A Report on the Progress Toward Achieving the

NSGCP 2009-2013 National Plan

January 19, 2011

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PREAMBLE

Each of the 32 Sea Grant programs submitted short summaries of the impact of their work (referred to as impact statements here after) for the first year of the National Strategic Plan (February 2009-January 2010) to the National Sea Grant Office (NSGO) through the annual reporting process. Dr. Leon Cammen, the National Sea Grant College Program Director, requested that each focus team review the impact statements relevant to their focus area to (1) assess Sea Grant's progress towards achieving the national goals, (2) identify national impacts that should be highlighted in communication products and reporting, (3) identify the gaps in being able to achieve the goals outlined in the National Strategic Plan, and (4) identify new opportunities or future directions for Sea Grant. All focus teams met in New Orleans, Louisiana on October 14-15, 2010 in response to this request. The findings of each focus team are summarized below, as well as shared recommendations for Sea Grant.

HEALTHY COASTAL ECOSYSTEMS

In recent years, Sea Grant has invested in the prevention and control of invasive species at a regional level, supported scientific research to meet ecosystem-based management needs, and trained citizen scientists to conserve water quality. Sea Grant's national goals in the Healthy Coastal Ecosystems (HCE) focus area include:

1. Sound scientific information to support ecosystem-based approaches to managing the coastal environment.
2. Widespread use of ecosystem-based approaches to managing land, water and living resources in coastal areas.
3. Restored function and productivity of degraded ecosystems.

Progress towards achieving Sea Grant's national goals

Sea Grant is making progress in supporting scientific research, the use of ecosystem-based management approaches, and restoration activities. Sea Grant's work in HCE is distributed across the state programs, with activities taking place at all 32 Sea Grant programs. The HCE focus team compared the programs' impact statements with the short and mid-term outcomes for each of the three national goals in the HCE focus area. The focus team found that Sea Grant is addressing all of these expected outcomes. The table below summarizes the focus team's assessment of how the state programs' impact statements were distributed across the HCE focus area outcomes. On many occasions, one impact statement contributed to multiple outcomes.

TABLE 1:

GOAL	OUTCOME	SEA GRANT PROGRAMS	IMPACTS	SEA GRANT REGIONS
1. Sound scientific information to support ecosystem-based approaches to managing the coastal environment.	Baseline data, standards and indicators developed by Sea Grant and partners are used to support ecosystem-based approaches.	28	126	10
	Methodologies are developed and used to evaluate ecosystem-based management approaches and guide future management efforts.	14	39	7
	Planners know how to minimize impacts of land use, resource extraction, and other human activities on ecosystems.	21	28	8
2. Widespread use of ecosystem-based approaches to managing land, water and living resources in coastal areas.	Constituencies have access to data, models and training that support ecosystem-based planning and management approaches.	27	126	8
	Coastal residents, resource managers, businesses, and industries have the capability to predict the effects of human activities and environmental changes on coastal resources.	10	23	2
	People of all ages understand coastal, ocean and Great Lakes environments and the need for stewardship of healthy ecosystems.	27	95	6

3. Restored function and productivity of degraded ecosystems.	Coastal residents, resource managers, businesses, and industries have access to new approaches and technologies developed to improve the effectiveness of restoration of coastal ecosystems.	9	14	6
	Coastal residents, resource managers, businesses, and industries understand chronic and catastrophic causes and consequences of degraded ecosystems.	20	45	8
	Managers draw on both scientific information and the public to prioritize which ecosystems to restore and to set realistic restoration goals.	12	20	8
	Degraded ecosystems function and productivity are restored.	13	35	5

Topics for national communication products and reporting

The HCE focus area covers a wide range of topics related to ecosystem-based approaches to management and ecosystem restoration in coastal, marine, and Great Lakes environments. Three themes stood out where Sea Grant has made a national impact in 2009: water quality, restoration, and stewardship.

1. *Water quality:* Sea Grant is advancing the science of nutrient discharge control, contributing to new national standards, and researching predictive modeling for water management. On the topic of nutrient discharge control, Sea Grant research is underway in many states and is being translated into new management and policy to reduce the influx and impacts of nutrients from both point and non-point sources. An example of new national standards is a Sea Grant researcher's work with NOAA to develop and test new national Coastal and Marine Ecological Classification Standards.

2. *Restoration:* Sea Grant is a leader in innovative restoration techniques and technologies. Major impacts in 2009 include coastal habitat creation, innovative technologies to determine coral health, scientific research on the implementation and valuation of restoration efforts, and estuarine and stream restoration.

3. *Stewardship:* Sea Grant's stewardship efforts in 2009 promoted the ecosystem-based management of coral reefs, explored the use of historic data for predicting ecosystem change, utilized science for stewardship of beach ecosystems, and assisted in the stewardship of the Everglades. For instance, Sea Grant work has resulted in a fundamental shift in how resource managers are planning for and implementing the restoration of the Everglades ecosystem by incorporating human dimensions into environmental restoration. Sea Grant developed a "Decision Theater" utilizing new technologies that enabled stakeholders to evaluate in real time management and restoration options for the Everglades. The efforts have resulted in the development of conceptual models such as "Tree Islands in the Everglades" which have

improved understanding of the ecosystem for both researchers and managers. This Sea Grant decision support system is now being used in NOAA's Marine and Estuarine goal setting process for South Florida to promote community engagement.

Gaps in achieving the National Strategic Plan

While assessing Sea Grant's progress towards its goals, the HCE focus team identified areas that need increased work and investment. The first gap is related to ways that Sea Grant can demonstrate the results of its work and gain insights for future work. Many of Sea Grant's restoration projects lack adequate post-project evaluation of their impacts; one way to address this gap could be to select a set of ecosystem restoration projects to measure ecological response to improvements. Sea Grant could also better understand the results of its activities in the HCE focus area through an increased emphasis in behavioral change assessment after education and outreach efforts.

Second, from an ecosystem perspective, working at a regional scale is important. Many impact statements in the HCE focus area deal with regional ecosystems such as the Great Lakes or marine protected areas. The focus team suggests that Sea Grant consider enhancing the coordination of regional ecosystem assessments to better address regional ecosystem issues.

Third, the Deepwater Horizon oil spill has demonstrated the need for more research on baseline habitat status. Related to the national goal of providing sound scientific information, an understanding of baseline habitat status is essential to understand the impacts of environmental changes such as those caused by an oil spill.

A fourth gap is the need for more widespread use of communication technologies to provide education on ecosystem-based approaches to coastal issues. Technologies such as webinars, distance-learning, and programs such as Wisconsin Sea Grant's Coastal Atlas offer new and useful ways to reach stakeholders.

New opportunities and future directions

Several new directions for ecosystem research and outreach were identified. On issues such as aquatic invasive species, Sea Grant is currently playing a role and there are opportunities to enhance that role. In addition, there are new directions that could increase Sea Grant's national impact.

1. *Addressing aquatic invasive species:* An opportunity to continue Sea Grant's leadership in addressing aquatic invasive species is to support the development of innovative and safe eradication methods for invasive species. Another is to assist in studying the implications of developing fisheries to overharvest invasive species such as Asian carp, lionfish, and mitten crab.
2. *Oil spill research needs:* Sea Grant could organize or sponsor a scientific symposium on the oil spill in the Gulf of Mexico and fund research on dispersants and oil behavior in deep water and high pressure environments, including partnering with the US Environmental Protection Agency to fund such research.

3. *Ecosystem services valuation:* In addition to the gap in project evaluation described in the previous section, the valuation of local ecosystem services could also help ecosystem managers and researchers demonstrate the value of Sea Grant's work in healthy coastal ecosystems. National efforts on this topic are currently underway; Sea Grant can contribute to these national partnerships.
4. *Cross-cutting issues:* There are a number of cross-cutting issues which address the goals of more than one focus area. Both the HCE and the Safe and Sustainable Seafood Supply focus areas involve oyster restoration, marine protected areas, and oil spill response. Coastal and marine spatial planning is relevant for multiple focus areas; in the HCE focus area, Sea Grant can play a role in providing habitat mapping and ecosystem assessments.

SAFE AND SUSTAINABLE SEAFOOD SUPPLY

Under the National Strategic Plan, Sea Grant endeavors to utilize its capabilities in research, extension, and education to support a sustainable supply of safe seafood and meet the following national goals:

1. A sustainable supply of safe seafood to meet public demand.
2. A healthy domestic seafood industry that harvests, produces, processes, and markets seafood responsibly and efficiently.
3. Informed consumers who understand the importance of ecosystem health and sustainable harvesting practices to the future of our domestic fisheries, who appreciate the health benefits of seafood consumption, and who understand how to evaluate the safety of the seafood products they buy.

Progress towards achieving Sea Grant's national goals

The state impact statements describe a variety of activities and impacts in the SSSS focus area. However, because the focus team is aware that excellent activities are underway that have not yet been reported as impacts, it is difficult to assess progress towards the national goals by simply reading the annual state impact statements. Nonetheless, the focus team examined the statements and identified areas where Sea Grant has made national impacts and areas where there are gaps. Many Sea Grant program activities are supporting the three goals. However, the focus team concluded that more progress is needed towards the third national goal of increasing U.S. seafood consumers' understanding of seafood safety, nutrition, and sustainability.

Topics for national communication products and reporting

The SSSS focus team identified four areas where Sea Grant has made national impact in 2009:

1. *Supporting the responsible harvest of seafood:* In 2009, Sea Grant supported the development and transfer of new technologies and knowledge on bycatch reduction, the removal of abandoned or lost fishing gear, fuel efficiency, and worker safety. Sea Grant partnered with the National Marine Fisheries Service to administer a research program to reduce marine mammal bycatch in Atlantic Coast fisheries. In addition, collaboration with the fishing industry helped to attract an additional $700K in federal stimulus funds to support the removal of crab gear from the ocean floor, resulting in the removal of over 67 metric tons of crab gear and other marine debris in 2009.
2. *Educating consumers about local seafood*: Sea Grant is helping to support local seafood marketing and apply the community-supported agriculture marketing model to fisheries; this work is taking place along the East and West coasts and in the Gulf of Mexico. Activities included developing a consumer's guide to local and seasonal seafood, assisting local seafood dealers and fishermen in promoting and marketing their locally-caught or -raised finfish and shellfish, supporting consumer education on the handling of local seafood, and conducting a demonstration project to explore consumer interest in sustainable harvest.
3. *Helping to ensure the safe supply of seafood:* Sea Grant's ongoing work on ensuring the safe supply of seafood integrates Sea Grant's research and extension capabilities. Across the Sea

Grant programs, extension professionals provide training in safe seafood handling, including Hazard Analysis and Critical Control Points (HACCP) training, sensory decomposition workshops, and other programs. In one research project, Sea Grant combined biological oceanography and fisheries social science to determine correlations between seafood conditions and angler consumption patterns in the Santa Cruz Wharf recreational fishery. Another significant accomplishment is the World Health Organization's adoption of a wild fish population toxicity model developed by Sea Grant; this model assesses the potential effects of dioxin-like toxicity on wild fish populations.

4. *Providing technical information and advice to policy-makers:* Again, the integration of research and outreach allows Sea Grant to conduct policy-relevant research and communicate the results to policy-makers for informed decision making. For instance, Sea Grant worked with the National Marine Fisheries Service to conduct a baseline survey of fishes and invertebrates in eight new marine protected areas in central California. Sea Grant also identified key drivers of ocean productivity for populations of U.S. West Coast steelhead trout listed as endangered, threatened, and at-risk under the Endangered Species Act.

Gaps in achieving the National Strategic Plan

To maintain Sea Grant's leadership in the SSSS focus area, the focus team advises programs to address gaps in Sea Grant's involvement in coastal and marine spatial planning, research on climate change and ocean acidification, and development of relationships with federal agencies.

Coastal and marine spatial planning is occurring in a number of states and has become a national priority through the new National Ocean Policy. The zoning activities that will follow planning efforts are likely to have important impacts for fisheries and aquaculture. However, this issue has not yet become a priority for fishermen. To achieve Sea Grant's goal of supporting a healthy domestic seafood industry, it is important for Sea Grant to engage the appropriate groups with science-based information.

Climate change and ocean acidification are critical topics for maintaining a sustainable seafood supply. Although it is perhaps premature to be seeing demonstrable impacts in these areas, the focus team did not see many impact statements on these topics. Important research topics include the regional effects on fisheries distribution and productivity, impacts on ecosystems and humans, and the effects on species listed under the Endangered Species Act and the Marine Mammal Protection Act.

Sea Grant should consider partnering with NOAA and the U.S. Food and Drug Administration (FDA) on a wider range of seafood and fisheries management issues. The potential benefits from partnerships with federal agencies are not fully realized. This gap could be addressed by educating NOAA and the FDA on Sea Grant's capabilities and the opportunities for partnerships.

New opportunities and future directions

There are a number of opportunities for Sea Grant to play a role in emerging issues for fisheries and seafood at a national level. These emerging issues include:

1. *Potential for aquaculture and fisheries uses in the development of offshore wind farms:* Wind farm development is increasing along the East Coast and other areas. These farms are being sited for multiple purposes. There is an opportunity for Sea Grant to provide information on the benefits of co-locating fish farms with offshore development.
2. *Catch shares:* NOAA recently released a NOAA Catch Share Policy. It would benefit Sea Grant to continue to communicate with the National Marine Fisheries Service about the education and communication role that Sea Grant is uniquely positioned to play at the local and regional levels. In addition, Sea Grant can study the social and economic implications of catch share programs.
3. *Fishery data and information systems:* Sea Grant has made innovations in the collection of real-time fisheries data by creating a text-messaging program to involve recreational fishers. There is the potential to expand this work and to organize a symposium at the American Fisheries Society annual meeting on this topic.
4. *Engage new audiences and partners:* Sea Grant could increase seafood safety and sustainability by educating a wider audience, including youth, producers, processors, seafood retailers, food services, dieticians, and health professionals. In particular, educating non-coastal consumers would increase demand for sustainable seafood products in inland and urban areas. Sea Grant would also benefit from new partnerships with federal agencies, industry groups such as the National Fisheries Institute, and organizations such as 4-H.
5. *Consumer understanding:* A national impact story identified above is Sea Grant's work on ensuring a safe supply of imported and domestic seafood. However, the consumer does not adequately understand Sea Grant's role. At the same time, consumer information often lacks scientific credibility about the sustainability of seafood. Sea Grant offers current, science-based, and non-biased web portals and seafood cards. There is an opportunity for Sea Grant to re-explain what it has done for seafood safety and increase consumer understanding. In addition, the SSSS focus team has previously proposed a potential project with the US Department of Agriculture (USDA) on a periodic national seafood consumer survey that would be conducted by Sea Grant, the National Marine Fisheries Service, and USDA. Such a survey would allow Sea Grant to track consumer issues, needs, and knowledge across time and space. This project idea would address a number of national and regional issues in consumer understanding of seafood issues.
6. *Emerging issues across the focus areas of SSSS and Healthy Coastal Ecosystems:* The SSSS and Healthy Coastal Ecosystems (HCE) focus areas cover areas of interest to NOAA. One possible way to address some of the gaps and opportunities described above is to work with Sea Grant's capabilities in HCE. For instance, for coastal and marine spatial planning efforts, Sea Grant can develop geo-referenced and scale-appropriate fisheries and ecosystems data, assist in conflict resolution among multiple uses and users across these focus areas, and help to manage human expectations.

HAZARD RESILIENCE IN COASTAL COMMUNITIES

Sea Grant programs nationwide have been working together for a number of years to better understand coastal natural hazards and develop ways to reduce their impacts on lives, property and coastal economies. The Hazard Resilient Coastal Communities (HRCC) focus team received a total of 71 impact reports for 2009, the first full year of reporting on progress toward achieving the goals established in Sea Grant's 2009-2013 National Plan.

Progress towards achieving Sea Grant's national goals

HRCC is pleased to report that Sea Grant made significant strides in accomplishing the first and second goals identified in the plan. In 2010, the focus team anticipates considerable reporting of activities related to communities and climate change adaptation and the Deepwater Horizon technological disaster that affected the Gulf of Mexico programs, in particular.

1. **Goal 1: Widespread understanding of the risks associated with living, working and doing business along the nation's coasts.** Short-term outcomes expected under this goal include an increased understanding of hazards-related risks, the benefits of planning, and obtaining data and resources to assist in planning. In 2009, 22 Sea Grant programs regularly produced risk assessments and conducted outreach (extension, education and communication) activities used to inform stakeholders (Appendix A). Of the 71 reported impacts, 51 contributed to the outcomes of this goal. Nation-wide, approximately 660 training and technical assistance programs were conducted on matters related to local hazard resilience, mitigation tools and techniques, and best practices. The HRCC focus team recognized that these products and services make a significant contribution toward helping educate communities about the risks they confront and ways to mitigate. These should be cataloged and made available to the Sea Grant programs, NOAA and external partners.

2. **Goal 2: Community capacity to prepare for and respond to hazardous events.** The anticipated outcomes of the second goal are based on providing coastal communities and decision-makers with access to, knowledge of, and skills to adopt measures that will ensure reduced risk. According to the 2009 reports, 16 Sea Grant programs increased the capacity of targeted communities to prepare for and respond to hazardous events (Appendix A). Some 160 coastal communities adopted or implemented hazard resiliency practices to prepare for and respond to/ minimize coastal hazardous events. For example, state emergency managers use a new Sea Grant storm surge modeling program to plan for hurricane impacts and Sea Grant's coastal erosion research results are used to improve county setback laws. Sea Grant has a target of reaching 550 communities by the end of 2013 and some examples of the work-to-date are listed under *Community Planning, Mitigation and Adaptation* in the "National Impacts" section below. The focus team also concluded that there is a need for a systematic evaluation of these and other reported national impacts.

3. **Goal 3: Effective response to coastal catastrophes.** The third HRCC goal addresses the need to mobilize a full-range of public and private partners and resources to mount an effective response to a catastrophe. In 2009, none of the programs reported impacts addressing this goal (Appendix A). That is, in all likelihood, the fortunate result of no catastrophic events having taken place during the reporting period. Responses to recent Hurricanes Katrina, Rita, Gustav and Ike were reported in 2008. Sea Grant's response 2010 Deepwater Horizon oil spill, a technological disaster, will be reported in 2011.

   The HRCC focus team concluded that this goal needs modification in Sea Grant's next strategic plan. It is too narrow and depends entirely on significant disasters taking place in a coastal state. Sea Grant is not an emergency response program and its contribution to this focus area should not be dependent on a catastrophe occurring.

Topics for national communication products and reporting

During the annual meeting, the HRCC focus team thoroughly discussed the 71 impacts that had been categorized as belonging in this focus area. Whereas the impact statements, as a whole, were better than those previously submitted, many still did not document the verifiable results of Sea Grant's work and how efforts have made a difference in the lives of coastal residents, communities, and environments. Although many of the "impact statements" were actually project outputs or outcomes, this information is critical to the team when assessing progress towards the national plan. The team recommends that the NSGO require Sea Grant programs to categorize the impact statements into outputs, outcomes or impacts upon submission. In following years, programs can simply update an impact statement and show the progression of the project from an output to an outcome to an impact. This simple reporting change would allow the NSGO and focus teams to track the progress of Sea Grant's efforts more effectively.

The HRCC team recognized that all of the reported work contributed to goals 1 and 2. In addition, many of the projects will have impacts of national importance in the coming years. The HRCC focus team identified 22 statements that clearly stated an impact of national significance. From these impact statements, the HRCC focus team determined that Sea Grant has made an impact in three broad categories encompassing multiple types of hazards, including storm surge, hurricanes, erosion, earthquakes, tsunamis, and climate change.

1. *Community planning, mitigation and adaptation:*
   a. Guidelines adopted for hurricane-proof buildings.
   b. Wind insurance mitigation credits reduce insurance costs and increase public safety.
   c. Research and outreach efforts helped guide coastal community development in the face of coastal erosion.
   d. Research results used to improve county setback laws.
   e. Coastal communities prepare for predicted earthquake and tsunami events.

2. *Tool and model development:*
    a. New storm surge modeling program helps state emergency managers plan for hurricane impacts.
    b. Local government saves $1.3 million using financial health analysis coupled with storm cost predictions.
    c. Beach Erosion Research and Monitoring (BERM) Program documents beach system changes and the behavior of beach nourishment projects on an annual basis.
    d. Coastal cities use the Coastal Communities Planning Atlas to aid planning.

3. *Rip current education, outreach and research:*
    This category, unlike the others, does not contain specific impact stories of national significance by an individual Sea Grant program. Rather, the HRCC focus team recognized a significant amount of rip current statements from 2008 and 2009 that, when combined, make a national impact. Sea Grant has been actively working on rip currents and water safety for a number of years and an effort should be made to retrospectively analyze Sea Grant's work and how it might have contributed to safety.

Gaps in achieving the National Strategic Plan

Goal 3 is currently a gap.

New opportunities and future directions

The HRCC focus team encourages the Sea Grant programs to undertake or expand hazard-related research, extension and education. Currently, only 12 % (federal and match) of Sea Grant's funding is directed toward hazard resiliency efforts. This tracks, coincidentally, with the percentage share of the total number of submitted impact statements, 71 of 597 (11.87 %). Although the National Plan does not identify specific natural or technological hazards to be addressed, the team identified several major reporting gaps, most notably climate change adaptation and floodplain management.
In addition, the HRCC focus team's 2008 "Big Ideas" are still relevant and should be shared with the all Sea Grant programs. These recommendations have been updated and are as follows:

Near-Term Activities:

- Establish a Sea Grant Coastal Hazards Community of Practice
- Establish a National Sea Grant Center for Hazard Resilient Coastal Communities
    The HRCC team had initially recommended, in 2008, the establishment a National Sea Grant Center for Hazard Resilient Coastal Communities to fund peer-reviewed and Sea Grant institutions-based HRCC research, extension, and other outreach projects. However, given the current economic climate and federal and state budget concerns, establishing a

Community of Practice and a "virtual" Center appears to be more feasible at this time. The HRCC focus team and the Sea Grant Coastal Hazards Community of Practice would work together to bring partners to evolve the Center. Potential partners include (in no particular order):

1. Institute for Business and Home Safety (IBHS)
2. Federal Emergency Management Agency (FEMA)
3. Emergency Disaster Education Network (EDEN)
4. American Planning Association (APA)
5. Land Grant / Cooperative Extension
6. NOAA Coastal Services Center
7. NOAA Office of Ocean and Coastal Resource Management
    a. Coastal Zone Management (CZM)
        i. StormSmart Coast Program
8. U.S. Coast Guard

- Provision of education and training programs
    - Coastal processes, hazards and resiliency for local officials
    - Climate change in-reach
- Publications and training services
    - Guidebooks—(1) Safer Homes and Businesses, (2) Coastal Hazard Mitigation, (3) Coastal Adaptation
    - Community Resiliency Index

Research priorities to address HRCC-related issues

- Analyze public perceptions of risks associated with coastal hazards (e.g., sea or Great Lakes water level changes); develop programs to promote adaptive behaviors and test their efficacy.
- Develop new technologies, construction products, planning tools and guidelines, or model policies for local governments to increase resiliency to coastal hazards (e.g., water level changes).
- Analyze the socio-economic costs and benefits of implementing different adaptation and resilience actions for communities or states.
- Predict socio-economic impacts of climate, including sea and Great Lakes level changes, on population dynamics, community infrastructure, short- and long-term community demographic shifts, social capital, and commerce centers for county and community planners and local governments.
- Enhance real-time storm surge models and products to include meteorological, land use/land cover, and improved boundary and wave elevations data to better predict impacts from storms at local or regional scales.

- Determine linkages between human actions (e.g., physical alterations to coasts, groundwater depletion) and natural systems that can either increase or compromise ecological integrity and community resiliency to storm events and climate change.
- Evaluation of effectiveness of tsunami warning systems.
- Monitoring and research on chronic coastal hazards and coastal processes (including erosion and mechanisms of shoreline change).

Longer-term Activities:

- National Center For the Science and Practice of Public Engagement and Learning
- Center for Coastal Climate Change Engagement

SUSTAINABLE COASTAL DEVELOPMENT

Since the inception of the Coastal Community Development Program in 2001, Sea Grant has continued to build capacity in helping coastal communities implement sustainable development practices. Sea Grant's activities in Sustainable Coastal Development (SCD) led to 435 coastal communities adopting or implementing sustainable development practices and/or policies in 2009. Currently, roughly 25% of Sea Grant's funding effort (federal and match) is directed toward the SCD focus area. Coincidently, this roughly translates into the number of sustainable development impact statements, or approximately 30% (180 of 597) of all 2009 subject matter impact statements. As outlined below, Sea Grant has made significant strides in accomplishing all of the SCD national goals during the first year of the National Strategic Plan.

Progress towards achieving Sea Grant's national goals

1. **Goal 1: Healthy coastal economies that include working waterfronts, an abundance of recreation and tourism opportunities, and coastal access for all citizens.** Based on the annual reports, in 2009, 21 Sea Grant programs (66%) made significant strides in addressing and increasing Sea Grant's capacity to help communities develop sustainable coastal economies (Appendix A). Sea Grant is providing national leadership and coordination by advancing working waterfront planning and policy development with data, tools, and services. There was also a lot of work in facilitating coastal community economic development and preservation of coastal culture (e.g. maritime heritage). Sustainable tourism is critical to the economies of many coastal communities and Sea Grant contributes towards this effort by providing leadership, trainings, tools, and communication products. In addition, many Sea Grant programs are establishing websites of public, coastal access information for their coastlines, including legal mechanisms for addressing waterfront access issues.

2. **Goal 2: Coastal communities that make efficient use of land, energy and water resources and protect the resources needed to sustain coastal ecosystems and quality of life.** The 2009 annual reports demonstrated that nearly every program (90%) is conducting activities around efficient land, energy and water use (Appendix A). The Clean Marina programs, many catalyzed by Sea Grant programs, have a total of 563 certified marinas across the country taking measures to reduce their environmental impacts and help improve water quality. Water quality issues are a primary area of focus, being addressed by 27 Sea Grant programs, particularly stormwater management and pharmaceutical disposal and detection. Many of these impacts help fulfill the national goals of two focus areas, SCD and Healthy Coastal Ecosystems (HCE). In addition, Sea Grant extension staff are using Smart Growth principles to help communities be more sustainable. Eight Sea Grant programs are working on alternative and renewable energy, which is expected to grow within Sea Grant due to the Coastal and Marine Spatial Planning (CMSP) prioritized by the 2010 National Ocean Policy. Sea Grant is helping communities' address renewable/ alternative energy siting, selection, implementation, and conservation.

Goal 3: Coastal citizens, community leaders, and industries that recognize the complex inter-relationships between social, economic and environmental values in coastal areas and work together to balance multiple uses and optimize environmental sustainability. Impacts related to engagement, planning, and decision-making were reported by 19 Sea Grant programs in 2009 (Appendix A). Sea Grant fostered partnerships and disseminated tools and techniques to enable development that is socially, economically, and environmentally sound. The SCD focus team identified significant gain in knowledge and tool development; however there were few impacts reporting on collaborative planning, policy change, and behavior change. The team suspects programs are participating in collaborative planning and this effort is not being captured in the impact statements. The lack of impacts on policy or behavior change could be from these impacts not being reported, an inability to measure such impacts, or because these projects have not progressed to this stage.

The SCD focus team would like to provide the NSGO with a more thorough assessment of Sea Grant's progress toward accomplishing the SCD national goals. In order to do so, the SCD team would like to request that the NSGO provide the team with performance metrics and a list of SCD research and extension projects funded by the Sea Grant programs.

Topics for national communication products and reporting

The focus team crafted the following statement to succinctly communicate Sea Grant's SCD work: ***"Sea Grant's sustainable coastal development focus area empowers communities through engagement, planning, and decision-making processes to achieve sustainable economies and land, water, and energy use".*** This statement draws on the three goals of the focus area. Within each goal, the SCD team chose to highlight one or two stories that exemplified the body of work shown by Sea Grant, as described below.

1. Engagement, planning, and decision-making: **Sea Grant facilitated collaborative processes, tools & policies that led to community change.**
2. Coastal economies: **The dollar amount for Sea Grant's contribution to coastal economies nationwide.**
3. Land, water, and energy use:
    1. **The Sea Grant role in establishing and sustaining Clean Marina programs around the country**. This should be expressed both as number of marinas (563 cumulative marinas in 2009) & slips within marinas.
    2. **The pivotal role of Sea Grant in the development and siting of coastal and offshore energy**. This has two parts – highlighting focused cutting-edge energy (wave, biofuels, wind) research to develop new technologies and determine how to best use them, and simultaneously highlight the breadth of energy activities across the network.

The SCD focus team has identified eight broad SCD-related topics that are commonly addressed in Sea Grant's activities. The number of Sea Grant programs and regions that address each of these topics is outlined below (Table 2). The NSGO and the entire Sea Grant network should be informed on such hubs of activity to encourage collaboration and capacity-building within the Sea Grant network and for opportunistic occasions to communicate Sea Grant's work with external stakeholders.

TABLE 2: Summary of the number of Sea Grant programs and regions contributing to the sub-topics of each SCD goal. Data is based off the impact statements submitted by each Sea Grant program of impacts from February 1, 2009 through January 31, 2010. Sea Grant programs includes each of the 32 university-based programs and the National Sea Grant Law Center. Regions are based on the Sea Grant Regional Initiative found at http://www.seagrant.noaa.gov/regional/index.html .

		2009	
SCD GOALS	**BROAD TOPIC**	**SEA GRANT PROGRAMS**	**REGIONS**
Goal 1: Healthy coastal economies that include working waterfronts, an abundance of recreation and tourism opportunities, and coastal access for all citizens.	Working Waterways and Waterfronts	16	8
	Sustainable Coastal Tourism	9	7
	Coastal Access	7	6
Goal 2: Coastal communities that make efficient use of land, energy and water resources and protect the resources needed to sustain coastal ecosystems and quality of life.	Clean Marinas	9	6
	Alternative Energy (Siting, Selection & Implementation) (including CMSP)	8	7
	Green Infrastructure & Brownfield Redevelopment	8	6
	Water Quality, Supply, & Conservation	27	8
	Policy Changes & Ordinances to Develop within Carrying Capacity	14	6
Goal 3: Coastal citizens, community leaders, and industries that recognize the complex inter-relationships between social, economic and environmental values in coastal areas and work together to balance multiple uses and optimize environmental sustainability.	Stakeholder outreach, engagement, education, and communications.	19	7

Gaps in achieving the National Strategic Plan

The 2009 SCD impact statements showcase significant effort in SCD extension and education. However, minimal research is being conducted by Sea Grant. The SCD team has identified a need to assess (1) the economic and environmental impacts of coastal development patterns, (2) public perceptions of change, (3) whole-community carrying capacity, (4) cost-benefit tradeoffs for development, and (5) scenario

planning in the face of uncertainty. Similarly, the efforts of the Sea Grant legal programs, which were well reported in 2008, were substantively missing this year. Sea Grant must find a way to not only support strong outreach capabilities, but also to develop new knowledge through targeted research. The SCD focus team recommends that Sea Grant enhance capacity and expertise in green building, community design, and coastal and marine spatial planning, and build local capacity to evaluate cost/benefit tradeoffs for alternative future development scenarios. Sea Grant programs should capitalize on their university partnerships and actively engage experts from other disciplines, particularly architecture, planning and economics.

New opportunities and future directions

The SCD team recognized the need to bring the full power of the network to bear on the challenges of sustainable coastal development through integration of research, extension, and education. To facilitate this integration, the SCD focus team developed research priorities for Sea Grant Directors to consider including in their 2012 RFP process. These priorities are listed below and were sent to the Directors via a letter from the NSGCP Director, along with research priorities from the other focus areas.

1. Development of land use indicators or tipping points that threaten coastal, ocean, and Great Lakes ecosystems and the footprints needed to sustain these ecosystems.
2. Creation of better economic and market research-based decision tools.
3. Identification of perceived or assessed risks and benefits of energy technologies (traditional and renewable) and siting of coastal energy.
4. Development of decision-support tools that help stakeholders conceptualize or evaluate the trade-offs of future scenarios in coastal communities.
5. Analysis of public values, beliefs, attitudes, and behavioral intentions on issues relevant in your state and related collaborative environmental problem solving.
6. Economic analysis of (a) cost projections of climate change adaptation strategies; or (b) impact of working waterways and waterfronts on coastal communities.
7. Evaluation of Sea Grant's activities (e.g., document changes in knowledge, attitudes, behaviors or behavioral intentions, aggregate impacts of regional or national level efforts).
8. Integrated green building and community design.
9. Analysis of water supply issues in coastal communities.

One difficulty in accomplishing many of these research priorities is getting social science and sustainable development research proposals through technical review panels that are primarily composed of physical and biological scientists. The SCD focus team supports the formation of a National Technical Review Panel for social science and sustainable development research to help directors more accurately gauge the scientific and technical merit of such proposals submitted to them.

In addition to these recommendations for Sea Grant, the SCD focus team has identified a few initiatives that would benefit Sea Grant's SCD community. To further each initiative, the SCD focus team has formed two subcommittees as outlined below.

1. A comprehensive land-use/ cover/ intensity GIS data set for coastal watersheds is needed to further facilitate research on the connections between communities and their surrounding lands and waters. The SCD team will provide leadership for a scoping meeting with external partners to investigate the feasibility of creating and maintaining such a database. The National Sea Grant Director has already committed $10,000 in FY10 program development funds to support this effort.
2. A second subcommittee will examine the SCD tools already developed and use them to develop an SCD Toolbox, which will allow decision-makers to find and utilize the essential tools for sustainable development quickly and easily. These activities are part of a broader effort by the SCD team to ensure that program successes and tools are replicated nation-wide, by providing practitioners within Sea Grant with the information and connections they need to more comprehensibly collaborate.

The SCD team will outline the national stories, and then work with professional communicators to create high-impact stories, hand-outs, and interactive media that can showcase the power of Sea Grant in Sustainable Coastal Development. The SCD team suggests that the NSGO initiate a series of robust evaluations of initiatives that are national in scope and importance to document the full impacts of specific Sea Grant activities, nationwide. The SCD focus team suggests that Sea Grant start by assessing the economic and environmental impact of the Clean Marinas program, and identify other large scale programs that could benefit from such a retrospective study.

SHARED RECOMMENDATIONS

In addition to the focus teams' recommendations relative to their respective focus areas, the teams considered ways to improve evaluating, reporting and communicating Sea Grant's impacts on the nation.

1. *Separate annual reporting and impact reporting:* The focus teams found a small number of true impacts in the impact statements that were submitted; most statements describe projects or output/outcome-level activities. In the future, the focus teams suggest that impact statements be requested separately from annual reports. The state programs would still be able to report all activities, but designate only a few as impact stories.
2. *Coordinate and encourage regional reporting:* Utilizing Sea Grant's new regional structure, the focus teams suggest that Sea Grant considers regional reporting requirements to better capture regional activities and impacts. This would avoid duplication of reports from each program and would also ensure that regional activities are not overlooked in the reporting process.
3. *Continue impact guidance:* The quality of the impact statements was enhanced since last year due in part to the NSGO's guidance on preparing impact statements. The focus teams support continued impact guidance, including specific feedback to programs and in-person or web-based trainings.
4. *Fund robust evaluations of national impacts:* Through special funding for higher-level impact evaluation, Sea Grant should conduct robust evaluations of large and nationally important programs to understand and demonstrate the national impacts of Sea Grant's work. Complementary to this effort, the focus teams recommend individual Sea Grant programs conduct pre- and post-project evaluations to better document impacts of their work. Many impact statements claim that Sea Grant activities have led to changes in understanding or in ecosystem health, for example, but evidence of such changes is needed.
5. *Compile tools and resources for each area:* In reading through the impact statements, the focus teams learned about a number of useful tools and resources that Sea Grant programs have developed. The teams recommend creating an online resource center to compile these tools and resources, making them available for other Sea Grant programs and external partners to find and utilize.

APPENDIX A: Summary of the number of Sea Grant programs and regions contributing to the goals of each focus area outlined in the National Strategic Plan. Data is based off the impact statements submitted by each Sea Grant program of impacts from February 1, 2009 through January 31, 2010. Sea Grant programs includes each of the 32 university-based programs and the National Sea Grant Law Center. Regions are based on the Sea Grant Regional Initiative found at http://www.seagrant.noaa.gov/regional/index.html .

FOCUS AREA	GOAL	SEA GRANT PROGRAMS	SEA GRANT REGIONS
Healthy Coastal Ecosystems	Goal 1: Sound scientific information to support ecosystem-based approaches to managing the coastal environment.	29	10
	Goal 2: Widespread use of ecosystem-based approaches to managing land, water and living resources in coastal areas.	30	9
	Goal 3: Restored function and productivity of degraded ecosystems.	26	8
Safe and Sustainable Seafood Supply	Goal 1: A sustainable supply of safe seafood to meet public demand	24	8
	Goal 2: A healthy domestic seafood industry that harvests, produces, processes, and markets seafood responsibly and efficiently	23	9
	Goal 3: Informed consumers who understand the importance of ecosystem health and sustainable harvesting practices to the future of our domestic fisheries, who appreciate the health benefits of seafood consumption, and who understand how to evaluate the safety of the seafood products they buy.	15	7
Hazard Resilience in Coastal Communities	Goal 1: Widespread understanding of the risks associated with living, working and doing business along the nation's coasts.	22	9
	Goal 2: Community capacity to prepare for and respond to hazardous events.	16	8
	Goal 3: Effective response to coastal catastrophes.	0	0
Sustainable Coastal Development	Goal 1: Healthy coastal economies that include working waterfronts, an abundance of recreation and tourism opportunities, and coastal access for all citizens.	21	8
	Goal 2: Coastal communities that make efficient use of land, energy and water resources and protect the resources needed to sustain coastal ecosystems and quality of life.	30	9
	Goal 3: Coastal citizens, community leaders, and industries that recognize the complex inter-relationships between social, economic and environmental values in coastal areas and work together to balance multiple uses and optimize environmental sustainability.	19	7