hazard-prone areas are developed and used.
- Communication of hazard information (e.g., forecasts and warnings) to a population that understands, trusts, and responds appropriately to the messages.
- 113 Calhoun Street and HazNet Web sites are accessed at a greater rate.
- 113 Calhoun Street is a primary source of coastal hazard information.

Indicators

- Number of beachfront communities/businesses adopting rip current awareness activities
- Number of coastal communities taking action to improve overall hazards resiliency
- Number of individuals/groups participating in 113 Calhoun Street-related hazards awareness/mitigation activities, programs, events
- Number of hazards resiliency workshops and participants
- Number of hazard mitigation tools and technologies and practices developed for individual property owners, businesses, emergency/coastal managers
- Evidence of communities incorporating hazard resilient policies and practices into land-use and other plans, ordinances, zoning regulations, and codes
- Evidence of the use of Consortium-produced information in public and private decision making related to coastal hazard resiliency
- Number of unique visits to HazNet and 113 Calhoun Street Web sites

III. Coastal-Dependent Economy

The Consortium plans to continue examining coastal management issues and exploring sustainable economic development opportunities in cooperation with state and local management agencies and coastal resource users.

Needs of the state and region will thus 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 includes a wide variety of businesses including commercial fishing, recreational fishing, aquaculture, tourism, and future endeavors such as energy development.

Recreational fishing, always a favorite past-time among local residents, has grown to play an increasing role in the state's tourism economy. While the role of the recreational fishery in the tourism economy has grown, the commercial industry struggles with increasing regulation, competition from imports, low domestic prices, rising operational costs, and changing land use patterns. The aquaculture industry has also been threatened by disease, competition from overseas imports, and concerns with regulations.

Traditional uses of coastal waterfront property are drastically changing as more of the U.S. population moves to the coast. For example, commercial fishermen are finding it 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/recreational fishermen, developers, and resource managers. Solutions are needed to help preserve the historical profiles of coastal communities while allowing for community-driven, economic development.

Offshore energy development is becoming a consistent topic of discussion. Two of the prominent discussions have been in wind energy and oil and gas exploration. For years, the information available said 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 was limited by Federal laws which are being changed. Therefore, the potential for gas and oil exploration and eventual extraction are raising coastal access and support issues as well as economic and environmental issues.

The focus of this priority area is to conduct research, education, and extension projects dealing with production and resource economics, policy, law, regulation, preservation, and development of coastal resources in relation to a coastal-dependent economy. The constituent survey identified fisheries, aquaculture, and coastal and marine businesses as being important to coastal South Carolina. In particular, the development of viable and sustainable marine fisheries (commercial and recreational) practices and operations, dynamics and processes for the development of ecosystem-based approaches to fisheries management, shellfish and finfish restoration programs, and viable and sustainable coastal and marine-oriented recreation and tourism practices and operations were identified as being the most important.

Issues

- With the globalization of the U.S. economy, trade, and commerce and continued human impact on the natural environment, the threat of invasive species to the natural environment will become imminent. Fishery managers, scientists, fishermen, and citizens must be prepared to take a pro-active approach to addressing these threats – on natural fisheries, water-dependent industries, coastal landscapes, beaches, and humans.
- The era of managing single species in fisheries has progressed into a holistic and comprehensive strategy of ecosystem approaches to fisheries management that includes the interactions of multiple species, habitat, and humans. The complexity of this management approach proves to be challenging and will need innovative techniques that incorporate both natural sciences and human dimensions (e.g., socio-economics).
- Often times, fishing industry associations are operated by a core group of fishermen that make decisions on behalf of the entire industry.
- As wild fish populations continue to be exploited and sustainable fishing and management practices are still being developed, there is a potential for the development of marine aquaculture practices to offset

the loss of wild stock harvests (e.g., shrimp). However, there is a potential for negative impacts of aquaculture development on the natural environment and there will be a need to develop environmentally sustainable aquaculture practices (e.g., offshore aquaculture).

- In the course of history, humans have impacted natural environments and as a result fisheries and their associated habitats may experience negative impacts (e.g., decline in fisheries). Restoration efforts, both habitat and stock, are critical to offset these impacts.
- 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 balancing the changing needs of coastal communities is a challenge for individual property owners, commercial/recreational fishermen, developers, and resource managers. Solutions are needed to help preserve the historical profiles of coastal communities while allowing for community-driven, economic development.
- User conflicts with regard to public access to waterfront and coastal properties are increasing as more property is privately developed. There are policy implications related to the private use of public trust resources (e.g., marinas, dockminiums, conservation leases) and user conflicts (e.g., private and commercial uses of public trust resources).
- Recent interest by industry in the potential for energy development (oil, gas, wind, wave, and current) offshore of South Carolina has raised a series of environmental, economic, and land use questions.

Goal – Sustainable economic development in the coastal region that is compatible with changing demographics, business development, regulatory environments, and long-term conservation of natural and cultural resources.

Objective 1 – Support research and technology transfer efforts to enhance viable and sustainable fisheries, aquaculture, and related industries.

Strategies

- Improve knowledge regarding the linkages among fisheries populations in support of ecosystem-based management.
- Understand the relationships between fisheries production in estuaries and the quality of habitat.
- Establish criteria to assist management agencies with critical/essential habitat identification.
- Document the dynamic processes that regulate fisheries (finfish and shellfish) recruitment and migration patterns.

- Evaluate and assess the environmental and economic feasibility of stock enhancement programs for key commercial and recreational fisheries in South Carolina.
- Support restoration of impacted and new habitats (e.g., oyster reefs, salt marsh).
- Support the development of viable and sustainable aquaculture and fisheries practices and operations.
- Assess and mitigate the impacts of invasive species on living marine resources and associated industries.
- Improve relations among commercial and recreational fishermen, state fishery managers and policymakers, non-governmental conservationists, and fishery scientists.
- Establish training programs to develop leadership skills in commercial fishermen in order to enhance their ability to communicate within the industry and with fishery managers and elected officials.
- Assist fishermen in understanding different learning styles and knowledge bases in order to effectively navigate the political and regulatory environment with regard to their fishery.

Outcomes

- Aquaculture and commercial fishing industries are economically stable and diverse.
- Innovative shellfish restoration strategies are evaluated, tested, and implemented.
- Information is generated and provided to state and federal fisheries managers for use in identifying essential fish habitat and marine protected areas.
- Better fishing practices are necessary to sustain fisheries populations.
- Staff are formally participating in the development of the statewide Aquatic Invasive Species Management Plan (AISMP).
- Improved understanding and communication is developed between commercial fishing stakeholders.
- Commercial fishermen use leadership skills to engage in the economic, political, and fishery management process.

Indicators

- Number of aquaculture firms that request and receive technical assistance from Sea Grant extension
- Increased value of aquaculture businesses in South Carolina
- Number of commercial and recreational fishermen served by Sea Grant extension
- Number of newly created industry associations and partnerships

- Extent to which degraded habitats are restored (e.g., oyster reefs, salt marsh) through research, information sharing, volunteer programs, and conferences
- Number of fishermen and other attendees at leadership and business training programs
- Number of Consortium representatives participating on fishery management advisory boards and committees
- Evidence of research and extension information in the management and eradication of aquatic nuisance species in South Carolina
- International Conference on Shellfish Restoration (ICSR) is held biennially in the US
- Produce and distribute ICSR publications to facilitate information sharing among researchers and resource managers

Objective 2 – Identify sustainable community-based economic development and management strategies to support traditional and emerging coastal-dependent business and industry.

Strategies

- Understand the socio-economics and demographics of South Carolina's traditional coastal economic activities and "working waterfronts," and identify options for sustaining these uses.
- Support the development of viable and sustainable recreation and tourism practices and operations.
- Identify and evaluate regionalized approaches to land use and watershed planning to support integrated community and economic development projects.
- Establish economic values of upland and submerged land conservation and management efforts as part of quality growth planning and sustainable economic development.
- Evaluate the public policy and legal dimensions of submerged lands use and management.
- Evaluate the ecological, economic, and policy implications of offshore energy development (oil, gas, and wind) on the South Carolina coastal landscape (i.e., shoreline development to support offshore enterprises).
- Identify and evaluate the potential environmental issues and consequences from offshore energy development (oil, gas, and wind) off the South Carolina coast.

Outcomes

- Regional approaches are incorporated into coastal land use/watershed planning efforts by local governments.

- The value of coastal natural resource-based tourism and recreation businesses in South Carolina is increased.
- Relevant natural resource agencies involved in submerged land use issues use science-based information in decision- and policy-making.
- Economic models are used in guiding the land use planning process.
- Traditional uses become a prominent issue in the public dialogue on waterfront development.
- State or regional plan for ocean management and development is used.

Indicators

- Number of communities that recognize the value of maintaining working waterfronts; e.g., through changes in land use policies
- Number of natural resource-dependent recreation and tourism opportunities along the coast
- Number of community-based land use and watershed planning efforts incorporating a regional approach
- Natural resource agency policy is developed to address private use of public trust waters along the coast
- An ocean management and development strategy is developed for South Carolina with science-based information provided through Consortium efforts
- Number of requests for economic information related to land use decisions

IV. Scientific Literacy and Workforce Development

The Consortium's scientific literacy program is focused on providing early awareness of information and career opportunities in coastal and marine areas for the students of formal and informal educators. Through teacher professional development programs and the development of classroom lessons aligned with science education standards, the Consortium provides access to resources and training that will facilitate the inclusion of marine, coastal, and natural resources information in the classroom and also in public aquarium, science centers and museums.

Workforce development has provided research opportunities for college and graduate students through Consortium-funded research projects. With more than one-half 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. Further, the ocean-based work force for the future must also look at

diversification of its ranks, and promote ocean and coastal related careers to individuals of under-represented groups.

The focus of this priority area is development and implementation of strategies and products to provide information to coastal constituents, particularly formal and informal educators, K-12 and college students, concerning sustained use, conservation, and management of coastal and marine resources. A well-informed constituency has proven to be essential for balanced coastal and marine resource management and economic growth. Education and stewardship were identified by the constituent survey as being very important, particularly innovative curricula and programs for K-12, professional development opportunities for K-12 teachers, and environmental literacy of coastal residents and visitors.

Issues

- For innovative science learning curricula to be accepted by state school systems, ocean science materials must be aligned with the S.C. state standards.
- The *South Carolina Education Report Card* indicates improvement in the state's public schools, but the state still lags far behind in science literacy and learning.
- Due to the pressures of growth and development on coastal and natural resources, the need is greater than ever to provide opportunities to the next generation of coastal and ocean scientists and policy-makers.
- There is a need to increase public awareness about the value and function of South Carolina's coastal ocean, estuaries, and watersheds so that residents and visitors appreciate the value to society provided by these natural resources and to promote their stewardship.
- The Consortium strives to engage junior research faculty as well as graduate and undergraduate students from Consortium institutions in Sea Grant problem solving research and through research and fellowship opportunities.

Goal – Coastal and ocean education programs foster scientific literacy, stewardship, and a scientifically trained workforce.

Objective 1 - Design and implement K-12 educational programs for teachers that increases proficiency in science and knowledge of coastal and ocean ecosystems.

Strategies

- Promote and extend existing K-12 marine science educational lessons and program support materials that align with state education standards.
- Promote the development of educational resources that reflect the current Consortium research agenda to further the implementation of Sea Grant's K-12 educational programs.
- Offer professional development opportunities for South Carolina K-12 pre-service and in-service teachers.
- Support and implement recruitment strategies that engage underrepresented and underserved (UR/US) in-service and/or pre-service teachers in professional development programs as well as develop and support model inclusive and multi-culturally diverse strategies for engaging UR/US students.
- Promote a stronger relationship between the Consortium educational activities and Consortium funded research projects.

Outcomes

- Educational materials developed and promoted by the Consortium are being used in classrooms and informal education facilities throughout S.C..
- Pre-service and in-service teachers are teaching coastal and ocean concepts to K-12 students in S.C. schools.
- An increase in K-12 teachers utilizing coastal and ocean science using inclusive and multi-culturally diverse strategies in their classrooms.
- Copies of the textbook "Of Sand and Sea" are made available electronically to educational communities.
- Quarterly issues of *Curriculum Connection*, a supplemental classroom resource for educators based on topics covered in *Coastal Heritage* magazine, are produced and made available on the Web.
- The Consortium Web site reflects and links to all of the Consortium education materials (e.g., COASTeam lessons).

Indicators

- Percentage of S.C. K-12 teachers participating in Consortium programs who continue to use ocean and earth science material in the classroom
- Number of Web site hits on *Curriculum Connection*, COASTeam lessons and other Consortium educational material
- Number of S.C. educators who are engaged in professional development conferences and workshops through Consortium funding
- Number of "Of Sand and Sea" PDF downloads
- Number of S.C. research proposals that include educational components

Objective 2 - Support the development of a diverse and scientifically trained workforce.

Strategies

- Encourage the involvement of new faculty, professional staff, and students in Consortium-supported programs and activities.
- Provide experiences in coastal and marine research to graduate and undergraduate students in South Carolina universities and colleges.
- Identify of Best Practices to recruit UR/US into the marine and ocean sciences at the college/university level.
- Offer educational and professional development opportunities for outstanding South Carolina undergraduate and graduate students through national fellowships.
- Offer education and professional development opportunities for outstanding South Carolina university and college students through in-state internships (Consortium, private industry, NGOs).

Outcomes

- Graduate and undergraduate student training continues to be a priority for Sea Grant-supported research projects.
- Sea Grant-supported graduate and undergraduate students secure ocean science related- employment opportunities upon graduation or pursue advanced degrees.
- South Carolina graduate and undergraduate students successfully compete for national fellowship opportunities and internship opportunities.
- Sea Grant-supported graduate and undergraduate interns and fellows obtain real-world experiences.

Indicators

- Number of new and continuing faculty supported at the Consortium's universities
- Number of undergraduate and graduate students participating in Consortium funded research projects
- Number of graduate and undergraduate students applying and selected for national fellowships
- Number of Knauss fellows selected from S.C.
- Number of undergraduates and graduate students participating in internship programs
- Nature of employment of students upon graduation

Management Areas

Three management areas were identified as priorities for the Consortium over the next four years: (1) Planning, Program Management, and Overall Performance, (2) Connecting with Users, and (3) Human Resources.

V. Planning, Program Management, and Overall Performance

The development and success of our Programmatic Areas is contingent on the success of our planning, program management, and overall performance. These serve as the foundation of effective and efficient programs.

The Consortium identified priority coastal and marine resource needs through its strategic planning process. These needs will be addressed through research, education, communication, and extension programs. The strategic plan will also help 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. Solicits formal evaluations from all Consortium conferences and workshop participants, and
4. Is formally evaluated by the NOAA National Sea Grant College Program Office through its Program Assessment 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 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 and finances. Strategic Planning, National Program Assessments (PATs), State Accountability Reports, State and Federal audits, and other reporting are all part of these reviews.

Issues

- The Consortium depends on its annual state appropriation to support many operational and management functions, which also serves as matching funds for the core Sea Grant program. These funds must be

justified on an annual basis before the S.C. General Assembly, and any request for increased funding comes under more scrutiny.

- Consortium programs are supported through the successful acquisition of competitive grants from federal, other state, and other sources of funds (now approximately 90 percent of the agency's total budget). As the competition for federal funding (from ever-decreasing federal discretionary funds) continues to increase, the Consortium must expend additional staff time and energy 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, but the resources (human and fiscal) are not there to satisfy all needs for maintaining and expanding the agency's programs and activities.
- The Consortium's success is predicated on its ability to maintain an efficient, timely and responsive administrative and program management capabilities, including a rigorous peer review process for Consortium proposals and good communications with member institutions.
- Competition for federal and state dollars requires strict accountability and performance metrics.

Goal– Maintain and enhance viable planning, financing, and performance efforts in support of the mission and programmatic goals of the Consortium.

Objective 1 – Ensure the programmatic mission of the Consortium is accomplished through planning activities and a viable administrative and management system which supports its programmatic themes.

Strategies

- Identify priority areas, engage users, develop programs, and assess proposed priority areas.
- Develop and continually update the Consortium's strategic plan (including performance indicators) and biennial implementation plan 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 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 between university officials and 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 management team (Core Group) to facilitate communication and information exchange to set the agency's short- and long-term directions.

Outcomes

- Strong short- and long-term planning is conducted by agency Core Group with support of the Consortium Program Advisory Board, extension specialist advisory committees, and other user input.
- Strategic and implementation plans are the foundation for the Consortium activities.
- Viable research and education programs funded through the Consortium that meet constituent needs.
- Open communication with liaisons and methods for effective processing of paperwork between the Consortium and member institutions are maintained and fostered.

Indicators

- Program Advisory Board and extension specialist advisory committee engagement in short- and long-term planning
- State and federal approval of strategic and implementation plans
- Number of external peer reviews received per each proposal
- Number of Sea Grant research and education proposals submitted and funded
- Implementation planning milestones met

Objective 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, and training programs of the Consortium.

Strategies

- Adhere to Consortium Board and State leadership directives to maintain and where possible enhance state funding.
- Compete for public and private extramural funding in support of Consortium programs and activities to benefit the citizens and state of South Carolina.
- Obtain research and outreach funding through National Sea Grant Core and other National competitions.
- Ensure that the Consortium's accounting and fiscal management procedures meet or exceed federal, state, and local policies, regulations, and guidelines.

- Develop and implement a Consortium-wide Web-based Management Information System (MIS) to track program progress and document performance.
- Prepare annual State Accountability and National Sea Grant Annual Reports.
- Ensure that the most current software and equipment are used to enhance efficient operations.
- Prepare for the quadrennial external National Sea Grant Program Assessment review.

Outcomes

- Increased level of both state and non-state financial support to further the Consortium's program goals is obtained.
- Sound fiscal practices are implemented and maintained.
- A strong and diverse funding base to support Consortium programs and activities and administrative needs is established.
- Consortium MIS is fully implemented and used by staff and university partners.
- Statewide single agency audits will have no significant findings.
- Annual state and federal accountability reports will document the agency's performance.
- The Consortium will be rated as one of the highest performing Sea Grant College Programs in the nation.

Indicators

- Amount of state recurring funds secured on an annual basis in comparison to the growth in the state budget
- Return on investment (federal funding to state funding) ratio
- Level of extramural (competitive and otherwise) funding secured from non-state sources
- Number of extramural proposals submitted, and funded
- Approval of accountability reports by respective state and federal officials
- Statewide single agency audit results
- Number of grant award and interagency billing and accounting processes completed within a two-week timeframe
- Rating by the external National Sea Grant Program Assessment process
- Percentage of grant activities managed in MIS

VI. Connecting with Users

The S.C. Sea Grant Consortium has two ways to connect with users: (1) input from our constituents; and (2) output to our constituents. This two-way communication is imperative to the success of the agency.

The S.C. Sea Grant Consortium, by definition, continuously and consistently seeks involvement and input from its constituents, Consortium's Board of Directors, liaisons at the Consortium's member institutions, and Sea Grant Extension 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. Sea Grant Extension Program efforts are directed to specific user groups and involves the development and delivery of publications, workshops, and direct contact. Informal education and awareness efforts are also developed for the general public; vehicles for information transfer include brochures, slide shows, group presentations, media interaction, and others.

The agency has no management or regulatory responsibilities. This allows the agency to maintain a non-advocacy role and serve as a neutral 3rd 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

- One of the primary functions of the Consortium is to identify priority coastal and marine resource needs as mentioned in the Planning, Management and Overall Performance section. To do so effectively requires ongoing interaction with and engagement of 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 groups; non-governmental organizations; K-12 educational institutions; and others.
- In the world of the Internet, accessibility to information through the Web is an essential addition to more traditional information media. Keeping up with evolving communications technology, for both internal and external communications, is and will be a significant challenge in the foreseeable future.
- The human landscape of the coast is changing. With coastal growth and development also comes demographic shifts. For example, 20 years ago the Hispanic population of the coast consisted mainly of migrant farm workers for the spring tomato harvest. Today Hispanics account for a large segment of the permanent labor force serving the tourism, landscape and other industries. The Consortium must attempt to address the needs of all coastal stakeholders with its programs.
- Science can and should play a role in informing the decision-making process in natural resources policy. To do so requires the engagement of scientists with resources managers in the identification of research issues, and the extension and communication of research results in forms in which they can be easily understood and used by decision-makers at all levels.
- According to a 2006 National Science Foundation survey, the public is "science-starved." To promote enhanced coastal stewardship, there is a need to release more science and technical information to the public in friendly and readable 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.

Goal – The Consortium effectively identifies and addresses the needs of its diverse constituencies throughout the state and region.

Objective 1 – Ensure that problems and needs of those who live and work along the coast are accurately identified.

Strategies

- Periodic engagement of constituents in the identification of coastal and marine resource problems and needs through a range of activities such as surveys and individual contact.
- Periodic engagement of 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 individual extension specialist advisory committees on a regular basis.
- Seek programmatic guidance from *ad hoc* program area advisory groups on a regular basis.
- Maintain and expand partnerships with federal, state and local governments, business and industry, non-Consortium universities, and non-governmental organizations.

Outcomes

- The problems and needs of those who live and work along the coast are accurately identified.
- Advisory committees, which represent our varied constituents, are engaged in program planning.
- Consortium is partnering with a diverse group of organizations, institutions, and individuals.

Indicators

- Number of constituencies engaged
- Engaging technically diverse groups of constituents
- Number and diversity of partners
- Engagement of Program Advisory Board in setting priorities
- Percent return rate on constituent survey
- Level of constituent survey responses regarding programmatic area

Objective 2 – Ensure that Consortium programs are effective in providing the necessary science-based information and that this information is delivered to target audiences in a timely fashion and appropriate formats.

Strategies

- Produce and distribute quarterly issues of *Coastal Heritage* magazine, which covers relevant issues pertaining to coastal- and marine-resource policy, science, and history.
- Produce and distribute bi-annual issues of *Inside Sea Grant*, a newsletter that reports on the programmatic highlights of the agency to local, state, regional, and national key decision-makers.

- Enhance the knowledge and awareness of coastal residents and visitors on the value of coastal and marine resources through Consortium communication efforts.
- Serve as the co-coordinators of the S.C. Beach Sweep/River Sweep litter cleanup program with S.C.DNR.
- Publicize Consortium-funded research, education, and outreach through print, broadcast, electronic, and web-based media.
- Information on the Consortium Web site and ancillary Web sites are regularly maintained and enhanced.
- Electronic and hard copy publications and products, targeted to constituent needs, are produced and distributed.
- Community volunteers are engaged in Consortium outreach activities.
- Solicits formal evaluations from all Consortium conferences and workshop participants.

Outcomes

- The public has a better understanding of Consortium-funded research, education, and outreach programs.
- High quality scientific and outreach publications are produced.
- Residents and visitors participate in Beach Sweep/River Sweep, people understand the impacts of litter and practice responsible disposal of debris, and businesses recognize the importance of litter cleanups by sponsoring Beach Sweep/River Sweep.
- The demand for the Consortium's regularly produced publications is increased.
- Consortium Web site continues to be a significant source of coastal and marine resource information.
- Informal educational programs have fostered a scientifically informed public and stewardship of coastal and ocean resources.
- Consortium programs are effective in providing the necessary science-based information.
- Consortium information is delivered to target audiences in a timely fashion and user-friendly formats.
- Constituents are utilizing the science-based information disseminated by the Consortium.
- Volunteers are engaged in Consortium outreach activities.

Indicators

- Number of awards and recognition for *Coastal Heritage*
- Number of Inside Sea Grant newsletters produced and distributed
- Formal and informal feedback from *Coastal Heritage* subscribers
- Number of professional awards for its programs, staff and products
- Number and quality of scientific publications

- Number of Web hits, unique visits, downloads, and information requests
- Percentage of Consortium Web sites that are ADA-compliant
- Number of publications produced, requested, and distributed
- Number of festivals and events at which there was a Consortium exhibitor
- Number of Beach Sweep/River Sweep site captains and locations cleaned, total volunteers and number of community and school groups participating, number of tons of debris collected, and number of sponsors and amount of cash and in-kind donations for Beach Sweep/River Sweep
- Number of presentations to rotary clubs, community associations, and schools
- Number of and attendance at extension workshops and presentations
- Number of news releases distributed; number of media placements as a result
- Number of unsolicited media placements

VII. 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. In addition the Consortium staff also work to demonstrate leadership skills and agency engagement of 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 (NGOs). 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.

Issues

- 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 budgets is a significant one that senior management endeavors to 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.
- 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 and experienced 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.

Goal – Maintain and enhance a highly qualified, well-trained, and recognized agency staff.

Objective 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 their constituents.
- Enhance skills, capabilities (including the possibility of cross-training), and professional development goals of the Consortium staff through attendance at workshops, seminars, and development events and activities.
- Promote performance excellence through incentive-based efforts and program competition, and encourage staff through staff recognition and awards.
- Encourage staff to become actively involved in professional organizations pertinent to their staff positions (e.g., as committee members, elected officers).

Outcomes

- Staff are well-trained and engaged in internal and external agency activities.
- Staff are regionally and nationally recognized by peers and professional organizations.
- Staff assume leadership roles within relevant professional institutions and organizations.
- Staff retention is high.

- Joint partnerships to support agency staffing needs and program responsibilities are developed.

Indicators

- Staff retention rates (e.g., FTE/TGE vacancy rate)
- Number of staff professional development opportunities
- Number of staff recognized for performance
- Staffing level of Sea Grant Extension Program
- Number of leadership activities staff are involved in
- Number of joint partnerships established
- Level of Consortium staff and extension specialist participating on a variety of program-related, community-based committees and task forces

National Context

The Consortium is an academically based state agency and a member of the National Sea Grant College Program (NSGCP) which is administered by the National Sea Grant Office (NSGO). The NSGO is a under the National Oceanic and Atmospheric Administration's (NOAA) Oceanic and Atmospheric Research (OAR). In order to participate as an active member of the NSGCP, the Consortium will maintain a high level of performance in all of these areas by planning and conducting its activities in association with the National office. Through continuing improvements in internal and external structures (e.g., communications networking, formal extension feedback mechanisms, long-range program planning), the Consortium will continue to realize this potential.

The NOAA FY2006-2011 Strategic Plan identifies the following four goals: (1) Protect, Restore, and Manage the Use of Coastal and Ocean Resources Through an Ecosystem Approach to Management; (2) Understand Climate Variability and Change to Enhance Society's Ability to Plan and Respond; (3) Serve Society's Needs for Weather and Water Information; and (4) Support the Nation's Commerce with Information for Safe, Efficient, and Environmentally Sound Transportation (http://www.ppi.noaa.gov/pdfs/Strategic_Plans/NOAA_Strategic_Plan.pdf).

The Consortium's plan identified in this document has components which fall within each of the NOAA Mission Goals. A series of cross-cutting priorities are also identified including: (1) Developing, Valuing, and Sustaining a World-Class Workforce; (2) Integrating Global Environmental Observations and Data Management; (3) Ensuring Sound, State-of-the-Art Research; (4) Promoting Environmental Literacy; and (5) Exercising International Leadership. The Consortium's Plan also conforms to these cross-cutting principles. The NSGO is currently revising its strategic plan. When a new

plan has been completed by the NSGO, the Consortium will review its plan to ensure it is in agreement with the National Plan.

Each state Sea Grant program is charged with identifying and serving the needs of the people who live, work, and recreate along the coast of its state through an integrated program of university research, extension, and education. In addition to serving the needs within the state, Sea Grant operates within a broader regional and national context in collaboration with other state Sea Grant programs, the National Sea Grant Office, agencies of state government, NOAA and other Federal programs, non-governmental organizations, and the private sector.

Therefore, the Consortium receives guidance and input from NOAA and National Sea Grant Strategic Plans to provide the national context and direction for its plans and programs. Likewise it receives guidance and input from South Carolina coastal constituents to provide the local context and direction for its plans and programs. The Consortium develops a synthesis of both of these inputs to create its final plans and programs.

The Consortium's strategic plan and priorities have also been developed in association with guidance from the NSGCP and other National scientific priority setting efforts such as the US Ocean Commission Report and the Ocean Research Priorities Plan (ORPP) and Implementation Strategy Report (<http://ocean.ceq.gov/about/docs/orppfinal.pdf>). The ORPP Report identified six societal themes: (1) Stewardship of Natural and Cultural Ocean Resources, (2) Increasing Resilience to Natural Hazards, (3) Enabling Marine Operations, (4) The Ocean's Role in Climate, (5) Improving Ecosystem Health, and (6) Enhancing Human Health. Within each societal theme a series of research priorities were highlighted. The Consortium's strategic plan areas, particularly Programmatic Areas 1, 2, and 3, can be found in the ORPP Report highlighting the importance of the goals and objectives laid out in this document.

What is the Consortium?

The S.C. Sea Grant Consortium is unique among the nation's 30 Sea Grant programs. Created by the S.C. General Assembly, the Consortium undertakes a diverse range of initiatives to improve understanding of the regions coastal resources and our ability to manage them for long-term benefit. Recognizing the needs and opportunities embodied by the state's vast array of ocean and coastal resources, the S.C. General Assembly formally united the state's various marine programs through the creation of the S.C. Sea Grant Consortium in 1978 (Code of South Carolina, Section 48-4510:100). This legislative mandate sets out three main tenets upon which the Consortium operates:

“To provide a mechanism for the development and management of the Sea Grant Program for the State of South Carolina and adjacent regions which share a common environment and resource heritage.”

“To support, improve and share research, education, training and advisory services in fields related to ocean and coastal resources.”

“To encourage and follow a regional approach to solving problems or meeting needs relating to ocean and coastal resources in cooperation with appropriate institutions, programs, and persons in the region.”

Consortium Membership and Interactions

Institutions that hold charter membership in the Consortium include The Citadel, Clemson University, the College of Charleston, the Medical University of South Carolina, S.C. State University, S.C. Department of Natural Resources, Coastal Carolina University, and the University of South Carolina. Consortium institutions provide the expertise of their respective faculty and professional staffs, as well as a wide range of facilities and equipment, necessary to carry out the diversity of programs supported by the S.C. Sea Grant program.

The S.C. Sea Grant Consortium became an operating entity in January 1980. With the submission and acceptance of its initial program proposal for Sea Grant support, the S.C. Sea Grant program was designated an Institutional Program that year. In April 1985, application was made to the Secretary of Commerce for Sea Grant College designation; Sea Grant College status was conferred on the Consortium in August 1986 by then-Secretary of Commerce Malcolm Baldrige.

Consortium Organization

The S.C. Sea Grant Consortium is structured to optimize communication and feedback linkages necessary for the proper development and implementation of its programs. Its offices are headquartered in Charleston, with additional extension agents in Beaufort and Conway. Activities of the Consortium are governed by authorizing committees of the S.C. General Assembly and a Board of Directors to which the Executive Director reports. The Board of Directors includes the chief executive officers of the Consortium's member institutions:

The Board meets annually to review Consortium program policies and procedures. The Board also provides a direct line of communication between the Consortium Executive Director and the higher administrative levels of its eight member institutions.

The S.C. Sea Grant program maintains direct contact with coastal and marine user groups and the general public, and serves as a conduit between institutional knowledge-seekers and coastal and marine knowledge-users, through S.C. Sea Grant Extension Program (SGEP) and Communications and Information Services (CIS) activities. These outreach programs assure that (1) problems and needs of those who live and work along the coast are accurately identified, (2) research projects and programs are effectively providing the necessary information, and (3) this information is delivered to target audiences in a timely fashion and user-friendly format.