

NATIONAL SEA GRANT ADVISORY BOARD

AUGUST 12, 2016
CONFERENCE CALL

BRIEFING BOOK



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Agenda



**National Sea Grant Advisory Board (NSGAB) Meeting
August 2016
AGENDA
Conference Call**

FRIDAY, AUGUST 12, 2016

OPEN TO THE PUBLIC 3:00-5:00 PM EDT

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| 3:00-3:10 | Welcome, review of agenda, and roll call (Dale Baker, Chair NSGAB; Jonathan Eigen, Designated Federal Officer) |
| 3:10-3:20 | Public Comment Period |
| 3:20-3:30 | Lake Champlain Sea Grant- Letter of Intent to apply for Institutional status (Jonathan Pennock, Director, National Sea Grant College Program) |
| 3:30-4:00 | Discuss and approve draft text of the 2016 Biennial Report to Congress on the State of Sea Grant (Rosanne Fortner, NSGAB) |
| 4:00-4:30 | Discuss and approve the draft NOAA Sea Grant Extension Liaison Review Committee Report (D. Baker, NSGAB) |
| 4:30-5:00 | Discuss and approve the draft PIE II Committee Report (Richard West; D. Baker, NSGAB) |
| 5:00 | Meeting Adjourned |

Public Comment



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Lake Champlain Sea Grant

Letter of Intent to apply for Institutional status





20 July, 2016

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• The University of Vermont
• SUNY Plattsburgh
• NOAA, Department of
Commerce

Dr. Jonathan Pennock
National Sea Grant Office
1315 East-West Highway, Room 11735
Silver Spring, Maryland 20910

RE: Lake Champlain Sea Grant Intent to Request Sea Grant Institute Status

Dear Dr. Pennock,

On behalf of the Lake Champlain Sea Grant (LCSG) I respectfully request that the National Sea Grant College Program (NSGCP) initiate the process to consider an application from the LCSG to move from a Coherent Area Program (CAP) to Institute status.

Background

The LCSG was established as a project of the New York Sea Grant (NYSG) in 1999. The original proposal stressed that the focus for this new initiative was “for a Lake Champlain Sea Grant Outreach Program, not a New York and a Vermont outreach program, but a basin wide coordinated effort.” We have adhered to and grown our programs based on this multijurisdictional model. Through the primary partnership between the University of Vermont (UVM) and State University of New York, Plattsburgh (SUNY-P) plus partnerships with other organizations in the basin, we actively operate in a lake catchment that includes two states (New York and Vermont) as well as the Province of Quebec in Canada. The Lake Champlain basin lies within the Laurentian-Great Lakes drainage. We share close environmental, social, and economic ties with the Great Lakes region and the Great Lakes Sea Grant programs, with whom we associate. Geographically we are also closely associated with and communicate with the New England Sea Grant programs on topics of mutual interest.

Initially the LCSG consisted of two Outreach specialists with an ambitious charge to provide education and outreach on critical challenges including “water quality, non-point source pollution, sustainable development in the coastal region, coastal economic development, recreational fisheries, and aquatic exotic species.” The early successes of the program led to designation as a Sea Grant Coherent Area Program (CAP) in 2012. In his letter of decision (August 9, 2012) the NSGCP Director at that time, Dr. Leon Cammen, noted that “The Lake Champlain Sea Grant project has earned this designation for demonstrating a strong core of capabilities in research, extension and education, and applying this competence to regional challenges and opportunities.” Dr. Cammen’s letter also summarized the steps required to attain Sea Grant Institute status.

In the years since the LCSG attained CAP status we:

- Appointed a new LCSG Director
- Hired a new Sea Grant Extension Program Leader
- Successfully developed and implemented an omnibus proposal, in addition to two previous omnibus proposals fully executed prior to achieving CAP status
- Expanded the Outreach staff to deliver new and innovative programs
- Developed a new Green Infrastructure Collaborative with the Vermont Department of Environmental Conservation (VTDEC) which led to shared (50:50) support for a manager who promotes education and communication on low-impact design and community resilience on behalf of the VTDEC and LCSG
- Hosted the Great Lakes Network meeting of regional Sea Grant programs
- Developed outreach programs tailored to a new audience (e.g., real estate agents) which have been enthusiastically received
- Undertook an intensive strategic planning initiative that engaged diverse stakeholders in a series of meetings and surveys to identify our core strengths

In 2015 we opted to host an external, NSGCP-led, Site Review as part of the national review program then underway in preparation for the Performance Review process. As a program with only CAP status we were not required to have this Site Review. However, with the guidance of then Interim Director Nikola Garber, we decided to use this mechanism to assess our readiness to propose Institute status. The Site Review report (April 17, 2016) concluded that “the LCSG Coherent Area Program partnership meets the standards of NOAA’s Sea Grant program and has demonstrated the potential to begin the process of becoming an institutional program.”

Request and Intent

Based on our recent performance and the clear need to expand our program as determined by input from our stakeholders in strategic planning meetings, we request that the NSGCP initiate the process to consider an application from the LCSG to move to Institute status. We intend to submit an application for Institute status in the first quarter of 2017. We request that this application be reviewed in a timeframe that would allow us to host a Site Review in the summer of 2017. We hope that this timing would allow a final decision to be rendered in time to prepare project and budget proposals for the next omnibus cycle beginning in 2018.

We look forward to working with the NSGCP staff and the National Sea Grant Advisory Board on this critically important evolution of the LCSG. If you have any questions about this request please contact me at 802-646-2513 or breck.bowden@uvm.edu.

Sincerely,



William B. Bowden, Director
Lake Champlain Sea Grant

cc: Nikola Garber, NOAA National Sea Grant Office
Elizabeth Rohring, NOAA National Sea Grant Office
Jonathan Eigen, NOAA National Sea Grant Office
Dorn Carlson, NOAA National Sea Grant Office

David Rosowsky, Provost, University of Vermont
James Liszka, Provost, State University of New York, Plattsburgh
Richard Galbraith, Vice President for Research, University of Vermont
Nancy Mathews, Dean, Rubenstein School of Environment and Natural Resources, UVM
Doug Lantagne, Dean, Extension, UVM

Draft text

2016 Biennial Report to Congress on the State of Sea Grant



The State of Sea Grant 2016

Biennial Report to Congress

Draft text for approval by the Sea Grant Advisory Board

Version 8.03.2016

Contributing authors: Rosanne Fortner, Judy Gray, Dale Baker, Rollie Schmitten, Elizabeth Rohring, Nancy Rabalais, Jim Murray, Nancy Balcom, LaDon Swan

Edited by Brooke Carney

Special thanks to April Croxton, Laura Early, and Peg Brady for contributions and edits

Letter from the Chair

Dear Members of the Congress of the United States of America,

On behalf of the National Sea Grant Advisory Board (the Board), I am proud to share this Biennial Report to Congress, *The State of Sea Grant 2016*, as directed by the 2008 Sea Grant Act (PL 110-394). *The State of Sea Grant 2016* provides an update on the National Sea Grant College Program (Sea Grant) over the past two years. This report represents the fourth such report to Congress, and once again, the Board recognizes Sea Grant's impacts (economic, environmental, and cultural) on the coastal and Great Lakes communities the program serves.

In 2016, Sea Grant celebrates 50 years of using research, extension, and education to positively impact coastal communities. Sea Grant's work encompasses diverse issues relevant to local, regional, and national priorities. Sea Grant helps to ensure the coastal areas in which we live, work, and recreate are clean, safe, and sustainable.

The state and regional Sea Grant programs know their constituents well and are constantly looking for ways to meet their communities' needs. Throughout this report the Board has identified national, regional, and local highlights from the program chosen from literally hundreds of reported Sea Grant impacts. Sea Grant leverages federal dollars through matching funds and capacity building efforts; in 2015 the Sea Grant program was funded at \$67.3 million and delivered an economic return of \$350 million. This represents a 475% return on investment of federal funds.

Since the 2014 Biennial Report to Congress, there have been some changes at Sea Grant. Most significantly, the National Sea Grant Office (NSGO) has had a change in leadership. Dr. Leon Cammen stepped down as director of the Sea Grant after 25 years with the program. NOAA led a national search and in July 2016 Dr. Jonathan Pennock became the director. Dr. Pennock, an internationally known coastal scientist, previously served as the director of the New Hampshire Sea Grant program and the deputy director of the School of Marine Science and Ocean Engineering at the University of New Hampshire. The Board looks forward to working with Dr. Pennock as we usher in a new era of leadership for Sea Grant. The Board acknowledges with gratitude the service of Dr. Nikola Garber as interim Acting Sea Grant Director throughout much of 2015 and 2016. The NSGO also filled several assistant director positions to align with the major functions of the office, including an assistant director of partnerships to help identify and nurture high-value collaborations both nationally and across the network.

Sea Grant is an asset to the National Oceanic and Atmospheric Administration (NOAA). It provides a national network to share its research, information, products, and services with universities, industry, decision-makers, and coastal communities. Sea Grant has been responsive to the Board recommendations in previous reports. This year the Board has turned its attention to several new matters including diversity and inclusion in the Sea Grant network as well as expanding its extension and liaison programs across NOAA.

Sea Grant's legislation has not been reauthorized as of the printing of this report. The Board, along with Sea Grant and NOAA leadership, is eager to assist Congress in this endeavor and is also available to work with transition teams after the 2016 election. The Board looks forward to advising on and reporting Sea Grant's impacts for another 50 years.

Dale Baker
Chair, National Sea Grant Advisory Board

Photo: Dale Baker

Executive Summary

The State of Sea Grant 2016 is the Biennial Report to Congress from the National Sea Grant Advisory Board (the Board), as mandated by reauthorization on the National Sea Grant College Program (Sea Grant) in 2008 [PL 110-394]. This report celebrates the 50th Anniversary of Sea Grant, illuminates its contributions to the nation and the economy in the last two years, and offers recommendations and opportunities for continued advancement in science serving America's coasts. The report encapsulates what Sea Grant is able to accomplish with a 475% return on federal investment.

Recommendations made in the 2014 Biennial Report have been met by Sea Grant:

- Sea Grant advanced national priorities while solving problems locally and regionally, emphasizing partnerships and meeting stakeholder needs.
- Sea Grant completed its four-year review of all state activities, and all programs have been found to meet standards of excellence.
- Budget equity among programs is being addressed and will continue as additional federal funds become available.
- Environmental literacy and workforce development, key requirements for environmental quality and next generation Sea Grant leadership, are receiving increased attention.

Focus Areas 2014-2017

Among the 33 state Sea Grant programs, the focus areas identified in the national Strategic Plan were addressed in creative and efficient ways, using a full catalog of science and communication skills. Examples in this report represent impacts in those focus areas, which include healthy coastal ecosystems, sustainable fisheries and aquaculture, resilient communities and economies, and environmental literacy and workforce development.

Sea Grant in Action

While the range of Sea Grant activities is as broad as its geographic reach, as deep as its science capability, and as diverse as its list of stakeholders, this report focuses on community resilience, ocean acidification, and aquaculture as highlights of program activities in the past two years.

- In the face of environmental change and coastal hazards, Sea Grant works with coastal communities and businesses to develop models for potential climate scenarios, assists with anticipating and overcoming hazard-driven challenges, and shares strategies for adaptation and mitigation.
- Aquaculture has been part of the Sea Grant portfolio for all of its 50 years. Current research and extension deal with pending regulatory decisions, new and emerging species for aquaculture, seafood safety, and product quality.
- Ocean acidification affects important ecosystem services as well as the seafood industry and ecotourism. Sea Grant research aids public understanding of the changes and development of strategies to mitigate consequences.

Achieving Organizational Excellence

Within the Sea Grant organization, 20 national office staff, 33 university-based state programs, 300 extension agents, 2,300 scientists, 1,100 university Sea Grant employees, and over 1,300 partners work together cooperatively to reach program goals. Since the last Biennial Report, all parts of the program have been evaluated by multiple processes. One program, Pennsylvania Sea Grant, was advanced to full College Program status.

Education in Sea Grant, now recognized as one of the focus areas, is getting expanded attention as a result of a 2014 Recommendation by the Advisory Board. The range of education efforts, from family awareness programs to Federal fellowships and graduate training, and the diverse approaches to education in the 33 programs, present challenges that are being accepted as opportunities for building program strength.

Sea Grant undertakes critical law and policy research, translates science for policy makers, and assists communities with legal barriers to innovation. Sea Grant legal programs in four states, along with attorneys throughout the country, can address a variety of law and policy issues to serve coastal stakeholders.

A Sea Grant Extension Liaison program, which embeds Sea Grant extension personnel in partner agencies, including five NOAA Sentinel Sites for climate change, expanded during this reporting period. The program leverages resources to facilitate the transfer of scientific information, tools, and technologies to coastal stakeholders. An evaluation of the program by the Board provided information on funding and administrative models for consideration as new appointments are considered.

Recommendations

The Board looks forward to reauthorization of the Sea Grant in coming Congressional sessions. The Board recommends the following recommendations be addressed in the coming two to three years:

- NOAA seeks partnerships with Sea Grant to build on existing investments and the reputation of Sea Grant;
- The NSGO supports the expansion of the Sea Grant Extension Liaison Program;
- Sea Grant enhances diversity and inclusion throughout its network to be more reflective of the nation and the audiences served;
- Sea Grant emphasizes measuring the impact of K-12 and informal education programs and enables collaboration within the Sea Grant Education Network; and
- Sea Grant revisits the concept of focus teams to enhance program guidance.

Emerging Opportunities

An analysis of existing program efforts identified some opportunities based on current research, perceived needs for science information as well as policy and management strategies, and mechanisms for expanding outreach. The Sea Grant network has formed a “Data Stewardship Committee” in advance of efforts that could bring together and integrate into large spatial and time-specific datasets the scientific data collected by individual programs. Preparing for the next 50 years of Sea Grant is exciting and challenging, and Sea Grant is poised to meet new and ongoing challenges.

Introduction and History

The oceans, coasts, and Great Lakes resources of the U.S. give us food, wealth, and wonder. They challenge us with their power while sustaining us with their bounty. The sea's role in Earth processes influences everyone.

In 2016, the National Sea Grant College Program (Sea Grant) marks its 50th birthday. Congress established the program through PL 89-688 to recognize the importance of the oceans, coasts, and Great Lakes to the world's environment, to the nation's economy, and to human well-being. Those 50 years have chronicled many changes as Sea Grant has worked to maintain relevance in the face of human actions and natural forces affecting the coastal environment. The program's consistent trajectory upward and outward in terms of impact and outreach speaks well for the founders' vision and those who strive to carry it forward.

Sea Grant grew from a keynote presentation at the American Fisheries Society in 1963. Dr. Athelstan Spilhaus called for a sea grant college program to parallel the successes of the university land grant colleges program in bringing academia, government, and public interests together to solve land use issues (NOAA, 1979). He then tirelessly advocated for the program with the help of two other champions, Senator Claiborne Pell of Rhode Island and Dean of the Graduate School of Oceanography of the University of Rhode Island, Dr. John A. Knauss, until it became a federally funded reality three years later. President Lyndon Johnson signed the Pell-Rogers Sea Grant College and Program Act into law in October 1966. The legislation had the support of nearly every coastal state's congressional delegation. The new program began its life in the National Science Foundation in February of 1967, and a year later Sea Grant awards were made to the Massachusetts Institute of Technology (MIT), California Institute of Technology (CIT), and Louisiana's Nicholls State College.

Sea Grant was one of nine ocean and atmospheric programs from five departments that were consolidated into the newly legislated National Oceanic and Atmospheric Administration (NOAA) in 1970. The Secretary of Commerce designated the first Sea Grant Colleges in 1971—Oregon State University, University of Rhode Island, University of Washington, and Texas A&M University. By 1985, there were 31 programs in 29 coastal states and Puerto Rico, of which 21 were designated as Sea Grant Colleges. Fifty years from inception, there are 33 programs in the Sea Grant network.

The high economic impact of Sea Grant remains true 50 years after development of the program with continually increasing economic impact. The stakeholders continue to grow in number and encompass a broader slice of coastal and Great Lakes interests than 50 years ago. The ethos of Sea Grant remains the strength of the program—research, extension, and education that brings intellectual and physical resources to bear on the needs of marine and coastal communities.

When Sea Grant was reauthorized in 2008 (PL 110-394), Congress included a mandate for the National Sea Grant Advisory Board (the Board) to report to Congress on a biennial basis. The 15-member board provides advice to NOAA and Sea Grant to address the national's highest priorities regarding the understanding, assessment, development, management, utilization, and conservation of ocean, coastal, and Great Lakes resources. *The State of Sea Grant 2016* thus reviews the past two years of program accomplishments and impacts, summarizes issues and challenges within the program, and offers recommendations for actions to maximize program effectiveness. The report also looks back in homage to Sea Grant's beginnings and progress.

Sea Grant, a program within NOAA and the U.S. Department of Commerce, is proud of its mission of **“Putting science to work for America’s coastal communities.”** By harnessing the academic and research power of universities and partners, Sea Grant investigates important resource questions and develops methods for carrying that information to coastal communities. It honors the heritage of its past while looking at contributions that can enhance its future.

Graphic: visual display showing results of an analysis of Sea Grant’s current partnerships with explanatory caption

Graphic: table showing annual appropriations and non-federal matches for last five plus years

Tribute: John A. Knauss – new material, committee to review

In 2015, the marine science and policy community lost one of its greatest leaders. Dr. John A. Knauss was nationally and internationally recognized as a leader in oceanography and marine policy and has had a lasting impact on marine science, policy, and management in the United States. Knauss' legacy and the achievement that he is perhaps best known for is as the founder of the Sea Grant internship program which was renamed the Dean John A. Knauss Marine Policy Fellowship in 1987 in honor of his leadership role. In partnership with Senator Claiborne Pell and Dr. Athelstan Spilhaus, Knauss was instrumental in the formulation and development of the National Sea Grant Program in 1966 and remained involved with Sea Grant for the rest of his career.

Knauss was born in Detroit, Michigan, in 1925. Though he originally sought liberal arts training, his interests turned to meteorology, and he earned a Bachelor of Science from the Massachusetts Institute of Technology (1946) and a Master of Science from University of Michigan in physics. After working with the Navy Electronics Laboratory in San Diego, Knauss decided to pursue a Ph.D. in oceanography from the Scripps Institution of Oceanography.

In his Ph.D. dissertation, he made the first comprehensive measurements of the Pacific Equatorial Undercurrent and demonstrated it to be a major component of the Pacific Ocean circulation. He discovered a similar current in the Indian Ocean. The observations from his Ph.D. dissertation were published in *Science*, *Scientific American*, and *Nature*.

In 1962, he founded and became Dean of the Graduate School of Oceanography at the University of Rhode Island (URI), serving there until 1987. Knauss considered his involvement in Sea Grant at URI to be his biggest political contribution. He strongly believed that scientists have a role and a responsibility to be involved in public policy. While at URI, Knauss served on a commission that led to the creation of NOAA (1970) and the Coastal Zone Management Act.

Knauss served on many government and scientific panels, including being President of the Association of Sea Grant Program Institutions and Fellow of the American Association for the Advancement of Science, the American Geophysical Union, and the Marine Technology Society. He was the Administrator of NOAA from 1989 to 1993. Knauss was inducted into the Rhode Island Heritage Hall of Fame in 1983 and was awarded an honorary Doctor of Science degree from the URI in 1992.

Photo of Dr John A. Knauss with caption: Dr. John A. Knauss (1925 – 2015) was instrumental in the formulation of the National Sea Grant College Program. Credit: University of Rhode Island

The Sea Grant Model

As Sea Grant celebrates its 50th year anniversary, it is important to note that the Sea Grant model builds upon the longstanding tradition of American support for higher education. The Sea Grant model of research, extension, and education provides the scientific foundation and requisite citizen involvement to encourage and promote the wise use and conservation of our nation's natural resources.

Modeled after the land grant system, the National Sea Grant College and Program Act of 1966 authorized "the establishment and operation of Sea Grant colleges and programs by initiating and supporting programs of education and research in the various fields relating to the development of marine resources." Over its 50-year history, Sea Grant research, extension, and education have similarly led to dramatic improvements in the conservation and use of U.S. coastal and marine resources.

The Sea Grant model has withstood the test of time in large part because of its nimble ability to respond to emerging challenges through its partnership structure of the federal government, coastal states, universities, and the private sector. This partnership relies on a framework that includes leadership from the National Sea Grant Office (NSGO), Sea Grant Association (SGA), and the Board, management and support from NOAA; and the intellectual capabilities of more than 3,000 professionals from 300 participating academic institutions. By harnessing the enormous capacity contained at our nation's leading universities, Sea Grant has conducted research leading to new pharmaceutical, fisheries, aquaculture, and energy products from the sea.

Through its network of over 300 university-based extension professionals, Sea Grant has improved fisheries management and product development through applied research and training. It has promoted educational and informational processes that have led to greatly improved community-based planning processes in coastal communities. Through its core mission of building the next generation of scientists and community leaders, Sea Grant educational programs have informed tens of thousands of students annually and support roughly 1,000 undergraduate and graduate students per year who will become the next generation of scientists and coastal leaders in an increasingly global and competitive world. Sea Grant continues to support the renowned Knauss Marine Policy Fellowship Program that has supported over 1,100 alumni since its inception nearly 30 years ago. Many of these fellows currently serve as leaders in government, academia, and the private sector.

As we look forward to the next 50 years, the Sea Grant model will be needed more than at its birth 50 years ago. Information and facts easily gathered from the internet will not be enough for the US to maintain its knowledge pre-eminence. Researchers will need to continue the discovery of new information, and that information will need to be transferred to those who can apply it. A quote from Benjamin Franklin may best illustrate the continuing need for the Sea Grant model, "Tell me and I forget. Teach me and I remember. Involve me and I learn." Through its highly emulated citizen involvement process, the necessary model is in place for the coastal public to expand its learning.

Full page graphic: Sea Grant model and program quick facts to include three-legged stool of Sea Grant, number of programs, and other basic facts

2014 Recommendations and Responses

The following recommendations were made by the Board in *The State of Sea Grant 2014*. Responses under each recommendation note the ways in which each one was addressed by Sea Grant in the succeeding biennium.

2014 Recommendation One

Sea Grant should continue to focus on advancing national priorities while solving problems on a local and regional basis. This national focus must continue to emphasize partnerships and collaborative efforts within the Sea Grant network and with other federal, regional, state, and local agencies and organizations, without loss of sensitivity to community stakeholders' needs.

Response: In accordance with its Federal mandate and widely accepted model, Sea Grant has actively addressed this recommendation. For example,

- Sea Grant Programs around the Gulf of Mexico addressed a need noted by the National Marine Fisheries Service. Sea Grant hosted a red snapper workshop for government and research scientists, the Gulf Fisheries Management Council, and representatives from the fishing community. Plans were made to move forward on addressing the issue of stock assessment and modeling.
- Partnerships are building through Extension Liaisons in NOAA environmental laboratories (see Appendix B map of facilities).
- Topical collaborations on oyster research, harmful algal blooms, aquatic non-native species, and other issues are expanding.
- Sea Grant is a leader in NOAA's coastal community resilience efforts through its community-based research and extension efforts and online Resilience Toolkit.

The Board feels that activities in this category are numerous and expansive; this no longer needs to be a recommendation but a continuing expectation of Sea Grant operations.

2014 Recommendation Two

Sea Grant should continue to support tracking and reporting of the cumulative, measurable impacts of Sea Grant activities toward the achievement of national goals.

Response: Sea Grant's legislative mandate for research, extension, and education carries a responsibility for ongoing demonstrations of effectiveness, awareness of additional opportunity for growth, and responsiveness to local, state, regional, and national needs. Metrics for impacts have been developed and implemented in all aspects of Sea Grant programming. The Planning, Implementation, and Evaluation (PIE) process has achieved another four-year cycle of annual reports, Site Review Visits, and Program Review Panels, and all programs have been found to meet the Sea Grant Standards of Excellence.

The Board feels that this no longer needs to be a recommendation but a continuing expectation of Sea Grant operations.

2014 Recommendation Three

The continued viability of Sea Grant relies on adjustment of budget equity among programs, while maintaining program review and merit considerations. The Sea Grant network should embrace steps toward balancing the federal funding among programs, with a goal of assuring all programs a minimum base of funding.

Response: Budget rebalancing began through the 2014 appropriation, with smaller programs being provided funds to raise their budget to at least \$1 million. Seven Sea Grant programs were affected. When additional Federal funds are available, the rebalancing will continue for greater budget equity among the state programs.

2014 Recommendation Four

Sea Grant should strengthen the focus area in environmental literacy and workforce development by demonstrating how Sea Grant K-12 and informal Science, Technology, Engineering, and Mathematics (STEM) education programs and targeted graduate fellowships are mission critical, respond to national priorities, and result in evidence-based accomplishments and impacts.

Response: Environmental literacy and workforce development continue to be a priority to the Sea Grant network, and there continues to be increased attention to it in the NSGO. New hires have been charged with education responsibilities; the Sea Grant Educator's Network meets regularly online for sharing program information and ensuring its availability to the public.

Metrics for education have been strengthened, but more review is needed in this area. Further efforts to strengthen evaluation of program efforts are included in the 2016 recommendations. NOAA's Office of Education reaches out to Sea Grant with its research webinars to review successful practices and how success is measured.

Language in both House and Senate Sea Grant Reauthorization bills strengthens the Knauss Fellowship by noting that it SHALL be implemented (rather than MAY).

Focus Areas

The 2014-17 Sea Grant Strategic Plan identifies four focus areas—Healthy Coastal Ecosystems, Sustainable Fisheries and Aquaculture, Resilient Communities and Economies, and Environmental Literacy and Workforce Development. This section contains a sampling of some of the many impacts and accomplishments in the four focus areas.

Healthy Coastal Ecosystems

Sea Grant is a leader in understanding, maintaining, and restoring healthy coastal ecosystems. Sea Grant supports ecosystem based approaches to managing the coastal environment, including restoring the productivity of degraded ecosystems and promoting the stewardship of healthy ones through research, extension, and education.

Impacts

Woods Hole Sea Grant coordinates a group called the River Herring Network in support of the professionals who manage the 60 herring runs in Massachusetts. The goal of the Network is to facilitate communication and assist herring wardens make local management decisions that are informed by the best available science, an ecosystem based outlook, and an understanding of regional, state, and federal management decisions. Woods Hole Sea Grant hosts a website dedicated to this program as well as an annual forum.

PHOTO AND CAPTION: California Sea Grant has studied the effects of Marine Protected Areas and shown that they are effective in restoring fish populations but the change does not happen quickly.

Delaware, Maryland, and Virginia Sea Grant programs are working together to improve water quality in the Delmarva Peninsula by assisting local planners using computer models to assess nitrogen inputs into the Chesapeake Bay from different land uses.

Texas Sea Grant led a study to determine that bioaccumulation of pharmaceuticals used daily by Texas residents end up in marine life and can exceed human therapeutic doses. Texas Sea Grant researchers are currently studying the effects these products have on fish and wildlife.

PHOTO AND CAPTION: A researcher supported by Minnesota and Michigan Sea Grant programs developed the first ever vertebrate pheromone biopesticide for use in US waters. The pheromone attracts invasive lampreys to a location where they can be trapped.

PHOTO AND CAPTION: Ohio Sea Grant leads an ongoing effort against Harmful Algae Blooms (HABs) in Lake Erie. They work with water treatment facilities to help them identify HABs and remove toxins from their facilities water output.

Ohio Sea Grant's shrink wrap recycling program is saving marinas and taxpayers money while conserving landfill space and providing a useful product. More than 4,000 pounds of boat shrink wrap was recycled from Ohio marinas in 2014 (2.2 million pounds of shrink wrap in total has been recycled since 2006). Marinas save about \$300 per year in reduced waste disposal costs while keeping the material out of landfills. The recycled plastic has been made into nearly 332,000 highway guardrail spacer blocks, protecting over 414 miles of highway.

North Carolina Sea Grant led an effort in 2015 to survey nearly 170 miles of waterways by agencies and volunteers to address growing issues with invasive hydrilla. A North Carolina Sea Grant extension specialist convened local, state, and federal agencies resulting in a new multi-agency technical advisory group to address the issue. Additionally, North Carolina Sea Grant conducted technical training and produced educational materials focused on hydrilla.

PHOTO AND CAPTION: Indiana-Illinois Sea Grant helped eight new pharmaceutical collection centers get started in 2015. There are now 49 in the two states. They collected 28,577 pounds of pharmaceuticals in 2015, keeping them out of the states' waterways.

MIT Sea Grant research on biometric sensors to understand changing ocean conditions is expected to grow into a significant business opportunity. The market for these sensors is expected to grow globally to a 17.4 billion dollar business by 2020.

Alaska Sea Grant collaborated with Alaska native hunters to document marine mammal subsistence hunting and habitat knowledge to create GIS maps with traditional knowledge and current sea otter distributions. Bristol Bay regional tribes used this information to develop a marine mammal conservation plan.

In 2015, Texas Sea Grant-led volunteers protected, enhanced, or restored 1,161 acres of coastal prairie, dune, and wetland habitat including land in the Houston-Galveston metro area.

Sustainable Fisheries and Aquaculture

The original Sea Grant legislation in 1966 emphasized aquaculture which "can substantially benefit the U.S., and ultimately the people of the world, by providing greater economic opportunities, including expanded employment and commerce; the enjoyment and use of our marine resources; new sources of food; and new means for the development of marine resources." (*Sea Grant, The First Ten Years*)

Seafood safety and sustainability, along with public education about seafood selection and benefits, are the goals of this Focus Area. Programs for aquaculture, new markets for seafood, and fishing fleet sustainability are important means of meeting stakeholder needs.

Impacts

Callout sentence: Sea Grant research and education expands perceptions and perspectives on aquaculture.

Maine Sea Grant developed the Maine Oyster Trail, Downeast Fisheries Trail, and other routes that combine tourism with introducing oysters and other seafood to new audiences.

South Carolina Sea Grant likewise combines ecotours, farm, and aquaculture tours. Visitors to sustainable industries along the routes meet local people and learn how the environment is protected as foods from sea and land are harvested and marketed.

Callout sentence: Climate change will challenge some aquaculture efforts

Shellfish and seaweed growers can now get loss protection for natural hazard damage to their crops just like farmers do on land. Connecticut Sea Grant, state and federal agencies, the aquaculture industry, and Connecticut's congressional delegation worked with the USDA to broaden the Noninsured Crop Disaster Assistance Program to include farmed shellfish as commodities. The change to the program adds shellfish grown directly on the ocean bottom and crops grown on ropes underwater, such as mussels and seaweed.

Callout sentence: Sea Grant research on pathogens leads to greater aquaculture success.

Georgia Sea Grant's research on the black gill disease in shrimp yielded a diagnostic tool for monitoring and launched a collaborative project with South Carolina Sea Grant. Investigators leveraged new funding, and newly developed curriculum introduces the issue to students.

Callout sentence: Sea Grant has been instrumental in new business starts for aquaculture.

For the first time, commercial production of marketable size littleneck clams and blue mussels were achieved thanks to research-industry partnerships led by Alaska Sea Grant.

Maryland Sea Grant has provided business training and assistance to help oyster aquaculture entrepreneurs apply for low-interest loans. The seven applicants in 2014 received more than \$400,000 in loan commitments.

Mississippi-Alabama Sea Grant research and extension has led to development of a commercial off-bottom oyster farming industry that approaches \$1 million/year.

Callout sentence: Sea Grant research and development enhances aquaculture outcomes.

Florida Sea Grant research led in 2015 to a new state law allowing use of mechanical harvesters for clams. Research showed only minor short-lived effects on water quality and sediment disturbance.

A Texas Sea Grant-funded research project developed and pioneered a super-intensive indoor shrimp aquaculture technique, the bio-floc system, which was implemented by three commercial shrimp operations, sustaining three businesses and 112 jobs and creating 20 additional jobs for a combined economic impact of \$10.2 million.

Delaware Sea Grant developed artificial bait for eel and conch fisheries that reduces their reliance on valuable horseshoe crabs previously used as bait. Similar catch rates with new and traditional baits demonstrate the value of the new bait in wild harvest.

PHOTO AND CAPTION: Wisconsin Sea Grant, with the Urban Farm Project which raises yellow perch for local markets, reports research indicating fish can thrive in waters with elevated ammonia, nitrogen, and nitrate levels.

Callout sentence: Sea Grant programs coordinate efforts regionally for greater impact.

The live bloodworm trade can bring invasive species into the ecosystem. Wormweed in which the worms are packaged can harbor live animals native to other states. Sea Grant and partners in the Mid-Atlantic region have worked to reduce the risk of importing invaders by creating an ambitious research and education project. Sea Grant programs in Delaware, Maryland, New Jersey, North Carolina, Pennsylvania, and Virginia are involved.

Callout box: Red Snapper

The red snapper is popular with sport and commercial fishers across the Gulf of Mexico. Historical overharvesting resulted in a depleted population, but under current management measures the population is recovering, with full recovery expected by 2032. Some controversy surrounds the current stock assessment, particularly the accuracy of population estimates on artificial reefs and other structures difficult to sample using trawl surveys. After regional consultations with state, academic, and user communities, a two-phase competitive grant process was instituted. Phase I includes the development of an experimental design. Phase II will use this design to implement a U.S. Gulf of Mexico study to obtain a one-time estimate of absolute abundance to compare with the current red snapper stock assessment. Sea Grant and NOAA Fisheries are working together to take full advantage of the \$12.5 million research competition appropriated in fiscal year 2016.

Resilient Communities & Economies

Sea Grant uses research and its extension infrastructure expertise with communities to inform them of the risks of living in the coastal regions. Sea Grant helps communities respond to environmental issues and hazardous events and ensure a strong coastal economy.

Impacts

Mississippi-Alabama Sea Grant working with federal and local partners place markers throughout the coastal community reminding residents of previous high water levels.

PHOTO AND CAPTION: Louisiana Sea Grant developed a free smartphone app that will improve emergency preparedness for those who navigate Louisiana coastal waters.

Five Sea Grant Programs, with the support of the NSGO and NOAA National Ocean Service, hired individuals to serve as regional coordinators for the NOAA Sentinel Site Program. They measure the ecological impacts of sea level rise and apply science-based solutions. The coordinators bring researchers, managers, and other stakeholders together throughout their assigned Sentinel Site region.

South Carolina Sea Grant is part of the Charleston Resilience Network, a public-private partnership designed to coordinate regional efforts to plan for and adapt to increasing flood challenges in Charleston. The area is flooding more frequently, forcing the closure of streets.

Washington Sea Grant educates Ship Pilots and Coast Guard personnel on how to escape “one of the worst exposed areas on the west coast” – Port Angeles.

The Homeowners Handbook to Prepare for Natural Disasters was first developed by Hawai'i Sea Grant. They have distributed more than 75,000 copies and now have a free online version available. The fourth edition will be published in 2016 with hurricane and tsunami risk.

PHOTO AND CAPTION: A \$50,000 project funded by Virginia Sea Grant led to an additional \$120 million in grant funding from the USDA to implement resiliency designs in a Norfolk community. The area had experienced a 14-inch rise in local sea level since the 1930s.

A Florida Sea Grant extension specialist partnered with local businesses to develop a mobile application that markets local ecotourism opportunities in Florida's Panhandle region. The application was showcased at the Pensacola Airport in 2015 and was viewed by over 200,000 visitors. Interviews with ecotourism businesses showed that their businesses had improved because of the app.

PHOTO AND CAPTION: Georgia Sea Grant, using a participatory approach, assessed how coastal flooding risks exacerbated by sea level rise were impacting the City of Tybee Island, and explored adaptation actions to make the City more resilient over time. Tybee Island City Council voted unanimously to accept the plan, the first of its kind in Georgia.

Oregon Sea Grant, working with the Seismic Rehabilitation Grant Program (SRGP), created an earthquake preparedness app that was viewed a quarter of a million times in the first six months. Because of the effort, the SRGP was awarded \$300 million from the Oregon Legislature for public renovations in seismically sensitive areas. Oregon Sea Grant also works with communities on the desirability of relocating schools and emergency services out of tsunami hazard zones, setting up neighborhood supply caches on high ground, and holding regular community-wide disaster drills.

Environmental Literacy and Workforce Development

"Adequate training and education of manpower" was one of the three pillars supporting the original design of the National Sea Grant Program in 1966. Today's Sea Grant seeks to build an environmentally literate public through a continuum of lifelong formal and informal engagement opportunities. Sea Grant builds a future workforce with knowledge and skills critical to local, regional, and national needs.

Impacts

Callout sentence: Sea Grant Educators are national and global leaders who contribute to national STEM culture.

Florida Sea Grant extension staff received a NOAA Marine Debris grant for statewide public education on threats and sources of microplastics, along with data collection and analysis by volunteers in coastal rivers. Over 100 trained volunteers now present information statewide. Program evaluations show overwhelming awareness and behavior change responses to the education efforts.

Connecticut Sea Grant has a designated Fulbright Specialist for international ocean literacy on staff. In 2015 she co-led an international Ocean Literacy workshop in Copenhagen with invited experts from Japan, US, Canada and the European Union to assess strategic benefits for integrating Ocean Literacy into institutional research and training strategies. The European Commission has learned from the U.S. and developed funded partnerships based on the concept of ocean literacy.

Callout sentence: Sea Grant adapts to educational and workforce needs in many settings and time frames.

Alaska Sea Grant's Young Fisherman's Summit has had 50-70 trainees each year for all aspects of the seafood industry. Fishing industry leaders mentor new or young fishermen on topics such as business management, seafood markets, the regulatory process, and fisheries science.

Pennsylvania Sea Grant assisted technical school students to assemble porcupine fish habitat structures, which mimic the natural environment and could result in healthier, more diverse fish communities. Three hundred students monitor the sites using student-built Remote Underwater Vehicles (ROVs) following the MIT Sea Grant model.

PHOTO (of Puerto Rico Sea Grant) AND CAPTION: Sea Grant curriculum materials, keyed to Ocean and Great Lakes Literacy principles as well as Next Generation Science Standards, are updated and expanded often. New curriculum topics in this biennium include ocean acidification (Washington Sea Grant), mangroves and seagrass beds (Puerto Rico Sea Grant, in Spanish), and microplastics (Oregon Sea Grant).

North Carolina Sea Grant researchers conducted an environmental education (EE) evaluation and distributed a new model for assessing EE effectiveness. Publications and media reports have increased conversations and interest in EE evaluation across North Carolina and the Southeast.

PHOTO AND CAPTION: In Guam, Sea Grant's Builders of a Better Bay (BBB) students collect turbidity and water level data at rivers within the Pago watershed. BBB can help assess the extent to which upland activities affect the bay. The Biib's Kids curriculum for Palau now spans four elementary grades. Students in the curriculum have met with local, state, and national legislators about resource management.

Callout sentence: Innovative media and methods illustrate Sea Grant educators' skills in pedagogy and science for bringing timely topics to learners.

Maryland Sea Grant educators train teachers in aquaponics, in which fish and plants are raised in recirculating closed systems. In turn, the teachers help students to use science and engineering to solve practical problems, important STEM goals. Sea Grant's data on students and process were published in the European Journal of Health & Biology Education in 2015.

Louisiana Sea Grant developed an award winning oral history film, *The Telling Tide*, with interviews conducted by high school students in four coastal communities. Students became more aware of coastal issues, reported being more confident talking to their elders, and noted the value of communication skills.

Ohio Sea Grant developed the first Sea Grant iTunesU course on the topic of climate Impacts in the Great Lakes. Launched in November of 2014, it was featured by Apple, Inc. and was the top downloaded Ohio State University course in December 2014 with 69,587 viewers and 7,587 subscribers. This is one of several eLearning opportunities developed by Ohio Sea Grant to bring current research to the public and stakeholders.

South Carolina Sea Grant engaged the support of a local business to provide a high-technology weather buoy for STEM learning in elementary education.

Sea Grant in Action

In addition to the ongoing efforts within each of Sea Grant's four focus areas, some efforts stand out as addressing new and growing challenges and opportunities. In this section, we highlight the ways in which Sea Grant is currently "in action" to address issues related to resilience, aquaculture, and ocean acidification.

Resilience

As our coastlines continually face change and are confronted by hazards, Sea Grant is working with coastal communities to ensure their ability to overcome hardships and bounce back as healthy, thriving communities. Improving the resilience of coastal communities to natural hazards (floods, storms, earthquakes, etc.) as well as man-made disasters (oil and hazardous material spills, levee breaches, etc.) depends on our ability to understand and anticipate hazard-driven challenges. Sea Grant is in a position to mobilize and respond quickly to disasters. The Sea Grant model allows for local solutions that are adaptable and transportable to other communities and other hazards. Sea Grant is developing tools and techniques, downscaling models to examine potential local scenarios, increasing awareness of natural hazard driven challenges, and creating consensus on how communities can best adapt.

By the numbers

Each year, Sea Grant programs dedicate approximately \$16 million to resilience efforts. A portion of this amount comes from the annual mini-grants the NSGO provides to the 33 Sea Grant programs to support program development in the area of resilience. These mini-grants have led to ongoing research, extension, and education efforts on resiliency and have resulted in Sea Grant programs securing tens of millions in additional grant funds.

In 2015, Sea Grant provided 730 resilience-focused trainings. In addition, 570 communities worked with Sea Grant in 2015 to implement sustainable development practices. Currently, there are over 100 tools available in the Sea Grant Resilience Toolkit (which links to the broader NOAA Climate Toolkit).

Impacts

Each coastal community deals with a unique set of challenges, and Sea Grant programs across the country adapt the Sea Grant Model to work locally, involving stakeholders and decision-makers, to identify resilience options that best fit the community.

Through an inclusive collaborative planning process facilitated by Alaska Sea Grant and others, the village of Shaktoolik, AK, decided to "defend in place" against anticipated climate threats. Facing imminent flooding and erosion due to climate change, the team prepared an adaptation plan that was approved by the community. It emphasizes public safety, property protection, cost-effectiveness, and fundable options using local talent, labor and materials. As a result, residents and leaders of Shaktoolik prioritized response measures and have completed a protective berm, the first adaptation measure.

PHOTO AND CAPTION: University of Southern California Sea Grant is building resilience in coastal communities with a new citizen science program called the Urban Tides Community Science Initiative.

The Planning Board of Chelsea, MA has new climate change adaptation guidance thanks to a group of students from Worcester Polytechnic Institute (WPI) and MIT Sea Grant.

The Hawai'i Sea Grant project, "Building Resilience to Coastal Hazards and Climate Change in Hawai'i," helps communities reduce their vulnerability to natural hazards and climate change. The project is supported by a grant of \$850,000 from NOAA's Regional Coastal Resilience grant program.

Supported by Lake Champlain Sea Grant and partners, communities are implementing storm water plans to improve flood resilience via rain gardens, pervious paving materials, and gravel.

Rhode Island Sea Grant is helping to bring the FORTIFIED Home™ program to the state in order to construct resilient buildings. FORTIFIED Home™ is a set of engineering and building standards designed to help strengthen new and existing homes through building upgrades to minimum building code requirements that will reduce damage from specific natural hazards.

Callout box with photos: Hurricane Sandy Response

Sea Grant helps communities and businesses develop long-term solutions for climate change adaptation. The 2013 Disaster Relief Appropriations, a \$1.8 million grant to Sea Grant programs in Connecticut, New Jersey, and New York is supporting the Coastal Storm Awareness Program (CSAP). Overseen by local and state emergency managers, the National Weather Service, and state coastal zone managers, CSAP identified which sources of storm warnings are most trusted, what factors influence decisions by residents, and what changes might make storm warnings more impactful. New Jersey Sea Grant integrated CSAP results into a series of workshops and a hands-on lesson plan to teach students about storm surge. Connecticut Sea Grant established the Climate Adaptation Academy to identify climate issues and share solutions on topics such as flooding, living shorelines, and legal issues. At the request of the Governor's New York State Resilience Institute for Storms and Emergencies, New York Sea Grant helped evaluate evacuation plans and community response capabilities, identify local emergency responders, and analyze critical information gaps needed to improve evacuation plans and save lives.

Aquaculture

The U.S. imports more than 90% of the seafood we consume; over half of that is produced via aquaculture. Current estimates of US aquaculture production, freshwater and marine, are valued at \$1.2 billion; 6% of domestic seafood landings by weight and 20% by value. Since its beginning, Sea Grant has been involved in research to support sustainable aquaculture, leveraging federal, academic, and industry partners to support increased efficiency and yield, investing in high-priority research, and engaging communities through extension programs that bring together the collective expertise of extension agents, educators, and communicators.

By the numbers

Sea Grant funding for aquaculture has ranged from \$1 to 9 million. In FY 2016, Sea Grant has up to \$3.4 million for two national competitions in aquaculture research (a total of \$5.1 million with match dollars). Topical priorities are: a) research to inform pending regulatory decisions regarding aquaculture on the local, state, or federal level leading to an information product—such as tool, technology, template, or model—needed to make final decisions on a specific question; b) research to support the introduction

and/or increase in production of new and emerging species; c) research that supports continued seafood safety and product quality; and d) social and/or economic research to understand aquaculture issues in a broader context. Also available through competition is \$400K for aquaculture conferences, workshops, training, and information transfer projects. Detailed information, including past award recipients and projects, can be found on the Sea Grant website. The 2017 President's budget includes a budget line for \$7 million for national grant competitions called "Marine Aquaculture Program," that funds the Sea Grant aquaculture program. In addition to the annual aquaculture competitions, many Sea Grant programs include aquaculture research, extension, and education in their ongoing base-funded program activities.

Impacts

PHOTO AND CAPTION: A team led by University of New Hampshire Sea Grant designed an aquaculture raft that allows for a four-season fish and shellfish source and improves water quality by removing nitrogen. Testing is underway with steelhead trout, blue mussels, and sugar kelp, potentially valued at \$70,000 annually.

Not everyone embraces aquaculture. Rhode Island Sea Grant research is investigating reasons for support or opposition to help understand the "social carrying capacity" of aquaculture-grown shellfish in the state. Washington Sea Grant assessed stakeholder perceptions of geoduck aquaculture in South Puget Sound and analyzed challenges to permits. Results revealed a level of conflict unsuitable for a collaborative process, but led to a case study for use in college courses.

Procedures developed by North Carolina Sea Grant for spawning striped bass without hormone manipulation have been adopted by the National Program for Genetic Improvement and Selective Breeding. The processes produced millions of fry in 2015 and efforts are ongoing.

A Mississippi-Alabama Sea Grant project found that recirculating aquaculture systems can be a nutrient source for common marsh plants when solids are removed.

Ocean Acidification

Ocean chemistry is rapidly changing because of the burning of fossil fuels and rise in anthropogenic carbon dioxide (CO₂) emissions. Since the start of the Industrial Revolution, the global ocean has absorbed approximately 41% of the CO₂ released to the atmosphere from fossil fuel burning, resulting in a decline in ocean pH on a scale not seen in at least one million years. A lower, more acidic, pH reduces the ability of many organisms to create hard calcium carbonate shells and skeletons. The effects reach from zooplankton to oysters, mussels and corals. This additional stressor, combined with warming oceans and rising sea levels, is causing some economically important organisms to struggle and could lead to the potential collapse of certain aquaculture industries and coral reefs. Sea Grant supports research to improve community understanding of ocean acidification and other climate change-related effects on coastal communities, economies, fisheries, and ecosystems.

By the Numbers

In 2015 grant funds were announced to address the impacts of ocean acidification on key resource species in the northeast (New York Bight to the Gulf of Maine). This effort is supported by dedication of existing funds from the Northeast Sea Grant Consortium (consisting of the Sea Grant programs in the Northeast including New York, Connecticut, Rhode Island, MIT, Woods Hole, New Hampshire, Maine and Lake Champlain) in partnership with the NOAA Ocean Acidification Program. The grant funds are meant

to serve as an aid to assist coastal communities in adapting to current and future ocean acidification conditions in the region. The competition is expected to provide at least \$700,000, and all grant awards will require a 50% non-federal match.

Impacts

PHOTO AND CAPTION: Hawai'i Sea Grant maintains and has expanded the Ocean Acidification Network, begun in 2005, the longest continuous time series of carbon dioxide data in coastal coral reef environments worldwide. Near real-time data is available at several websites maintained by their collaborators at NOAA Pacific Marine Environmental Laboratory (PMEL).

Maine Sea Grant is a member of the steering committee for the Northeast Coastal Acidification Network (NECAN) to develop an Ocean Acidification plan for the region (Long Island Sound to Nova Scotia).

Understanding the role that eelgrass ecosystems play in preparing for and mitigating the effects of climate change provides an opportunity to secure protection and restoration resources.

MIT Sea Grant worked with several partners in Massachusetts to quantify the carbon storage of eelgrass beds, which could serve as refuges for marine bivalves.

Washington Sea Grant was instrumental in obtaining a \$1.5 million grant from the Paul Allen Family Foundation to pilot a novel ocean acidification mitigation strategy in Puget Sound using algae.

Washington, Oregon, and Maine Sea Grant programs are conducting research to increase the viability of aquaculture-grown bivalves in more acidic waters, seeking to develop/identify oysters and mussels that are more tolerant of lower pH.

MIT Sea Grant worked with the Northeast Coastal Acidification Network to convene scientists and stakeholders in two, one-day workshops on ocean acidification to discuss its current known effects, predicted impacts, and knowledge gaps. MIT Sea Grant's most recent research portfolio is dedicated solely to focusing on ocean acidification.

In 2015, New Hampshire Sea Grant-funded researchers determined more acidic seawater reduces lobsters' responses to bait, indicating that ocean acidification may impact lobster populations and the commercial lobster fishery.

Achieving Organizational Excellence

The Sea Grant organization continually works towards excellence, and many of the recent achievements and efforts are highlighted in this section. Sea Grant deserves to be proud of its legal network, the highly successful Knauss Fellowship program, and the completion of another quadrennial review of all program aspects. Concerns still arise with the failure of Congress to reauthorize the program and the ways in which education lacks sufficient understanding and support in the states.

Sea Grant Law and Policy Expertise

Promising solutions to some of our most pressing environmental problems are often derailed for lack of knowledge or by misinformation about existing legal authorities and the opportunities these authorities provide for innovation. Sea Grant is uniquely positioned around the country to undertake critical law and policy research, translate scientific information for policy makers, and reduce legal barriers to the adoption of innovative management strategies to address emerging community needs.

The National Sea Grant Law Center is a nationally recognized and respected resource on ocean, coastal, and Great Lakes law. The Law Center's work with the Western Regional Panel on Aquatic Nuisance Species is helping Western states and several Canadian provinces align their invasive species laws and regulations to improve interstate cooperation and reduce the risk of introduction from recreational watercraft.

The Sea Grant Legal Network also includes legal programs in five states (LA, MS-AL, NC, and RI), and attorneys working with Sea Grant throughout the country. The Legal Network provides technical assistance, develops model ordinances, and facilitates community-planning initiatives. These initiatives help local governments improve floodplain management, adapt to sea level rise, and increase their participation in the National Flood Insurance Program Community Rating System. Sea Grant legal programs and attorneys are responsive to stakeholder needs and can address a variety of law and policy issues arising locally and nationally.

Performance Review Panels and Site Review Teams

Sea Grant is committed to careful planning and rigorous evaluation at both the state and national level to ensure that the program has local, state, and national impacts. The network is currently developing new strategic plans, both on the national and state level, and also has completed evaluations of programs' success in meeting the goals of their 2014-2017 strategic plans. The quadrennial Site Visits were completed in September 2015 and assessed state Sea Grant program operations. Programs are evaluated, on-site, in three general areas: 1) their approach to management; 2) the scope and success of their engagement with stakeholders; and 3) the degree of collaboration with other Sea Grant and NOAA programs, and other relevant partners. The quadrennial Performance Review Panels were held in October 2015 to conduct retrospective evaluations of each program's overall impact on society from both environmental and socioeconomic perspectives and were evaluated against on the state program's 2014-2017 strategic plan. The results of the Site Review are used by the NSGO to determine whether the Sea Grant program is: 1) recertified, and 2) eligible for merit funding. Performance Reviews determine the amount of merit funding a program may receive.

Education in the Network

For 2014-17, Sea Grant recognizes key Environmental Literacy and Workforce Development education efforts as a focus area rather than their previous “Cross-Cutting” status. Formal (K-12 and post-secondary classroom education), informal (non-classroom) education, and workforce development (for trainees and active professionals) are included in the new focus area.

Recognition of education as a focus area shines a spotlight on how the network addresses this “third leg” of the Sea Grant stool, and some issues are brought to light. Every Sea Grant program identifies at least one educator responsible for its activities, but financial support is inconsistent depending on each state program’s strategic plan. Uncertain support for travel and for innovative multi-program initiatives makes it difficult for Sea Grant education to respond collectively to emerging national issues and opportunities. Given the range of audiences and venues for education efforts, it is also difficult to coordinate and evaluate on a national level, and current metrics scarcely encompass the range of impact.

The education “pipeline” from awareness to informed citizens begins like a funnel. Sea Grant educators capture a wide audience, and efforts are locally tailored to increase awareness of ocean, coast, and Great Lakes resources and issues among children and communities. Sea Grant educators work to instill excitement and concern for these resources. More formal engagement of students in science and environmental studies is achieved through innovative Sea Grant curricula and the professional development of teachers. These efforts—from community engagement to formal classroom experiences—can nurture interest in STEM careers. The National Sea Grant Educators Network meets regularly to share program ideas and evaluation techniques. Information from the Network was used by the Board and NSGO to present programs targeting classroom and informal educators at the annual meeting of the National Marine Educators Association in 2016.

Within Sea Grant Education, national and state-based fellowship programs serve to bridge formal education into workforce development. Fellowship recipients are effectively trainees for careers in marine policy, resource management, and science.

Impacts of the John A. Knauss Marine Policy Fellowship

The Dean John A. Knauss Marine Policy Fellowship has been launching illustrious careers by offering direct experience working on the latest issues in ocean and coastal management, fisheries, and research. As a key component of Sea Grant’s workforce development, the Fellowship has provided opportunities for promising students for 37 years. Through these fellowships, nearly 750 fellows have been placed in federal departments and agencies, and over 360 have been placed in the U.S. Congress. Many are impacting current Sea Grant focus areas and Congressional priorities. In recognition of Sea Grant’s 50th Anniversary, the programs collected profiles of many of the more than 1,100 Knauss alumni in a new “Where are they now?” feature on the Sea Grant website.

Return on Investment

Because of Sea Grant’s matching requirement, there is at least one dollar of state and local funds for every two federal dollars spent. The work Sea Grant does earns a 475% return on federal investment, creating jobs, and ensuring Americans can live near, vacation at, and earn a living from our oceans and Great Lakes for generations to come.

Graphic: federal investment compared to ROI

Sea Grant Reauthorization

Since the passage of the National Sea Grant College and Program Act in 1966, Sea Grant has continuously received strong bipartisan support from the Senate and House of Representatives in the U.S. Congress. This is evidenced by repeated reauthorization every five years until 2015. In the 114th Congress, identical bills were introduced from the Senate (S. 2030) and House of Representatives (H.R. 4394) to reauthorize Sea Grant. More recently, the Senate has passed S. 3282 having the same provisions.

The NSGO is the only NOAA program that has operated under an administrative funding cap. To improve management of the Program, the reauthorization bills recommend an increase for the NSGO to 5.5% of the authorized appropriation for the whole program or the amount specifically appropriated for administration, whichever is less. This will help the Office replace numerous office vacancies and increase productivity for the Sea Grant Programs that they serve. The bills also authorize the NSGO to use the Inter-governmental Personnel Act to take on short-term appointees from the Sea Grant Colleges. Both of these measures will facilitate the greater range of support services needed at the national level.

Further, the reauthorization legislation seeks to solidify the popular John A. Knauss Marine Policy Fellowship program by making it mandatory, subject to available appropriations. Over 1,100 graduate students have served as Knauss Fellows. There is language recommending the placement of Fellows in the legislative branch each year, and authorization for direct hire authority into any federal agency for which the candidate meets qualification standards (subject to availability of appropriations). Finally, reauthorization would change the frequency of this report from the Sea Grant Advisory Board, to every three years rather than biennially.

Significantly, the current Senate and House bills both recommend authorization of appropriations at exactly the same five-year amounts from 2015-2020 as were recommended in 2008 for the years 2009-2014. Congress indicated in the legislation that the activities for fiscal years 2016-2021, with an additional \$18,000,000 per year for competitive research grants, should include priority concerns of aquatic non-native species, oyster disease, harmful algal blooms, coastal resilience, sustainable aquaculture, and fishery extension activities to enhance existing core programs.

The Sea Grant Advisory Board and Sea Grant Association continue to support current re-authorization legislation and encourage early passage.

Full page graphic: Sea Grant by the numbers

Full page graphic: Sea Grant program locations

2016 Recommendations and Justifications

Recommendation One

Encourage NOAA to seek partnerships with Sea Grant to build on the existing investments and reputation of the Sea Grant Extension Program.

Justification: Sea Grant's extension program is consistently recognized for engaging stakeholders with reliable products, services, and information that address local needs, while also transferring research priorities back to their universities. Sea Grant should work with other NOAA line officers to raise awareness of Sea Grant extension capabilities, and find common opportunities that build on Sea Grant expertise and experience to increase the impacts of NOAA investments and NOAA's service to society.

Recommendation Two

The NSGO should support the expansion of the Sea Grant Liaison Program throughout NOAA line offices, labs, and programs, based on the recommendations of the Board in their XX/XX/2016 Liaison Subcommittee Report.

Justification: The NSGO has successfully provided Sea Grant Liaisons to requesting NOAA line offices and laboratories. The program is a partnership between Sea Grant college programs, Sea Grant extension, and the receiving NOAA line office and/or laboratory, and is especially beneficial when there is need for stakeholder engagement.

Recommendation Three:

Sea Grant should enhance diversity and inclusion throughout the network so that its workforce is representative of the nation and audiences the programs serve.

Justification: Census projections estimate that more than half of all Americans will belong to a minority group by 2044. To meet the needs of a changing society, Sea Grant must make sure their workforce is representative of, and meeting the needs of, local communities.

Recommendation Four

Sea Grant needs to demonstrate how its K-12 and informal education programs collectively respond to national priorities and result in evidence-based accomplishments and impacts. To accomplish this, Sea Grant programs should enable collaboration through consistent financial and political support so the Education Network can work together.

Justification: Sea Grant can leverage its extensive program and products to be on the forefront of environmental literacy and STEM nationally and globally, but much energy is wasted on political justification and garnering fiscal support beyond salaries. An educator within a program has multiple masters and demands for service, with little time, money, or incentive to offer follow-up to enthusiastic participants and reflect substantively on program impacts. With additional program funds and opportunities to work as a group, Sea Grant Educators could develop collective projects for wider impact.

Recommendation Five

Sea Grant should revisit the concept of focus teams (or similar) as a mechanism for gathering and sharing the wisdom and experience of experts in subject matter relevant to Sea Grant's mission.

Justification: Sea Grant's highly praised nimbleness to address important and emerging coastal issues depends on awareness of emerging issues and cutting edge science. It is important for Sea Grant to maintain and enable this forward-looking function and the NSGO should organize and support a new mechanism that replaces focus teams.

Emerging opportunities

The Board highlights several emerging opportunities in this section including prospects within the four strategic focus areas as well as additional possibilities in data sharing and results from a recent Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis.

Healthy Coastal Ecosystems

- Increased coordination within SG network and with NOAA/external partners.
- Building up HCE social science portfolio to support development of ecosystem-based management strategies.
- Innovation and outreach on ocean acidification, climate impacts, and blue carbon, as well as in more established topic areas.

Sustainable Fisheries & Aquaculture

- New seafood markets and techniques.
- Growing demand for sustainably caught and produced seafood.
- Guidance needed to navigate complicated aquaculture regulatory environment.
- Integrated plant and seafood aquaculture systems that reduce nutrient levels and, perhaps, ocean acidification effects.

Resilient Communities and Economies

- Catalyze larger impacts by coordinating data and information delivery across Sea Grant and across NOAA.
- Build on the progress achieved through the COP21 Climate Agreement, including fostering cooperation, identifying knowledge and legal gaps and needs, and promoting the development and dissemination of tools and methodologies for the implementation.
- Portfolio Opportunities:
 - Natural infrastructures for mitigation and adaptation,
 - Integrated approaches to water issues, and
 - Climate adaptation with regards to all impacts.

Environmental Literacy & Workforce Development

- Sea Grant can leverage its extensive network and products to be on the forefront of environmental literacy and workforce development in STEM nationally and globally. Recommendation #4 for 2016 would provide the opportunities for collaboration and collective growth to make this happen.
- New technologies for instruction can enhance Sea Grant education. Engaging people at earlier ages [“digital natives”] enables Sea Grant to become aware of the potential for new technologies for learning.
- Reaching out to diverse and underrepresented groups helps expand the potential for a STEM workforce.

Data Sharing

Sea Grant network has formed a “Sea Grant Data Stewardship Subcommittee” to develop a consistent set of principles that guide the formulation and operation of Sea Grant data management plans. Members of the subcommittee were invited to participate in a NOAA Environmental Data Management workshop held in January 2016. A key opportunity is Sea Grant can play in the generation and integration of coastal big data. Several Sea Grant funded research projects generate data that is local or regional in scope. Combined together, Sea Grant programs produce substantial quantities of spatiotemporal data that can be aggregated, analyzed, and evaluated to advance our focus areas and create additional education and research opportunities as well as opportunities to connect coastal big data to Sea Grant’s 2018-2021 national and state-level strategic planning.

National Leadership Planning Session

In 2016 a team of Sea Grant leaders consisting of representatives from the NSGO, SG, and the Board, conducted a high-level SWOT analysis of Sea Grant to inform future planning. Nine themes emerged as areas of opportunity for Sea Grant. They include:

- Branding for Sea Grant
- Knauss Fellowship program
- Future funding opportunities to support the Sea Grant mission
- Strategic partnerships
- Regionalizing the Sea Grant model
- Staying ahead of emerging issues
- Education and the balance of the three-legged stool (extension, research and education)
- Workforce development (including a focus on diversity and inclusion)
- Operational matters

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Draft

NOAA Liaison Committee Report



**NOAA Sea Grant Extension Liaison Program Review
Presented to the National Sea Grant Advisory Board
August 12, 2016**

I. Background and Rationale

Since 1966, the National Oceanic and Atmospheric Administration (NOAA) National Sea Grant College Program (Sea Grant) has demonstrated its effectiveness in extending science-based ocean and coastal research to coastal stakeholders. Sea Grant is a program administered by NOAA's Office of Oceanic and Atmospheric Research (OAR) and in the past 50 years, millions of constituents have benefited from an outreach infrastructure that consists of Sea Grant Extension (SGE) agents and specialists, communications professionals, and educators in 33 coastal states and territories. Some 400 university-based SGE agents and specialists serve as educators who apply science-based knowledge to solving many of the urgent problems confronting coastal, marine, and Great Lakes audiences.

By the late 1990s, it was determined that SGE and many of its stakeholders would benefit from closer collaboration between Sea Grant and OAR's research laboratories. By doing so 1) Sea Grant would gain wider access to OAR's expertise and products; and 2) Sea Grant's constituents would be better served with additional scientific and technological information. At around this time, the National Sea Grant Advisory Board was tasked with evaluating the Sea Grant Extension Program (SGEP) including its role within NOAA. The Advisory Board enlisted former NOAA Administrator, John Byrne, to chair a committee of experts in developing findings and recommendations to guide the SGEP in the future. The resulting seminal report, "A Mandate to Engage Coastal Users: A Review of the National Sea Grant College Extension Program and a Call for Greater National Commitment to Engagement," considered the placement of Sea Grant within NOAA and the need for NOAA to improve its contact with its user community. The Panel recommended improving the role of Sea Grant within NOAA, improving NOAA's organization with respect to its engagement with the public, and improving the ability to deliver extension services to the public by the National Sea Grant Office (NSGO), SGEP, and their university partners.

The Mandate to Engage Coastal Users report provided the impetus for Sea Grant to work with its NOAA partners to develop extension liaison relationships. These liaison positions serve as a conduit for a two-way flow of information: the transfer of NOAA Labs and Programs' research and educational information to operations and the transfer of community needs to inform NOAA Labs and Programs' research through the Sea Grant Extension framework. The early positions with OAR labs (GLERL, AOML, NSSL) originated from discussions at NOAA headquarters by both the NSGO and OAR leadership in part as a reaction to the report. At first and in general, the reaction from

the Sea Grant network to establishing liaison positions ranged widely, from wariness about becoming too closely aligned with NOAA and thus losing its education neutrality to recognition that the SGEP provided Sea Grant an idea vehicle to enhance its utility to NOAA. Over time the Sea Grant network and the NOAA programs involved have been convinced of the value of the partnerships and by 2016, the NSGO now provides partial funding for 13 NOAA-Sea Grant Extension Liaison (Liaison) positions, shown in Table 2.

The first Liaison was established in 2001 at the Great Lakes Environmental Research Laboratory (GLERL) following a March 1999 meeting between Great Lakes Sea Grant Network's outreach/ extension staff and GLERL leaders. It was agreed that such a position would facilitate the transfer of information between extension agents and specialists in the Great Lakes Sea Grant Network and the scientists and managers at GLERL. The position is funded by the three project partners: GLERL, the National Sea Grant Office (NSGO) that administers Sea Grant, and Michigan Sea Grant.

Shortly after the GLERL position was established, scientists from the Atlantic Oceanic and Marine Laboratory (AOML) noted the need for a coordinated outreach and education effort to address the long-term management and restoration goals for South Florida ecosystems. An outreach specialist was hired in 2002 to conduct a South Florida Ecosystem Education Project and the NSGO, AOML and Florida Sea Grant agreed to cost-share the position.

A third Liaison position was created in 2005 at the National Severe Storms Laboratory (NSSL) after several years of conversations between OAR administrators, NSSL managers, and NSGO. It was deemed desirable to increase collaboration between the Lab and the SGE network by helping build a weather/climate/coastal management infrastructure for both Sea Grant and OAR that would allow all involved parties to make mutual use of available expertise. A Weather and Climate Extension Specialist (WCES) position at the University of Oklahoma's (OU) Cooperative Institute for Mesoscale and Meteorological Systems the (CIMMS/NSSL) is funded by the NSGO with match provided by OU's Office of the Vice President for Research and CIMMS.

In 2012, two half-time positions were established by the NSGO, Washington Sea Grant (WASG) and Pacific Marine Environmental Laboratory (PMEL) to primarily address tsunami hazards and ocean acidification issues. The tsunami hazards position is currently vacant. There was also a mutual interest on the part of the NSGO, WASG and the Northwest Fisheries Science Center (NWFSC) that led to the establishment of a jointly funded position that focuses on fisheries and related social science issues.

NOAA's Sentinel Site program began in 2011 and is made up of five initial Cooperatives located in the Chesapeake Bay, Hawaii, North Carolina, Northern Gulf of Mexico, and San Francisco Bay. These locations were selected based on the potential for measuring ecological impact of sea level change; socioeconomic factors, such as large population centers; the potential to expand the use of existing NOAA tools, services, and other assets in a given region; and the potential to apply science-based solutions to solve

specific regional coastal problems. The Sentinel Site Cooperatives Sea Grant Liaison position was initiated in 2014 and five outreach coordinators were recruited. Two-year funding for this effort involves National Ocean Service (NOS)/Office for Coastal Management, the NSGO and the five Sea Grant programs in Maryland, North Carolina, Mississippi-Alabama, California and Hawaii. The outreach coordinators facilitate the transfer of information related to the impacts of climate change, sea level change, and coastal inundation to stakeholders in nearby coastal communities.

In January of 2016, Sea Grant developed a new Liaison position in Alaska where, starting in 2015, OAR's Climate Program Office (CPO), Alaska Ocean Observing System (AOOS), the National Sea Grant Office, and Alaska Sea Grant are cost-sharing a coastal community resilience position.

Most recently, Sea Grant partnered with the National Weather Service (NWS) to create an Integrated Water Extension Liaison position located at the National Water Center in Tuscaloosa, AL. A competition was held to find a partnering state Sea Grant program for the position. Initially, it will be a four-year position funded by NWS, NSGO, and the winning state Sea Grant program.

Thus, by leveraging resources, Sea Grant programs and NOAA partners are providing a viable solution to the transfer of scientific information, tools and technologies to coastal stakeholders.

In 2015, Dr. Nikola Garber, Sea Grant's Acting Director, requested that the National Sea Grant Advisory Board (NSGAB) review the progress of the Liaisons' efforts to date and suggest practical improvements to the existing management practices, if any. Mr. Rollie Schmitt, the NSGAB's Chair at the time, was asked to appoint a small committee to explore successes and shortcomings of various models/arrangements, highlight best practices, and recommend opportunities for improvement, and perhaps, expansion or contraction of these positions.

Mr. Dale Baker, the NSGAB's Vice-Chair and former New York Sea Grant Extension Program Leader, heads the committee which also includes Mr. Schmitt, Dr. Jim Murray, and Dr. Amber Mace. The National Sea Grant Office's Ms. Helen Cheng (National Sea Grant Knauss fellow 2015), Ms. Laura Early (National Sea Grant Knauss fellow 2016), Mr. Michael Liffmann (Former Program Director for Extension), and Ms. Elizabeth Rohring (Engagement Lead) staff the Committee.

II. NOAA-Sea Grant Extension Liaison Positions

Sea Grant Extension professionals play a vital role, taking the best science-based solutions and making it understandable and useful to coastal residents, businesses and communities. In addition, Sea Grant extension liaison professionals bring expertise within NOAA on applied research and processes of collaborative science stakeholder engagement to solve problems through needs analysis and provide a mechanism for

engaging NOAA scientists with stakeholders on developing decision-making tools and exploring alternatives.

Much of the background and related information used to produce this report was obtained from documents in NSGO's files, and supplemented through personal conversations with NSGO staff. Telephone conversations were held with the incumbent liaisons, several of the Sentinel Site outreach coordinators, as well as immediate and other Sea Grant and Lab supervisors. They provided updates and additional details concerning their roles, interactions with SGE, accomplishments to date, expectations, and suggestions for improvements. See Table 1 for a complete listing of Sea Grant/Partner contacts. As of late 2015, the following individuals serve in these positions:

1) Dr. Rochelle Sturtevant is located at the Great Lakes Environmental Research Laboratory (GLERL), Ann Arbor, Michigan. She has been in the position since it was established in 2001. Her immediate supervisors are Ms. Margaret Lansing (GLERL's Information Service Branch Chief) and Dr. Heather Triezenberg (Michigan Sea Grant's Extension Program Leader).

2) Dr. Pamela Fletcher, Atlantic Oceanographic and Meteorological Laboratory (AOML), Miami, Florida. 2002. Immediate supervisors are Dr. James Hendee (Supervisory Oceanographer and Director, Ocean Chemistry and Ecosystems Division) and Dr. Martin Main (Florida Sea Grant Extension Leader).

3) Dr. Kodi Monroe, National Severe Storms Laboratory (NSSL), Norman, Oklahoma. 2005. Immediate supervisor is Mr. Alan Gerard (WRD Deputy Division Chief, NSSL).

4) Dr. Meg Chadsey, (Ocean Acidification Specialist) Pacific Marine Environmental Laboratory (PMEL), Seattle, Washington. 2012. Immediate supervisors are Dr. Richard Feely (Senior Scientist) and Ms. Penny Dalton (Director, Washington Sea Grant)

5) (Vacant), (Coastal Hazards/ Tsunami Specialist) Pacific Marine Environmental Laboratory (PMEL), Seattle, Washington. 2012. Immediate supervisors are Dr. Jeremy Mathis (Division lead of Ocean Environment Research Division) and Ms. Penny Dalton (Director, Washington Sea Grant)

6) Dr. Melissa Poe, NMFS Northwest Fisheries Science Center, (NWFSC) Seattle, Washington, 2013. Immediate supervisors are Dr. Philip Levin (Acting Director of Conservation Biology and Program Manager in Ecosystem Science) and Ms. Penny Dalton (Director, Washington Sea Grant).

7) Dr. Davin Holen, Alaska Center for Climate Assessment and Policy; Anchorage, Alaska, 2016. Immediate supervisory committees are Alaska Regional Integrated Sciences and Assessments (RISA) as part of the OAR Climate Program Office (CPO),

Alaska Ocean Observing System (AOOS), the National Sea Grant Office, and Ms. Paula Cullenberg (Director, Alaska Sea Grant).

8) Ms. Sarah Wilkins, Chesapeake Bay NOAA Sentinel Site. 2014. Immediate supervisors are Dr. Jim Sullivan (Chair of the NOAA Sentinel Site Program) and Dr. Fredrika Moser (Director, Maryland Sea Grant).

9) Ms. Maya Walton, Hawaiian Islands NOAA Sentinel Site. 2014. Immediate supervisors are Dr. Jim Sullivan (Chair of the NOAA Sentinel Site Program) and Dr. Darren Lerner (Director, Hawaii Sea Grant)

10) Ms. Jennifer Dorton, North Carolina NOAA Sentinel Site. 2014. Immediate supervisors are Dr. Jim Sullivan (Chair of the NOAA Sentinel Site Program) and Dr. Susan White (Director, North Carolina Sea Grant)

11) Ms. Renee Collini, Northern Gulf of Mexico NOAA Sentinel Site. 2014. Immediate supervisors are Dr. Jim Sullivan (Chair of the NOAA Sentinel Site Program) and Dr. LaDon Swann (Mississippi-Alabama Sea Grant).

12) Ms. Maya Hayden, San Francisco Bay NOAA Sentinel Site. 2014. Immediate supervisors are Dr. Jim Sullivan (Chair of the NOAA Sentinel Site Program) and Dr. James Eckman (California Sea Grant).

13) To be hired, Integrated Water Extension Liaison, National Water Center. 2016. Immediate supervisors will include the Director of the National Water Center (NWS) and the competitively selected state Sea Grant program.

Please see Appendix A for examples other Agency - Sea Grant partnership positions that are not funded through the NSGO.

III. Funding of the NOAA-Sea Grant Liaison Positions

By and large, funding of the NOAA-Sea Grant Liaison positions has involved three (and in one instance, four) parties: the NSGO, a NOAA partner, and the host Sea Grant program. But since each position was created under special circumstance, there is no single funding model. In some instances, the costs are shared equally between three or four partners while in others, the NSGO and NOAA partner share 80% of the cost and the host Sea Grant program provides the balance by matching the NSGO portion. In one case, the Sea Grant program's share exceeds the 50% match requirement and in two instances, the cooperative institutes affiliated with the OAR laboratory pay a sizable portion of the costs while the OAR labs themselves contribute little to the funding.

To provide a better historic funding context, when the first liaison position (GLERL) was created, the NSGO, GLERL and Michigan Sea Grant agreed to split the costs three

ways.¹ But currently, the NSGO and GLERL provide 75 percent of the salary and the remaining 25 percent is covered by Michigan Sea Grant.² The original agreement also stated that the Sea Grant program's costs (in this case Michigan Sea Grant) could also be paid by "the Great Lakes Sea Grant Network." The operating expenses (travel, computer system, phone, email, office space, graphics support, visualization lab, etc.) are provided by GLERL.

Unlike the GLERL arrangement, the AOML liaison relies heavily on extramural funding from the NOAA Lab's partner cooperative institute, the University of Miami's Cooperative Institute for Marine and Atmospheric Studies (CIMAS) and the funding amounts from each partner is variable. The NSGO is currently working with Florida Sea Grant, CIMAS, and AOML to see if there is a more effective funding arrangement for this position.

The NSSL position is funded by the NSGO (67%) with a 33% matching amount from the University of Oklahoma's Cooperative Institute for Mesoscale Meteorological Studies (CIMMS).³ The NSSL does not contribute directly to this position and the liaison does not have a host Sea Grant program. The funding mechanism is also different. The project is funded through a biennial proposal submitted by NSSL to the NSGO. The other liaison positions are included in the Sea Grant host programs' four-year, omnibus proposals.

A new funding model is being used to fund three positions, two with PMEL (2012) and one at the Northwest Fisheries Science Center (NWFSC; 2013). The costs are shared equally between the NSGO, Washington Sea Grant, and either PMEL or NWFSC. The projects are being piloted over a five-year period.^{4 5}

A similar arrangement is in place for the Alaska coastal resilience position. Four parties contribute 25% each: the NSGO, Alaska Sea Grant, the Alaska Center for Climate Assessment and Policy (ACCAP) which is part of NOAA's Regional Integrated Sciences and Assessments (RISA) program, and the Alaska Ocean Observing System (AOOS).⁶

Five liaison positions were created in 2015 to serve as liaison/outreach coordinators at five NOAA Sentinel Site Cooperatives in Maryland-Virginia, North Carolina, Alabama-

¹ "Model for Sea Grant/ OAR/ NOAA Outreach Pilot Position Description; Sea Grant Outreach position at GLERL"

² Memorandum for: Arlene Simpson Porter, Director Grants Management Division; From: Leon Cammen, Director, National Sea Grant College Program / Subject: FY2014-17 Sea Grant Funding Plan for Omnibus Proposals // (Sea Grant Spend Plan 2014-2017).

³ National Sea Grant Weather and Climate Extension Specialist: Continuation of support for Sea Grant Outreach Position at NSSL and the Cooperative Institute for Mesoscale Meteorological Studies at the University of Oklahoma Sept 1 2015 – Sept 30 2016.

⁴ Washington Sea Grant and PMEL Project Proposal Narrative: 'Establishment of a Liaison between Washington Sea Grant and the Pacific Marine Environmental Laboratory'

⁵ Washington Sea Grant and NWFSC Project Proposal Narrative: 'Establishment of a Social Science Liaison between Washington Sea Grant and NOAA Fisheries.'

⁶ 'Enhancing Alaskan Coastal Community Resilience and Adaptation to a Changing Environment' Proposal and Budget Justification June 8, 2015.

Florida, California and Hawaii. Funding is only available for two years and involves cost-sharing between three parties: the NSGO contributes 40%, the host Sea Grant Program's matching amount (20%) and 40% from NOAA's Sentinel Site Program that is administered by National Ocean Service.⁷

The new Integrated Water Extension Specialist position is funded by the National Weather Service (60%) and the NSGO (40%) with matching funds from the competitively selected state program for the NSGO 40%. The position will be funded for a four-year period.

Please see Table 2 for a complete table of funding.

IV. Findings

Below are specific findings from each Lab/Program Liaison

GLERL

The Great Lakes Sea Grant programs and GLERL administrators laud the liaison's work, ability to think regionally, and coordinate with GLERL and other NOAA regional efforts. The annual travel budget is a concern. It is very limited and makes working with the eight Sea Grant programs in the region very difficult.

The Great Lakes Sea Grant Network, Michigan Sea Grant, Michigan State University and GLERL are proposing (see Appendix B) that the NSGO be a signatory to a five-year and renewable Memorandum of Understanding (MOU) between the parties. The MOU would address funding, programmatic oversight, recruitment and supervision, and an annual plan of work.

AOML

The AOML liaison is considered a valuable asset by AOML, the University of Miami's Cooperative Institute for Marine and Atmospheric Studies, and Florida Sea Grant. The position has helped make South Florida coastal marine ecosystems science more available to environmental managers and has produced excellent outreach products and services.

The single biggest concern involving this position is the heavy dependence (nearly 50 percent) on soft money procured through grant competitions. AOML and Florida Sea Grant agree that this arrangement has precluded the liaison from becoming better integrated in AOML and Florida Sea Grant strategic priorities and developing more of a niche(s) as a SGE specialist. Florida Sea Grant, AOML and the NSGO are working to address the funding and programming issues.

⁷ Sentinel Site Proposals 2015-2016; Funding Availability Announcement: NOAA Sentinel Sites Cooperative

NSSL

The current NSSL Liaison along with her predecessor worked with North and South Carolina Sea Grant programs on the Lab's Coastal and Inland Flooding Observation and Warning (CI-FLOW) project. Project emphasis has shifted, and while the current liaison still explores opportunities for coastal flooding/inundation research, it is done under the umbrella of FACETs (Forecasting a Continuum of Environmental Threats), a next-generation hazard forecasting and communication approach, and application of social, behavioral, and economic sciences to high-impact environmental threats.

The NSSL project would greatly benefit from closer collaboration with Sea Grant programs involved in risk communication and hazard resilience which is at the heart of the FACETs program. Also, unlike the other Liaison positions, this project has no host Sea Grant program. Currently, the NSSL liaison attends selected regional and professional meetings with many of her Sea Grant colleagues but the bulk of the communication and project planning involves coordination with other meteorologists, civil engineers, social scientists, and hydrologists, as well as National Weather Service (NWS) forecasters, federal researchers, university faculty, and private businesses.

PMEL

The Sea Grant-PMEL Liaison for ocean acidification has worked with PMEL scientists to produce and distribute several meaningful publications on ocean acidification and established an ocean acidification-monitoring program for local high school students.

The Liaison office is at Washington Sea Grant and she frequently interacts with PMEL scientists at the nearby Lab. The broader Liaison effort would, however, benefit from an increased presence at the Lab but this requires improvements to physical workspace and better IT support services at the PMEL campus.

NWFSC

The Sea Grant-NWFSC Liaison is a social scientist that, among other research and coordination activities, partners with researchers at Swinomish Indian Tribal Community and the University of British Columbia to study the connections between shellfish harvesting, sense of place, and quality of life. The PMEL Liaison is involved with the NOAA California Current Integrated Ecosystem Assessment (IEA), and has been deeply involved in developing approaches to include the representation of Human Well-Being in the IEA. This has included collaboration with more than 10 different institutions including universities, agencies, and Tribes.

The Sea Grant-NWFSC Liaison work is greatly valued by the NWFSC and Sea Grant and there is interest at the NWFSC to make this a permanent position rather than the current five-year term.

Sentinel Sites and Alaska Coastal Resilience Specialist

The five Sentinel Site Outreach Coordinators have been in these positions since spring 2015 and the Alaska coastal resilience specialist was hired very recently. All partners are pleased with the new arrangements and optimistic that the Coordinators will be able to achieve the objective stated in their respective work plans.

Below are general and overall findings of the Liaison Program itself.

- 1) Each of the Lab Liaison positions was established on different dates and agreed upon through correspondence and grant proposals. Thus, there is no consistency as to roles, responsibilities, funding, reporting requirements, etc.
- 2) Found that there was varying and uncertain commitments to duration of funding for the position which could make it difficult to build networks and establish trust necessary for effective extension programming.
- 3) There is no collaboration or communication between all of the Lab Liaisons to discuss successes, challenges, and opportunities for learning from each other.
- 4) The National Sea Grant Office does not have any one individual to oversee the Lab Liaisons. Such a role in the NSGO might help to address Finding 3.
- 5) Overall, the positions are highly valued by the relevant NOAA Labs, the Northwest Fisheries Science Center, Sentinel Sites, and host Sea Grant programs. In general NOAA is unaware of these positions and more importantly, the potential for these positions to help integrate NOAA with its constituents.

V. Recommendations

Based on the findings of the committee, the following recommendations outline some general standard operating procedures intended to improve clarity and efficiency, while still maintaining the flexibility and adaptability of each unique partnership. Some of the recommendations may be more or less relevant depending on the scope of each position. These recommendations are organized around 1) funding sources, 2) the recruitment process, 3) operations, 4) reporting, and 5) evaluation.

Funding Sources

1) Funding: The NSGO should provide more clarity on the availability of resources including funding and NSGO support staff to create and sustain partnerships. In situations where the Sea Grant benefits are regional or national, the NSGO should consider modifying or waiving local program match to reflect the relative value of the position to the program vs. the larger Sea Grant network.

Time Commitment: Since effective extension programming requires establishing trust and building networks among relevant user groups which takes time, the parties establishing liaison positions should typically be considering a minimum of a three-year commitment to the position.

Recruitment Process

2) Application Process: The NSGO should provide more clarity about the process to apply for available resources to sustain existing or create new partnerships. A competitive process to establish new positions is desired but may not be necessary depending on the situation. For example, it may make more sense to award a position to a single program based on the requisite location of the position.

3) Host Sea Grant Program: All placements should have a host Sea Grant Program. Mechanisms and opportunities should be discussed with the Sea Grant Association and Sea Grant Extension Assembly.

Operations

4) Point of Contact: The Liaisons and their hosts and partners would benefit from having a NSGO point of contact that has responsibility for managing, coordinating, and marketing the liaison program throughout NOAA and the Sea Grant network. The Extension Leader is best positioned to help integrate within the broader network and coordinate among the positions.

5) MOUs: When positions would benefit from memorandums of understanding or equivalent agreements between the Labs and the NSGO, it could be modeled after the proposed Great Lakes MOU (see Appendix B) and would address funding responsibilities, supervision, programming and a work plan. MOU should be in effect for four years to coincide with NSGO Strategic Planning and Omnibus cycles. The next cycle begins on February 1, 2018.

6) All Liaisons Meeting: The Liaisons would benefit from occasional joint meetings and, where relevant, coordinated programming. An exchange of ideas would foster further collaborations and partnerships. As Sea Grant extension ambassadors within NOAA, the Liaison should be encouraged and supported to promote the value of Sea Grant extension to NOAA. Promotion (SG Ext ambassadors within NOAA should be encouraged and supported to promote the position throughout NOAA)

7) Advisory Board: Each Liaison should establish a small Advisory Board (AB) whose members are drawn from the Lab, the host Sea Grant program, key constituents, and the NSGO's Extension POC. The AB would primarily advise annual plans of work and opportunities for improved coordination.

Reporting

8) Reporting: Reporting needs to be strengthened with a greater emphasis on deliverables and outcomes. Whereas the Liaisons report annually to their host Sea Grant programs, that information needs to be fully captured and reported to the NSGO as well as the NOAA partner(s). Some information is embedded in the host programs annual PIER reports but the Liaison efforts are typically understated given the reporting limitations.

9) Outreach: The Sea Grant network, in particular, and NOAA OAR in general, know

very little if any about these positions and their roles in helping integrate NOAA with its constituents. A strategy should be devised to raise awareness and the profile without undue burdening of all parties. The NSGO should consider establishing a periodic competition within NOAA to encourage the establishment of additional liaison positions. Such a competition would provide an ideal opportunity to advertise and promote Sea Grant's unique extension strengths within the agency and encourage additional NOAA offices to partner with Sea Grant to enhance the delivery of informational services to the public. NSGO should consider a periodic competition within NOAA to promote the liaison program.

Evaluation

10) Impacts: A summary of Liaisons' impacts and accomplishments, based on the information collected via PIER or another mechanism, should be included as part of the SGAB's Biennial Report to Congress and reported both orally and in writing to NOAA leadership by the SGAB.

Table 1 List of Contacts

Affiliation	Personnel	NOAA Lab Director	NOAA Lab Point of Contact	Year Initiated	Sea Grant Program
Great Lakes Environmental Research Laboratory	Rochelle Sturtevant rochelle.sturtevant@noaa.gov	Deborah Lee Phone: 734-741-2244 deborah.lee@noaa.gov	Margaret Lansing; Information Services Branch Chief 734-741-2210 margaret.lansing@noaa.gov	2001	Michigan: James Diana/ Heather Triezenberg
Atlantic Oceanographic and Meteorological Laboratory	Pamela Fletcher Pamela.Fletcher@noaa.gov	Robert Atlas Phone: 305-361-4300 robert.atlas@noaa.gov	James C. Hendee; Supervisory Oceanographer and Director of Ocean Chemistry and Ecosystems Division 305-361-4396 Jim.Hendee@noaa.gov	2002	Florida: Karl Havens/ Martin Main
Pacific Marine Environmental Laboratory	Meg Chadsey mchadsey@u.washington.edu	Chris Sabine Phone: 206-526-6800 chris.sabine@noaa.gov	Richard Feely; Senior Scientist 206-526-6214 richard.a.feely@noaa.gov	2012	Washington: Penelope Dalton
Pacific Marine Environmental Laboratory	TBA	Chris Sabine Phone: 206-526-6800 chris.sabine@noaa.gov		2012	Washington: Penelope Dalton
National Severe Storms Laboratory	Kodi Monroe Kodi.Nemunaitis@noaa.gov	Steve Koch Phone: 405-325-6904 Steven.Koch@noaa.gov	Alan Gerard; WRD Deputy Division Chief 406-325-6477 alan.e.gerard@noaa.gov	2005	
Northwest Fisheries Science Center	Melissa R. Poe melissa.poe@noaa.gov	Mike J. Ford Phone: 206-860-5612 mike.ford@noaa.gov	Phil Levin; Program Manager of Ecosystem Science 206-860-3473; phil.levin@noaa.gov	2013	Washington: Penelope Dalton
Sentinel Sites MD	Sarah Wilkins sarah.wilkins@maryland.gov	Jim Sullivan, Jim.Sullivan@noaa.gov		2014	Maryland: Fredrika Moser
Sentinel Sites MS-AL	Renee Collini rcollini@disl.org	Jim Sullivan, Jim.Sullivan@noaa.gov		2014	Mississippi-Alabama: LaDon Swann
Sentinel Sites NC	Jennifer Dorton dortonj@uncw.edu	Jim Sullivan, Jim.Sullivan@noaa.gov		2014	North Carolina: Susan White
Sentinel Sites CA	Maya Hayden mkh@berkeley.edu	Jim Sullivan, Jim.Sullivan@noaa.gov		2014	California: James Eckman
Sentinel Sites HI	Maya Walton altonm@hawaii.edu	Jim Sullivan, Jim.Sullivan@noaa.gov		2014	Hawaii: Darren Lerner
Alaska Center for Climate Assessment and Policy	Davin Holen dlholen@alaska.edu	TBA		2016	Alaska: Paula Cullenberg
National Water Center	TBD	TBD	TBD	2016	TBD

Table 2 - Funding

NOAA Affiliation	Original Intent	Reference	Current funding arrangement	Reference
GLERL	Salary is provided by OAR headquarters (75%) and Michigan Sea Grant or the Great Lakes Network (25%)	Model for Sea Grant/ OAR/ NOAA Outreach Pilot Position Description: Sea Grant Outreach Position at GLERL 2001	The current arrangement is as follows: NSGO (30%), OAR/ GLERL (30%), and MISG (40%)	From 2014-2017 Omnibus Spend Plan
AOML	No historical documents were found from the original intent.		The current arrangement is variable. The NSGO, AOML and CIMIS are working to find a more efficient funding arrangement.	
NSSL	No historical documents were found from the original intent. However a draft version of "Proposed Sea Grant Outreach position at NSSL stated: "1) Salary for the position will be provided by OAR headquarters 2) Operating expenses will be provided by NSSL and OU 3) Additional travel support will be provided in the amount of \$3,000 per program annually by the four Gulf of Mexico Sea Grant Programs 4) Space will be made available in the offices of the Gulf of Mexico Sea Grant Programs as necessary when the specialist is working the coastal states. 5) Annual evaluations of the specialist for possible promotion and salary increases will be conducted by the appropriate administrator at OU and by the director of the NSSL	Draft version of "Proposed Sea Grant Outreach position at NSSL. Created in 2005, Modified in 2013	The current arrangement is as follows: NSGO (67%); OU (33%)	National Sea Grant Weather and Climate Extension Specialist: Continuation of support for Sea Grant Outreach Position at NSSL and the Cooperative Institute for Mesoscale Meteorological studies at the University of Oklahoma. May 6, 2015
PMEL	Funding Request of a total of \$165,000; FY2013: \$82,242, with match \$16,448, to give a total \$98,690 FY2014:\$82,757, with match \$15,933, to give a total of 92,690. For five years duration of this pilot position, the proposed funding is as follows: Year 1: PMEL 83%; NSGO 0%; WSG 17%/ Year 2: PMEL 84%; NSGO 0%; WSG 16%/ Year 3: PMEL 0%; NSGO 56%; WSG 44%/ Year 4: PMEL 0%; NSGO 54%; WSG 46%/ Year 5: PMEL 7%; NSGO 52%; WSG 41%/ To provide a total funding as follows: PMEL 33%; NSGO: 33%; WSG: 33% Budget justification for each PMEL liaison position for Year 1 and 2: Coastal Resources Specialist: Sea Grant ~\$22,000 + match ~\$4,000 Ocean Acidification Specialist: Sea Grant ~\$26,000 + ~\$5,000	"Establishment of a Liaison between Washington Sea Grant and the Pacific Marine Environmental Laboratory" Project Narrative & Sea Grant Budget Form 90-4 (OMB Control NO. 0648-0362)	The current arrangement is as follows: Allocation for PMEL and NWFSC positions will be as follows: In FY2014: \$15,306; in FY2015: \$221,784; FY2016: \$221,784; FY2017: \$227,862	From 2014-2017 Omnibus Spend plan

NOAA Affiliation	Original Intent	Reference	Current funding arrangement	Reference
NWFSC	Funding Request of a total of 105,000; Projections for liaison costs through the full first five years are as follows: Year 1: NMFS 54%; NSGO 12%; WSG 33%/ Year 2: NMFS 13%; NSGO 54%; WSG 33%/ Year 3: NMFS 33%; NSGO 33%; WSG 33%/ Year 4: NMFS 33%; NSGO 33%; WSG 33%/ Year 5: NMFS 33%; NSGO 33%; WSG 33%/	“Establishment of a Social Science Liaison between Washington Sea Grant and NOAA Fisheries” Project Narrative & Sea Grant Budget Form 90-4 (OMB Control NO. 0648-0362)	Same as above	Same as above
Sentinel Site Coordinators	The NOAA National Sea Grant Office and the NOAA Sentinel Site Program anticipate that up to \$200,000 in total Federal funding will be available to support Sea Grant Extension (SGE) projects at the NOAA's Sentinel Sites under this announcement. (Also consult the Federal Funding Opportunity NOAA-OAR-SG-2014-2004033 on grants.gov	Funding Availability Announcement for Competition: NOAA Sentinel Sites Cooperative. Date of Posting April 22, 2014	The current arrangement is as follows: NSGO (40%); NOS/ OCM (40%); and SG Program Match (20%)	From two-year (2015-2016) Sentinel Site Proposals
Alaska Coastal Resilience Specialist	This position is new. The current arrangements for this position are as follows: Year 1 Request Budget Narrative Total funds: \$73,000/ Year 1 Total Match Budget UAF: \$36,371; Year 2 Request Budget Narrative Total funds: \$73,000/ Year 2 Total Match Budget UAF: \$36,629	“Enhancing Alaskan Coastal Community Resilience and Adaptation to a Changing Environment: UAF Budget Justification” Sent to National Sea Grant Office 2014-2017.	The current arrangement is as follows: AKSG = \$30k AK RISA = \$30k AK OOS = \$30k CPO/COCA = \$5k CPO/RISA = \$5k NOS/OCM = \$20k NWS/AK Region = \$10k OAR/NSGO = \$33K	This position is new.
National Water Center	This position is new. The current arrangements for this position is \$600K over four years, plus match on Sea Grant Funds only (National Weather Service funds do not require match.)	Funding availability announcement for competition: Integrated Water Extension Specialist at NOAA NWC	The current arrangement is %150K.yr plus match: NWS = \$90K/yr NSGO=\$60K/yr Sea Grant program match=\$30K/yr	National Water Center Liaison proposal.

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Draft

Program Implementation & Evaluation Committee II Report



To: Chair of National Sea Grant Advisory Board

**Final Report of the
*PIE-2 Assessment Committee***

5/9/2016


5/9/16
Admiral Richard West, Chair



CC: Nikola Garber, Director (A) National Sea Grant College Program
Chris Hayes, Committee Co-Chair
Sylvain De Guise, Committee Co-Chair

National Sea Grant Advisory Board Assessment of Sea Grant's Planning, Implementation and Evaluation (PIE) Process Spring 2016

Charge:

The National Sea Grant Advisory Board (NSGAB) should assess the efficacy and implications of the PIE system - review what worked, identify weaknesses, and recommend revisions to improve and streamline the process where possible. This charge was directed by a vote of the NSGAB at its Fall 2015 meeting, and a subsequent task from the National Sea Grant Office (Appendix I).

PIE-2 Assessments Committee Members:

National Sea Grant Advisory Board (NSGAB) – Dick West (Chair), Dale Baker and Brian Helmuth
Sea Grant Association (SGA) – Sylvain De Guise (Co-Chair), Judith McDowell, Rick DeVoe
National Sea Grant Office (NSGO) – Chris Hayes (Co-Chair), Peg Brady, Joshua Brown and Sharon Aziz

Under Review:

Sea Grant's Planning, Implementation and Evaluation System

- Program and Network Planning process and results
- Implementation (e.g., Focus Teams)
- Evaluation
 - Program Annual Reports
 - Program Site Visits
 - Performance Review Panels
 - NSGO Annual Review
 - Biennial Report

Strategy:

Use legislation and previous recommendations, including the 2006 National Research Council review, the 2007 Response Integration Team report, and the 2013 PIE assessment (PIE-1) as basis to make recommendations to improve the process. This document refers to the 2016 assessment as PIE-2 for clarity. The Committee considered feedback from the SGA, participants in evaluation processes (site visits and performance review panels), and other personal communications. The primary driver for the planning and evaluation processes is the legislation: 33 USCS § 1123. For all recommendations, the committee ensured that the PIE process met standing legislative requirements:

- National Network must have a strategic plan (Legislation – 1123D2a)
- All programs must have a four year plan that establishes priorities for the National Sea Grant College Program (Legislation – 1123C1)
- All programs must implement their plans (Legislation – 1126D1)
- All programs must be evaluated (Legislation – 1123D3a)
- Every two years – the NSGAB is to report to Congress on the progress made toward meeting the priorities identified in the National Network plan (Legislation – 1128B2)

Timeline:

After a January 13, 2016 conference call, the PIE Assessment Committee met in Silver Spring on February 17-19, 2016. Chair Dick West presented the findings and recommendations to the NSGAB and SGA on March 7-9, 2016.

This report is a summary of recommendations for improving the PIE process. The complete PIE process is described in Appendix II. Other appendices include the Sea Grant Standards of Excellence (Appendix III), and the 2013 PIE Assessment Committee Report (Appendix IV).

General Finding and Recommendation:

The PIE-2 committee found that the PIE process does meet federal requirements, but it remains too costly, complex, and opaque, the evaluation components are cumbersome and not integrated, and there is a major time lag between program strategic planning and final merit funding allocation.

Recommendation: The NSGO should coordinate with the NSGAB and Program Directors on implementation of the recommendations.

Planning and Recommendations:

Background: There are no major issues with the planning process, although several minor issues were discussed where clarification would be helpful.

Recommendations:

1. NSGO should clarify guidance on preparation and evaluation of strategic plans,
2. State programs should develop plans based on the Network Plan in consultation with their state-level program advisory committees,
3. NSGO program officers should be more involved in the state Sea Grant programs planning process, and
4. NSGO should formally review and approve program plans in a timely fashion.

The committee recommends no major changes to the planning process, beyond closer and clearer collaboration with the NSGO via the program officer.

Implementation and Recommendations:

The PIE-2 committee discussed two key areas related to program implementation: (1) the state of Focus Teams and (2) the relative importance of state program RFPs.

1. Relatively large Focus Teams were once appointed with membership from NSGO and Sea Grant programs, charged with the following tasks: coordinating Sea Grant activities; identifying new opportunities; fostering external partners; and marketing Sea Grant. It was broadly agreed that the Focus Teams performed well in summarizing impacts and accomplishments within Focus Areas, but did not engage deeply in the intended tasks. Focus Teams no longer receive funding to support their activities, and are no longer active.

2. A state Sea Grant program's request for proposals (RFP) represents a significant step in strategically implementing the priorities of a program's strategic plan. Program Officers should review them to better understand a program's focus on the priority needs at both the State and Federal levels.

Recommendations:

1. NSGO should, in coordination with the SGA and NSGAB, take responsibility for:
 - a. Coordinating Sea Grant activities
 - b. Identifying new opportunities
 - c. Fostering external partners
 - d. Marketing Sea Grant
2. NSGO program officers should consult with programs regarding request for proposals to better understand the degree to which the program is addressing its priority needs.

The NSGO has primary responsibility for the implementation of all the important functions previously assigned to Focus Teams, and program officers will consider the request for proposals in their qualitative annual review of the state programs.

Evaluation and Recommendations:

Principles -

The PIE-2 committee felt that the current evaluation system can be greatly improved through better coordination, more transparency, and incorporating greater efficiencies in work load. As such, the committee agreed that program evaluation should adhere to the following principles:

- Utilize and integrate all evaluation tools,
- Maximize collaboration and transparency of process and decision-making,
- Be based on the "Standards of Excellence" (Appendix III),
- Streamline to minimize costs and effort, and
- Ultimately, focus on continual program improvement.

Evaluation Elements –

The PIE-2 committee identified the following as key elements of the evaluation process:

- Site Visits
- Annual Reports
- NSGO Annual Reviews
- Independent Review Panel (IRP)
- NSGCP Director Decision on Merit Funding and Recertification

Program Site Review Visits –

Site Reviews currently evaluate program management and organization, stakeholder engagement and collaborative network activities. Site Visits provide an opportunity for team members to directly engage with state program staff and stakeholders as they

assess operational aspects of the program. The PIE-2 committee feels that site visits could also be used to assess program benefits, as many state programs already share and describe their program efforts and results to illustrate their program organization, engagements, and collaborations as part of their Site Visit exercises. Site visits could capitalize on opportunities to assess performance (at least some elements of leadership) and contribute to performance assessments (see IRP below).

Recommendations:

1. The structure of the Site Visit team should remain in its current form
2. State programs should expand the Site Visit by no more than one-half day (2 days of interaction, half day to draft and present report outline) to consider **all** of the Standards of Excellence (see Appendix III), and
3. Site review reports should include an executive summary for consideration and use by the Independent Review Panel as described below.

The results of this slightly restructured site visit would be formally considered in the overall evaluation process leading to the final rating of the state Sea Grant program and in the distribution of merit funds by the NSGO.

Annual Reports –

Annual reporting is a necessary condition of the grant process. Annual reports currently include impacts and accomplishments, metrics, and performance measures. Some are concerned that there is an incentive to provide an artificially high number of impacts and accomplishments to be reported, thus missing the opportunity to integrate impacts and accomplishments over time to make for stronger stories. The PIE-2 committee discussed limiting the number of impacts and accomplishments in the annual report, as was the case for the most recent PRP review. [Guidelines](#) already exist on the expected number and length of impact to report per year, but those guidelines were not enforced until the recent PRP.

The PIE-2 committee also felt that the state programs, the NSGO (through its program officers), and the IRP would all benefit from the preparation of a one-page narrative by the state Sea Grant director. The narrative would highlight challenges and opportunities the program has/is/will be addressing. The narrative would provide important context within which the state program is working in any given year, and would likely lead to a better understanding of what needs to be done to address them.

Recommendations:

1. The NSGO should significantly limit the number of both impacts and accomplishments submitted by state Sea Grant programs as part of the annual report process, encouraging programs to prepare and submit synthesized results where possible (quality over quantity).
2. State program directors should prepare and submit a one-page summary of challenges and opportunities.

Overall, such steps could reduce the pressure towards over-reporting (and associated time, effort and costs), and shift focus towards continued program improvement.

NSGO Annual Review and PO Visits –

The PIE-2 committee agreed that NSGO program officers should provide more informed feedback and guidance to state programs. Historically, program officers inconsistently reviewed state program annual reports with their programs and presented highlights to the NSGO; this informal assessment included little feedback to the state programs.

Recommendations:

1. NSGO program officers should visit each of their programs annually,
2. The NSGO should meet annually to qualitatively review:
 - a. State program annual reports (including progress on current strategic plan, as well as impacts emerging from past activities),
 - b. NSGO program officer annual visit reports, and
 - c. Follow-up on site review team visit report recommendations
 - d. State program requests for proposals (when applicable),
3. The NSGO program officer should provide formal feedback to the program after each annual qualitative NSGO review,
4. State program directors should have the opportunity to respond to the NSGO annual qualitative review report.
5. The state program annual qualitative review report, along with the state program director's response, should be included in the materials provided to the IRP for consideration as part of the overall quadrennial program evaluation.

Overall, honest and constructive feedback on a regular basis provides opportunity for program improvement. Further, annual feedback and an opportunity to respond provide a basis for documenting program improvement. Program improvement should be taken into account as part of the overall program evaluation.

Independent Review Panel (IRP) –

The Program Review Panels (PRP) from the current PIE process provides ratings that are considered to distribute merit funding. Performance in each focus area is evaluated by a different PRP. The PIE-2 committee finds that the Performance Review Panels (PRP) are inconsistent among the Focus Areas, require an excessive amount of work, and obscure the interactions across focus areas of projects.

Recommendations:

1. The PRPs should be replaced with an Independent Review Panel, which will review and rate all programs relative to Sea Grant's Standards of Excellence,
2. The IRP should consider the following materials package in its evaluation of a state Sea Grant program:
 - a. A brief written program synthesis (retrospective and prospective) provided by the state program director
 - b. The four NSGO annual qualitative review reports and program director responses

- c. The Site Visit reports of the state program (which will include an executive summary);
3. The IRP should meet over the course of five days to quantitatively evaluate the state programs.
 - a. Each review should consist of a presentation by the state Sea Grant director, followed by Q&A.
 - b. The IRP then deliberates in closed session.
 - c. The NSGO program officer should attend.

Overall, multiple focus area-specific PRPs would be replaced by a single IRP that would review each program with an opportunity for a Director's presentation and Q/A.

Conclusions

The revised PIE process would build on regular assessments and feedback. Importantly, the overall assessment process would focus more on program improvement. Finally, the new evaluation process would be decoupled from the 4-year omnibus cycle, strategic planning process, and would not require a long lag period for impacts to realize. The annual reviews would assess progress against current goals as well as emerging impacts from past investments.

When these recommendations are adopted, PIE will be more

- effective in program improvement,
- inclusive of all current evaluation tools,
- collaborative and transparent,
- based on the Sea Grant "Standards of Excellence"
- cost effective with less requisite staff time and 'paper work'.

Appendix I



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL SEA GRANT COLLEGE PROGRAM
1315 East-West Highway, Silver Spring, MD 20910

December 17, 2015

Mr. Rolland Schmitten
Chair, National Sea Grant Advisory Board
1315 East West Highway
Silver Spring, MD 20910

Dear Mr. Schmitten,

In response to the National Sea Grant Advisory Board's (NSGAB) motion at the November 2015 meeting, and with support from the Sea Grant Association (SGA), I support a second formal review of the Planning, Implementation, and Evaluation (PIE) Process. Considering the first full PIE cycle ended in 2015, a review of the entire process is timely. I propose the PIE II Committee include representation from the NSGAB, SGA, and the National Sea Grant Office. I look forward to the recommendations, as we work to support Sea Grant's dedication to strengthening programs through evaluation.

Charge: The NSGAB should assess the efficacy and implications of the PIE system - review what worked, identify weaknesses, and recommend revisions to improve and streamline the process where possible.

Timeline: The report should be available for discussion at the March 2016 NSGAB Meeting.

Sincerely,

Nikola M. Garber, Ph.D.
Acting Director
National Sea Grant College Program

cc: J. Eigen
D. Baker
R. West
S. Deguise

Appendix II

The National Sea Grant College Program's Planning, Implementation and Evaluation System (April 2014)

Overview

The National Sea Grant College Program (NSGCP) is committed to careful planning and rigorous evaluation at both the state and National Program level in order to ensure that the Program has local, state, and national impacts. The Planning, Implementation and Evaluation (PIE) Process includes three phases:

- **Planning** at both the national and state levels that is strategic and ambitious in addressing local, regional, and national needs;
- **Implementation** of the plans within each state, with coordinated and collaborative research, outreach and education activities for four years; and
- **Evaluation** of the success of those efforts in meeting the goals, measures, and objectives set forth in the plans. The evaluation component begins with a site visit to each Sea Grant program to ensure programs are well managed, connecting with stakeholders, and collaborating with other Sea Grant and NOAA programs, and other relevant partners. A Performance Review Panel then looks at the outcomes and impacts of the programs in relation to their plans. Ongoing evaluation of the program happens through program annual reports and the NSGO Annual Review.

Sections I-V below describe each component of the integrated PIE system, and how merit funds are allocated.

I. Planning

National Network Strategic Plan (every four years; next planning process begins in 2016 for the 2018-22 National Network Plan): Every four years, the NSGCP develops a new national, network-wide strategic plan. Sea Grant's national plan is completed iteratively with the development of strategic plans for the individual Sea Grant programs. NOAA's strategic plan, NOAA's Five-Year Research Plan, the National Ocean Policy and other relevant national plans provide a broad set of potential priorities for Sea Grant's national planning effort. Likewise, stakeholder input collected for individual Sea Grant planning efforts is integrated with other relevant local and regional plans to identify the most appropriate national priorities. Sea Grant's national, network-wide plan priorities serve as the foci for Sea Grant's next four-year implementation cycle and results obtained help NOAA achieve its strategic objectives.

Individual Sea Grant Program Strategic Plans (every four years; next in 2016):

The national strategic plan serves as the basis for individual Sea Grant programs to complete their strategic plans. The individual program plans include performance measures and targets that align with and support national performance measures for the national priority areas. Since each program has a unique set of local and regional stakeholders, partners and priorities, the individual program plans may not address all of the national priority areas. Sea Grant program plans are developed in concert with the assigned Federal Program Officer and reviewed and approved by the NSGCP Director. Sea Grant program plans guide and inform their requests for proposals and all other, research, outreach and education activities. In addition, these plans are used as the basis for program evaluation.

These plans are living documents; programs may make changes to their plans to address *significant* emerging or unexpected issues (e.g., Hurricane Sandy, Deepwater Horizon, Fukushima debris field, etc.). The National Sea Grant Office (NSGO) must be notified of and approve any plan changes.

II. Implementation

Once their strategic plans are approved, the Sea Grant programs have the authority to implement their plans in order to achieve optimal results. They consider the local, regional and national priorities identified during the planning process as they conduct research, outreach and education activities. At the national level, focus area teams identify areas where gaps may exist for achieving the goals identified in the national, network-wide plan. National Strategic Investments are used to address gaps and help the National Program reach its goals. Implementation of Sea Grant activities happens primarily at the individual Sea Grant program level.

The PIE system contributes to improved regional and national coordination. For instance, funding competitions, omnibus grant applications and awards are synchronized to facilitate collaborative efforts among programs. Also, there is a common format for annual reports so that impacts of individual projects and Sea Grant programs can more easily be synthesized to highlight nation-wide achievements.

III. Evaluation

Sea Grant's program evaluation processes are designed to ensure the greatest benefit for the federal and state investment and are based on program annual reports. Site visits ensure that all programs are managed effectively and continue to meet the *Standards of Excellence* (see Appendix A) expected of all Sea Grant Colleges and Institutions. Performance reviews are used to evaluate each program's impacts on society, economy and environment according to the priorities set forth in the individual program plans. The NSGO Annual Review considers all aspects of the programs, and the National Sea Grant Advisory Board's Biennial Report to Congress gives an overall assessment of the National Sea Grant College Program.

The integrated components of program evaluation within Sea Grant are described below.

Annual Reports – Programs submit annual reports through an online database: Planning, Implementation and Evaluation Resources (PIER). Information provided in PIER is used by each program and the NSGO to evaluate progress relative to the program’s plan, targeted performance measures and metrics, and serves as the basis for the four-year Performance Review Panels’ evaluation. Annual Reports are also a way for the program to conduct a self-evaluation of its progress toward accomplishing the four-year plan. Information from PIER is used by the NSGO to track and report progress of the National Sea Grant College Program to NOAA.

Program Site Review Visits (every four years; begins in 2014) – Every four years, a site review team (SRT) visits each Sea Grant program to assess program operations. Programs are evaluated, on-site, in three general areas: 1) their approach to management; 2) the scope and success of their engagement with stakeholders; and (3) the degree of collaboration with other Sea Grant and NOAA programs, and other relevant partners. At the conclusion of the site visit, the SRT produces a report that describes findings and makes suggestions and recommendations to improve the Sea Grant program’s operations. Although the SRT is not responsible for providing numerical ratings for any of these three areas, the report should include a finding addressing whether the program meets the *Standards of Excellence* (i.e., addressing appropriate categories within the Sea Grant Regulations; see Appendix B). The SRT reports are used by the NSGO to determine whether the Sea Grant program: 1) is recertified, and 2) is eligible for merit funding.

Performance Review Panels (every four years; next in 2015) – Every four years, following the completion of all Sea Grant program site visits, external Performance Review Panels (PRP) conduct retrospective evaluations of each program’s overall impact on society from both an environmental and a socioeconomic perspective based on the program’s four-year plan. A numerical rating is assigned by each PRP. The results of the PRP are used to determine eligibility for and amount of merit funding; the process is described below in the section on “Rating and Allocation of Funding.”

NSGO Annual Review – The NSGO meets each year to discuss the progress of each Sea Grant program relative to its plan, and to identify aspects of the program that might be improved. Once every four years – in the year following the PRP – an expanded NSGO Review is conducted. It includes a complete program evaluation that is based on the SRT report, the PRP findings and ratings, and the Sea Grant program’s responses to the SRT recommendations and PRP findings. The NSGO Review makes the final determination of whether or not a Sea Grant program meets the *Standards of Excellence* and finalizes the rating of the PRP.

“The State of Sea Grant” (every two years; next in 2014) – Every two years, the National Sea Grant Advisory Board provides a “State of Sea Grant” report to Congress as mandated by Sea Grant legislation. The biennial report assesses the overall

progress of the National Sea Grant College Program in addressing the priority areas highlighted in the national plan. This review relies extensively on information collected through PIER from Sea Grant program annual reports and the subsequent analysis of the national focus areas. It also informs the next national strategic planning process.

IV. Rating and Allocation of Funding

The program evaluation process results in recertification, an overall rating and a determination of merit fund eligibility for each program. Overall program ratings are assigned by the NSGO based on the PRP ratings. Merit funding eligibility is determined based on the SRT reports, the PRP rating, and the responses from the Sea Grant Program.

Site Visits

After the site visits and reporting are completed, the NSGO discusses the findings, suggestions and recommendations included in the site visit reports and assesses any response from the program during the expanded NSGO Review. Based on that discussion, the NSGO makes the final decision of whether the program is meeting the *Standards of Excellence* expected of all programs. Programs that meet the *Standards of Excellence* are eligible for merit funding.

Performance Review Panels

There is one PRP per national focus area. Each PRP is responsible for providing a rating for each program that participates within that national focus area (identified in the program's strategic plan). The PRP uses the following rating scale:

- a. *Highest Performance* – exceeds expectations by an exceptional margin in most areas/aspects (1)
- b. *Exceeds Expectations* by a substantial margin in some areas/aspects (2)
- c. *Meets Expectations* in most areas/aspects (3)
- d. *Below Expectations* in some areas/aspects (4)
- e. *Unsuccessful* in most areas/aspects (5)

For each program, the national focus area rating is weighted based on the proportion of funding resources allocated by the program to that national focus area. "Funding resources" include all NOAA federal, matching and leveraged funds that are managed by programs, and used to meet the goals and objectives of the four-year plan. Each program's national focus area PRP scores are then combined to provide an overall performance rating. For example, if a program allocated 10% of its resources to the Sustainable Coastal Development (SCD) focus area and was rated *Highest Performance* (1), and 90% of its resources to Healthy Coastal Ecosystems (HCE) with a rating of *Exceeds Expectations* (2), it would receive an overall weighted rating of 1.9, calculated as follows:

SCD	HCE
-----	-----

$$[10\% * 1] + [90\% * 2] = (0.1) + (1.8) = 1.9$$

There is no requirement that a program address all national focus areas in its strategic plan. Instead, the rating process is intended to emphasize those areas that each program considers most important based on the amount of allocated resources.

If a program receives an overall rating of 4 or more, it will not be eligible for merit funding, and the program will be placed on probationary status (See Section V).

Allocation of Merit Funds

Merit funding eligibility is based on the site review and PRP, and the funds are allocated based on the overall program rating from the PRP. The merit rating is calculated by subtracting the PRP rating from 5, and then cubing that number. For instance, the program in the example above received a PRP rating of 1.9; the merit rating of this program is 29.8 ($5 - 1.9 = 3.1$; $3.1^3 = 29.8$). If the merit pool were \$10M, and the sum of all of the individual ratings for all eligible programs happened to be 1,000, each merit rating point would be worth \$10,000. In this example, the program would receive \$298,000 in merit funding. Any program that does not meet the *Sea Grant Standards of Excellence* based on the site review or is put on probation based on the PRP rating will not be eligible for merit funding. Once a program reaches the *Standards of Excellence*, they are eligible for merit funding.

V. Recertification of the Sea Grant Programs

The Office of Management and Budget, the National Sea Grant Advisory Board and other entities have recommended that the Sea Grant programs be recertified on a reasonable and regular schedule. The four-year evaluation, including the site visit, the performance review panel and the NSGO Annual Review constitutes the Sea Grant program recertification process. A successful review results in recertification of the program for the next eight years. Recertification is required for a program to maintain its federal funding.

If a program does not meet the *Standards of Excellence* based on the site visit or if the program's overall performance is *Below Expectations* or *Unsuccessful* based on the PRP rating, the program is placed on probationary status. Any Sea Grant program on probation will not be eligible for merit funding.

During each succeeding NSGO Annual Review, any program that did not meet the *Standards of Excellence* will be assessed to determine the program's progress toward meeting the *Standards of Excellence*. If progress is satisfactory, the program will be allowed to continue on probation until the next site visit. If at that time the program meets the *Standards of Excellence*, the program is considered recertified. However, if progress is found not to meet the *Standards of Excellence* expected of a Sea Grant program after two years of NSGO Annual Reviews, or if a program does not reach the *Standards of Excellence* for a second consecutive four-year review cycle, the National Sea Grant College Program Director will refer the matter to the National Sea Grant

Advisory Board for consideration of whether to recommend decertification of the program. Any Sea Grant program placed on probation as a result of the PRP review must be rated *Meets Expectations* (3) or higher in the next PRP review. If the program fails to achieve that rating, the National Sea Grant College Program Director will refer the matter to the National Sea Grant Advisory Board for consideration of whether to recommend decertification of the program.

Appendix III

Sea Grant Program *Standards of Excellence*

This section lists the *Standards of Excellence* that are expected of every Sea Grant program. This information can also be found in [Sea Grant's Federal Regulations](#) (15 CFR 918.3). The Site Visit Teams are responsible for reviewing seven of the qualifying areas plus “collaboration” (collaboration was added based on the 2006 National Research Council Report, *Evaluation of the Sea Grant Review Process*). The remaining two qualifying areas, (1) Leadership and (8) Productivity, are evaluated through Sea Grant’s PRP process. The Federal Regulations state that Sea Grant programs “must rate highly in all of the following qualifying areas”.

I. Site Review Criteria

A. Program Management and Organization

- **Organization.** The Sea Grant College under review must have created the management organization to carry on a viable and productive Sea Grant program and must have the backing of its administration at a sufficiently high level to fulfill its multidisciplinary and multifaceted mandate.
- **Programmed team approach.** The Sea Grant program under review must have a programmed team approach to the solution of ocean/coast/watershed/Great Lakes problems which includes relevant, high quality, multidisciplinary research with associated educational and advisory services capable of producing identifiable results.
- **Support.** The Sea Grant program under review must have the ability to obtain matching funds from non-Federal sources, such as state legislatures, university management, state agencies, business, and industry. A diversity of matching fund sources is encouraged as a sign of program vitality and the ability to meet the Sea Grant requirement that funds for the general programs be matched with at least one non-Federal dollar for every two Federal dollars.

B. Stakeholder Engagement

- **Relevance.** The Sea Grant program under review must be relevant to local, state, regional, or national opportunities and problems in the ocean/coast/watershed/Great Lakes environment. Important factors in evaluating relevance are the need for ocean/coast/watershed/Great Lakes resource emphasis and the extent to which capabilities have been developed to be responsive to that need.
- **Extension/Advisory services.** The Sea Grant program under review must have a strong program through which information, techniques, and research results from any reliable source, domestic or international, may be communicated to and utilized by user communities. In addition to the educational and information

dissemination role, the advisory service program must aid in the identification and communication of user communities' research and educational needs.

- **Education and training.** Education and training must be clearly relevant to national, regional, state and local needs in fields related to ocean, Great Lakes, and coastal resources. As appropriate, education may include pre-college, college, post-graduate, public and adult levels.

C. Collaborative Network Activities

- **Relationships.** The Sea Grant program under review must have close ties with Federal agencies, State agencies and administrations, local authorities, business and industry, and other educational institutions. These ties are: (i) To ensure the relevance of its programs, (ii) to give assistance to the broadest possible audience, (iii) to involve a broad pool of talent in providing this assistance (including universities and other administrative entities outside the Sea Grant College), and (iv) to assist others in developing research and management competence. The extent and quality of an institution's relationships are critical factors in evaluating the institutional program.
- **Collaboration.** The Sea Grant program under review must provide leadership in ocean/coast/watershed/Great Lakes activities including coordinated planning and cooperative work with local, state, regional, and Federal agencies, other Sea Grant programs, and non-Sea Grant universities.

II. Performance Review Criteria

- **Leadership.** The Sea Grant program under review must have achieved recognition as an intellectual and practical leader in marine science, engineering, education, and advisory service in its state and region.
- **Productivity.** The Sea Grant program under review must have demonstrated a degree of productivity (of research results, reports, employed students, service to State agencies and industry, etc.) commensurate with the length of its Sea Grant operations and the level of funding under which it has worked.

Appendix IV

National Sea Grant Advisory Board Assessment of Sea Grant's Planning, Implementation and Evaluation Process Report September 2013

I. Introduction

Charge to the National Sea Grant Advisory Board

The National Sea Grant College Program (NSGCP) Director charged the National Sea Grant Advisory Board (NSGAB) to assess the lessons-learned from the 2010-13 Planning, Implementation and Evaluation (PIE) cycle. Capitalizing on the completion of this first cycle of the PIE process, the NSGAB should base recommended revisions for the 2014-17 cycle by reviewing what worked well and what did not from the 2010-13 cycle.

The NSGAB developed a subcommittee (PIE Assessment Committee) with membership from the Advisory Board, Sea Grant Directors and the National Sea Grant Office (NSGO).

This committee reviewed all PIE guidance and informational documents, which included feedback from the Performance Review Panels and Site Visit panelists, the Sea Grant Network, and a Sea Grant Association survey on the entire PIE process. When reviewing materials and making any recommendations, the committee ensured that the PIE process met standing legislative requirements:

- National Network should have a strategic plan (Legislation – 1123D2a)
- All programs must have a four year plan that establishes priorities for the National Sea Grant College Program (Legislation – 1123C1)
- All programs must implement their plans (Legislation – 1126D1)
- All programs must be evaluated (Legislation – 1123D3a)

- Every two years – the NSGAB is to report to Congress on the progress made toward meeting the priorities identified in the National Network plan (Legislation – 1128B2)

Overarching Findings

After several weeks of document reviews and conference calls, followed by an in-person meeting, the committee agreed with the following as overall guidance for their PIE assessment:

The Planning, Implementation, and Evaluation (PIE) process has a good structure and meets the recommendations from the 2006 National Research Council Report, *Evaluation of the Sea Grant Program Review Process*. The first cycle was largely successful; however, it was too big and costly. The committee also found that all the components of the evaluation process were not well integrated into an overall assessment of the individual Sea Grant programs (programs) or the Sea Grant network.

II. Findings and Recommendations

Below are recommendations to improve the efficiency of the current PIE process without compromising the ability to evaluate programs and the overall Sea Grant network.

PLANNING

Findings

The National Sea Grant College Program (NSGCP) has a rigorous and thorough planning process at both the National and program level. Currently, planning at the National and program level happens simultaneously, with programs needing to ensure their plans align with the National Network plan. This simultaneous timing of the plans can be confusing and require significant additional work to ensure this alignment.

In the current planning process, programs are required to request permission from the National Sea Grant Office (NSGO) to make changes to their strategic plans. This

requires time and effort from both the program and the NSGO for minor changes (i.e., changes in personnel and funding), and is inefficient.

Recommendation P-1: The NSCGP should continue initiating a broad National Network Strategic plan based on National Ocean Policy and NOAA top-down mission requirements. Once this national plan is complete, the programs will then develop their own plans based on this broad national strategic plan. The individual program will receive approval of their strategic plan from the NSGO.

Recommendation P-2: Minor changes in program plans do not need to be approved by the NSGO. Adjusting performance measure targets should be *strongly* discouraged. Programs should contact the NSGO for proposed changes to their individual plans to address only *significant* emerging or unexpected issues (e.g., Hurricane Sandy, Gulf Oil Spill, or irradiation of a new aquatic invasive species).

IMPLEMENTATION

Findings

Implementation happens at different levels within the National Sea Grant Program. At the National level, activities are organized into focus areas. Focus areas are managed by focus teams.

The original expectations of these Focus Teams were to:

1. Facilitate planning, implementation, synthesis and reporting of Sea Grant activities and accomplishments;
2. Identify new opportunities and directions for Sea Grant national and regional initiatives;
3. Catalyze cooperative efforts among Sea Grant programs, the NSGO, NOAA, other agencies and stakeholder organizations, and NGO's; and
4. Provide a mechanism to further solidify Sea Grant's local, regional, and national identity.

These tasks are important and should be continued. Currently, for various reasons (including budget constraints) these tasks are not being fully met. The focus teams are large (64 members) and geographically dispersed. Focus Team contributions to the

Sea Grant mission have been limited with most of the participation done by the Sea Grant Fellows and Focus Team Chairs and Vice-Chairs. Our committee recognizes that these Sea Grant mission tasks should reside within the NSGO, but the NSGO currently lacks the capacity to address all four expectations.

Recommendation I-1: The NSGCP Director should find more efficient ways to accomplish each of the four tasks currently given to the large focus teams. Examples of Teams that could perform these tasks could include:

- An external panel,
- Smaller, more narrowly directed Focus Teams,
- A NSGAB subcommittee, or
- NSGO staff (redirected from other efforts).

EVALUATION

Findings

The current evaluation process of the individual Sea Grant programs includes annual reports from the programs, an annual NSGO review, a program site visit, and performance review panels. During the annual review, the NSGO reviews the programs' annual reports, site visit reports, and performance review panel findings and any programs' responses. The site visits review the performance of the programs in three areas: 1) program management and organization, 2) stakeholder engagement, and 3) collaborative network/NOAA activities. The performance review panels evaluate the results (impacts, accomplishments and success of reaching performance measures) of the programs. The site visits and performance review panels are conducted once during the four-year evaluation cycle. These evaluation processes are compartmentalized and not fully integrated into the overall evaluation of the program.

Recommendation E-1: Integrate annual reviews, site visits, and an external evaluation panel into an overall four-year evaluation process.

Annual Reports

Findings

The committee finds the annual report a necessary part of the PIE process, and an important part of the program evaluation. On an annual basis, programs submit a report to the NSGO. These annual reports include impacts and accomplishments, and progress towards performance measures and metrics. All annual report information is currently submitted by the programs into a database known as PIER (Planning, Implementation and Evaluation Resource). Thus, the PIER outputs assume a much higher priority than simply tracking database input. Annual Reports can track progress; however, they should not be the only source of data for the overall program evaluation process.

The annual report serves as an 'annual review of programs' and also serves as a performance progress report for the purpose of grant renewal.

Recommendation E-2: Continue on-going, joint, NSGO/SGA efforts to improve NSGO annual reporting guidance, particularly the definitions of performance measures and metrics.

Recommendation E-3: The format of the PIER outputs should be improved to enhance usability across the various reporting and performance evaluation needs across the network.

Annual Review Process

Findings

The annual review conducted by the NSGO is an important process to assess each program on an annual basis. This is an opportunity for the programs to work closely with the NSGO program officer to demonstrate annual results through their annual report. The NSGO also includes the site visit report, the performance review panels' findings and ratings, and program responses in the year the annual review is conducted. However, the results of these NSGO reviews are not included in the four-year evaluation process that affects merit funding. There are portions of the NSGO annual review process that are closed to the programs.

Recommendation E-4: We encourage constructive feedback between the NSGO program officer and the Sea Grant program to assure continued improvement and cooperation. The committee feels this is an important step to improve the annual review process which should be included as input to the four-year evaluation. The role of the program officer should be that of a liaison (honest-broker), communicating with programs.

Recommendation E-5: The results of the annual reviews should be included in the program's four-year evaluation process.

Recommendation E-6: The program Director should be invited to all segments of the NSGO annual reviews for their program.

Site Visits

Findings

The site visit proved to be a valuable part of Sea Grant program assessment. The site visit team meets with the program management team, advisory committees, and university administration to review and discuss broad issues related to 1) program management and organization, 2) stakeholder engagement; and 3) partnerships with the Sea Grant Network and NOAA. There is network consensus on the success of the site visits; however, the site visit reports have not been adequately integrated into the overall four-year evaluation process.

Recommendation E-7: The site visit report should be included as an influential input to the program's four-year evaluation.

Recommendation E-8: With inclusion of the site visit reports in the four-year evaluation process, there should be new training and guidance developed, for the NSGAB, the NSGO and individual programs, on how the site visit will be used in the evaluation process.

Performance Review Panel

Findings

The current performance review panels (PRPs) assess the impacts of the program by focus area. The simultaneous performance review of all programs by the same panelists allow for consistent rating within panels. However, due to the amount of material provided by the programs, the review was very labor intensive. The impacts were not prioritized by the programs, which made it difficult for the reviewers to evaluate their relative importance in their program goals. Separating program results into focus areas assessed by separate PRPs was perceived as inhibiting a consistent scoring across the four focus areas. An analysis of the performance review scoring however showed no significant difference between panels.

The impacts across focus areas for the individual programs and the network were lost by separating the program results by focus areas.

Recommendation E-9: The committee recommends the PRP be replaced with the external evaluation panel.

Recommendation E-10: The committee supports the concept of all programs being evaluated simultaneously every four years by a 'National Sea Grant External Evaluation Panel' to evaluate each individual program in the following categories:

Program Director's Impact Report	50%
Site Review Team (SRT) Report	35%
Annual Review Summary	15%

- The external evaluation panel should be comprised of members from the NSGAB, NOAA, other State/Federal Agency Officials, and leaders from academia/industry.
- The NSGCP Director, in consultation with the NSGAB and Sea Grant Directors, shall develop guidance for producing the three documents as well as evaluation/rating criteria to be used by the external evaluation panel.

- Limitations should be set on the volume of material presented to the National Sea Grant External Evaluation Panel:
 - Program Director's Impact Report should not exceed 15 pages.
 - Directors should explain how their program accomplished their individual Sea Grant program plans.
 - The SRT Report should not exceed 10 pages.
 - The NSGO program officer Annual Review Summary:
 - A brief presentation, and
 - Annual review summary memorandums (should not exceed 6 pages).

Recommendation E-11: The External Evaluation Panel will give each program a rating, which should be used by the NSGCP Director to determine merit funds.

Timing of the External Evaluation Panel

Finding: The committee recognizes there are two guiding principles in a conceptual review framework:

1. A Sea Grant program should be evaluated based on its success over a full four-year strategic planning window.
2. A Sea Grant director needs to be informed about his/her projected funding level prior to planning for the next four-year Omnibus program.

Due to time restraints, it is impossible for a full review of a four-year Omnibus (strategic plan cycle) to occur immediately following a cycle and a determination of base/merit funding by the NSGCP Director prior to beginning of the next four-year cycle. It is more important for a program Director to know future funding levels for research, outreach and education work plan development, than to have an exclusive review of only a specific strategic plan window.

Recommendation E-12: The committee feels that a mid-cycle review (year three) is the best option to allow proper time for the previous cycle's research accomplishments to become impacts and External Evaluation Panel results to be synthesized by the start of the next cycle. Site visits should occur in years one and two.

III. General Recommendation

The NSGAB PIE Assessment committee recommends, with implementation of any or all of the NSGAB recommendations contained in this report, the NSGCP Director coordinate evaluation guidance with the Sea Grant Directors and the National Sea Grant Advisory Board.

NSGAB PIE Assessment Committee

NSGAB

Dick West - Chair

Dale Baker

Amber Mace

Bill Stubblefield

NSGO

Sami Grimes - co-Chair

Chris Hayes

SGA

Sylvain De Guise, CT Program Director

Jim Hurley, WI Program Director

Biographies



Biographies

Advisory Board Members



Dale Baker (Chair)
Ithaca, NY

Dale Baker worked with Sea Grant for over 36 years and served as a Sea Grant Extension Program Leader for 34 years. His major programmatic responsibilities were in the areas of commercial fisheries, ports and harbors, aquaculture and coastal climate change. Mr. Baker retired from Cornell University in January of 2009, but continues to do work for Sea Grant and the Cayuga Lake Watershed Network.



Patricia Birkholz
Saugatuck, MI

Senator Patty Birkholz is director of the Michigan Office of the Great Lakes. Previously, she served as a member of the Michigan State Senate from 2002 to 2010. In the Senate, she represented the 24th District comprising of Allegan, Barry and Eaton Counties. Prior to her terms in the Senate, she represented the 88th District in the Michigan House of Representatives from 1996 to 2002. She was the Allegan County Treasurer from 1992 to 1996. Birkholz began her career in politics as a trustee for Saugatuck Township.



Paulinus Chigbu, PhD
Fruitland, MD

Dr. Paulinus Chigbu is the Director of the NOAA Living Marine Resources Cooperative Science Center, Director of the National Science Foundation Center for Research Excellence in Science and Technology: Center for the Study of Coastal Ecosystem Processes and Dynamics in the Mid-Atlantic Region and a professor of marine environmental science at the University of Maryland. Chigbu has been involved in many programs to bring diversity to marine science including projects and partnerships with NOAA, Jackson State, University of Mississippi, Office of Naval Research and the Louis Stokes Alliance

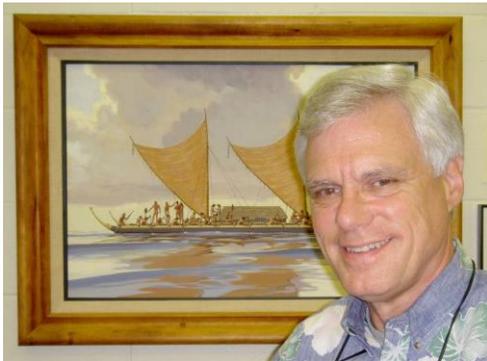
for Minority Participation. Dr. Chigbu has been the recipient of a Fulbright scholarship, an Excellence Fellowship from the University of Washington and served as Chair of the Mississippi Academy of Sciences.



Rosanne Fortner, PhD
Oak Island, NC

Dr. Rosanne Fortner is a retired professor of environmental science education from The Ohio State University and a former middle school science teacher. In her 27 years at OSU she taught environmental communications and education to undergraduates and graduate students on campus, and Great Lakes interdisciplinary sciences for educators at F.T. Stone Laboratory on Lake Erie. From a position as a project investigator, she coordinated the Ohio Sea Grant Education Program until 2005. Her research was directed at identifying needs for science education programs and training, comparing effectiveness of methods for Earth system science education, and assessing the impact of environmental education programs in field and classroom settings. Curriculum development and assessment were also an important part of her responsibilities as an educator, and her 12 books of curriculum activities were funded by Ohio Sea Grant, the National Science Foundation, Great Lakes Protection Fund and other sponsors.

She works with current Ohio Sea Grant investigators to bring the curricula into modern technological forms, and to match Great Lakes with marine science learning through online teaching. Dr. Fortner was the Director of the Center for Ocean Science Education Excellence [COSEE] Great Lakes, a collaboration of the seven Sea Grant Education programs in the region, with NSF and Sea Grant support from 2006-2010. With her assistance the scientists and educators of that program developed the Great Lakes Literacy Principles. Fortner is the author of over 80 research and education-based publications, has advised 15 PhDs and 50 MS programs to completion, and served as a Fulbright Senior Scholar in Cyprus. She is currently Co-Chair of the Oak Island Beach Preservation Society at her retirement home in North Carolina.



E. Gordon Grau, PhD
Kaneohe, Hawaii

Dr. Grau is a Professor of Zoology at the Hawai'i Institute of Marine Biology, University of Hawaii. Although a Maryland native, Professor E. Gordon Grau has lived in Hawai'i for 33 years. For 15 years, he served as the director of the University of Hawai'i Sea Grant College Program (UH Sea Grant), a partnership program among the State of Hawai'i, University of Hawai'i at Mānoa, federal government, private industry, and other stakeholders. He was also

appointed the interim director of the Water Resources Research Center at the University of Hawai‘i at Mānoa, which focuses on addressing the unique water and wastewater management practices facing people in the Pacific. Previously, he served as Interim Director of the Hawaii Institute of Marine Biology and as Commissioner on the Honolulu Charter Commission, in the government of the City and County of Honolulu. He also served as President of the Sea Grant Association as well as President of the Center for a Sustainable Future, a 501(c) (3) nonprofit organization.

During his tenure as director, Professor Grau positioned UH Sea Grant at the forefront of the 33 Sea Grant Programs nationwide by organizing his program around the theme of coastal communities and economies. Through Sea Grant, both locally and nationally, Professor Grau worked to advance coastal communities to become more prosperous, more economically, socially and culturally inclusive, and to have the smallest environmental footprint.

Professor Grau holds a bachelor of science from Loyola University in Maryland, a master of science from Morgan State University, and a PhD from the University of Delaware. He also completed postdoctoral studies at the University of California, Berkeley. Currently, he is a professor and a member of the faculty of the Hawai‘i Institute of Marine Biology where he maintains a laboratory. He is the author of nearly 200 papers in peer-refereed journals. He has mentored, and supported through peer-refereed Federal grants, 16 Postdoctoral, 13 Ph.D. Students, and 22 M.S. students. Professor Grau continues to conduct research, and to mentor graduate and undergraduate students and postdoctoral associates.



Judith Gray
Block Island, RI

Judith (Judy) Gray retired in 2011 after a 33-year career as a meteorologist with the National Oceanic and Atmospheric Administration (NOAA). Judy started her career as a commissioned officer with the NOAA Corps. Her civilian career began at the Pacific Marine Environmental Laboratory in Seattle, where she studied winds along the mountainous coastlines of Alaska on NOAA ships and aircraft in support of the Fisheries Oceanography Coordinated Investigations. She moved to NOAA headquarters to be an advocate for oceanic and atmospheric research, served as the Acting Deputy Director of NOAA’s 12 Environmental Research Laboratories, and was the NOAA Program Manager for the Coastal Forecast System and, together with the National Science Foundation, GLOBEC (Global Ocean Ecosystems Dynamics). For 15 years, she was the Deputy Director of the Atlantic Oceanographic and Meteorological Laboratory, in Miami, supporting deep sea and coastal oceanography, climate, hurricane, and ecosystems research, and served on the FL Sea Grant Senior Advisory Council.

Her last position with NOAA was Acting Deputy Assistant Administrator for Oceanic and Atmospheric Research Programs and Administration, one of two deputies to the head of NOAA Research. She was responsible for the daily operations and administration of NOAA’s research

enterprise, and the execution of programs including the National Sea Grant Program, NOAA's Climate Program, and Ocean Exploration and Research. In retirement, Judy continues her mentoring of NOAA scientists in developing leadership skills. She is the Vice President of the Block Island Maritime Institute, whose mission is to provide educational programs and maritime activities including aquaculture, marine science, and maritime heritage for residents and visitors on Block Island. Judy is a citizen scientist, conducting monthly profiles of Block Island beaches to monitor routine and storm-related changes. In addition to the National Sea Grant Advisory Board, she is a member of the Senior Advisory Council for the Rhode Island Sea Grant Program.



**Brian Helmuth, PhD
Marblehead, MA**

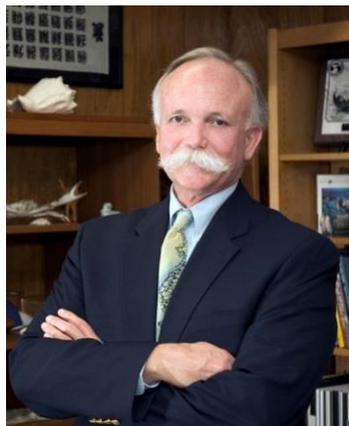
Dr. Brian Helmuth is a Professor at the Marine Science Center at Northeastern University in Boston, Massachusetts, with a joint appointment in the Department of Marine and Environmental Sciences and the School of Public Policy and Urban Affairs. Helmuth's research and teaching focus on predicting the likely ecological impacts of climate change on coastal ecosystems, and on the development of products that are scientifically accurate, understandable, and useful by a diverse array of stakeholders. He has authored or co-authored over 70 peer-reviewed journal articles in the areas of climate change and marine ecology. Helmuth is a Fellow of the Aldo Leopold Leadership program, which trains select scientists to interact with policy makers, journalists and the public and in 2011 was named a Google Science Communication Fellow in the area of climate change. He also served as a lead author on the Technical input document for the inaugural Oceans chapter of the US National Climate Assessment.



**Amber Mace, PhD (Vice-Chair)
Sacramento, CA**

Dr. Amber Mace is the Deputy Director of the California Council on Science and Technology (CCST). In addition to providing strategic advice to the executive director and advancing CCST organizational goals, Mace leads the California Science, Technology and Policy Fellows program. Concurrently with her position at CCST, Mace maintains her affiliation with the UC Davis Policy Institute for Energy, Environment and the Economy as a Policy Fellow advancing a regional climate adaptation initiative. Prior to this position she served as the Executive Director of the California Ocean Protection Council (OPC) and Assistant Secretary for Coastal Matters at the California Natural Resources Agency from 2009 to 2012 and in dual roles as the Executive Director of the California Ocean Science Trust and the Science Advisor to the OPC from 2006 to 2009. Mace worked as a National Sea Grant John A. Knauss marine policy fellow for the U.S. Senate's Committee on Commerce, Science,

and Transportation in 2006, and as a California Sea Grant state fellow at the Ocean Resources Management Program in the California Natural Resources Agency in 2005. Mace is dedicated to ensuring policy development and resource management decisions are outcome driven, cost-effective, and informed with sound science.



Michael Orbach, PhD
North Carolina

Dr. Michael Orbach is a Professor of the Practice of Marine Affairs and Policy in the Division of Marine Science Conservation at the Nicholas School of the Environment at Duke University. He has performed research and has been involved in coastal and marine policy on all coasts of the U.S. and in Mexico, Central America, the Caribbean, Alaska and the Pacific, and has published widely on social science and policy in coastal and marine environments. He has worked as a Cultural Anthropologist with the National Oceanic and Atmospheric Administration, and has held several Governor's appointments to environmental Boards and Commissions as well as appointments to National Academy of Sciences Boards and Committees. He has been the President of The Coastal Society, and Chairman of the Board of Directors of the Surfrider Foundation.



Jim Murray, PhD
Naples, Florida

Dr. James D. Murray retired in 2011 as Deputy Director of the NOAA National Sea Grant College Program. He spent his entire 37-year career in various Sea Grant positions including Sea Grant Scholar at SUNY College of Environmental Science and Forestry, Regional Extension Specialist at Minnesota Sea Grant, Extension Leader for both the New Jersey and North Carolina Sea Grant Programs, National Sea Grant Extension Leader and finally Deputy Director of the National Sea Grant College Program. His professional interests are in marine resource and fisheries management where he was the Principal Investigator on over 40 grants which led to 58 professional publications. Murray was the recipient of the President's Award, Sea Grant Association in 2010, and the William Q. Wick Award for Visionary Career Leadership in Administration by the Assembly of Sea Grant Extension Leaders in 2011. Currently he serves as a member of the Florida Sea Grant Extension Program's Advisory Committee (Collier County) and volunteers as an Interpretive Ranger at Everglades National Park and as a research assistant at NOAA's Rookery Bay Estuarine Research Reserve.



**Nancy Rabalais, PhD
Cocodrie, Louisiana**

Dr. Nancy Rabalais is a Professor at the Louisiana Universities Marine Consortium where she is also Executive Director. Dr. Rabalais' research interests include the dynamics of hypoxic environments, interactions of large rivers with the coastal ocean, benthic ecology, and science policy. Dr. Rabalais is an AAAS Fellow, an Aldo Leopold Leadership Program Fellow, a Past President of the Estuarine Research Federation, and a National Associate of the National Academies of Science and has served as Chair of the Ocean Studies Board. She currently serves on two National Research Council committees, the Council for the University-National Oceanographic Laboratories, the Executive Board for the Consortium on Ocean Leadership, and Board of Directors of the Gulf of Mexico Coastal Ocean Observing System, and is President Elect of the Southern Association of Marine Labs and the National Association of Marine Labs. She received the 2002 Bostwick H. Ketchum Award for coastal research from the Woods Hole Oceanographic Institution, the Blasker award shared with R.E. Turner, the Clarke Prize from the National Water Resources Institute, the Ruth Patrick Award from the Association for the Sciences of Limnology and Oceanography, a Rachel Carson Lectureship for the American Geophysical Union, and a Heinz Award. She earned a Ph.D. in Zoology from the University of Texas at Austin in 1983.



**Rollie Schmitt (Past Chair)
Leavenworth, Washington**

Rolland A. (Rollie) Schmitt has been a natural resources manager for 44 years; focusing on marine fish, shellfish, and mammals for the past 31 years. He has served as the Washington State Director of Fisheries and the National Marine Fisheries Service West Coast Regional Director for 6 western states. Upon moving to Washington, D.C. he became the Assistant Administrator/Director for the National Marine Fisheries Service; later the U.S. Department of Commerce Deputy Assistant Secretary for International Affairs in NOAA, and the National Director for NOAA Fisheries Office of Habitat Conservation. During his career he served 4 presidents with Presidential appointments as the U.S. Tuna Commissioner, U.S. Atlantic Salmon Commissioner, the Pacific and Alaska Fisheries Management Councils, and 12 years as the U.S. International Whaling Commissioner. His many awards and recognitions include: Presidential Merit Award, Trout Unlimited Washington Sportsman of the Year, Presidential award for outstanding achievement of a Vietnam veteran, and the Department of Transportation (USCG) Commandant's Award for Meritorious Public Service. In 2005, Mr. Schmitt retired and moved back to Sockeye Point Lodge in Washington State where he continues to work on marine and fresh water resource issues. He is currently serving his 6th year as a Fish and Wildlife Commissioner in Washington State.



Dick Vortmann
La Jolla, California

Richard H. Vortmann retired after a 30-year career with National Steel and Shipbuilding Company (NASSCO) based in San Diego, California where he served as President for 22 years. He also retired after six years as Vice President of General Dynamics Corporation. He most recently completed an assignment as Interim President and CEO of the San Diego Regional Chamber of Commerce. Vortmann recently completed a 7-year term on the Board (including 2 years as Chairman) of Scripps Health; Vortmann is a

Member of Council, American Bureau of Shipping. He is a Trustee on the San Diego County Employees Retirement System. Previously Vortmann served as Chairman of both the American Shipbuilders Association and the Shipbuilders Council of America, and Vice Chairman of the National Academies of Science Marine Board.

For 14 years he was the Chairman of the American delegation to the Japanese, European, Chinese, Korean, and United States Annual Shipbuilding Conference. He also served as a Director of the San Diego Chamber of Commerce and the San Diego Economic Development Corporation. He was a member of the San Diego Mayor's Blue Ribbon Finance Committee, and Vice Chair of the San Diego Pension Reform Committee. Vortmann was born in San Francisco, California. He earned a Bachelor's degree in finance in 1966 and an MBA in 1967 from the University of California, Berkeley, for whom he also played basketball. He taught on the Business School faculty of his alma mater from 1967 to 1969 while doing postgraduate work before entering private industry.

Ex-officio Members



Jonathan Pennock, PhD
Director
National Sea Grant College Program

Prior to joining NOAA, Jon was the director of the New Hampshire Sea Grant Program and the deputy director of the School of Marine Science and Ocean Engineering at the University of New Hampshire. Jon is a nationally-known coastal scientist with expertise in oceanography and estuarine sciences. His research has focused on understanding human impacts on coastal marine food webs. Jon has a PhD in oceanography and master's in marine studies from the University of Delaware and a bachelor's in biology from Earlham College.



**Sylvain De Guise, DMV, PhD
President, Sea Grant Association**

Sylvain De Guise is director of the Connecticut Sea Grant College Program, Professor of Pathobiology and Veterinary Science at the University of Connecticut, and President of the Sea Grant Association. He currently serves as the Sea Grant representative on the NOAA North Atlantic Regional Team, is past-chair of the Northeast Sea Grant Consortium, an entity consisting of the Sea Grant programs from Maine to New York, and is a member of both the Management and Science and Technical Advisory Committees of the EPA-funded Long Island Sound Study, one of the National Estuary Programs. He is one of three Science Directors of the Connecticut Institute for Resilience and Climate Adaptation. He has a degree in veterinary medicine (1988) and a residency in veterinary pathology (1993) at the Université de Montréal, as well as a Ph.D. in immunotoxicology at the Université du Québec à Montréal (1996).

As the president of the Sea Grant Association, Dr. De Guise is an ex-officio member of the National Sea Grant Advisory Board. Dr. De Guise's personal research interest is the influences of man-made and natural toxicants on the health of aquatic organisms (from marine mammals to fish, lobsters and oysters), with focus on the immune system. He and his wife Jean live in Coventry, Connecticut.

Designated Federal Officer



**Jonathan Eigen
CFO, DFO, Program Officer,
National Sea Grant Office**

Jonathan Eigen is the Chief Financial Officer for the National Sea Grant College Program, Designated Federal Officer for the National Sea Grant Advisory Board, and the Program Officer for the Illinois-Indiana, Minnesota, New York, and Pennsylvania Sea Grant programs. Jon graduated from the University of Maryland in 1988 with a BS in Marketing and Finance. He completed his Masters of Business Administration with an emphasis of Business Economics and Public Policy from The George Washington University. His duties with the National Sea Grant College Program include all aspects of the Budget and Grants administration as well as serving as Program Officer for the Great Lakes Region. Prior to joining NOAA in 1991 he worked in television sports for the now defunct Mizlou Sports News Network. His hobbies include basketball, reading science fiction/fantasy and board games.