



Strategic Plan 2024-2027

New Jersey Sea Grant Consortium

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## OVERVIEW

### ABOUT US

New Jersey Sea Grant Consortium (NJS GC) is a not-for-profit affiliation of colleges, universities, and other entities dedicated to advancing knowledge and the sustainable use of New Jersey's marine and coastal resources. The organization was founded in 1969 by six state colleges to provide equal opportunity to marine and marine-related environmental education for New Jersey's undergraduate and graduate level students. Today, NJS GC consists of a multi-institutional membership of colleges, universities, and other groups that share and support the vision and mission of the organization. To achieve its goals, NJS GC engages the intellectual power of its diverse membership and partners to initiate and carry out interdisciplinary programs and projects that contribute to the well-being of New Jersey's Ocean and coastal environment and the resilience of its marine dependent economy.

In 1976, NJS GC was chosen as the host institution for the National Oceanic and Atmospheric Administration's (NOAA) National Sea Grant College Program in New Jersey. In recognition of

its academic and scientific achievements, NJSGC was awarded full Sea Grant College Program status in 1989. Over the years, NJSGC has continually diversified itself such that it currently manages approximately \$3.1 million annually in federal, state, and other funds to support its Sea Grant research, education, extension, and communications programs. NJSGC influences an additional \$1.8 million in leveraged funds through its funded researchers and extension team.

## **OUR HOME STATE**

New Jersey is widely known as the “Garden State,” but with 130 miles of ocean beaches and 1,792 miles of tidal shoreline, it could just as easily have been called the “Coastal State.” Over 80% of New Jersey’s counties border estuarine or ocean waters. NOAA defines all but one of those counties as coastal, and, under Section 6217 of the Federal 1990 Coastal Zone Management Reauthorization Act, all of New Jersey is considered coastal since all of its watersheds drain to the ocean.

Like many coastal states, New Jersey is highly dependent upon its coastal resources. In addition to its coastal tourism, boating, and recreational fishing industries, New Jersey is home to nine commercial fishing ports and two of the nation’s largest commercial shipping ports. The value of these industries is enormous, with ports commerce supporting a \$65 billion industry, coastal tourism at \$40 billion, and total sales revenue in commercial and recreational fisheries accounting at over \$8 billion. More than 1.5 million individuals with per capita incomes among the highest in the nation depend on these coastal-dependent industries for their livelihoods. The coast is also a source of recreation for New Jersey’s nearly 9 million residents and the 96 million-plus potential visitors who live within a four-hour drive.

These competing uses have created intense competition for New Jersey’s coastal lands, waters, and resources. The state’s coastal communities face enormous pressure to balance demand for revenue and growth with protection of marine and coastal resources. While it is the country’s fourth smallest state area-wise, it is the most densely populated in the nation. In addition, because New Jersey’s coastline is heavily developed, human safety, protection of property, and coastal hazard mitigation are areas of ever-increasing concern. Balancing economic growth, development, and redevelopment, with coastal resource quality and human safety is the critical issue for the future of New Jersey’s coastal communities. Science-based management and effective public policy are essential to ensuring human health and safety and to preserving New Jersey’s ecological services and economically essential uses.

## **VISION**

The vision of NJSGC is a sustainable future for New Jersey where people live, work, and play in harmony with their marine and coastal resources. To turn vision into reality NJSGC strives to advance creative and innovative solutions that address emerging and chronic challenges through engagement, science, and stewardship. Through its research, education, and outreach programs, NJSGC endeavors to build a caring, informed, engaged, marine and coastal-science

literate citizenry that has the knowledge, skills, and tools necessary to make decisions based on sound, scientific information, and evidence.

## **MISSION**

The National Sea Grant College Program's mission is to enhance the use and conservation of coastal, marine and Great Lakes resources to create a strong and sustainable economy, a healthy environment, and resilient and inclusive communities. The mission of NJS GC is to advance stewardship and responsible use of New Jersey's coastal and marine resources. NJS GC works towards its mission through integrated research, education, and outreach efforts that help New Jersey's citizens and visitors balance diverse needs and interests as they pertain to New Jersey's marine and coastal environments. NJS GC also supports like-minded organizations throughout the state, including New Jersey's pre-college and post-secondary academic institutions, to ensure the quality, availability, and accessibility of marine and coastal education programs.

## **PLANNING PROCESS AND STRATEGIC APPROACH**

Through this plan, NJS GC renews its commitment to advance knowledge and stewardship for New Jersey's marine and coastal environments and provide New Jersey's citizens, interested parties, and policymakers with a trusted source of sound, unbiased, and evidence-based information, and technical assistance to help them make well-informed decisions and take appropriate actions affecting the future of the state's coastal resources and all who depend on them.

This plan aligns with the National Sea Grant College Program's 2024-2027 Strategic Plan and is organized in accordance with its four focus areas: Environmental Literacy and Workforce Development, Healthy Coastal Ecosystems, Sustainable Fisheries and Aquaculture, and Resilient Communities and Economies. The plan also affirms NJS GC's support of the National Sea Grant College Program's core values and cross-cutting principles while drawing on the unique strengths and abilities of NJS GC to address critical state needs.

The process for building NJS GC's 2024-2027 Strategic Plan was part of a Sea Grant networkwide effort to develop the 2024-2027 National Sea Grant Network Strategic Plan. This collaborative effort brought the wealth of expertise and experience of all 34 state Sea Grant programs to the task of creating the national plan. For New Jersey, participation in this process ensured that the priorities of our state and our many interested parties were reflected in the national plan.

In response to guidance from the national Strategic Plan steering committee, NJS GC conducted a survey administered to its stakeholder community through its website, social media platforms, and email contact lists. NJS GC's contacts not only include individuals from state and local government, NGOs, and nonprofit organizations, and NJS GC's membership and academic researchers, but also include a diversity of interested parties who became interested or engaged with NJS GC through its extension, communications, and/or and education efforts

including classes, meetings and workshops, presentations, and public and professional outreach events. Input was also solicited from NJS GC's various boards and committees, and through NJS GC's extension staff to their stakeholder communities. The survey included questions targeted to national needs, but largely contained questions that were useful in collecting information, opinions, and perspectives needed to identify important issues as they pertained to New Jersey's marine and coastal environments and the development of NJS GC's 2024-2027 Strategic Plan.

The survey was implemented during the spring and summer of 2022. Results were applied to national Strategic Planning queries, and, at the state level, responses were summarized and distributed to NJS GC staff and advisory groups for further analysis and comment, including NJS GC Board of Trustees, Stakeholder Advisory Board, and Member Representatives. The final results were used by NJS GC staff, including educators and agents, in the development of their contributions to both the state and national Strategic Plans.

Collectively, this information was vetted through the Sea Grant network, national stakeholder groups, representatives from NOAA programs, other federal agencies, and environmental nonprofit organizations. Subsequent draft national plans were reviewed through the Sea Grant network, other NOAA line office programs, and national stakeholder groups.

The survey also informed NJS GC's research priorities process. Major categories of concern for coastal issues within Sea Grant's four focus areas were identified in the survey and were used as the basis to develop a second survey that was implemented to define research criteria and priorities for NJS GC's 2024-2027 request for research proposals, which was released in December 2022.

NJS GC has developed its 2024-2027 Strategic Plan using data from the survey, guidance from the National Sea Grant Office, and reviews of drafts of the state and national plans by NJS GC management, staff, and advisory boards. NJS GC's plan includes goals and outcomes across all four focus areas of the 2024-2027 National Sea Grant Network Strategic Plan and will, in addition to providing benefits to the state of New Jersey, contribute to meeting the goals of the national plan and many of its performance measures and metrics. The resulting plan also continues NJS GC's ongoing commitment to integrate research, extension, education, and communications to achieve stated outcomes and goals.

## **CORE VALUES**

*NJS GC relies on the following set of core values to support its vision and mission. They are essential to maintain NJS GC's long-standing identity not only as a leader, but also as a trusted source of unbiased, science-based information as it relates to greater knowledge and wise utilization of New Jersey's marine and coastal resources.*

## **Vision**

We believe that stewardship for our marine and coastal resources is achieved through knowledge and engagement. We seek to cultivate and establish a citizenry of committed and well-informed stewards through the wide range of education and outreach programs and services we provide. The vision of NJSGC is a sustainable future for New Jersey where people live, work, and play in harmony with their marine and coastal resources.

### **Collaborative Teamwork and Partnerships:**

There is no greater force than people working together to achieve shared goals. Collaboratively seeking and sustaining partners with whom we leverage each other's strengths, and responsively and respectfully integrating diverse expertise and perspectives is essential to identify and realize mutual goals and outcomes. The goals and outcomes of NJSGC's Strategic Plan have been determined with input from interested parties, partners, and internal and external relationships, and are therefore desirable for our state and its coastal zone. Therefore, we are also committed to working with these interested parties and partners to leverage existing resources and assets to establish a collective culture for success.

### **Sustainability and Resilience:**

We believe that widespread understanding of the interdependence between humans and the natural system is essential for long-term survival. To us, advancing environmental stewardship practices and communicating the value of the services that our estuarine, coastal, and marine waters and ecosystems, and associated watershed ecosystems provide to New Jersey is vital to achieving our mission and vision. We strive to nurture, inform, encourage, and enhance those behaviors and policies that promote balance between New Jersey's economy and the environment.

### **Non-Advocacy Commitment to Organizational Excellence and Accountability:**

In addition to providing the best possible response to the needs of our state and our interested parties, NJSGC operates with integrity and transparency while maintaining quality and relevance in all functional areas, including program management. We are committed to contributing to the realization of goals and outcomes expressed in the 2024-2027 National Sea Grant College Program Strategic Plan including the achievement of national performance measures and metrics. Although we often highlight issues at stake, we remain committed to non-advocacy to adhere to public trust. It is of the utmost importance to maintain a commitment to objective research and programming that avoids bias and advocacy in the development and delivery of information, tools, and services.

### **Efficiency and Effectiveness:**

We aim to provide services and products in a timely, thoughtful, responsive, ethical, and friendly manner that exceeds expectations. We set ambitious targets to measure the success of our work and do our best to meet or exceed those targets. Whether we are leading an effort or contributing to one, we strive to behave in a manner that sets an example, delivers high standards, and treats others the way we want to be treated ourselves.

### **Diversity, Equity, Inclusion, Justice, and Accessibility:**

Our work includes proactively engaging with a wide range of identities, cultures, communities, and capacities present throughout all areas of work, with respect and sensitivity to each person's experiences, historical, and systemic challenges. We take responsibility for our actions, decisions, and outcomes. We are honest, respectful, and fully committed to our mission and vision and that of the National Sea Grant College Program. We operate with a sense of broad possibility and believe that open and transparent science and communication at all levels is fundamental to our own growth and the success of the collaborations and partnerships towards which we contribute.

## **NJSGC CROSS-CUTTING PRINCIPLES**

*The following cross-cutting principles apply across the entirety of NJSGC's 2024-2027 Strategic Plan. They also guide NJSGC's management and staff as they implement planned activities and respond to emerging challenges and opportunities.*

### **Stakeholder and Community Empowerment:**

Through research, education, and outreach, we seek to empower our partners, interested parties, and the state's residents and visitors, to work with us to solve the issues and problems they face as they relate to New Jersey's marine and coastal resources. We regard this empowerment as essential to our long-term success as a Sea Grant program.

### **Stewarding Education:**

NJSGC is dedicated to advancing the State's environmental health and robust economy by educating our citizenry and expanding our workforce. We strive to be the resource necessary to realize educational excellence and equity in coastal, marine, and climate science literacy and supporting careers as we work to prepare and support leaders throughout the state. NJSGC's education initiatives are innovative, purposeful, and strategic, utilizing all available resources to bring timely, best available, scientifically accurate information to the table to educate the public, solve stakeholder problems, produce engaging educational programs, and support industry statewide.

### **Diversity, Equity, Inclusion, Justice, and Accessibility:**

We strive for equality and inclusiveness in the broadest possible sense of accessibility for each program and service we plan and deliver. We are fully committed to engaging people of all ages, genders, ethnicities, socio-economic backgrounds, perspectives, interests, and religions. It is our goal to work within and among the diverse communities across New Jersey to provide them with information and experiences that build capacity and establish mutual trust, respect, understanding, and sense of community. We also strive to engage diverse communities for advice and guidance on setting priorities and goals for our research, education, and outreach programs so they will be inclusive, effective, and equitable.

# NATIONAL FOCUS AREAS

To help New Jersey and the nation understand, manage, and use its coastal resources wisely, the National Sea Grant College Program has identified four focus areas central to the needs of the nation's coast, NOAA's goals, and the National Sea Grant Network's strengths and core values.

As part of a national network of 34 programs within NOAA, NJS GC has included goals and outcomes in support of each of these focus areas in its 2024-2027 Strategic Plan. The focus areas are:

- **Environmental Literacy and Workforce Development**
- **Healthy Coastal Ecosystems**
- **Sustainable Fisheries and Aquaculture**
- **Resilient Communities and Economies**

It should be noted that these four focus areas are not mutually exclusive. Many of the activities and programs NJS GC plans to implement over the next four years will cut across two or more of these focus areas. For example, coastal hazard resilience will be addressed across several focus areas. NJS GC plans to be an active participant in delivering resilience education, outreach, and research to its coastal constituents and will work with those communities to increase understanding of impacts, including climate change, and assist them in implementing adaptive strategies for risk reduction that support economies and environmental services. Water quality and quantity are also important themes that will span several focus areas. Bringing the results of scientific research through outreach (extension, education, and communications) to the people and decision makers of New Jersey is the surest way to secure NJS GC's vision of a safe, sustainable future for New Jersey's coastal communities.

The following describes NJS GC's goals and desired outcomes for each of the National Sea Grant College Program's four focus areas as they relate to the needs of New Jersey as determined by NJS GC's partners and interested parties. Outcomes should yield increased awareness, knowledge, skills, and/or changes in attitudes, opinions, or motivations, behavioral change, social action, adoption of information, changes in practices, improved decision-making and/or policy change. These outcomes may occur over various time frames including short-term, mid-term, or long term over years.

## ENVIRONMENTAL LITERACY AND WORKFORCE DEVELOPMENT

Education is a foundational and integral part of the work of Sea Grant and has been at the forefront of NJS GC's activities since the organization was founded in 1969. NJS GC remains committed to assuring that New Jersey's citizens and visitors understand and value the state's marine, coastal and watershed environments, and are able to apply sound scientifically supported evidence to make well-informed decisions regarding its use, management, and care. This is accomplished through the wide range of educational services and products that NJS GC provides. These include, but are not limited to, outdoor experiential learning programs, remote

synchronous learning programs, summer camp, scout programs, in-school visits, professional development workshops for formal and non-formal educators, curriculum development, college coursework, undergraduate internships, high school apprenticeship programs, as well as participation in professional and public outreach events.

In the last few years, anthropogenic activities in the face of changing climates as well as the almost insurmountable problem of marine plastic pollution have gained importance and risen to the forefront of education efforts. New Jersey became the first state in the nation to adopt climate change learning standards across the K-12 learning system in 2020 and is leading the way in equipping children with the tools necessary to address climate impacts on society. Marine debris is one of the most visible forms of ocean pollution, and scientists are only beginning to discover the dangers to both ecosystem and human health. To ensure that New Jersey's citizens and visitors understand the science of these major issues and can address and adapt to present and future challenges, NJS GC is committed to the development of educational tools that are relevant and connect the issues to state and national learning standards and goals.

Educational experiences not only provide individuals with the opportunity to grow intellectually and emotionally, but also have the resourcefulness of expanding skill sets and awareness of economic opportunities. A skilled workforce is necessary to foster prosperous and resilient communities and encourage economic growth. NJS GC is committed to providing educational opportunities to serve state and regional ocean-related industries such as aquaculture and fisheries to develop a diverse workforce and foster viable and sustainable economies.

NJS GC's educators engage thousands of citizens and visitors each year through their leadership and participation in numerous education programs and public and professional outreach events that showcase the work of NJS GC's research, education, communications, and extension personnel.

**Overall strategies for implementation of targeted goals and desired outcomes in Environmental Literacy and Workforce Development include:**

-Advance ocean and climate literacy across generations by providing and contributing to a diversity of environmental learning, career awareness, and stewardship-building tools and experiences.

-Work with Sea Grant research, extension, and communications counterparts to enrich and expand their programs and existing ocean and climate literacy programs including those that motivate learners to pursue higher education and careers in environmental science and STEM fields.

-Use NJS GC's university connections to advance greater understanding of best practices for creating and delivering engaging, effective, and culturally relevant ocean, climate, and STEM education.

- Foster opportunities and create tools for formal and non-formal educators to advance and improve science education and STEM career awareness through the integration of ocean and climate educational content and experiences.
- Engage a wide variety of like-minded partners and supporters to build public awareness on priority coastal issues including coastal hazard awareness and resilience, hazard preparedness, climate impacts, and conservation and protection of water resources.
- Work with NJSGC's Communications Program to increase participation in education programs and expand dissemination of educational messages, products, and publications.
- Work with NJSGC's researchers, and other ocean and climate scientists to develop researched-based curriculum materials and career awareness tools and programs.
- Provide workforce training to support the growing demand for skilled employees in the aquaculture and fisheries industries.

## **GOALS AND OUTCOMES: ENVIRONMENTAL LITERACY AND WORKFORCE DEVELOPMENT**

### **1.0 GOAL**

An environmentally literate public is informed by a continuum of lifelong formal and non-formal engagement opportunities that are diverse, equitable, inclusive, just, accessible, and reflective of New Jersey's communities.

### **1.1 ACTION**

Develop, implement, and assess educational resources and opportunities for students, educators and lifelong learners that foster curiosity, encourage learning, and strengthen abilities to synthesize and use knowledge in environmentally literate ways.

### **DESIRED OUTCOMES:**

1.1.1 NJSGC educators explore, adopt, and implement best practices to improve outreach and engagement with New Jersey's diverse populations.

1.1.2 Environmental awareness and science literacy among schoolchildren, their educators and lifelong learners are advanced, and appreciation of New Jersey's natural environments is increased as a result of participation in NJSGC education programs.

1.1.3 Education programs and products organized around the theme of environmental change help citizens better understand how physical, biological, and human factors impact the state's marine, coastal, and watershed systems and communities.

1.1.4 Formal and non-formal educators incorporate activities and learning modules developed by NJSGC to enhance their own curricula and engage students in marine and coastal sciences.

## **2.0 GOAL**

A climate-literate New Jersey citizenry is informed through a variety of learning and engagement opportunities focused on the local impact of climate change and is able to take action to prepare and adapt.

## **2.1 ACTION**

Increase opportunities for students and educators at all levels to gain knowledge and experience addressing climate issues that are impacting New Jersey's Ocean, coasts, and watershed environments.

### **DESIRED OUTCOMES:**

2.1.1 New Jersey's students, educators, and lifelong learners, increase their climate literacy including understanding of the indicators and measurements of a changing climate, through participation in NJSGC education programs.

2.1.2 Formal and non-formal K-12 educators gain access to climate and hazard resilience curriculum materials and training focused on local impacts and implications.

2.1.3 Formal and non-formal K-12 educators incorporate "place-based" classroom and hands-on climate and hazard resilience lessons into their teaching to connect theoretical concepts to relevant and current impacts.

2.1.4 Educators, students, and their families are aware of behaviors and technologies that can combat the effects of climate change and begin to adopt them.

2.1.5 Students, educators, and lifelong learners access and use research-driven data to understand the connection between New Jersey's marine and coastal environments, and effects of climate change.

## **3.0 GOAL**

STEM education throughout the state and the region is improved through the availability of interdisciplinary ocean and climate science curriculum products and training opportunities for formal and non-formal educators directed towards meeting state and national education standards.

## **3.1 ACTION**

Cultivate programs that give STEM educators the support to teach evolving subjects pertaining to marine pollution, coastal processes, and marine ecosystems and to adapt and thrive in changing education conditions.

## **DESIRED OUTCOMES:**

3.1.1 Formal educators implement ocean science and marine pollution-related goals of the New Jersey Student Learning Standards for Science in their classrooms using pedagogical training and curriculum materials developed and disseminated by NJSGC.

3.1.2 Non-formal educators working with K-12 groups adopt new teaching methods that correspond to state and national standards.

3.1.3 New Jersey's pre-service educators are prepared to include standards-based STEM education that incorporates marine, coastal, and marine pollution topics in their future teaching careers and gain experience using pedagogical methods that support New Jersey Student Learning Standards for Science.

## **4.0 GOAL**

A diverse, environmentally literate workforce that is skilled and prepared to support New Jersey's blue economy and is enabled to address critical local and regional needs.

## **4.1 ACTIONS**

Develop, implement, and assess resources and opportunities for interested parties to increase awareness, gain knowledge and experience, and explore career paths that support current and future needs of coastal communities and ecosystems and can adapt in changing conditions and prosper.

Support development of a trained and diverse workforce and enhance skills in a manner that recognizes a variety of methodologies and approaches, including those based on traditional and local knowledge.

## **DESIRED OUTCOMES:**

4.1.1 Awareness of maritime occupations and career pathways is advanced through programs and tools produced with input from Sea Grant researchers and extension professionals together with industry and academic partners.

4.1.2 Training in industry-driven methods develops a workforce pool for expanding the aquaculture and fishing industries and enhances their profitability and sustainability.

4.1.3 STEM-based programs that link Sea Grant educators and scientists with partner academic and industry professionals are utilized by New Jersey's formal and non-formal education communities.

4.1.4 Groups traditionally marginalized in STEM careers are introduced to opportunities that build awareness and capacity.

4.1.5 Undergraduate and graduate students conduct research in fields related to understanding and managing marine and coastal resources.

4.1.6 Undergraduate and graduate students enhance their professional careers and develop job skills through involvement in NJS GC K-12 programs.

4.1.7 Students supported by NJS GC-funded research, education programs, fellowships, and scholarships enter careers in fisheries and aquaculture, marine science, marine industries, science education, and marine policy.

## **HEALTHY COASTAL ECOSYSTEMS**

Healthy coastal ecosystems are the foundation for life along the coast. Fish, wildlife, and plants depend on healthy coastal ecosystems for their survival. These same resources support New Jersey's thriving coastal economy. The ability to balance economic growth while maintaining ecosystem health is vital to sustaining New Jersey's coastal communities. Our coastal ecosystems are increasingly challenged by development, particularly in the upper reaches of the state's coastal watersheds. With the desire to live or visit near the coast continuing to grow, non-point source pollution, increased demand on freshwater supplies, and other human use activities are contributing to degraded water quality, habitat loss, declining fisheries, spreading of invasive species, marine debris, climate change, and other challenges. The appropriate management, protection, and enhancement of these ecosystems must be addressed with innovative techniques that can quickly and efficiently address future changes.

NJS GC plans to utilize the goals outlined for Healthy Coastal Ecosystems (HCE) in the National Sea Grant College Program Strategic Plan as the basis for addressing the needs of New Jersey's coastal ecosystems and the interested parties that depend on them. NJS GC will focus its diversity, equity, inclusion, justice, and accessibility efforts on addressing the needs of New Jersey's overburdened communities as defined by the New Jersey Department of Environmental Protection. NJS GC stays informed of stakeholder needs through personal interaction, program-related meetings, workshops, and public forums that staff hold and participate in. In addition, NJS GC's Stakeholder Advisory Board provides direct input and helps to develop the relevancy criteria that drive the research component of NJS GC's activities.

For New Jersey's interested parties to make informed decisions, it is vital for a common understanding of the importance and value of healthy ecosystems and oceans as well as the connection between human activities and respective impacts on the environment. NJS GC plans to accomplish this by conducting activities in the HCE focus area that address impacts associated with stormwater discharges, improving operational practices at waterfront and inland facilities, reducing impacts from various recreational activities, restoring ecological function to impaired water bodies, improving adaptive management techniques among managers, and educating the citizens on anthropogenic impacts to coastal and ocean resources.

### **Overall strategies for implementation of targeted goals and outcomes in Healthy Coastal Ecosystems:**

- Distribute scientific information from NJS GC-funded research and other relevant sources to coastal residents, resource managers, county and local government officials, businesses, and industries, and facilitate understanding of such information so that it may be used effectively when making decisions and developing policy, especially in overburdened communities. - Promote the implementation and maintenance of best management practices and innovative approaches and technologies to reduce impact and help restore function to coastal ecosystems.
- Develop innovative methods and programs to help New Jersey’s residents, resource managers, businesses, and industries to understand the effects of human activities and environmental change on coastal resources.
- Provide technical support, particularly in overburdened communities, to residents, government officials, and businesses that need help with specific coastal resource related issues or problems.
- Provide lifelong learning programs for people of all ages – learning that enhances understanding of marine and coastal environments and promotes the strongest possible sense of stewardship and understanding.
- Assist marinas to adopt environmental best management practices and realize their economic benefits.
- Collaborate through organizations such as the New Jersey Coastal Resilience Collaborative across sectors (federal, state, and local communities, academia, nongovernmental organizations, and industry) to obtain a comprehensive understanding of ecosystem needs and restoration goals. Partners can then leverage each other’s strengths, and responsively, respectfully integrate their diverse expertise and perspectives to reach the shared goal.

## **GOALS AND OUTCOMES: HEALTHY COASTAL ECOSYSTEMS**

### **1.0 GOAL**

Ecosystems and the services they provide are preserved and/or improved by sustaining biodiversity and the abundance of living resources to support communities and economies.

### **1.1 ACTION**

Co-develop, improve, and share knowledge, decision-support tools, technologies, and approaches to protect and restore ecosystems.

### **DESIRED OUTCOMES:**

1.1.1 Communities have greater awareness and understanding of ecosystem functions and the services they provide.

1.1.2 Resource managers integrate scientific information on commercially, recreationally, and ecologically important coastal species into resource management practices.

1.1.3 Watershed function to coastal estuaries and coastal water quality in New Jersey are managed using adaptive management techniques.

1.1.4 Effective implementation and maintenance of best management practices allow for enhanced ecosystem function to coastal estuaries and dune systems.

## **2.0 GOAL**

Land, water, and their living resources are managed by applying sound science, tools, and services to sustain ecosystems that support communities and economies.

## **2.1 ACTION**

Support a science- and management-driven framework that integrates research, observations, monitoring, and modeling and that includes stakeholder engagement and traditional and local knowledge to provide a scientific basis for informed decision-making.

### **DESIRED OUTCOMES:**

2.1.1 Coastal managers and citizens consider scientific information obtained from Sea Grant funded research when making ecosystem, economic, and recreation related decisions.

2.1.2 New Jersey's businesses, residents, visitors, and other users understand how their actions impact New Jersey's coastal water quality and how coastal water quality impacts them.

2.1.3 Through Mid-Atlantic and Northeast Sea Grant regional and New Jersey-specific education programs, coastal residents, visitors, and other coastal users understand how their actions impact the mid-Atlantic region and New Jersey's coastal ecosystems from beaches and dunes to rivers to estuaries and the ocean.

2.1.4 Resource managers and businesses integrate scientific information into resource management practices.

## **3.0 GOAL**

Ecosystems and their habitats are protected, enhanced, or restored to support communities and economies.

## **3.1 ACTION**

Identify and advance successful strategies that enhance resilient ecosystems and watersheds in the context of changing conditions, including environmental variability and climate change.

### **DESIRED OUTCOMES:**

3.1.1 New Jersey residents, visitors, and other coastal users understand how their actions impact New Jersey's coastal water quality and how coastal water quality impacts them.

3.1.2 Community-based restoration and education programs are implemented that improve understanding of the ecological value of vital habitats and promote environmental stewardship values among K-12 students and adult participants.

3.1.3 Green Infrastructure Champions will be trained and certified to engage community leaders to adopt green infrastructure as a stormwater management solution.

3.1.4 Effective implementation and maintenance of best management practices allows for the infiltration or treatment of stormwater and wastewater, thus restoring watershed function to coastal estuaries.

3.1.5 Natural and nature-based solutions are implemented to promote ecosystem stabilization, habitat function, and/or flood control.

3.1.6 Green Infrastructure Champions secure local support to implement stormwater management practices that reduce flooding and water quality impacts from existing and planned development.

3.1.7 Community-based green infrastructure programs decrease the quantity of stormwater and nonpoint source pollution entering local water bodies and impacting coastal waters.

3.1.8 Community-based shellfish restoration programs enhance habitats and increase abundance and overall biodiversity.

3.1.9 Water monitoring professionals integrate decontamination protocols for gear and scientific equipment to reduce the spread of Aquatic Nuisance Species.

3.1.10 Watershed function is improved in New Jersey's coastal estuaries.

3.1.11 Improved biodiversity on dune ecosystems enhances their stability and function.

3.1.12 Shellfish populations recover, and ecosystem function and productivity are restored in targeted shellfish enhancement areas.

3.1.13 Community and ecosystem resilience is improved through ecosystem preservation, enhancement activities and restoration projects.

## **SUSTAINABLE FISHERIES AND AQUACULTURE**

After a decade or more of incremental increases in seafood consumption, per capita consumption decreased in 2020 as a result of the COVID-19 pandemic which shut down restaurants and dramatically decreased demand. Nevertheless, global production increased, a trend that is unsustainable unless seafood is caught or farmed responsibly with consideration given to the long-term health of the environment and the livelihoods of the people who depend

on it. In New Jersey and elsewhere, to make use of excess production, seafood harvesters and producers found innovative ways to get seafood to consumers via direct marketing or use excess production by contributing it toward restoration and conservation projects. Even so, it is unlikely that the gap between domestic seafood demand and domestic fishery harvest of 2.4 billion pounds can be easily filled with domestic production as domestic wild fishery harvests have reached a plateau and domestic aquaculture production is an order of magnitude too low. These challenges to the current and future of the fishing industry will be greatly exacerbated due to climate change.

The United States now ranks 18th worldwide in production of aquaculture, after previously being among the top five. In addition, our nation imports around 85% of its seafood and it is estimated that more than half of this imported seafood is produced via foreign aquaculture. Driven by imports, our national seafood trade deficit has grown to \$17 billion in 2020. ([NOAA, U.S. Aquaculture](#), 2022). Given a stagnant wild catch, aquaculture is considered the best method to reduce the demand gap as well as the trade deficit. In fact, global aquaculture production is predicted to continue to increase over the next decade, so there is opportunity for the United States aquaculture industry to expand and innovate through sound production and marketing strategies. The wild fisheries industry will need to innovate as well. For example, the industry will need to continue to develop value-added products in addition to developing stock rebuilding programs within sustainable management plans.

New Jersey has a long history as a major center for commercial and recreational fisheries. The natural capital of these resources is estimated at \$32 billion. Commercial fisheries in New Jersey rank among the most productive on the East Coast and in the nation. New Jersey is the second most valuable fishing port on the East Coast. The commercial fisheries sector lands more than 100 varieties of finfish, squid, and shellfish at its six major ports (Atlantic City, Barnegat Light, Belford, Cape May, Point Pleasant, Port Norris). In 2018, the commercial fishing and seafood industry in New Jersey generated the largest employment impacts in the MidAtlantic region with 49,398 full-and part-time jobs ([Fisheries Economics of the U.S.](#), 2018). New Jersey also generated the largest sales impacts (\$10.3 billion), value-added impacts (\$3.6 billion), and income impacts (\$2.1 billion).

Landings revenue was dominated by shellfish in New Jersey at \$121 million (led by sea scallops and surf clams), with finfish landings at \$30 million. Of all the Mid-Atlantic states, New Jersey holds the largest employment impacts from expenditures on saltwater recreational fishing (14,395 jobs), largest sales impacts (\$1.9 billion), biggest income impacts (\$814.7 million), and greatest value-added impacts (\$1.3 billion). New Jersey is second in the Mid-Atlantic for landings revenue, valued at \$151.9 million ([Fisheries Economics of the U.S.](#), 2018).

Recreational economic impacts of \$1.9 billion were driven by approximately 5 million trips with Summer Flounder the largest recreational harvest.

Nationally marine and freshwater aquaculture production was estimated at 680 million pounds in 2018, accounting for a nearly 8% increase in production volume compared to 2017 ([Aquaculture Development Plan Update New Jersey 2021-2026](#), 2021). The US remains 17th globally in terms of aquaculture production with an estimated \$1.5 Billion in value from all products. New

Jersey has a long history of oyster and shellfish culture supported by a century of research and industry cooperation through the Haskin Shellfish Research Laboratory. NJSGC has and does support research at Haskin through state Sea Grant funds and National Strategic Investments (e.g., research and extension on the biosecurity of interstate oyster seed transport) and continues to support a Shellfish Aquaculture Program Coordinator. The activities support a structural shellfish aquaculture industry that generates over \$7 million in farmgate value annually or approximately \$42 million in total sales based on an economic multiplier of six ([Aquaculture Development Plan Update New Jersey 2021-2026](#), 2021).

NJSGC also recognizes the importance of multi-species aquaculture and aquaculture for ecological restoration. Previous work by the NJSGC Shellfish Aquaculture Program Coordinator contributed to ecological restoration through the development of oyster reefs and structures. In addition, strategic planning survey results support restoration of Submerged Aquatic Vegetation (SAV) in our inland bays (e.g., Barnegat Bay) through aquaculture due to historic losses of SAV due to water quality and wasting disease infections. New Jersey SAV losses of 62% over a 25-year period have been documented in Little Egg Harbor ([NJDEP Submerged Aquatic Vegetation and Habitat: Survey And Mapping Methodologies Review](#), July 2021). Our shellfish aquaculture program coordinator will continue their relationship with Rutgers Haskin Shellfish Research Laboratory, Rutgers Aquaculture Innovation Center, and Consortium membership to meet those ends.

NJSGC will continue to support fisheries-related research that assists resource managers in the management and conservation of commercial, recreational, and aquacultured species. Through research, outreach, and education, NJSGC will continue to lead and support developments in innovative technologies, workforce development education and training, and fair regulations to produce a safe and sustainable seafood supply in many sectors of the industry, in particular within the shellfish aquaculture industry. NJSGC's overarching goal in this focus area is healthy fisheries (commercial and recreational) and mariculture industries within New Jersey that harvest seafood responsibly, ethically, efficiently, and sustainably. Furthermore, NJSGC will seek to inform interested parties so that they will understand the importance of ecosystem health and sustainable harvesting, and support sustainable management and consumption practices to protect and increase the supply of safe and sustainable seafood. Support and guidance of Sustainable Fisheries and Aquaculture focus area activities are augmented by the participation of representatives of the fisheries industry on NJSGC's Stakeholder Advisory Board.

### **Overall strategies for implementation of targeted goals and outcomes in Sustainable Fisheries and Aquaculture:**

- Form partnerships to advance environmentally responsible and sustainable fisheries and aquaculture.
- Enhance the seafood industry and public understanding of the importance of a healthy ecosystem for a vibrant seafood industry in New Jersey.

-Utilize new and traditional media platforms to make individual and group contacts, to develop meetings, workshops, forums, and trainings, and to produce written documents including manuals, articles, brochures, fact sheets and survey and evaluation materials that increase awareness and understanding of sustainable fisheries and aquaculture in New Jersey.

-Support research that enables scientifically sound fisheries management (including ecosystem-based management) or develops new technologies or products that are environmentally responsible and contribute to a competitive and viable mariculture industry.

-Identify and transfer research results and new mariculture technologies and methodologies that are environmentally responsible, ensure seafood safety, improve production, and promote ecosystem-based fisheries management to managers.

-Promote sustainable water-dependent industries (marinas, boaters, for-hire industry) and responsible use of catch and release techniques among recreational anglers.

-Work directly with the fishing and aquaculture industries on cooperative research, training, education, and outreach, including policy changes that lower barriers for entry and development within the industry.

## **GOALS AND OUTCOMES: SUSTAINABLE FISHERIES AND AQUACULTURE**

### **1.0 GOAL**

A safe, secure, and sustainable supply of aquatic natural resources to meet current and future needs of the fishing and aquaculture industries operating in New Jersey.

### **1.1 ACTION**

Develop, promote, and support safe harvest and processing techniques that are economically viable, socially acceptable, and ecologically sustainable while providing high quality, healthy products.

### **DESIRED OUTCOMES:**

1.1.1 Fishers and aquaculturists gain awareness of best management practices and approaches impacting health and safety issues as well as sustainability around fishing and aquaculture.

1.1.2 Business strategies/models are developed that promote sustainability and minimize multiuse conflicts.

1.1.3 Consumers obtain an understanding of the value of domestically produced seafood and other aquatic resources via fishing and aquaculture, while recognizing the need to balance economic, community, cultural and conservation goals.

1.1.4 Fishers and aquaculturists are aware of and have an interest in new opportunities, e.g., new target species or novel technologies.

1.1.5 New aquacultured species are produced that increase individual, industry and community economic resilience via successful introduction and marketing strategies.

1.1.6 Best management practices are implemented to promote sustainable fisheries and aquaculture.

## **2.0 GOAL**

Fishing communities and fishing industries including aquaculture enhance their productivity and sustainability through sustainably managed natural resources.

## **2.1 ACTION**

Ensure the best available science, services and tools are available to and trusted by resource managers, the fishing and aquaculture communities, conservationists, and consumers.

### **DESIRED OUTCOMES:**

2.1.1 Shellfish aquaculturists to increase awareness of novel technologies and approaches, seafood health and safety issues, and business strategies and models.

2.1.2 Youth participating in informal education activities at public outreach events will be inspired to participate in water-based recreational activities such as fin and shell fishing and boating.

2.1.3 Research is conducted on species vital to the commercial, aquaculture and recreational fishing industry.

2.1.4 Shellfish aquaculturists apply knowledge and adopt new techniques and approaches that enhance production in an environmentally sound and sustainable way.

2.1.5 New technologies and approaches developed through research that promote sustainable aquaculture practices are applied to enhance New Jersey's shellfish aquaculture industry.

2.1.6 Implementation of new aquaculture methods increases production and provides economic benefits to the industry and the region.

## **RESILIENT COMMUNITIES AND ECONOMIES**

New Jersey coastal communities are increasingly faced with severe threats from climate change, sea level rise, and coastal hazards that are affecting the state's coastal social, economic, and environmental systems. Climate change driven sea level rise is amplifying the impacts of coastal processes such as high tide and storm surge flooding, erosion, and wave attack; ultimately threatening trillions of dollars in coastal property and infrastructure. These

threats were exemplified over the last decade by the severe damage caused by Hurricane Irene in 2011, Superstorm Sandy in 2012, Winter Storm Jonas in 2016, and Tropical Storm Ida in 2021. At the same time, sea level rise has led to an increase in local tidal flooding and combined rainfall-high tide flooding that exceeds 45 days per year. These flooding occurrences are expected to significantly increase in the coming decades. Both types of events highlight the vulnerability of New Jersey's coast and have brought the topic of coastal hazards and resilience to the forefront of concerns among the state's coastal communities. In response New Jersey, with input from NJSGC, issued its first Climate Change Science report in 2020 and the New Jersey Climate Change Resilience Strategy and Coastal Resilience Plan in 2021 to guide community resilience action. NJSGC strives to improve coastal community and economic resilience by applying the best available science to inform decision making across all levels of government and all coastal community interested parties.

At the local level, resilience refers to a community's ability to understand, plan for, and respond to a given hazard or set of hazards, either natural or anthropogenic. In coastal communities, the concept of hazard resilience is of particular importance due to the number and assortment of hazards unique to the coastal zone and their frequent, significant impacts. The devastation caused by recent storm events only reinforced what coastal scientists have known for quite some time – choosing to live, work, and recreate in the coastal zone has numerous risks that must be balanced against economic and social benefits. It is also recognized that all coastal communities are not impacted equally by coastal hazards and that these impacts are further amplified in socially vulnerable and environmental justice (EJ) communities.

NJSGC's overall goal in Resilient Communities and Economies (RCE) is to ensure that all of New Jersey's diverse coastal communities, including residents, business owners, visitors, overburdened, EJ and others, understand these risks and are prepared to take appropriate measures to reduce their vulnerability and respond quickly and effectively to events when they do arise. NJSGC will achieve its goals in the RCE focus area by capitalizing on its existing infrastructure and strengths in the areas of research, education, and outreach to provide information and equitable access to tools designed to assist citizens, businesses, and decision makers in planning for hazardous events and creating diverse, vibrant, and sustainable coastal communities that are ready to adapt and respond to the challenges presented by an uncertain future.

NJSGC will support cutting-edge research in the areas of coastal processes, coastal hazards, stormwater management, living shorelines, ecosystem restoration, ocean planning, marine energy (e.g., offshore wind energy), climate change, and tourism. NJSGC's extension agents and specialists will engage New Jersey's diverse and ever-growing coastal population to assist them in equitably applying the best available scientific knowledge to address coastal resiliency. Ultimately, NJSGC will bring its unique research, education, and engagement capabilities together to support the development of resilient coastal communities and ecosystems that equitably sustain diverse and vibrant economies, effectively adapt, and respond to and mitigate natural and technological hazards, and function within the limits of their ecosystems.

## **Overall strategies for implementation of targeted goals and outcomes in Resilient Communities and Economies:**

-Develop and deliver a broad set of education and outreach services that address RCE issues relevant to New Jersey's citizens, visitors, and coastal interested parties.

-Through forums, surveys, and other means, encourage ongoing dialogue regarding stakeholder needs to achieve well-informed management of coastal resources.

-Work with public, private, government, non-profits, for profit, and academic partners to develop and deliver comprehensive research and education programs that improve public understanding of ocean related global change, climate variability, and hazardous ocean and ocean weather effects on coastal communities.

-Collaborate across sectors (federal, state, and local communities, academia, non-governmental organizations, and industry) and focus areas (Environmental Literacy and Workforce Development, Healthy Coastal Ecosystems, Sustainable Fisheries and Aquaculture, and Resilient Communities and Economies) so that a comprehensive understanding of all community systems can be obtained. This understanding can then be applied to all members and aspects of a community when addressing a specific community's resilience needs. Partners can then leverage each other's strengths, and responsively, respectfully integrate their diverse expertise and perspectives to reach the shared goal.

-Work directly with New Jersey's coastal communities to ensure that pre-storm preparedness and post-storm reconstruction are done with hazard resiliency in mind and an eye toward an uncertain future.

-Assist marinas to adopt best management practices and realize the economic benefits associated with being recognized as responsible stewards of the environment.

## **GOALS AND OUTCOMES: RESILIENT COMMUNITIES AND ECONOMIES**

### **1.0 GOAL**

New Jersey coastal communities have the capability and resources to prepare for and adapt to extreme and chronic weather and coastal hazards, climate change, economic disruptions and other threats to community health and well-being.

### **1.1 ACTIONS**

Improve and expand exchanges of knowledge to better identify the diverse needs of communities and to increase the public's understanding of changing conditions and related impacts.

Work with communities to advance collaborative comprehensive planning, actionable science, and adaptive management strategies.

Work with communities to explore and support diversification, strengthening, sustainability and social equity within coastal economic sectors and the blue economy.

Communities become more aware of natural hazards and respective risks and take steps to enhance community resilience to them.

### **DESIRED OUTCOMES:**

1.1.1 Scientific understanding, including traditional and local knowledge, provides foundational information, and all community members understand the impacts of changing conditions and coastal hazards and have the capability to prepare, respond and adapt.

1.1.2 Community leaders improve their understanding of changing conditions and coastal hazards and their capability to implement mitigation and adaptive strategies.

1.1.3 Inclusive collaborations with diverse interested parties and partners support mitigation and adaptation efforts built on knowledge from and responsive to the needs of all, especially the most vulnerable.

1.1.4 Coastal communities incorporate climate adaptation into their policy and planning and take action to reduce the impacts of coastal hazards on property using the full range of policy, engineering, and planning tools available.

1.1.5 A culture of preparedness is promoted throughout the state making all New Jersey's communities more resilient with a particular emphasis on underserved and over-burdened communities.

1.1.6 Coastal communities have access to and share knowledge, tools, services, and technologies to adapt and grow resilient economies.

1.1.7 Leaders in coastal economic sectors understand how they can become more resilient through innovation and diversification including expanded renewable, regenerative, and clean practices.

1.1.8 Industries in the blue economy sector become more aware of their vulnerability to coastal hazards and take steps to improve the resilience of vulnerable infrastructure.

1.1.9 New Jersey offshore wind developers will apply equitable decision-making to reduce impacts on overburdened and EJ communities, access to blue economy jobs and training, and understand and mitigate industry impact on coastal communities, economies, and natural resources.

1.1.10 Youth, particularly those from underserved and overburdened communities, participating in informal educational activities at public outreach events will be inspired to participate in water-based recreational activities such as fishing and boating.

## **2.0 GOAL**

Water resources are enhanced, sustained, and protected to meet existing and emerging needs of the communities and economies that depend on them.

## **2.1 ACTIONS**

Use engagement and information exchange to advance the understanding of how actions impact water quality.

Collaborate with diverse partners and interested parties, especially the most vulnerable, to advance plans and management practices for protecting and managing water resources.

## **DESIRED OUTCOMES:**

2.1.1 Communities understand watershed and coastal functions and the ecosystem services they provide, understand how their actions will impact water resources, and are able to make informed decisions.

2.1.2 Educators, students and lifelong learners participating in NJSGC' education and outreach programs will become aware of the impact their behaviors have on water quality and be inspired to think and care about the water.

2.1.3 New Jersey entities become more aware of the vulnerability of port facilities and infrastructure and influence on the economy.

2.1.4 New Jersey takes steps to improve the resilience of port facilities and urban infrastructure.

# APPENDIX A

## NATIONAL AND STATE PERFORMANCE MEASURES BY FOCUS AREAS

*The following performance measures will be used to assess the success of the Sea Grant Program at NJS GC in meeting the goals and objectives of the 2024-2027 State and National Sea Grant Strategic Plan.*

### ENVIRONMENTAL LITERACY AND WORKFORCE DEVELOPMENT MEASURES

Number of New Jersey Sea Grant Consortium products that are used to advance environmental literacy and workforce development. *National Target*

Number of people engaged in New Jersey Sea Grant Consortium-supported nonformal education programs. *National Target*

Number of New Jersey Sea Grant Consortium-supported graduates who become employed in a job related to their degree within two years of graduation. *National Target*

Number of products produced by New Jersey Sea Grant Consortium to advance the ocean and climate education goals of the New Jersey Student Learning Standards. *State Target*

Number of formal and non-formal educators trained by New Jersey Sea Grant to advance the ocean and climate education goals of the New Jersey Students Learning Standards. *State Target*

Number of Title 1 schools in New Jersey that participate in NJS GC developed and implemented education programs. *State Target*

### HEALTHY COASTAL ECOSYSTEMS MEASURES

Number of resource managers who use ecosystem-based approaches in the management of land, water, and living resources as a result of New Jersey Sea Grant Consortium activities. *National Target*

Number of acres of coastal habitat protected, enhanced, or restored as a result of New Jersey Sea Grant Consortium activities. *National Target*

Number of gallons of water infiltrated or treated by an individual or business through the implementation and maintenance of best management practices promoted by New Jersey Sea Grant Consortium such as rain gardens, rain barrels, pump-outs and wash wastewater capturing systems. *State Target*

## **SUSTAINABLE FISHERIES AND AQUACULTURE MEASURES**

Number of fishers and seafood processing or aquaculture industry personnel who modify their practices using knowledge gained in fisheries sustainability and seafood safety as a result of New Jersey Sea Grant Consortium activities. *National Target*

Percentage increase of individuals who enhance their awareness of sustainable water-dependent industries (marinas, boaters, charter industry) and responsible, ethical recreational fishing through NJBoating.org. *State Target*

Number of youth participants engaged in fishing and boating practices. *State Target*

## **RESILIENT COMMUNITIES AND ECONOMIES MEASURES**

Number of communities that adopt/implement sustainable economic and environmental development practices and policies as a result of New Jersey Sea Grant Consortium activities. *National Target*

Number of communities that adopt/implement hazard resiliency practices to prepare for and respond to or minimize coastal hazardous events as a result of New Jersey Sea Grant Consortium activities. *National Target*

Number of projects related to the blue economy that adopt/implement sustainable economic and environmental development practices and policies as a result of New Jersey Sea Grant Consortium activities. *State Target*

## **CROSS-CUTTING NATIONAL FOCUS AREA MEASURES**

*The following measures are not specific to a single focus area but rather represent results that have impact across two or more focus areas pertaining to the National Strategic Plan.*

Number of New Jersey Sea Grant Consortium tools, technologies and information services used by our partners/customers to improve ecosystems-based management. *National Target*

Economic and societal impacts and benefits derived from New Jersey Sea Grant Consortium activities market and non-market; jobs and businesses created or sustained; patents). *National Target*

# APPENDIX B

## CROSS-CUTTING NATIONAL PERFORMANCE METRICS

*These are the performance metrics that New Jersey Sea Grant Consortium anticipates in support of the 2024-2027 National Sea Grant Strategic Plan.*

Number of individuals and full-time equivalents devoted to Sea Grant.

Number of core Sea Grant Funding Proposals.

Number of Volunteer Hours.

Number of Postsecondary Students and Degrees Financially Supported by Sea Grant in Higher Education Programs.

Number of P-12 Students who participated in Sea Grant-supported formal education programs.

Number of P-12 Students Reached Through Sea Grant-Trained Educators.

Number of educators who participated in Sea Grant-supported professional development programs.

Number of Sea Grant-Sponsored/Organized Events.

Number of Attendees at Sea Grant-Sponsored/ Organized Events.

Number of Public or Professional Presentations.

Number of Attendees at Public or Professional Presentations.

Number of Marinas Certified as “Clean Marina” by the Clean Marina Program as a result of Sea Grant Activities.

Number of peer-reviewed publications produced by Sea Grant.

Number of people that visit museums, aquariums, and other informal education institutions hosting NOAA-supported exhibits or programs.

Number of people participating in environmental actions through NOAA education programs.