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I am Dr. Richard W. Spinrad, Assistant Administrator of the Office of Oceanic and Atmospheric Research, within the National Oceanic and Atmospheric Administration (NOAA). The Office of Oceanic and Atmospheric Research conducts and sponsors the scientific research, environmental studies, and technology development needed to improve NOAA's operations and applications, and broaden our understanding of the Earth's atmosphere and oceans. NOAA's National Sea Grant College Program is contained within the Office of Oceanic and Atmospheric Research. The National Sea Grant College Program is NOAA's primary university-based program in support of coastal resource use and conservation. Sea Grant's research, outreach, and education programs promote better understanding, stewardship, and use of America's coastal resources.

I am pleased to be here to tell you about the National Sea Grant College Program. Today, I will discuss Sea Grant's vision and mission, what lies ahead for the program, the issues we would like to see addressed in its upcoming reauthorization, and why this program is important to NOAA.

Sea Grant's Vision and Mission

Sea Grant's legislative charge (PL107-299) is to "increase the understanding, assessment, development, utilization, and conservation of the Nation's ocean and coastal resources by providing assistance to promote a strong education base, responsive research and training activities, and broad and prompt dissemination of knowledge and techniques."

The National Sea Grant College Program envisions a future where people live along our coasts in harmony with the natural resources that attracted and continue to sustain them. This is a vision of our Nation's coasts in which we use our natural resources in ways that capture the economic and recreational benefits they offer, while preserving their quality and abundance for future generations.

Sea Grant is an integral part of NOAA's mission and instrumental in helping the agency achieve its objectives in coastal communities throughout the United States and our territories. Sea Grant's research, outreach and education activities are connected to NOAA's mission, which is

to understand and predict changes in Earth's environment and conserve and manage coastal and marine resources to meet our Nation's economic, social, and environmental needs.

The National Sea Grant College Program

The National Sea Grant College Program was created 42 years ago to unite the academic power of the nation's universities with a wide range of public and private sector partners. Sea Grant brings together government, universities and citizens living and working in our nation's coastal and Great Lakes states and territories to respond to problems and opportunities in these complex and dynamic environments. Through these partnerships, Sea Grant provides integrated research, outreach and education programs aimed at creating tangible benefits for ocean, coastal and Great Lakes environments and communities.

Sea Grant is a national network comprised of NOAA's National Sea Grant Office, 32 university-based state programs, the National Sea Grant Review Panel, a National Law Center, a National Sea Grant Library and hundreds of participating institutions. Each Sea Grant program is established through a competitive process and reviewed every four years. The Sea Grant network enables NOAA and the nation to harness the best science, technology and human expertise to balance human and environmental needs in coastal regions.

Sea Grant's alliance with major research universities provides support to more than 3,000 scientists, outreach specialists, educators, and students every year. Collectively, Sea Grant has formed partnerships with over 4,000 organizations to help reach its mission goals. Sea Grant's university-based programs develop future scientists and managers to conduct research and to guide the responsible management of our nation's coastal, ocean, and Great Lakes resources. As a pioneer in what is referred to as "translational research: from discovery to application," Sea Grant strives for unbiased, science-based information that is accessible to all. The diverse capabilities of Sea Grant's network of state programs enable the organization to be creative and responsive in generating policy-relevant research and in disseminating scientific and technological discoveries to a wide array of audiences. Because it is science-based, non-regulatory, and has an established presence in local communities, Sea Grant is a trusted broker, working to increase coastal, ocean and Great Lakes literacy among decision-makers and the public as a whole. Sea Grant's commitment to these core values is vital to achieving its mission.

With its strong research capabilities, local knowledge and on-the-ground workforce, Sea Grant is ready to identify and capitalize on opportunities, and to generate practical solutions. Sea Grant extension, with its unique relationship with coastal partners, helps identify key local and regional issues for the university-based programs whose resources are directed to solve these problems. Extension is defined as the effective transfer of science-based information by university specialists and agents to support decision-making by individuals, groups or institutions. Extension agents link university resources and expertise with local communities and user groups. In short, these specialists take complex information and show people how to use it to solve problems. For example, Sea Grant was successful in working with the city of Cleveland, Ohio to construct artificial reefs from the rubble of the old Cleveland Municipal Stadium in the nearshore zone of Lake Erie. Estimates indicate that these reefs attract 12 to 66 times as many fish as the surrounding non-reef areas and produce approximately $1 million of economic benefit annually.

This is just one example of how Sea Grant agents work with communities in order to share expertise and solve problems.

Sea Grant also expands the reach and effectiveness of NOAA and other partners in planning for and managing the future of America's ocean, coastal and Great Lakes resources by leveraging additional funds. Sea Grant programs are required to match every $2 of federal funding with $1 of non-federal funds, and many state programs far exceed this match. The match required for federal funding also ensures this country receives significant benefit from each dollar invested by the federal government in Sea Grant.

The success of Sea Grant's approach to coastal resource use and stewardship is being recognized globally. Other countries are using the Sea Grant model when designing their own programs for engaging universities in marine research through granting programs, outreach, and education. With the assistance of Sea Grant, Korea has developed its own Sea Grant program and Indonesia has created a Sea Partnership Program with a network that extends country-wide.

Sea Grant's Work

Sea Grant addresses emerging issues at local, regional and national levels through its integrated national network by bringing decades of experience and expertise through its scientists, extension agents, educators and communicators located in every coastal and Great Lakes state, Puerto Rico and the U.S. Pacific island territories.

By investing in mission-priority research, Sea Grant addresses issues such as growth in coastal communities, hurricane preparedness and response, coastal storms and tsunamis, invasive species, development of drugs and industrial materials from marine resources, fish and shellfish farming and seafood safety. Each year, Sea Grant supports some 400 research projects investigating a wide variety of marine and coastal topics, and produces more than 700 peer-reviewed journal articles and book chapters.

While research is a crucial component of Sea Grant, transferring the results of research to the people who can benefit from this knowledge is equally important. Sea Grant's network of more than 300 extension experts work with coastal communities and decision-makers to provide informal education and transfer new technologies. These extension experts work with communities in countless ways, including:

- helping fish farmers develop environmentally-sound shellfish farming practices;
- explaining the impacts of land use on water quality; and
- providing technical assistance to communities planning for and dealing with hurricanes and other natural hazards.

Education is an integral part of Sea Grant's outreach program. A network of 30 Sea Grant educators work with K-12 teachers to bring environmental sciences into the classroom and the classroom out into the natural environment. Sea Grant's support for higher education over three decades of service has trained more than 12,000 college and graduate students, preparing them to be the next generation of coastal stewards. More than 650 alumni within the Dean John A. Knauss Marine Policy Fellowship program now hold positions in NOAA, other partner agencies,

the industry sector, and non-governmental organizations. This strong workforce is needed to solve the major environmental challenges that face the nation and the planet.

Each program within the Sea Grant network has a dedicated communications staff that works to deliver accurate, reliable, science-based information. Through newsletters, brochures, posters, articles, web sites, books, radio, videotape, and other media, Sea Grant's network of more than 100 communicators have earned their reputations as honest brokers of information about marine and coastal issues. In recent years, Sea Grant communications experts have created products ranging from environmental radio podcasts and video documentaries to informational guides and books about the history and science of the nation's coastal regions.

Sea Grant's place-based programs throughout the nation give the organization the flexibility to respond to emerging needs. Sea Grant worked throughout coastal Louisiana following Hurricanes Katrina and Rita to help coastal communities recover. The recovery of Louisiana's Plaquemines Parish following Hurricanes Katrina and Rita was an example of Sea Grant's ability to respond to these disasters. Sea Grant's work in Louisiana included partnerships with the private sector. Investment firm Goldman Sachs Group Inc. sent 30 volunteers and donated $50,000 to the Sea Grant-led volunteer efforts. The funding helped Sea Grant extension agents organize volunteer workers who came into the city and put them in touch with people with the greatest needs to help Plaquemines Parrish recover in time for fishing season. In addition, Sea Grant worked with energy firm Royal Dutch Shell plc and partners to facilitate the donation of an industrial icehouse to serve Cameron Parish. The icehouse was a critical component of the re-vitalization of the Louisiana seafood industry.

Sea Grant's research efforts have catalyzed a greater understanding of our coastal resources. Sea Grant's investment in biotechnology, for instance, has led to the development of novel marine products and processes. Impacts from this research extend from the marine and aquatic realm to dimensions of human health and safety. A Great Lakes Sea Grant researcher invented two new technologies to mass produce anti-toxins and gauge infections. One will harvest a human antidote to counter bioterrorism; the other technology detects deadly pathogens like salmonella, E. coli, and cholera. This patent-pending biosensor process can detect the state of more than 50 pathogens within minutes.

Another Sea Grant research project eliminated organic contaminants from menhaden oil. Fish oil is an important ingredient in pet foods and aquaculture feeds, but organic contaminants have kept the processed product from being sold in lucrative international markets. The research demonstrated a simple refining process to eliminate dioxin and other impurities from crude fish oil allowing a fish oil producer operating in the Gulf of Mexico to deliver a product that meets European Union specifications. A Sea Grant investment of less than $50,000 saved 200 jobs in Louisiana and helped boost U.S. exports.

Sea Grant conducts socio-economic research to help coastal managers formulate policies that minimize the negative ecological impacts of coastal development and coastal resource use. For example, Sea Grant worked with the Rhode Island Coastal Resources Management Council to help them develop an innovative Urban Coastal Greenway Policy that provides a new level of flexibility to a previously rigid coastal development regulatory structure — both in terms of

environmental protection and in building and landscape aesthetics. The policy enabled the partners to collaborate more closely with developers on their plans during the application process, and to tailor the plans to best benefit the coastal environment, the developer and the public alike. As a result, Sea Grant and its partners have been able to secure almost two miles of new public access along the urban shore, while still maintaining the economic integrity of development plans and the environmental quality of a critical portion of northern Narragansett Bay.

Sea Grant helps the seafood industry increase quality and safety, add value, lower costs and expand seafood supplies and markets, with more than 30 years of experience working in every coastal and Great Lake state and involving every type of seafood product. Since 2001, training courses led by Sea Grant extension and others with the National Seafood Hazard Analysis and Critical Control Point (HACCP) Alliance (an intergovernmental partnership with industry and academia) have reached about 5,000 U.S. processing plants, 6,000 importers and international suppliers and 14,000 employees and regulators. The U.S. Department of Health and Human Services estimates that the HACCP program has prevented between 20,000 and 60,000 seafood-related illnesses a year, translating into savings of about $155 million annually. In one survey of seafood businesses, 77 percent reported that they could not have met FDA regulations without the HACCP training programs. Sea Grant extension staff have also extended HACCP protocols to address invasive species, offering training to aquaculturists in the Great Lakes in order to prevent the spread of highly destructive aquatic invasive species.

Sea Grant researchers and outreach specialists are uniquely situated to promote collaborations on subjects critical to decisions being made by fisheries managers on a variety of topics from stock assessment, habitat and ecosystem health, environmental contamination and conflict resolution, among many others. For example, Sea Grant researchers have developed a revolutionary, rapid and reliable method of DNA analysis to identify shark species from fins, carcasses and other body parts. This one-step forensics technique allows for the identification of U.S. fishing vessels suspected of catching and selling protected species such as the dusky and the great white shark. This technology helped federal prosecutors confirm the presence of prohibited species in four of five investigations, resulting in fines of more than $100,000 and creating further deterrence for illegal fishing activities. Thus far, the Sea Grant research team has fully developed and tested DNA markers for 18 U.S. Atlantic shark species.

Recognizing the demand for fisheries extension services and the complexity of fisheries issues, the National Sea Grant Office and NOAA's National Marine Fisheries Service (NMFS) were asked by Congress to develop a program to improve communications with and among fisheries constituents. The partnership between Sea Grant and NMFS was enhanced by developing a regionally-coordinated, constituent-based fisheries extension program. The initial Sea Grant investment of $5 million led to:

- a partnership between NMFS and the U.S. Fish and Wildlife Service to reduce seabird bycatch in the Bering Sea and Gulf of Alaska, an activity that led to new fishing regulations and circumvented potential lawsuits that might have shut down a $200 million fishery;
- the Eliminator Trawl designed to catch underutilized haddock, likely resulting in economic gains of $30 million — a design for which Rhode Island Sea Grant extension

agents were awarded the grand prize in the 2007 World Wildlife Federation's International Smart Gear Competition; and

- a partnership between the National Marine Fisheries Service Southeast Fisheries Center and Sea Grant extension agents to deliver training programs and to distribute 1,000 bycatch reduction devices to fishermen in the Gulf of Mexico.

This list of just some examples of accomplishments demonstrates many of the Sea Grant capabilities that have earned it a reputation as a highly effective national program.

Future of Sea Grant

National Strategic Planning

Sea Grant is currently completing its national strategic planning process for 2009 to 2013. This five-year strategic plan establishes direction for the Sea Grant network to address critical national needs in coastal, ocean and Great Lakes environments. The plan capitalizes on Sea Grant's unique capacities and strengths, allows for flexibility and creativity on the part of state Sea Grant programs, and supports a broad range of priorities in NOAA's strategic plan, and NOAA's 20-Year Research Vision and Five-Year Research Plan

Over the next five years, Sea Grant will concentrate effort in four focus areas: healthy coastal ecosystems, sustainable coastal development, a safe and sustainable seafood supply, and hazard resilience in coastal communities. These four interrelated focus areas emerged from diverse stakeholder input, including advice from the Sea Grant Review Panel, during the strategic planning process as areas of critical importance to the health and vitality of the nation's coastal resources and communities. These areas reflect issues of major importance to NOAA and are areas in which Sea Grant has made substantial contributions in the past and is positioned to make contributions in the future. In addition, these focus areas are consistent with the work of the NOAA coastal program integration effort which is working to improve coordination in the development and delivery of services within NOAA's coastal programs.

Sea Grant's new strategic plan will address timely issues affecting coastal regions, including issues related to climate change, coastal hazards and coastal development. Sea Grant's extension staff, with diverse backgrounds and coastal specialties, will play a critical role in identifying local needs for climate research and information. Sea Grant extension staff can serve as intermediaries between NOAA's climate researchers and coastal decision-makers, helping to define and deliver NOAA's climate tools and products that are needed at the local level. In this way, Sea Grant's work complements the outreach efforts of other NOAA programs, such as the National Integrated Drought Information System and the Regional Integrated Sciences and Assessments program, with Sea Grant maintaining a specific focus on coastal communities. Sea Grant is committed to support research and outreach to effectively apply innovative techniques to restore degraded ecosystems. Also, Sea Grant has recognized the need to invest in research that evaluates the environmental and socio-economic trade-offs involved in coastal planning and decision-making.

Sea Grant is one of many partners working to address these complex and interrelated issues. Using partnerships to accomplish shared goals is a strategy inherent to Sea Grant and key to its successes.

Regional Plans

Consistent with the President's *U.S. Ocean Action Plan*, and the recommendations of the U.S. Commission on Ocean Policy, NOAA has committed to adopting ecosystem-based approaches to management to achieve balance among ecological, environmental and social influences in our nation's coastal, ocean and Great Lakes regions. In order to advance this effort, regional coordinators of Sea Grant programs are facilitating planning efforts to aid in the transition toward regional ecosystem-based management. Sea Grant is engaging a wide array of stakeholders to develop a "bottom-up" needs assessment by identifying research and information gaps, developing prioritized management-based regional research and information plans, coordinating technology and information transfer to appropriate end users, and providing an ongoing platform for coordination, collaboration, and resource-sharing among participants.

These regional plans will include clear statements of the major regional, ocean and coastal management issues, outlines of existing scientific and informational resources, analyses of the information necessary to address the critical issues, and a prioritized list of actions to be taken. Each final plan will include a prioritized list of forecast products that would aid in the transition toward regional ecosystem-based management. Eight regions are currently participating in this planning process (Gulf of Maine, Great Lakes, Insular Pacific, Alaska, Pacific Northwest, Pacific Southwest, Gulf of Mexico, and the South Atlantic) and their plans will be completed by the end of FY 2008. The remaining three regions (New York Bight, Mid-Atlantic and the Caribbean) are beginning the process in FY 2008, with plans scheduled for completion by the end of FY 2010.

Although the planning process is not complete, every region has identified climate change impacts as a top priority for research, including research that refines predictive models to regional and local scales, and consideration of socioeconomic and ecological effects. Beyond this issue, priorities are as diverse as the different regions' geological and ecological signatures. The Insular Pacific region prioritizes beach and reef restoration research, in the Great Lakes the priority is aquatic invasive species, in the Northeast the priority is storm safety, and along the Pacific coast the priority is ocean observation systems for better assessing the land-sea connection. Each region must include an outreach component in their plan, ensuring timely delivery of pertinent technologies and tools to the appropriate users.

Sea Grant Reauthorization

The *National Sea Grant College Program Act* (*Act*) was first enacted in 1966 and has been amended nine times, most recently in 2002. NOAA is supportive of efforts to reauthorize this *Act* as the National Sea Grant College Program has achieved significant accomplishments nationwide in promoting research, education, training and advisory service activities that have increased the understanding, assessment, development, utilization and conservation of the nation's ocean, coastal and Great Lakes resources.

Currently, the Administration is preparing a bill to reauthorize the National Sea Grant College Program, and will propose several changes we would like to see made in the next reauthorization. These changes include:

- *Advancing Sea Grant's Capacity for Regional and National Leadership:* Since its inception, Sea Grant has addressed issues at both the national and local levels. The *U.S. Ocean Action Plan*, recognizing that many of our nation's most compelling ocean and coastal issues are most effectively addressed regionally, has established regional collaboration as one of three near-term priorities, and NOAA is strengthening its ability to coordinate its activities regionally. The U.S. Commission on Ocean Policy highlighted Sea Grant's potential for carrying out regional science and information tasks. Regional research and information plans are already underway, as mentioned earlier in my testimony, and a reauthorization bill that would strengthen this regional leadership effort would benefit to the program.

- *Transforming the National Sea Grant Review Panel into a National Advisory Board:* The National Sea Grant Review Panel (Panel) was established in 1976 to provide advice on all applications submitted to Sea Grant for funding, on the Sea Grant fellowship program, on the designation and operation of Sea Grant colleges and on the development and application of planning guidelines and priorities. Over the past 30 years, the role of the Panel has evolved in consonance with the evolution of Sea Grant's influence and effectiveness. The Panel no longer reviews funding or fellowship applications and the designation of new Sea Grant colleges happens rarely as there are few coastal and Great Lakes states without a Sea Grant college. The 2006 National Research Council report called for the Panel to be "better positioned to comment on issues of broader significance to the overall program" and stated the Panel's sole function should be "to promote the effectiveness of the program as a whole." The duties of this body should be more focused on providing strategic advice regarding the national program, as well as providing assessment of the overall effectiveness of the program. A reauthorization bill should reflect these changes to the Review Panel and allow for them to better address the needs of the program as it has evolved since 1976.

H.R. 5618, the *National Sea Grant College Program Amendments Act of 2008*, does address many of the same concepts that NOAA and the Administration are considering as part of a reauthorization bill. We look forward to working with the Subcommittee on Fisheries, Wildlife and Oceans as this is important legislation to NOAA as we continue to better understand, assess, develop, utilize and conserve our coastal and Great Lakes resources.

Conclusion

In summary, Sea Grant is working to realize its vision for a future where people live along our coasts in harmony with the natural resources that attracted and continue to sustain them. This is a vision of our Nation's coasts in which we use our natural resources in ways that capture the economic and recreational benefits they offer, while preserving their quality and abundance for

future generations. This work allows Sea Grant to effectively serve NOAA's mission goal to protect, restore and manage the use of coastal and ocean resources.

Sea Grant has demonstrated an ability to leverage resources and engage issues in partnership with other entities; this program has proven itself to be an effective investment of taxpayer dollars. Looking ahead, the Sea Grant network of universities provides a national infrastructure with the ability to adapt and respond to emerging issues. I look forward to working with you to ensure that the National Sea Grant College Program continues to generate practical solutions to real problems in real places.

Thank you for inviting me to testify on the National Sea Grant College Program today. I thank you also for your interest in and support of NOAA's National Sea Grant College Program.