

# Alaska Sea Grant Strategic Plan 2018–2021

This plan identifies Alaska Sea Grant’s goals, objectives, strategies, and desired outcomes in addressing key coastal and marine issues in Alaska, the nation’s only arctic state. The plan helps us focus and unify Alaska Sea Grant’s vision and communicate our priorities to stakeholders and partners. We use the plan to align with National Sea Grant focus areas and to guide how we direct staff and fiscal resources.

## Alaska Sea Grant

The Alaska Sea Grant College Program, one of 33 Sea Grant programs nationwide, is a state-wide program headquartered at the University of Alaska Fairbanks. Our mission is to enhance the wise use and conservation of Alaska’s marine, coastal, and watershed resources, through research, education, and extension.

Alaska Sea Grant was established in 1970 and is the only Sea Grant program located in the Arctic. We are a state-federal partnership with the majority of federal funding coming from the National Oceanic and Atmospheric Administration (NOAA). State funding comes from the University of Alaska Fairbanks, through the College of Fisheries and Ocean Sciences. Grants and donations from state, federal, and local governments; tribes; industry; organizations; and program income from training and meeting fees and publication sales enhance Alaska Sea Grant’s funding.

Alaska Sea Grant is an integrated program of communication, education, Marine Advisory outreach, and research that engages partners and functions as a creator of knowledge, a convener of diverse stakeholders, and a trusted provider of information. We strive to innovate and adapt as we address critical and changing coastal and marine issues in our state. We work to enhance the wise use and conservation of our marine, coastal, and watershed resources.

Alaska Sea Grant’s strength is in the trust that Alaskans have in our work and those who carry it out including Marine Advisory faculty, communications and administrative staff, researchers and students funded by Sea Grant, and a diverse and active group of partners and advisors. For more than 45 years, we have served Alaska from offices located in coastal communities across the state as well as on the main University of Alaska Fairbanks campus. We increase our effectiveness and reach by collaborating with and building networks among people, communities, and organizations.

## Our mission

Alaska Sea Grant’s mission is to enhance the wise use and conservation of Alaska’s marine, coastal and watershed resources through research, education and extension.

## Our vision

Alaska will sustain its vibrant marine, coastal, and watershed ecosystems, with strong coastal communities and people who make decisions using science-based, local and indigenous knowledge, for social and economic benefit.

## Core values

1. **Service** — Accessible and responsive
2. **Science-based** — Support research and connect people with science
3. **Education** — Prioritize education and training to inform stewardship, support industries, and build and train workforces
4. **Collaborative** — Build partnerships to have greater impact meeting shared goals
5. **Forward thinking, adaptable, practical** — Develop capacity in businesses and communities to anticipate and adapt to change

## Alaska's coast and marine environment defines us

Alaska's marine, coastal, and watershed environments are the most productive and pristine in the nation and are vital to the culture, livelihood, and economy of the state's residents. The Gulf of Alaska, Bering Sea, and arctic coastlines stretch nearly 44,000 miles, and the marine systems off Alaska are larger than those in the rest of the United States combined. These marine, coastal, and watershed ecosystems are diverse, ranging from a temperate rainforest in Southeast Alaska, to tundra in far north Alaska, defining the United States as an arctic nation.

Alaska's coastal waters support some of the world's largest fisheries, as well as vibrant populations of marine birds, mammals, and invertebrates. Ecosystem change in Alaska has direct social and economic impacts that are likely to be more profound with the advances of climate change.

## Alaska's people

Over 70 percent of Alaska's 730,000 residents live along its coastline, seasonally joined by close to 2 million visitors each year. Fewer than 10 percent of coastal communities in Alaska are connected by road; most are accessible only by boat or airplane. This remoteness is a defining feature of Alaska, and can lead to limited opportunities for education or business enterprises and high costs of power and transportation. On the other hand, residents live in communities that embody a sense of place, often support a rich subsistence lifestyle, and are close to extended family.

Alaska is home to many culturally and linguistically diverse Alaska Native peoples organized into over 200 federally recognized tribes, making up about 15 percent of the state's population with a much higher percentage in rural Alaska. Alaska Natives carry on rich cultural traditions today in both urban and rural communities.

In Alaska's urban centers, the population is diverse, with Anchorage having one of the largest and most culturally mixed school systems in the nation. The few larger communities

in Alaska are hubs of educational, employment, and other opportunities. However, many Alaskans in urban centers have limited reasons to travel to non-road accessible communities, leading to a sense of “rural-urban” divide in understanding and lifestyles that challenges policy makers.

## **Alaska’s unique dependence on marine and coastal resources**

Over 200 coastal communities from Ketchikan to Kaktovik depend on the harvest and processing of fish and other marine resources including shellfish, marine mammals, seabirds, marine invertebrates, and plants to feed their families and sustain local economies. For thousands of years, Alaska Native families and communities have shared marine resources, and this continues today with all cultures throughout rural Alaska. Food security in Alaska is a growing concern that encompasses food safety, sustainable supply of marine resources, and continued access to harvest.

The commercial fishing industry off Alaska is valued at \$6 billion, and more than half of the fish and shellfish harvest in the United States comes from waters bordering Alaska. Commercial fishing and seafood processing are the largest private employers in the state, providing 70,000 seasonal and year-round jobs to Alaskans and non-Alaskans. Recreational and guided sport fishing activities occur along Alaska’s expansive coastline, in lakes and rivers.

Coastal tourism accounts for much of the state’s visitor industry. In 2014, nearly 2 million out-of-state visitors came to Alaska. Tourism supported 45,000 peak-season jobs and contributed over \$1.25 billion in wages and benefits.

Alaska’s coastal economy depends as well on other maritime occupations, such as oil and gas development, marine transportation and freight delivery, mineral extraction, shellfish mariculture, marine research, and coastal infrastructure such as boat building, repair, and provisioning. For many coastal communities throughout Alaska, the local economy depends on a blend of cash jobs and subsistence harvest.

## **Environmental change creates uncertainty**

Alaskans depend on healthy coastal ecosystems. The impacts of climate change are readily apparent in Alaska, as is true across the entire Arctic. Alaska is experiencing dramatic reductions in sea ice quality, quantity, and duration, resulting in increased storm surges and accelerated coastal erosion and infrastructure damage. Coastal inundation, changes in precipitation, diminishing permafrost, increasing stream temperatures, and changes in the abundance and distribution of subsistence and commercially important resources are all presenting difficult challenges to Alaska’s resource-dependent communities. Expansion of harmful algal blooms, marine invasive species, and ocean acidification are looming worries.

Erosion and flooding conditions are endangering coastal communities, primarily Alaska Native communities. In a statewide assessment by the Army Corps of Engineers in 2009, 178 Alaska communities were found to have erosion problems with 26 designated as Priority Action Communities.

Food security and food safety are growing concerns for coastal communities, both rural and urban. Concerns include ocean acidification affecting the abundance of shellfish and

fisheries food chain stocks, increasing harmful algal blooms that impact commercial and subsistence shellfish harvest, and threats to marine mammals from novel diseases, increased pollution, and noise from vessel traffic that threaten animals depended upon for food. The nutritional, cultural, and economic health of families and Alaska communities, many with few other economic opportunities, is reliant on the harvest of healthy, abundant, and regionally relevant marine-based resources.

Alaskans depend heavily on boating as commercial fishermen, subsistence harvesters, and recreational mariners. Drowning and accident rates in Alaska are eight times the national average, and drowning is the second leading cause of death for Alaska's children. While loss of life at sea among commercial fishermen in Alaska has been trending downward, in part due to mandatory and voluntary marine safety training, it still remains high.

## Strategic Plan 2018–2021

The Alaska Sea Grant strategic plan was developed with input from stakeholders and partners who participated in regional community meetings convened by Marine Advisory agents, and through an extensive online survey. Alaska Sea Grant Marine Advisory faculty and staff, and our 25-member statewide Advisory Committee, reviewed and added to this input.

The plan is organized under four National Sea Grant focus areas and aligns itself with National Sea Grant goals and the relevant goals of the University of Alaska Fairbanks. The four National Sea Grant focus areas are:

1. Healthy Coastal Ecosystems
2. Sustainable Fisheries and Aquaculture
3. Resilient Communities and Economies
4. Environmental Literacy and Workforce Development

In the context of these themes, Alaska Sea Grant identifies priorities in addressing critical coastal and marine issues in Alaska for the period 2018–2021, through eight goals and thirteen objectives.

Alaska Sea Grant believes that building priorities based on stakeholder needs ensures that we are responsive, adaptive, and flexible. Alaska Sea Grant uses a number of strategies to address the priorities in this plan. We identify and assess the needs and interests of stakeholders to focus our research, education, and outreach, and share information tailored to a range of audiences. We prioritize partnerships and emphasize ways to ensure that stakeholders' voices are heard. We work to be collaborative in Alaska Sea Grant–funded research, and to include traditional and local knowledge throughout the work.

Alaska Sea Grant identifies our **stakeholders** broadly to include, in no particular order:

- Coastal community residents
- Coastal industry groups
- State and federal legislators
- State and federal agencies
- Local and tribal governments

- Nongovernmental organizations engaged in conservation or wise use of marine resources
- K–12 teachers and students
- University faculty and students
- General public

We define **partners** as any group with which we are sharing work or finances to serve a common goal.

Alaska Sea Grant’s work is grounded in best practices, and we provide statewide leadership in bringing stakeholders and partners together to identify and act to address the pressing issues of our state.

## I. Healthy Coastal Ecosystems

### Situation

Alaskans depend on healthy coastal ecosystems. Healthy ecosystems maintain structure and function over time in the face of external stress and change. They are biologically productive and resilient to physical forces and to the social, political, and economic drivers that dictate human interactions. Humans are a part of Alaska’s coastal ecosystems, using seasonally abundant resources to meet subsistence, cultural, and economic needs. Many Alaskans have a deep knowledge and engagement with their natural surroundings.

Alaska’s marine ecosystems are facing unprecedented challenges, from increasingly sophisticated fisheries, nearshore oil and gas exploration, increased vessel traffic in arctic waters, expanding tourism, and industrial development.

Climate change and related atmospheric carbon-induced forces are altering coastal ecosystems, directly and through their influences on human activities. Ocean acidification, sea level rise, accelerated coastal erosion, harmful algal blooms, marine invasive species, novel diseases, and the decline of sea ice pose growing threats to natural and human environments, and in some cases present new opportunities.

Alaskans who depend on healthy marine ecosystems are intensely interested and engaged in the conservation as well as the wise use of coastal environments.

### Goal 1 Healthy marine, coastal, and watershed ecosystems in Alaska.

**Objective 1** Increase the shared body of knowledge about marine, coastal, and watershed ecosystems in Alaska, emphasizing the concerns and interests of stakeholders.

### Strategies

1. Consult with stakeholders to identify information gaps, knowledge, and skills that would inform their work in promoting and protecting healthy ecosystems.
2. Sponsor, facilitate, and collaborate on research, information gathering (including local and indigenous knowledge), and analysis to address stakeholder priorities.
3. Engage stakeholders in planning, design, and implementation of research and information gathering.
4. Share the results of research and information gathering with stakeholders.
5. Organize and facilitate community-based monitoring programs and networks to develop and extend long-term data sets.

### **Desired outcomes**

- New information (including local and traditional knowledge) will be generated on the marine, coastal, and watershed ecosystems of Alaska to fill existing gaps in knowledge.
- Stakeholders will engage in information gathering and understanding results.
- Science-based information will address stakeholder concerns and inform government and resource agency policies.
- Alaskans will increase their participation in community-based monitoring programs that contribute to the knowledge and increase environmental literacy.

**Objective 2** Support and enhance planning, management, and mitigation needed to ensure healthy ecosystems and coastal communities.

### **Strategies**

1. Consult and work with planners, resource managers, marine resource industries, and communities to provide information for maintaining healthy ecosystems, and to support adaptation and mitigation to address environmental change.
2. Support federal, state, municipal, and tribal governments' responses to environmental issues by sharing expertise and serving as a local liaison.
3. Participate in and advise on relevant boards and committees such as the Alaska Ocean Observing System board, the advisory committee to the Alaska Center for Climate Assessment and Policy, and the NOAA Regional Collaboration team.

### **Desired outcomes**

- Alaska coastal communities are better informed and have support for processes that promote long-term planning, including research, facilitation, and data synthesis.
- Planning processes in Alaska coastal communities articulate, and are inclusive of, cultural, social, and economic goals.
- The needs of Alaska coastal communities are represented in regional, state, and national governance and decision-making processes.

## II. Sustainable Fisheries and Aquaculture

### Situation

Alaskans depend on the harvest of fish, shellfish, and other marine resources including marine mammals, invertebrates, plants and seabirds, for food, and in the case of fish and shellfish, for jobs and income. Alaska’s waters provide over half of America’s commercial fisheries landings each year. Subsistence harvest of marine resources for food occurs across the state, serving as the base of a mixed cash-subsistence economy and lifestyle in many coastal communities.

Fluctuations in fisheries and marine resources impact Alaska’s food security and economy. Stress on marine ecosystems from environmental change and human-caused impacts challenges policy makers and resource managers, harvesters, and seafood businesses in ensuring resource sustainability.

Changing market demands and global competition are challenges to the seafood industry. Most commercial fishing access is restricted in Alaska, designed to meet increasingly complex conservation and management objectives. Alaska harvesters seek to participate effectively in the process. Harvesters and entrepreneurs have an ongoing interest in enhancing value through innovative marketing and product development across Alaska.

The Food Safety Modernization Act (FSMA) aims to ensure the safety of the US food supply by focusing on preventing contamination rather than responding to it. FSMA makes hazard analysis and critical control points (HACCP)-type preventive controls the norm in all food processing facilities. Alaska’s seafood processors are ahead of the curve with regard to HACCP, but must continue to be vigilant to respond to stricter preventive controls for their operations.

Seafood quality and safety is an ongoing issue for commercial and subsistence food processors. Foodborne illness rates are high in Alaska. Alaska’s commercial seafood processing industry with nearly 200 facilities is remote, seasonal, and diverse with an ever-changing workforce. Many seafood companies have limited training support, limited resources for product analysis, and high energy and production costs. There is a constant search to meet today’s emphasis on “green” manufacturing such as energy efficiency, lean manufacturing, or use of byproducts that can also increase value of the fishery.

**Goal 2** Sustainable fisheries and marine resources that provide safe food, jobs, and economic and cultural value.

**Objective 1** Promote and support harvest and processing techniques that lead to safe and high-quality food and economic benefit from seafood and other marine resources.

## Strategies

1. Provide information, training, and technical assistance in food safety and quality to harvesters, commercial seafood processors, people processing food for noncommercial use, and aquaculture operators.
2. Provide training and technical assistance in harvesting operations, seafood processing, value-added processing, new product development, workplace health and safety, and other areas related to profitability of the fisheries sector.
3. Conduct specific lab analysis and applied research to support seafood and other food producers in developing new products, improving processes, and reducing waste.
4. Educate users on the risks from harmful algal blooms (HABs) and support testing for paralytic shellfish poisoning in personal, subsistence, and commercial shellfish harvest.

## Desired outcomes

- Alaskans, whether harvesting and processing food for commercial value or food, will optimize the safety and quality of their products and meet regulatory requirements.
- Seafood harvesters and processors will optimize the profitability of their products.
- Shellfish harvesters and producers will be aware of the risks of HABs and will partner in field and laboratory trials of emerging testing technologies.

**Objective 2** While recognizing the priority of wild stocks and harvest, support sustainable aquaculture and enhancement of marine resources.

## Strategies

1. Support research on culturing systems and cultured species to improve the production and economic viability of aquaculture operations.
2. Develop and disseminate information to help aquaculture operations adapt to climate change and ocean acidification.
3. Support research and disseminate information about interactions between cultured and wild species, including implications for disease transmission, genetic diversity, and water quality.
4. Develop and implement culturing and out-planting technologies for shellfish and marine plants to further conservation goals, including the recovery and rehabilitation of depleted species.
5. Participate in the development of regulations and policy relating to aquaculture through committees such as the Alaska Mariculture Task Force.

## Desired outcomes

- Potential and current aquaculture operations have research-based information to support improved production, and to inform approaches to adapt to warming conditions and ocean acidification to ultimately improve economic viability.

- Hatchery operators and harvesters will have scientific information regarding enhancement operations and their interactions with wild species.
- Proven culturing and out-planting techniques are developed and disseminated to support enhancement opportunities when possible.

**Objective 3** Promote and support the sustainability of fisheries and other marine resource harvests.

### Strategies

1. Sponsor research that supports sustainable fisheries and other marine resources.
2. Provide training and outreach about fishery management participation, processes, and leadership.
3. Participate as members or advisors of state and federal regulatory agencies and committees that contribute to the sustainability of fisheries and shellfish industries such as local Fish and Game Advisory Committees and North Pacific Fishery Management Council committees.
4. Develop and disseminate information on marine resource harvesting strategies for adapting to climate change, ocean acidification, and other environmental or human-caused change.

### Desired outcomes

- New information (including local and traditional knowledge) will be generated on harvested species to fill existing gaps in knowledge to improve fishery sustainability.
- Marine resource users adapt their harvesting strategies to a changing environment.
- Regulatory decision-makers, including public boards and commissions, have access to science-based information and stakeholder perspectives to improve the sustainability of fisheries management in Alaska.

### III. Resilient Communities and Economies

#### Situation

Most coastal communities in Alaska are accessible only by boat and air. While valued by local residents, this remoteness results in higher costs for goods and services and fewer economic opportunities. Challenges in coastal communities include high energy costs, low margins for businesses, limited municipal revenues, limited internet capability, decreasing state financial support, and other factors that can make it difficult to attract business, create employment opportunities for residents, sustain community services, and provide for community well-being.

A diverse fiscal base is critical to the economic strength of coastal Alaska communities and residents. Commercial fishing and seafood processing continue to be a way of life and economic base for many coastal communities. Tourism, sport and charter fishing operations, handicrafts, vessel repair and maintenance, shellfish farming, resource professionals, and other coastal service businesses such as harbors, docks, and freight forwarding are also significant sources of jobs and income.

Dependence by Alaskans on coastal resources means that environmental change and hazards impact their lives. Uncertainty in weather and a changing climate is apparent across Alaska, most of all in the Arctic. Loss of sea ice in the Bering, Chukchi, and Beaufort Seas reduces access to marine mammals by subsistence hunters. Strong winds and waves are no longer buffered by sea ice, impacting shoreline buildings and accelerating coastal erosion. Coastal erosion and thawing permafrost in the warming Arctic are impacting community infrastructure. As sea ice diminishes, increased shipping in arctic waters may lead to improved ports and facilities, driving down costs for transporting goods to rural coastal communities. Proposed and ongoing mineral extraction and oil and gas drilling could lead to jobs for local residents. However, residents worry about oil spills, pollution from shipping, and other environmental concerns that could impact their subsistence way of life.

#### Goal 3 Vibrant coastal communities with strong and diverse economies.

**Objective 1** Support the success and expansion of Alaska-based maritime businesses.

#### Strategies

1. Provide training and technical assistance to new and expanding maritime and coastal businesses in business planning and management, risk management, and energy efficiency.
2. Coordinate and encourage exploration of industry diversification in maritime and coastal businesses.

**Desired outcomes**

- Alaska-based maritime businesses are more profitable.
- Alaska-based maritime businesses will evaluate diversification options.

**Objective 2** Increase the resilience of Alaska coastal communities through diversification, growth, and strengthening of coastal/marine economic sectors and social well-being, identity, and values.

**Strategies**

1. Facilitate, support, and serve as a resource for community-led planning, data collection and analysis, and decision-making.
2. Inform the public and private sectors about the challenges, needs, and opportunities in Alaska’s rural coastal communities.
3. Sponsor and collaborate with communities and other partners on projects and research relating to economic opportunities, diversification, development, and community well-being.
4. Promote and support participation by Alaska residents and communities in public policy and management processes that affect their livelihoods and economies.

**Desired outcomes**

- Alaska coastal communities are engaged in long-term planning, including research, facilitation, and data synthesis.
- Planning processes in Alaska coastal communities articulate and include cultural, social, and economic goals.
- The needs of Alaska coastal communities are represented in regional, state, and national governance and decision-making processes.

**Goal 4** Communities and residents with skills and knowledge to respond and adapt to coastal hazards and environmental change.

**Objective 1** Increase the capacity of Alaska’s coastal communities and residents to prepare for, and adapt and respond to, coastal hazards, disaster events, and environmental change.

**Strategies**

1. Educate communities and residents about coastal hazards, ocean acidification, climate and other environmental change, and related policy issues.
2. Facilitate, support, and serve as a resource for adaptation planning efforts that mitigate climate change effects while providing for improved community well-being.

3. Partner with community-based monitoring groups and others to promote local data collection efforts that enhance knowledge about coastal change for both monitors and residents.
4. Sponsor and collaborate in research, data collection, and data analysis related to coastal hazards and hazard mitigation planning.
5. Coordinate, teach, and participate in community-based prevention, preparedness, and response activities related to natural and human-caused coastal hazards.
6. Participate in and advise on relevant boards and committees such as the Alaska Ocean Acidification Network, the Local Environmental Observer Network, Alaska Center for Climate Assessment and Policy, and the Alaska Ocean Observing System.

### Desired outcomes

- Alaska residents are aware of and understand potential coastal hazards, work to mitigate, and make plans to respond to those hazards.
- Decision-making about collective response to coastal hazards is informed by local resident participation in planning, data-collection, and research.

## Goal 5 Safe participation in maritime travel and activities.

**Objective 1** Lower the risk of injuries and fatalities associated with boating and other maritime travel and activities, in a changing environment.

### Strategies

1. Train and inform Alaskans about marine safety, addressing boating, travel on sea ice, exposure to weather, adaptation to changing climate and environmental conditions, and other hazards.
2. Produce information and conduct training for workers in the maritime industries and for vessel owners that will promote personal safety and health.
3. Collaborate with marine safety and other educational and community groups in Alaska and nationally, to produce and share resources on safety practices.
4. Participate on and advise the Alaska Marine Safety Education Association Board of Directors, the Commercial Fishing Safety Advisory Committee, the Alaska Boating Safety Advisory Council, and other advisory groups focused on marine safety.

### Desired outcome

- Fatality and injury rates will decrease as marine operators have increased awareness of how to prevent and respond to marine incidents.

## IV. Environmental Literacy and Workforce Development

### Situation

National Sea Grant defines an environmentally literate person as “someone who has a fundamental understanding of the systems of the natural world, the relationships and interactions between the living and non-living environment, and the ability to understand and utilize scientific evidence to make informed decisions regarding environmental issues.”

In Alaska, the context of environmental literacy is a diverse population, with varying degrees of access to educational resources, challenged by a rapidly changing natural environment. The need for current, relevant information gleaned from research and the long-term perspectives of local knowledge is becoming more urgent for Alaskans. Environmentally literate citizens able to participate in public policy decisions that affect Alaska’s coastal resources are crucial.

Workforce development for maritime careers (defined as all occupations related to the marine environment) for the diverse population of Alaskans is a need outlined by the Alaska Maritime Workforce Development Plan. The graying of the fleet and coming retirements of experienced fisheries managers and seafood processors challenge the succession in these vital industries. Training and support, guided by industry, is critical as the next generation of harvesters, managers, processors, technicians, and maritime personnel take the helm of Alaska’s industries.

**Goal 6** An environmentally literate Alaska public and visitors.

**Objective 1** Increase effective environmental literacy instruction to Alaska K–12 students by formal and informal educators.

### Strategies

1. Develop and promote the use of standards-based Alaska Sea Grant–sponsored curriculum materials and other educational resources that reflect current science research and engage students in maritime technology.
2. Provide professional development for educators in instructional strategies, with emphasis on hands-on and field-based instructional strategies and engaging students in school-based environmental monitoring and stewardship activities.
3. Provide student instruction in the classroom, on field trips, and in extracurricular activities.
4. Promote and support systemic change at the school, district, and statewide level to include and implement environmental literacy education in Science-Technology-Engineering-Mathematics (STEM) and other subject areas.
5. Facilitate and support outreach and educational activities by Alaska researchers to teachers and students.

### Desired outcomes

- Environmental literacy instruction will be increased statewide through the integration of place-based and Alaska-relevant marine and aquatic education into the curriculum of Alaska school districts.
- Formal and informal educators trained in effective teaching strategies will increase the use of Alaska Sea Grant–sponsored curriculum materials and educational resources and improve the environmental literacy of Alaska K–12 teachers and students.
- Alaska Sea Grant will be a leader and catalyst of partnerships to improve environmental literacy statewide.

**Objective 2** Increase effective environmental literacy communication to stakeholders, including how ecosystem change affects economic, social and cultural values, and implications for conservation and management.

### Strategies

1. Develop and implement a communications plan that targets key topics and issues, audiences, and methods/technology and includes approaches for evaluating communication effectiveness.
2. Produce and distribute books, publications, media, and other educational products and tools to enhance environmental literacy.
3. Lead or participate in forums, regional science conferences, or other activities where scientific and local/traditional bodies of knowledge are shared.
4. Provide training in science communication methods to researchers and educators.
5. Facilitate and support researchers' outreach to Alaska communities and visitors that includes opportunities for dialogue, discussion, and community involvement.

### Desired outcomes

- Alaskans will have increased knowledge and understanding of marine resource issues so that they can make better decisions.
- Environmental literacy will be improved through effective outreach and interactive communication among researchers, educators, students, and the public.

## Goal 7 A responsive workforce of highly skilled Alaskans in the fisheries, seafood, and maritime occupations in the state.

**Objective 1** Prepare a diverse workforce, responsive to employer needs, to participate in and benefit from Alaska’s maritime sectors.

### Strategies

1. Provide training, instruction, and fellowships to college students, graduate students, and post-graduates to gain professional skills in science, communication, research, and policy development.
2. Provide support and training to workers to acquire skills that make them more successful and the industries they work in more cost-effective, energy-efficient, and competitive in the global market.

### Desired outcomes

- The Alaska workforce in fisheries, seafood processing, and other maritime occupations will have increased education and training opportunities that are accessible and relevant to changing needs.
- Qualified Alaska residents will increasingly fill maritime, fisheries, and seafood processing positions.

**Objective 2** Grow awareness of maritime occupations and career pathways among Alaskans.

### Strategies

1. Continue university leadership, partnering with Maritime Works, to implement the Alaska Maritime Workforce Development Plan.
2. Provide information about Alaska maritime careers to students and other target audiences and publicize job and training opportunities.
3. Support experiential maritime occupational programs around the state.

### Desired outcomes

- Alaska’s youth will be introduced to fisheries, seafood, and maritime occupations, information they can use in making career choices.
- An increased number of youth, particularly from underserved populations, will pursue a maritime educational pathway.

## Summary of 2018–2021 National Performance Measures and Metrics

National Sea Grant defines national performance standards related to all Sea Grant program activities.

### Focus area: Healthy coastal ecosystems

1. Number of resource managers who use ecosystem-based approaches in the management of land, water, and living resources as a result of Sea Grant activities.
2. Number of acres of coastal habitat protected, enhanced, or restored as a result of Sea Grant activities.

### Focus area: Sustainable fisheries and aquaculture

3. Number of fishermen, seafood processing, or aquaculture industry personnel who modify their practices using knowledge gained in fisheries sustainability and seafood safety as a result of Sea Grant activities.

### Focus area: Resilient communities and economies

4. Number of communities that adopt/implement sustainable economic and environmental development practices and policies as a result of Sea Grant activities.
5. Number of communities that adopt/implement hazard resiliency practices to prepare for and respond to/minimize coastal hazardous events.

### Focus area: Environmental literacy and workforce development

6. Number of Sea Grant products that are used to advance environmental literacy and workforce development.
7. Number of people engaged in Sea Grant–supported informal education programs.
8. Number of Sea Grant–supported graduates who become employed in a job related to their degree within two years of graduation.

### Cross cutting performance measures

9. Number of Sea Grant tools, technologies, and information services that are used by our partners/customers to improve ecosystem-based management.
10. Economic and societal impacts derived from Sea Grant activities (market and non-market; jobs and businesses created or sustained).