

Maine Sea Grant Strategic Plan 2014-2017
Marine Science for Maine People in the 21st Century
October 2013

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 2014-2017 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 Sea Grant programs throughout the coastal and Great Lakes states, Maine Sea Grant supports integrated scientific research, outreach, and education programs.

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. A fundamental feature of Maine Sea Grant, the MET makes us unique within the state, as 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.

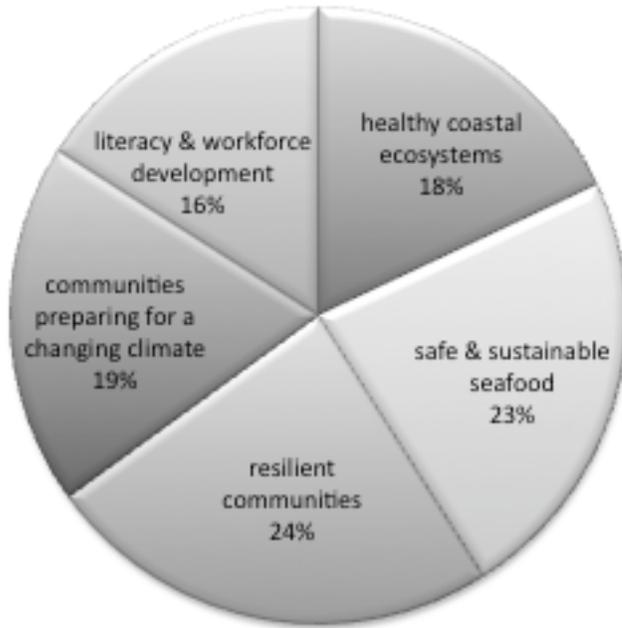
Marine Extension Team members use various methods to accomplish the above objectives. Examples include education programs, applied research projects, and organization and facilitation of workshops and forums to help stakeholders understand and address important issues. An important attribute to our approach 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.

As required by the National Sea Grant Office for evaluation purposes, Maine Sea Grant has calculated the relative level of effort in each of the strategic focus areas for the 2014-2017 period, in proportion to assessment of stakeholders needs, and in alignment with program and research capacity in Maine. This plan does not, however, represent all of the work that Maine Sea Grant plans or hopes to accomplish in the next four years, but rather that portion of activities that will be evaluated by NOAA Sea Grant.

Level of Effort, 2014-2017



This strategic plan reflects input collected in several phases in 2012 and 2013 from stakeholders and the Maine Sea Grant Policy Advisory Committee, and it is in alignment with the 2014-2017 National Sea Grant College Program Strategic Plan.

HEALTHY COASTAL ECOSYSTEMS

Maine's extensive coastline, stretching more than 5,000 miles, 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 of "Downeast." Large bays, including Casco, Penobscot, and Cobscook, and salt marshes, mud flats, and rocky intertidal zones support commercial fisheries and tourism, both 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.

Maine Sea Grant's primary audience in this focus area is coastal communities. To achieve the outcomes listed below, we work with many different constituents within communities. These include municipal officials, resource managers, researchers, private businesses, and citizens of all ages.

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 (for example, protecting, enhancing, or restoring habitat function and productivity).

OUTCOMES To achieve this goal, our work must ensure that coastal community constituents have the information, tools, resources, and support they need to:

Learning outcomes

- understand the values of ecosystems, and the effects of human activities and environmental changes on coastal resources.
- access data, models, technologies, approaches, policy information and training that support ecosystem-based approaches to planning, decision-making and management.

Action outcomes

- work to improve ecosystem health, using technologies and approaches developed in part through Sea Grant research.
- restore marine, estuary, and coastal habitats and their connections to inland watersheds (e.g., diadromous fish habitat restoration projects), and engage in related research, education, and outreach activities.
- practice stewardship that leads to participatory decision-making and collaborative ecosystem-based management decisions.

Consequence outcomes

- achieve protected, enhanced, or restored habitats and ecosystem function.
- achieve improved public stewardship and participation in collaborative decision-making.

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: 45)

Number of legislation, policy, or management changes resulting from Sea Grant activities (e.g., septic system pumpout ordinances, fish passage improvements). (4-year target: 7)

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 create conflict, 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. Year-round residents, especially many islanders, struggle to afford their property taxes, find employment, and pay their bills in the face of increasing energy costs. A healthy coastal economy includes a sustainable energy future. With extensive undeveloped coastline and some of the most promising tidal and offshore wind resources in the US, 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. We have laid out our goal, expected outcomes, and plans below for how we expect to advance this effort through the next four years, working with communities and our many partners throughout the state. Elements of our efforts to achieve coastal community resilience run across all five of our focus areas, so the concept of resilience and plans for achieving it appear throughout this proposal.

Our primary audience in this focus area is coastal communities. To achieve the outcomes listed below, we work with many different audiences within communities. These include municipal officials, resource industries and managers, researchers, private businesses, property owners, and citizens of all ages.

GOAL If we are successful, Maine will have resilient coastal communities that include viable neighborhoods, thriving waterfronts, and businesses that draw upon and maintain their natural and cultural heritage.

OUTCOMES To achieve this goal, our work must ensure that coastal community constituents have the information, tools, resources, and support they need to:

Learning outcomes

- understand that the health of the economy and the health of natural and cultural systems are interdependent.
- engage in public planning processes.
- understand the value of waterfront- and tourism-related economic activities.
- understand the strengths and weaknesses of alternative development scenarios on resource use, local economies, and cultural assets.

Action outcomes

- evaluate assets and opportunities in order to plan for their preferred futures.

- balance the coastal access needs of various stakeholders with strategies to reduce conflicts while preserving or enhancing access for water-dependent industries.
- pursue sustainable recreation and tourism products and opportunities.

Consequence outcomes

- achieve diverse, healthy economies and industries without displacing traditional working waterfronts or other natural or cultural assets.

We will measure our success by the

Number of communities that, with Sea Grant support, addressed coastal access and working waterfronts; evaluated assets and opportunities in order to plan for their preferred futures; realized sustainable recreation and tourism products and opportunities; and/or evaluated and implemented alternative ocean-based energy strategies. (4-year target: 50)

Number of legislation, policy, or management changes resulting from Sea Grant activities. (4-year target: 8)

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." Maine Sea Grant's work in this area is focused on fisheries, such as lobster, scallops, and clams, 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. Our work in aquaculture includes continued development of new culture techniques and target species, as well as marketing and industry support. 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.

Our primary constituents in this focus area are Maine fishermen, aquaculturists, seafood industries, resource managers, and fishing-dependent coastal communities. Secondary audiences include seafood consumers and the U.S. seafood industry.

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

OUTCOMES To achieve this goal, our work must ensure that constituents have the information, tools, resources, and support they need to:

Learning outcomes

- access current science on the dynamics of wild fish and shellfish populations.
- learn about innovative technologies, approaches and policies, including business development, research opportunities, and marketing strategies.
- learn about the seafood industry and its heritage.

Action outcomes

- respond to future changes, including those resulting from climate change, through strategies such as diversification and integration.
- engage in and support research, monitoring, and business development that increase quality and profitability of wild harvest and culture fisheries and dependent livelihoods.
- support and enhance safe, sustainable production and consumption of seafood.

Consequence outcomes

- achieve a safe, sustainable seafood industry in Maine.

We will measure our success by the

Number of seafood industry members who applied knowledge gained as a result of Sea Grant activities. (4-year target: 125)

Number of legislation, policy, or management changes resulting from Sea Grant activities. (4-year target: 6)

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, and coastal flooding. Extreme weather events can cause millions of dollars in damage and threaten coastal ecosystems and local economies that rely on tourism, a vital sector of Maine's economy. 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 many different audiences within communities 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 and maintain resilience.

OUTCOMES To achieve this goal, our work must ensure that coastal community constituents have the information, tools, resources, and support they need to:

Learning outcomes

- access and use climate and coastal hazard-related data and resources.
- understand the potential effects of climate change and related hazards.
- develop skills necessary to assess local risk vulnerability.

Action outcomes

- prepare for potential climate-driven changes to marine ecosystems and hazard events.
- minimize the potential hazards resulting from climate change by implementing resilient coastal development strategies and practices.

Consequence outcomes

- achieve and maintain resilience to climate change-related disruptions to life and economy.

We will measure our success by the

Number of communities and property owners who implemented climate-related hazard resiliency practices as a result of Sea Grant activities. (4-year target: 10)

Number of seafood industry members who applied knowledge gained as a result of Sea Grant activities. (4-year target: 50)

Number of legislation, policy, or management changes resulting from Sea Grant activities. (4-year target: 10)

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 development, participatory research, citizen science, 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 formal and informal educators, lifelong learners, and students and professionals in marine and coastal fields.

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.

OUTCOMES To achieve this goal, our work must ensure that constituents have the information, tools, resources, and support they need to:

Learning outcomes

- become familiar with environmental literacy principles.
- engage in informal science education opportunities focused on coastal topics.

Action outcomes

- use Sea Grant resources to engage students and other audiences in evidence-based learning.
- contribute to Sea Grant-supported citizen science programs.

Consequence outcomes

- 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 workforce skilled in science, technology, engineering, mathematics, and other disciplines critical to the ecological health, economic vitality, and resilience of Maine's coastal communities and ocean-related resources.

OUTCOMES To achieve this goal, our work must ensure that

Learning outcomes

- Students and professionals are aware of Sea Grant-supported academic and professional opportunities in science, technology, engineering, and mathematics (STEM) fields.

Action outcomes

- A diverse and qualified pool of applicants pursues Sea Grant-supported academic and professional opportunities.
- Sea Grant research projects support undergraduate and graduate training in fields related to understanding and managing our coastal resources.

Consequence outcomes

- A diverse workforce trained in science, technology, engineering, mathematics, law, policy or other job related fields is employed and contributing to the ecological health, economic vitality, and resilience of Maine's coastal communities and ocean-related resources.

We will measure our success by the

Number of Sea Grant facilitated curricula used by formal and informal educators. (4-year target: 5)

Number of participants in Sea Grant-supported informal education programs. (4-year target: 12,000)

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: 400)

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: 300)

Program-wide Performance Measures

Economic benefits derived from Sea Grant activities.
(4-year target = \$8 million)

Number of peer-reviewed publications produced as a result of Maine Sea Grant research.
(4-year target = 60)

Number of legislation, policy, or management changes resulting from Sea Grant activities.
(Collective 4-year target = 31; see individual focus area-specific targets listed above)