

Maine Sea Grant Strategic Plan 2018-2021

Marine Science for Maine People in a Time of Rapid Change

February 2017

Introduction

Maine's extensive coastline, home to more than half a million year-round residents and millions of summer visitors and seasonal residents, supports significant aspects of local and state economies and quality of life. Commercial and recreational fisheries, tourism, and boating are interdependent sectors that all rely on healthy coastal and marine resources.

Maine Sea Grant's Strategic Plan for the 2018-2021 period reflects our intent to continue to provide high-quality, science-based information, outreach, education, and support needed by Maine's coastal communities as they face economic and environmental transitions of the early 21st century.

The Maine Sea Grant College Program is a state-federal partnership based at the University of Maine and sponsored by the National Oceanic and Atmospheric Administration (NOAA) and the State of Maine. Part of a network of 33 Sea Grant programs throughout the coastal and Great Lakes states and territories, Maine Sea Grant supports integrated scientific research, outreach, and education programs. The Maine Sea Grant vision, mission, core values, cross-cutting principles, and strategic goals and objectives are aligned with the 2018-2021 NOAA National Sea Grant College Program Strategic Plan, and Maine Sea Grant reports to a set of common National Sea Grant Program performance measures and metrics.

We support scientific research that is relevant to the issues and needs of coastal communities in Maine and the northern Gulf of Maine region. Research in our program is accomplished in three ways, which are often connected: 1) competitive research grants from both Maine research funds and national solicitations; 2) program development grants to investigators in the state and region; and 3) research activities conducted by our Marine Extension Team (MET). Sea Grant staff cultivate effective working relationships with the research community by linking our extension, education, and communications staff with principal investigators and graduate students, and through our biennial research symposiums. In addition to linkages with Sea Grant-funded scientists and students, we take seriously our responsibility to serve as unbiased liaisons between research institutions throughout the state and our diverse constituents and stakeholders of all ages. We strive to share critical research findings related to our mission goals with our many audiences in the forms that serve each best.

In partnership with University of Maine Cooperative Extension, place-based members of the Marine Extension Team focus on issues of concern to Maine's coastal communities, extending current knowledge and expertise to stakeholders, while helping to ensure that Sea Grant supports research that is relevant to Maine people. From the Wells National Estuarine Research Reserve in southern Maine to the Eastport waterfront at America's eastern edge, MET outreach staff live in the communities they serve. As a fundamental feature of Maine Sea Grant, the MET makes us unique within the state. No other coastal or marine focused organization in Maine has such a reach, or such a long history in Maine's coastal communities. Our formal partnership with Cooperative Extension also is unique within Sea Grant, and has been called a model for the Network.

With a strong link to the scientific community of the University of Maine System and other institutions, Sea Grant outreach staff are able to provide science-based support to practical needs of the State of

Maine. Support comes in many forms and is provided to stakeholders and client groups, including industry, local, state, and federal governments, partner organizations, and the public. Sea Grant outreach staff provide a balanced approach to decision-making by: 1) facilitating discussions between potentially disparate points of view; 2) inspiring scientific inquiry that can provide for better information and credibility with subsequent decisions; and 3) providing learning opportunities for students, teachers, industry members, and the public.

Marine Extension Team members use various methods to accomplish the above objectives. Examples include education programs, applied research projects, and organization and facilitation of workshops and forums to help stakeholders understand and address important issues. An important attribute to our approach is the role of partnerships and professional relationships. These are frequently formalized either through MOUs that describe the respective roles of the parties, or through collaborative, extramurally funded initiatives. Sea Grant is committed, both nationally and locally, to leverage core funds to maximize investment and outcomes.

Our formal and informal education programs support the ecological health, economic vitality, and resilience of Maine's coastal communities and ocean-related resources by: 1) fostering an environmentally literate public who can use scientific knowledge to identify questions, draw evidence-based conclusions, and make decisions about issues that affect them and 2) supporting development of a workforce skilled in science, technology, engineering, mathematics, and other disciplines critical Maine's coast. We strive to reach diverse audiences across the age spectrum, as well as professionals seeking workforce development opportunities in marine and coastal sectors. Our programs include place-based participatory research opportunities and citizen science programs that link volunteers with local scientists and resource managers around locally relevant issues or themes.

A three-person communications team with skills in graphic design, web design and programming, writing, and editing supports all elements of the program, with a long-term goal of enhancing environmental literacy among public audiences. Our communications strategies and products are developed in partnership with the MET and the research community, who help identify information needs of target audiences and relevant stakeholders. In addition to communicating the results of Sea Grant-funded research and other research related to our mission goals, the communications team also produces independent projects, such as calendars, magazine articles, websites, and books.

A twenty-five-member Policy Advisory Committee (PAC) provides input to strategic planning, programmatic direction, and funding decisions. Members are nominated by committee, with an effort to seek a balanced representation of the interests and expertise of Maine's geographically distinct and socially, culturally, and economically diverse coastal communities and stakeholder groups. Members are appointed by the University of Maine President, and serve renewable three-year terms. They work closely with Maine Sea Grant staff to evaluate opportunities and gaps in research and programming, set priorities, and provide guidance and feedback on each new strategic plan and Omnibus proposal to National Sea Grant.

Program Vision, Mission, Core Values, and Crosscutting Principles

Vision

Maine Sea Grant envisions thriving coastal communities and ecosystems supported by an engaged public and informed decision-makers.

Mission

Maine Sea Grant's mission is to support the responsible use and conservation of coastal resources in order to sustain thriving coastal communities and ecosystems.

Core values

The Maine Sea Grant College Program's core values are essential and enduring tenets that influence the organization and support our mission. The core values support a culture of integrity, with the intent to maintain our role as a trusted source of science-based information among the people with whom we live and work. The Maine Sea Grant College Program will be:

Visionary – We strive to address existing and emerging challenges with creative and relevant science and stewardship.

Collaborative – We seek and nurture partnerships that amplify our impact. We approach our partnerships with responsiveness, accessibility, and respect for diverse knowledge. We facilitate communication among diverse interests.

Dedicated to sustainability – We practice and promote stewardship activities, and build capacity for applied research and monitoring to sustain and restore Maine's ocean and coastal ecosystems and the communities they support.

Accountable – We operate with integrity and transparency, and maintain quality in our service to Maine people.

Connected – We draw upon resources and expertise from NOAA and the University of Maine to address complex challenges in partnership with Maine communities from Kittery to Eastport.

Crosscutting principles

In alignment with the National Sea Grant 2018-2021 Strategic Plan, Maine Sea Grant will strive to address two specific areas that deserve attention in all facets of our work to enhance the Program's capabilities to meet future needs. The Maine Sea Grant Program will:

Cultivate Partnerships by integrating the expertise and capabilities of partners from the international, federal, tribal, state, and local communities and from academia, nongovernmental organizations, and industry.

Enhance Diversity and Inclusion by seeking and engaging diverse perspectives in order to enhance understanding and enable the network to pursue its vision and mission effectively and efficiently

Strategic Planning Process

This strategic plan reflects input collected in 2015 and 2016 from stakeholders, the Maine Sea Grant Policy Advisory Committee (PAC), and staff. The 2018-2021 strategic planning process has included the following steps:

December 2015: PAC listening session to collect input on the planning process and approach for a gaps and opportunities analysis of PAC members and coastal and marine stakeholders.

January – February 2016: Internal review of the National and Maine 2014-2017 strategic plans, and development of PAC/Stakeholder survey instrument.

March – May 2016: Gaps and opportunities analysis conducted via an online survey of twenty-five PAC members, and up to 5 additional coastal and marine stakeholders, or “thought leaders” identified by each PAC member.

April 2016: Concurrent with the PAC/Stakeholder analysis, Maine Sea Grant staff completed an individual questionnaire (based on their own work, and internal and external partnerships) to draw out our individual and collective vision for the next four years.

May – June 2016: Staff attended two full-day strategic planning sessions, in which this internal thinking was shared and summarized. Responses to both the PAC/Stakeholder survey and the internal staff questionnaire were coded and summarized. Results of the internal planning and the external survey were presented at a June Maine Sea Grant PAC meeting, and back to the Maine Sea Grant staff for additional discussion and input.

July – August 2016: Initial Maine Sea Grant 2018-2021 Strategic Plan was drafted based on analysis from PAC/Stakeholder and internal planning.

August – October 2016: Maine Sea Grant staff formed focus area teams to review and revise the Draft 2018-2021 Plan, and check alignment with the Draft National Strategic Plan through reviewing draft National Plans and participating in strategic planning discussions at National Sea Grant Week.

November 2016: Initial Maine Sea Grant 2018-2021 Strategic Plan submitted to the National Sea Grant Office, and shared with Policy Advisory Committee members ahead of a December PAC meeting.

December 2016: Received feedback from National Sea Grant, and from PAC members at PAC meeting.

January 2017: Reviewed NSGO feedback with staff at two-day staff retreat, revised plan language and content in response, and finalized language and examples in sections related to program vision, mission, core values, and cross-cutting principles.

February 2017: Final plan submitted to National Sea Grant.

HEALTHY COASTAL ECOSYSTEMS

Maine's extensive coastline varies from sand dune systems and barrier beaches in the south, to rocky peninsulas and numerous islands in the central portion of the state, to the steep cliffed and rugged shores Downeast. Large bays, salt marshes, mud flats, beaches, rocky intertidal zones, and river and streams support commercial fisheries and tourism, all of which depend on clean water, plentiful marine resources, and diverse wildlife. Compared to other Eastern states, Maine's population is small (slightly more than one million people) and our coastal ecosystems are relatively intact, a situation that presents challenges—how can we keep this place healthy and beautiful?—as well as opportunities for innovative resource management, restoration, and student engagement. In this time of rapid change, we must stay abreast of both those issues and challenges currently affecting Maine's coastal ecosystems, as well as those affecting ecosystems and communities in other states, particularly those to our south. For example, we have increased our vigilance in anticipating challenges such as nutrient pollution and public health concerns related to shellfish pathogens and harmful algal blooms that thrive in warmer waters.

Maine Sea Grant's partners and constituents in this focus area include municipal officials, resource managers, researchers, private businesses, and citizens of all ages in Maine's coastal communities.

GOAL If we are successful, people will understand the links between healthy ecosystems and resilient communities, and take action to ensure the long-term health of coastal resources.

OBJECTIVE 1 – Protect and restore coastal ecosystem health and function.

Activities to address this objective include applied research and science communication related to coastal and marine ecosystem health, support and coordination for environmental monitoring programs, and community engagement and facilitation for public decision-making related to ecosystem health.

OUTCOMES: through these activities, we provide our constituents with the information, resources, and support they need to:

Learn

- understand the impacts of stressors such as impaired water quality, climate change, and other human activities on ecosystem health.
- learn about policy, management, monitoring, and planning tools and approaches that can be used to protect or restore coastal and marine ecosystems.

Act

- access timely and relevant scientific information about coastal and marine ecosystems.
- assess ecosystem function, services, impairment and potential for protection or restoration.
- participate in or support applied research, environmental monitoring, ecosystem protection, planning, or restoration initiatives.
- practice or support community engagement efforts to increase participatory decision-making.
- practice or support consideration of coastal and marine ecosystem science in policy, planning, and management decisions.

Achieve Impact

- coastal ecosystem health and function are protected or restored.

OBJECTIVE 2 – Protect and improve coastal water quality.

Activities to address this objective include applied water quality research, pollutant source tracking and remediation, training and coordination for the Maine Healthy Beaches Program, and community engagement and informal education related to planning, decision-making, and management of water quality and water infrastructure.

OUTCOMES: through these activities, we provide our constituents with the information, resources, and support they need to:

Learn

- understand the value of ecosystem services provided by healthy watersheds and coastlines.
- understand the sources and effects of harmful bacteria and other pollutants on coastal water resources, and what actions they can take in their daily life to ensure clean coastal waters.
- understand the impacts of climate-related environmental change on water quality.
- access information to support ecosystem-based approaches to planning, decision-making and management of coastal water quality.

Act

- work to identify and remediate sources of pollution.
- expand and improve coastal wastewater/stormwater infrastructure.
- conduct or participate in applied research, education, and outreach activities to protect water quality practice or support stewardship and community engagement efforts to increase participatory decision-making and ecosystem-based management.

Achieve Impact

- maintain and upgrade coastal water infrastructure to address existing water quality problems and improve resilience to climate-related environmental change.
- sustain community-based water pollution monitoring, source identification, and remediation initiatives.
- improve coastal water quality.

OBJECTIVE 3 – Protect and improve habitat for native sea-run fish.

Activities to address this objective include applied research in watershed health and fish habitat restoration, coordination and support for community and state sea-run fish monitoring efforts, and outreach, community engagement, and science communication related to sea-run fish habitat protection and restoration.

OUTCOMES: through these activities, we provide our constituents with the information, resources, and support they need to:

Learn

- understand the value of ecosystem services provided by intact coastal watersheds, including healthy populations of sea-run fish.
- understand the effects of human activities (including restoration efforts) and environmental changes on coastal watershed resources.
- access information that supports ecosystem-based approaches to management and stewardship of sea-run fish populations and habitat restoration.

Act

- restore coastal habitats and their connections to inland watersheds (e.g., diadromous fish passage restoration projects), and engage in related research, education, and outreach activities.
- increase monitoring capacity to observe ecosystem-level effects of restoration efforts.
- build capacity for local management and stewardship of individual fish populations.

Achieve Impact

- improve migratory passage for sea-run fish.
- increased capacity for local management and stewardship.
- increase sea-run fish populations.
- increase scientific understanding of ecosystem-level effects of habitat restoration on prey communities and water quality.

We will measure our success by the

Number of Sea Grant tools, technologies, and information services that are used to manage, protect, or restore ecosystems. (4-year target: 12)

Number of legislation, policy, or management changes resulting from Sea Grant activities (e.g., septic system pumpout ordinances, fish passage improvements). (4-year target: 4)

Number of communities engaged in Sea Grant-supported research, outreach, or education related to sea-run fish. (4-year target: 20)

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 (4-year target: 300)

Number of private, municipal, or state water infrastructure upgrades or best management practices employed as a result of Sea Grant-supported research, outreach, or education. (4-year target: 20)

Number of bodies of water experiencing water quality improvements as a result of Sea Grant-supported research or pollution prevention, monitoring, or remediation initiatives. (4-year target: 4)

Acres of coastal or marine ecosystems that are protected or restored (4-year target: 400)

RESILIENT COMMUNITIES

Maine's coastal communities were founded on natural resources, from fish and shellfish to granite, salt, and a tradition of building wooden ships that connected the extensive forests of inland Maine to the coast. Where these communities continue to depend on marine resources, demographic, economic, political, and environmental changes often manifest as user conflicts, increase demand on the coastal environment, and have the potential to erode Maine's natural and cultural heritage. Only 20 of Maine's 5,300 miles of coastline support water-dependent industries, and the majority of commercial access points are privately owned and vulnerable to conversion to residential and other private uses, as well as the impacts of climate change. Year-round residents in Maine's coastal communities often struggle to afford their property taxes, find employment, and pay their bills in the face of increasing energy costs.

Resilient coastal communities require a sustainable energy future. The state's extensive undeveloped coastline may provide opportunity for tidal and offshore wind resources, and as such, Maine is at the forefront of the emerging ocean energy sector. Maine Sea Grant envisions a future in which Maine's coastal communities are resilient to challenges and changes – resilient communities continually gather the necessary skills, knowledge, and resources (human and physical) to plan for, cope with, and thrive in the face of both predicted and unexpected ecological, social, economic, and demographic changes.

Our primary audience in this focus area is coastal communities, their residents, and the industries that drive their economies. To achieve the outcomes listed below, we work with a range of community audiences. These include municipal officials, resource industries and managers, researchers, private businesses, property owners, and citizens and visitors of all ages.

GOAL If we are successful, Maine's coastal communities will draw upon their assets to adapt to, prepare for, address, and recover from the environmental, economic, and social/cultural vulnerabilities they have identified and prioritized.

OBJECTIVE 1 – Enhance public decision-making processes related to ocean and coastal resource use and community planning initiatives.

Activities to address this objective include social science research and science communication related to ocean and coastal issues, workshops and training courses in community engagement and facilitation skills, and coordination and support for community, state, and regional planning and resource management issues.

OUTCOMES: through these activities, we provide our constituents with the information, resources, and support they need to:

Learn

- understand the value of community engagement and skilled facilitation in public decision-making processes.
- understand perspectives and interests held by other stakeholder groups.
- develop a range of community engagement and group facilitation skills.

- learn strategies to access and share science-based information relevant to the decision.

Act

- participate in community dialogue about ocean and coastal resource use.
- apply community engagement and facilitation in public processes.
- share skills or resources gained with other communities seeking to address similar challenges.
- support community-based efforts to evaluate assets, opportunities, and vulnerabilities in order to plan for preferred futures.
- create decision-making processes that acknowledge the needs of various stakeholders and employ strategies to reduce conflict and honor shared values.

Achieve Impact

- increased local capacity in community engagement and group facilitation skills.
- ocean and coastal resource use and planning decisions reflect community input and values, relevant science, and information about historical and contemporary uses.

OBJECTIVE 2 – Maine’s coastal communities value and preserve their cultural heritage, including fisheries, working waterfronts, and other unique aspects related to the sea.

Activities to address this objective include leadership and coordination for cultural heritage education and outreach initiatives, such as the Downeast Fisheries Trail, a resource guide to connect residents and visitors with fisheries heritage information and experiences at 45 locations in Downeast Maine. We support community, state, and national efforts to document and preserve working waterfront assets, and produce outreach materials for a variety of media that engage citizens in learning about current issues and challenges for coastal communities, such as the Coastal Conversations community radio program.

OUTCOMES: through these activities, we provide our constituents with the information, resources, and support they need to:

Learn

- understand the value of marine and fisheries heritage to community identity and economic opportunity.
- understand the challenges facing working waterfront communities.
- learn about their unique connection to place through personal stories told by Maine citizens.

Act

- use stories or information produced by Sea Grant to help document or protect fisheries heritage, working waterfronts, or shared values in a community or region.
- use Sea Grant information or resources about changes and challenges facing coastal and working waterfront communities to inform community planning, resource management, and decision-making processes.

Achieve Impact

- Maine coastal communities’ unique history and working waterfront heritage is valued and protected.

OBJECTIVE 3 – Support marine businesses and infrastructure by identifying opportunities and vulnerabilities and prioritizing how to address them.

Activities to address this objective include leadership and coordination for coastal community development initiatives such as the Alliance for Maine’s Marine Economy, a statewide coastal and marine business and infrastructure development initiative, and community engagement and facilitation support for community-based planning efforts to identify and prioritize risks, vulnerabilities, and opportunities for growth.

OUTCOMES: through these activities, we provide our constituents with the information, resources, and support they need to:

Learn

- gain skills related to socially and environmentally responsible business planning, marketing, and content knowledge.
- identify bottlenecks or barriers to marine and coastal business development or growth at community, sector, or regional scales, and ways to address these barriers.

Act

- establish, grow, or diversify individual or cooperative enterprises in marine and coastal sectors.
- address barriers to growth and diversification in marine and coastal sectors.

Achieve Impact

- existing, expanded, and diversified marine and coastal business sectors help to create resilient coastal communities that include viable neighborhoods, and thriving waterfronts.

OBJECTIVE 4 – facilitate collaboration across sectors, including the seafood, tourism, and fisheries/aquaculture sectors, to enable diversification and mutually beneficial action.

Activities to address this objective include leadership, coordination, and support for cross-sector networking opportunities, discussion forums, and professional training, such as the Aquaculture in Shared Waters program for commercial fishermen interested in expanding into aquaculture, and industry exchange workshops designed to facilitate collaboration among seafood, culinary, and tourism industry members. These initiatives are supported with a range of print and web-based educational resources, and field tours of successful cross-sector business operations.

OUTCOMES: through these activities, we provide our constituents with the information, resources, and support they need to:

Learn

- learn about examples of mutually beneficial relationships between tourism, seafood industries and heritage or marine education-related organizations.
- understand the value of marine and fisheries heritage to community identity and seafood/culinary and tourism enterprises and opportunities.

Act

- use Sea Grant-supported information or content in heritage tourism activities.
- develop new partnerships between fisheries, aquaculture, tourism, and seafood/culinary industries.
- establish new or expanded cross-sector partnerships in sustainable tourism, and seafood industries.

Achieve Impact

- achieve cross-sector partnerships and networks that support diverse, healthy economies and sustain traditional working waterfronts and other natural and cultural assets.

We will measure our success by the

Number of communities, cross-sector partnerships, or businesses that use Sea Grant training or resources to support diverse, healthy economies, and sustain traditional working waterfronts or other natural or cultural assets. (4-year target: 40)

Number of, groups, communities, organizations, agencies that used Sea Grant-supported training to improve community engagement or facilitation of public decision-making processes. (4-year target: 75)

Number of constituents who used Sea Grant resources or training to identify, share, or preserve historical assets, fisheries heritage, or sense of place. (4-year target: 40)

Number of communities, initiatives, and businesses that, with Sea Grant support, engage in cultural heritage and tourism economic development opportunities. (4-year target: 50)

Number of legislation, policy, or management changes resulting from Sea Grant activities. (4-year target: 12)

SAFE & SUSTAINABLE SEAFOOD

Many of Maine's coastal communities rely on the sea for their economic and cultural livelihood. According to the National Marine Fisheries Service, the proportion of Maine workers employed in commercial fishing industries is more than ten times the national percentage. Yet Maine has lost most of its groundfish fleet and related infrastructure since 1980, and today a once-diverse fishing culture is overwhelmingly dependent on lobster, a vulnerable situation that one scientist has called "a gilded trap." For this reason, much of the seafood-related work undertaken by Maine Sea Grant is related to diversification along the working waterfront: what we catch or grow, how to broaden income opportunities for those in the seafood industry, widening the geographic scope of working waterfronts, and expanding opportunities for Maine citizens to enter the seafood industry.

Maine Sea Grant's work in this area is focused on fisheries that are managed by the state and/or communities, a scale at which our fishermen can get involved in science, monitoring, and management, and where communities can realize direct benefits from our work. Examples include fisheries for lobster, scallops, oysters, and clams. Our work in aquaculture includes continued development of new culture techniques and target species, as well as marketing, industry support, and connections to consumers. Because of the overwhelming importance of fisheries to the state, much of Maine Sea Grant's work also addresses general fisheries knowledge for consumers, residents, and visitors, and programming in other focus areas also relates to seafood.

This focus area also encompasses the ongoing need for Maine citizens and visitors to be knowledgeable about seafood: how it is produced, processed and distributed, as well as the management and science that guide the seafood industry.

GOAL If we are successful, Maine's wild harvest and aquaculture sectors and the communities that depend on them are economically viable and environmentally sustainable.

OBJECTIVE 1 – develop and support opportunities for wild harvesters and aquaculture producers to strengthen or diversify their seafood-related businesses.

Activities to address this objective include leadership, coordination, and support for cross-sector networking and professional training opportunities, such as the Aquaculture in Shared Waters program, which provides courses ranging from business development, to culture methods and leasing and siting information for fishermen interested in aquaculture, and aquaculture producers interested in additional species. We also support industry exchange workshops designed to facilitate collaboration among seafood, culinary, and tourism industry members, and sector-specific collaboration and consumer education initiatives, such as the Oyster Trail of Maine. These initiatives are supported with a range of print and web-based educational resources, and field tours or skills workshops with industry members who are interested in supporting and collaborating with others.

OUTCOMES: through these activities, we provide our constituents with the information, resources, and support they need to:

Learn

- access current science and management information on the dynamics of wild fish and shellfish populations.

- learn about species-specific and integrated aquaculture methods, leasing structures and requirements, siting, safe product handling, and regulations associated with establishing production of cultured species.
- learn business development skills, including business planning, marketing, product branding, and new and value-added product development.
- meet other seafood industry professionals across the wild harvest, aquaculture, culinary, and tourism sectors, and learn about the needs, timelines, and perspectives of each sector.

Act

- use information and skills gained through Sea Grant training to improve business management practices, establish a new business, or diversify or expand an existing business to include a new or additional aquaculture or wild harvest species.
- participate in or create networking opportunities with other seafood industry professionals.
- establish new or expanded partnerships or collaborations with seafood, tourism, or culinary industry professionals.
- improve seafood product safety and handling practices.

Achieve Impact

- Sea Grant activities contribute to a more diverse seafood industry in Maine, in which fewer individual operators, businesses, and communities are dependent on a single commercial species, and who become less vulnerable to environmental or economic changes affecting those species.

OBJECTIVE 2 – support applied research initiatives to diversify commercial seafood species through aquaculture and harvesting innovation

Activities to address this objective include applied research and technology transfer initiatives related to growth, population dynamics, harvest or culture methods, and feasibility for new species or products, such as our work in sea scallop aquaculture. In support of the research and technology transfer, we provide coordination and support for cross-sector networking, collaboration, and information exchange.

OUTCOMES: through these activities, we provide our constituents with the information, resources, and support they need to:

Learn

- access and disseminate research and development information related to new or innovative culture harvest, and fishing methods, products, or target species.
- access technical assistance and extension support required to test new methods, products, or species.

Act

- initiate trials of new aquaculture methods, species or products.
- participate in applied research and development initiatives in aquaculture.
- engage in and/or create networking activities and/or industry collaborations.
- Assist with technology transfer: connecting with other growers and researchers who are working with innovative culture methods, products or species.

- use knowledge or experience gained to develop a new or expanded business or product.

Achieve Impact

- Sea Grant activities contribute to a more diverse seafood industry in Maine, in which fewer individual operators, businesses, and communities are dependent on a single commercial species, and who become less vulnerable to environmental or economic changes affecting those species.

OBJECTIVE 3 – support applied research and extension services to improve coastal and marine resource monitoring and management, and inform community, regional, and statewide management planning processes.

Activities to address this objective include applied research related to population dynamics, efficiency and accuracy of monitoring, management, and regulatory tools, ecosystem change, and biological responses to ecosystem change. We provide leadership, coordination, and facilitation for community engagement in planning and decision-making processes that affect harvest and culture fisheries, and provide and support opportunities for communication among industry, research, and management sectors, and the public.

OUTCOMES: through these activities, we provide our constituents with the information, resources, and support they need to:

Learn

- access timely, accurate information about the management status, regulations, and monitoring data and practices for wild harvest and culture fisheries, and about changes therein and related planning or public decision-making processes.

Act

- facilitate engagement in public planning or decision-making process that affect wild harvest or culture fisheries.
- use information, services, or resources provided by Sea Grant to adapt fishing, aquaculture, or monitoring practices in response to changes in management status, regulations, monitoring requirements, or environmental conditions.
- participate in Sea Grant-supported applied research that seeks to improve coastal or marine resource monitoring, management, or related planning initiatives.
- engage in Sea Grant-facilitated meetings or other information exchanges among and between sectors, such as research scientists, industry members, resource managers, and the public.

Achieve Impact

- Sea Grant activities contribute to a more adaptive, efficient, and transparent marine and coastal resource planning and regulatory structure in Maine.

OBJECTIVE 4 – Consumers have access to science-based information about Maine seafood.

Activities to address this objective include production of educational products and outreach materials to provide consumers and the public with information about both wild harvested and aquaculture-produced species. For example, the Maine Seafood Guide, a web-based resource on the Maine Sea Grant website,

contains information related to harvest or culture methods, management status and regulations, seasonality, history, safe handling, and preparation and nutrition information for dozens of species of fish, shellfish, and sea vegetables. We also produce fact sheets and feature articles for a variety of publications with broad circulation. Both print and web-based products are updated as new scientific information becomes available.

OUTCOMES: through these activities, we provide our constituents with the information, resources, and support they need to:

Learn

- learn about harvest and culture methods, management and regulations, seasonality, safety and handling, and culinary and wholesale sources of Maine seafood.
- learn about the seafood industry, its people, and its heritage.

Act

- Consumers seek out information about Maine-grown and harvested seafood.
- Provide information about safe seafood processing, storage, serving, and consumption.

Achieve Impact

- Increased awareness of and demand for local seafood options.

OBJECTIVE 5 – Support marine business and infrastructure development by identifying opportunities and vulnerabilities and prioritizing how to address them.

Activities to address this objective include leadership and coordination for coastal community development initiatives such as the Alliance for Maine’s Marine Economy, a statewide coastal and marine business and infrastructure development initiative, and community engagement and facilitation support for community-based planning efforts to identify and prioritize risks, vulnerabilities, and opportunities for growth.

OUTCOMES: through these activities, we provide our constituents with the information, resources, and support they need to:

Learn

- gain skills related to socially and environmentally responsible business planning, marketing, and content knowledge.
- identify bottlenecks or barriers to marine and coastal business development or growth at community, sector, or regional scales, and ways to address these barriers.

Act

- establish, grow, or diversify individual or cooperative enterprises in marine and coastal sectors.
- address barriers to growth and diversification in marine and coastal sectors.

Achieve Impact

- existing, expanded, and diversified marine and coastal business sectors help to create resilient coastal communities that include viable neighborhoods, and thriving waterfronts.

We will measure our success by the

Number of seafood industry members who expanded or diversified their businesses, products, collaborations, and/or sources of income as a result of Sea Grant activities. (4-year target: 40)

Number of fishermen, seafood processing and aquaculture industry personnel who modify their practices using knowledge gained in fisheries sustainability and seafood safety as a result of Sea Grant activities. (4-year target: 200)

Number of legislation, policy, or management changes resulting from Sea Grant activities. (4-year target: 5)

COMMUNITIES PREPARING FOR A CHANGING CLIMATE

Coastal residents and towns need strategies to prepare for and adapt to climate change and its effects on sea-level rise, shoreline erosion, marine and coastal resources, and coastal flooding. Extreme weather events can cause millions of dollars in damage and threaten coastal ecosystems and local economies that rely on tourism and fishing, both vital sectors of Maine's economy. Ocean acidification, increasing ocean water temperatures, and other climate-related changes in Maine's coastal ecosystems threaten Maine's valuable wild and culture fisheries, and the marine heritage and cultural identity of many coastal communities. Maine Sea Grant is working with coastal communities to help them prepare for the potential local impacts of climate change and prevent or minimize damage from extreme rainstorm events. One of the challenges communities face in a changing climate is applying global-scale information and data to the local environment. Information, tools, and knowledge must extend to the next generation who will be confronting even greater degrees of change.

Maine Sea Grant's primary constituents in this focus area are coastal communities. To achieve the outcomes listed below, we work with a range of community audiences across the state. These include municipal officials, coastal property owners, resource managers, state and federal agencies, researchers, fishermen, aquaculturists, private businesses, and citizens of all ages.

GOAL If we are successful, communities understand the risks and opportunities that may result from a changing climate, and develop effective strategies that enhance preparedness for and resilience to uncertainty and change in environmental conditions.

OBJECTIVE 1 – support community, state, and regional efforts to understand, communicate about, and respond to climate-related changes in the marine and coastal environment, including ocean acidification, increased water temperature, and changes in native and non-native species populations, distributions, and disease.

Activities to address this objective include applied research related to the impacts of climate change on coastal and marine ecosystems in Maine, and leadership, coordination, and community engagement support for cross-disciplinary science, management, and education initiatives addressing climate change-related issues that affect Maine's coastal communities. These include participatory modeling and adaptation planning with the Maine lobster industry, the Northeast Coastal Acidification Network (NECAN), the Maine Ocean and Coastal Acidification Partnership (MOCA), and the Climate Change Adaptation Providers Network (CCAP) in Maine and New Hampshire.

OUTCOMES: through these activities, we provide our constituents with the information, resources, and support they need to:

Learn

- collaborate to share and generate diverse types of knowledge, and conduct joint fact finding on climate-related changes and impacts in the marine and coastal environment.
- Understand community values, barriers to action, and social structures related to climate change issues and responses.

Act

- access relevant, science-based information about how expected changes may affect specific species and ecosystem-scale health and function.
- use shared knowledge on climate-related changes in the marine environment to develop synergistic, multifunctional approaches to prepare for, adapt to, or mitigate potential climate-driven changes to marine species or ecosystems.
- make adaptive changes in community or state marine resource planning, management and regulatory practices to minimize the potential impacts on marine species, ecosystems, and communities that rely on them.

Achieve Impact

- achieve greater capacity to prepare for, adapt to, recover from, and mitigate climate change-related disruptions to life and economy.

OBJECTIVE 2 – conduct applied research, and support community and state risk assessment and planning initiatives related to the impacts of sea level rise, extreme storm events, and related erosion on coastal infrastructure.

Activities to address this objective include applied physical and social science research and science communication and education related to the impacts of sea level rise, extreme storm events, and erosion on coastal resources and infrastructure. We also provide leadership, coordination, community engagement, and facilitation support for state and community-based risk assessment, planning, and decision-making processes related to these issues.

OUTCOMES: through these activities, we provide our constituents with the information, resources, and support they need to:

Learn

- access timely data on the impacts of sea level rise, severe storms, and erosion on coastal infrastructure.
- access information about how expected changes may affect infrastructure at site-specific, community-wide, or regional scales.

Act

- use information supported or provided by Sea Grant to prepare for, adapt to, or mitigate climate-related impacts on coastal infrastructure.
- make adaptive changes in community or state infrastructure planning, management and regulatory practices to minimize the potential impacts of sea level rise, severe storms, and erosion on coastal communities.

Achieve Impact

- achieve greater capacity to prepare for, adapt to, and mitigate climate change-related disruptions to life and economy.

OBJECTIVE 3 – enhance and expand climate literacy and citizen science initiatives to increase understanding of the expected impacts of climate change, and address geographic and temporal gaps in climate data.

Activities to address this objective include support for applied research related to geographic and temporal gaps in local-scale climate change data, and leadership and participation in state, regional, and national citizen science organizations. We coordinate citizen science programs focused on the dual goals of increasing climate literacy and observing and recording data related to changes in phenology (timing of seasonal biological events), marine water chemistry, and coastal erosion. These include the Signs of the Seasons phenology monitoring program in Maine and New Hampshire, and the Southern Maine Beach Profile Monitoring Program.

OUTCOMES: through these activities, we provide our constituents with the information, resources, and support they need to:

Learn

- access timely, local-scale data and audience-specific information on climate-related changes in Maine’s environment.
- learn science observation and data management skills related to phenology, coastal erosion, and marine water chemistry.
- meet and interact with citizen scientists, climate scientists, and educators in Maine, and across the nation.

Act

- participate in Sea Grant-supported citizen science skills training workshops
- use standardized citizen science monitoring protocols to collect and report local scale phenology, coastal erosion, and water chemistry data to Sea Grant-supported data management tools.
- engage other community members in climate related citizen science, outreach, communication, or stewardship initiatives.
- engage in public decision-making or planning processes to help prepare for, adapt to, or mitigate climate-related impacts on coastal, marine, and upland ecosystems, and coastal communities.

Achieve Impact

- achieve greater capacity to understand, communicate about, prepare for, adapt to, and mitigate climate change-related disruptions to life and economy.

OBJECTIVE 4 – support community and state outreach and community engagement efforts related to offshore wind and tidal renewable energy development initiatives.

Activities to address this objective include leadership, coordination, and facilitation support for community engagement, outreach, and education initiatives related to offshore and tidal renewable energy development in Maine. These efforts currently include a tidal energy project in Cobscook Bay, and an offshore wind project near Monhegan Island.

OUTCOMES: through these activities, we provide our constituents with the information, resources, and support they need to:

Learn

- access site- and project-specific data and proposed plans for project design, engineering, potential human or environmental impacts, cost, timeline, and expected benefits of all proposed or permitted offshore wind and tidal energy development initiatives.
- access user-appropriate science communication resources that help translate available project-related data into accessible information about how the expected changes or impacts may affect specific species, marine ecosystems, or adjacent communities.
- access opportunities to interact with, ask questions of, and provide feedback to project engineers, climate and environmental scientists or consultants, and business development professionals.

Act

- organize, engage in, or help to facilitate public and resource-user specific planning meetings, as needed, to ensure that all relevant stakeholders are given access to decision-making processes surrounding proposed or permitted projects.
- provide input and feedback to project engineers and developers, based on personal experience, environmental knowledge, and existing uses of proposed alternative energy sites or project resources.
- share new data, information, and resources, as they become available, and create and maintain lines of communication and feedback between project engineers, planners, and community residents and stakeholders.
- use an adaptive approach to site and project-specific design, planning, permitting, construction, testing, and operations, to respond to stakeholder interests and/or limit potential impacts on marine species, ecosystems, and communities that rely on them.

Achieve Impact

- improve coastal and marine stakeholders' access to and engagement in decision-making related to offshore wind and tidal energy projects in Maine.
- improve efficiency and sustainability of alternative energy generation initiatives in Maine.

We will measure our success by the

Number of community stakeholders who implemented climate-related planning, risk assessment, environmental monitoring, or formal or informal education, as a result of participation in Sea Grant activities. (4-year target: 125)

Number of citizen scientists who observed and recorded climate-related phenology or coastal erosion data through Sea Grant-supported programs. (4-year target: 300)

Number of seafood industry members who applied knowledge gained as a result of Sea Grant activities. (4-year target: 35)

Number of legislation, policy, or management changes resulting from Sea Grant activities. (4-year target: 12)

ENVIRONMENTAL LITERACY & WORKFORCE DEVELOPMENT

Maine Sea Grant seeks to increase environmental literacy and workforce development opportunities for Maine citizens of all ages. Sea Grant extension, education, and communications staff work in collaboration with formal and informal education institutions, researchers, and others throughout the state, region, and nation to provide professional training, participatory research opportunities, citizen science programs, informal education, and free-choice learning opportunities. We serve as the point of contact for graduate students interested in marine-related fellowships through NOAA, and support graduate and undergraduate students working with faculty on a wide range of marine-related research projects. Maine Sea Grant also awards undergraduate student scholarships in marine science, and supports students and professionals in coastal and marine fields through internships and other professional opportunities.

Our primary constituents in this focus area are coastal and marine professionals, K-16 students and educators, graduate students in coastal and marine fields, and lifelong learners. It should be noted that many of the goals described above include topics related to environmental literacy and workforce development. Below, we outline goals that strictly target these focal areas.

GOAL 1. If we are successful, we will have helped create an environmentally literate public who can use scientific knowledge to identify questions, draw evidence-based conclusions, and make decisions about issues that affect the ecological health, economic vitality, and resilience of Maine's coastal communities and ocean-related resources.

Activities to address this goal include production of print, web-based, video, and audio outreach and education products and educational experiences tailored for audiences associated with each of our other four focus areas. We engage learners of all ages in informal education, citizen science, and free choice learning opportunities related to climate change, ecosystem health, coastal and marine wildlife, fisheries heritage, community and economic development, and fisheries and aquaculture in every coastal county in Maine, as well as through our radio programming, and web-based educational resources. In addition, Maine Sea Grant staff teach undergraduate and graduate courses in marine science, science communication, and human ecology at the University of Maine, and College of the Atlantic.

OUTCOMES: through these activities, we provide our constituents with the information, resources, and support they need to:

Learn

- access science-based information related to issues affecting Maine's coastal communities, and the marine and coastal ecosystems on which they depend.
- engage in formal and informal science education opportunities focused on marine and coastal topics.

Act

- use Sea Grant resources to engage students or other audiences in evidence-based learning.
- contribute to Sea Grant-supported citizen science programs and applied research projects.
- engage in public decision-making or stewardship activities as a result of knowledge gained through Sea Grant-supported activities.

Achieve Impact

- demonstrate increases in environmental literacy through reported or observed changes in attitudes, behavior, or personal decisions.

GOAL 2. If we are successful, Maine will have a diverse workforce skilled in disciplines critical to the ecological health, economic vitality, and resilience of Maine's coastal communities and ocean-related resources.

Activities to address this goal include recruiting and supporting diverse applicants for NOAA and Sea Grant scholarship, fellowship, and internship opportunities, teaching undergraduate and graduate courses at the University of Maine and College of the Atlantic, and providing professional training programs in community engagement and facilitation skills, science communication, fishing and aquaculture practices, and business development.

OUTCOMES: through these activities, we provide our constituents with the information, resources, and support they need to:

Learn

- learn new skills through Sea Grant-supported academic and professional training opportunities in fields such as community engagement, science communication, aquaculture, and business development practices.
- broaden their academic and professional networks through Sea Grant-supported opportunities for cross-sector engagement and information exchange.

Act

- a diverse and qualified pool of applicants pursues Sea Grant-supported academic and professional opportunities.
- Sea Grant applied research and extension programs support undergraduate and graduate training, and engage the knowledge and expertise of marine and coastal industry professionals.

Achieve Impact

- a diverse workforce trained in marine and coastal academic and professional fields, and skilled in outreach, community engagement, and science communication skills, is employed and contributing to the ecological health, economic vitality, and resilience of Maine's coastal communities and ocean-related resources.
- marine and coastal business owners have reduced their dependence on any single marine resource or enterprise through participation in Sea Grant-supported professional training in aquaculture and business development practices, and cross-sector collaboration.

We will measure our success by the

Number of Sea Grant products that are used to advance environmental literacy and workforce development. (4-year target: 100)

Number of participants in Sea Grant-supported informal education programs. (4-year target: 10,000)

Number of Sea Grant-trained citizens who collected and submitted environmental data that were used to improve resource management and advance environmental research. (4-year target: 300)

Number of Sea Grant-supported graduates who become employed in a career related to their degree within two years of graduation. (4-year target: 20)

Number of formal and informal educators who use Sea Grant resources to engage students in evidence-based learning. (4-year target: 125)

Number of coastal or marine industry members who developed new skills and diversified their businesses, products, collaborations, and/or sources of income as a result of Sea Grant activities. (4-year target: 75)

Program-wide Performance Measures

Economic benefits derived from Sea Grant activities.
(4-year target = \$4 million)

Number of legislation, policy, or management changes resulting from Sea Grant activities.
(Collective 4-year target = 41; see individual focus area-specific targets listed above)