

2016

Maine Sea Grant Annual Report 2015

Maine Sea Grant

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Maine Sea Grant
Annual Report to the Vice President for Research
1 July 2016

Executive Summary

This report contains information regarding Maine Sea Grant's performance over the past year, and tracks trends over multiple years, including return on investment.

Major Accomplishments

Members of the Sea Grant-Cooperative Extension Marine Extension Team continued their commitment to excellence in serving the people of Maine in 2015. Here are some selected highlights from their work:

- Esperanza Stancioff worked with lobstermen in South Thomaston and Spruce Head to identify climate change impacts and implement adaptive actions such as improved business plans, lobster health monitoring, and policy discussions with industry leaders and resource managers. NOAA highlighted the project as a **national example of climate resilience**.
- Since initiation of the Aquaculture in Shared Waters program 2013, more than 50 fishermen from communities across the coast (Corea, Thomaston, Harpswell) have received training in aquaculture products, processes, and business operations. **Eight have already secured aquaculture leases** as a result of their participation.
- In 2015, Sarah Redmond worked with partners to **develop organic certification guidelines for farmed sea vegetables**, to encourage research into drying and processing technology, and to offer education and training to interested new sea farmers. The first sea vegetable aquaculture nursery and farms were certified organic in Maine, which will allow organic sea vegetable companies to incorporate farmed product into their market. A group of food science and process engineers at the University of Maine received funding in 2015 to design and test high-efficiency solar driers in order to help farmers access affordable commercial scale driers for the new crops. Hundreds of inquiries and requests for assistance demonstrate that Redmond is known and trusted as **the lead provider of sea vegetable information, education, research, and technology in Maine**.
- Recognizing that Southern Maine communities face a disconnect between income and housing costs, Kristen Grant helped secure funding for and facilitate a series of planning workshops with several towns. As a result, municipal officials in Berwick, Kittery, and Wells, have implemented zoning and planning **processes to construct workforce housing**.
- A volunteer beach monitoring program in Maine, coordinated by Grant, **continued to guide beach management** in 2015. Data collected by 150 volunteers from 12 sandy beaches in southern Maine were referenced by NOAA in siting a data buoy in 2015. Data were also used by scientists in addressing media questions about sea level anomalies, in the development of state bill (LD 408) on municipal planning for sea-level rise, and in connecting middle school students to real world science applications.

The majority of Sea Grant funds support research and program development projects with direct application to coastal and marine resource issues in Maine. Here are a few highlights from 2015:

- Richard Wahle of the School of Marine Sciences continues to develop the American Lobster Settlement Index into a predictive tool to forecast future changes in the lobster fishery. Wahle's presentations at Maine Maritime Museum, the Maine Fishermen's Forum, and remarks in numerous media outlets demonstrate his position as **a leading authority on the lobster resource**.
- In a study published in *Biological Bulletin*, UMaine undergraduate Tyler Carrier showed that green sea urchin larvae consume the toxic algae *Alexandrium* at a range of concentrations, even when other food sources are present, and **saxitoxin exposure alters urchin development**.
- Jessica Muhlin of Maine Maritime Academy has been using data from the Sea Grant/Cooperative Extension coordinated Signs of the Seasons program to re-evaluate a historical model of **ocean temperature-mediated reproduction in *Ascophyllum nodosum***. Data from 10 coastal sites in Maine and New Hampshire indicate that reproduction onset in 2014 and 2015 was more than 30 days earlier than historically recorded. The findings were presented at four scientific conferences in the US and Great Britain in 2015.

Collaborations with UMaine System Campuses

University of Maine at Machias:

SEANET Bioregion 3 team (Beal, Nettleton)

Rockweed Working Group (Beal)

Marine Field Station/Downeast Institute Board of Directors

Sea Grant funds to support the development of a kelp nursery system (Nettleton)

The Catch editorial board (Hildebrandt)

University of Southern Maine

Sea Grant research funding (Wilson)

Highlighted student profile

Jocelyn Runnebaum, a Sea Grant Scholar and doctoral student in Yong Chen's lab, participated in a series of Sea Grant training workshops in science communication and facilitation in 2015.

Through these opportunities, and through her Sea Grant-supported research on bycatch in the American lobster fishery, Runnebaum observed that distrust and poor communication between researchers and industry professionals hinders information exchange that can help to identify urgent research needs, and ensure more timely and effective communication of research findings. In response, Runnebaum and several other Sea Grant-supported graduate students organized and led the first annual Maine Marine Resources Exchange, in which 40 student researchers and 40 industry professionals and resource managers spent a full day exchanging information, ideas, and perspectives on current research, data gaps, and opportunities for collaboration. Runnebaum is currently working with Sea Grant, the UMaine Graduate School, and the School of Marine Sciences to plan for the future of the Maine Marine Resources Exchange.

Overview

The University of Maine is a federally designated Sea Grant College. The Maine Sea Grant College Program is supported by the National Oceanic and Atmospheric Administration and the State of Maine. Part of a network of 34 programs across the nation's coastal and Great Lakes states and territories, Sea Grant supports marine and coastal research, education, and outreach.

Mission

Our mission is to play a leadership role in marine science and education and to promote the sustainable use and stewardship of marine and coastal resources.

Vision

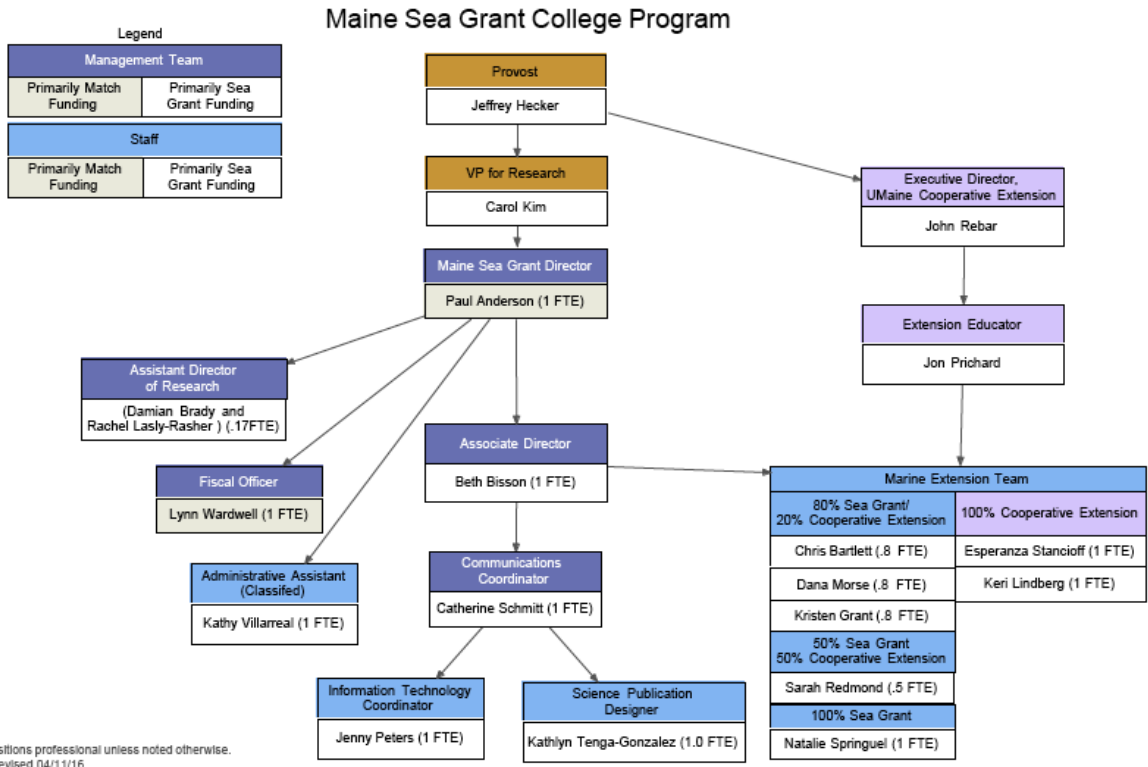
Our vision, from our current strategic plan, is a Maine where people recognize that healthy ecosystems are the foundation of resilient communities, and act to ensure the long-term health of coastal resources. Maine's coastal communities include viable neighborhoods, thriving waterfronts, and businesses that draw upon and maintain their natural and cultural heritage. Wild harvest and culture fisheries and the communities that depend on them are economically viable and environmentally sustainable. Maine has a diverse 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.

Status of strategic plan

Our current Strategic Plan (seagrant.umaine.edu/strategic-plan) covers the four-year period from 2014 to 2017. The plan, which is in alignment with the National Sea Grant Strategic Plan and has been approved by NOAA Sea Grant, 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.

In November 2015, Maine Sea Grant began its 2018-2021 strategic planning process, which has included a survey of its 25-member Policy Advisory Committee representing diverse marine and coastal stakeholders, and additional stakeholders identified by each Committee member. The draft plan, due in October 2016, will undergo further stakeholder review, and a subsequent review by the National Sea Grant Office. The final plan will be released in March 2017.

Administration and staffing structure



Serving Maine

Community engagement

Our primary means of engaging stakeholders is through the Marine Extension Team (MET), a formal partnership with the University of Maine Cooperative Extension. Nine professionals are based in coastal communities from Wells to Eastport. The Marine Extension Team performs the traditional “extension” function of connecting scientific researchers and coastal stakeholders. The specific communities engaged in Sea Grant programming vary from year to year, but 2015 collaborations can be found in the partner list in [Appendix A](#).

Economic Development

Economic impact	Businesses created	Businesses retained	Jobs created	Jobs retained
\$500,000	8	12	2	31

Workforce development

Maine Sea Grant's workforce development opportunities include student fellowships and scholarships; funding criteria that favor meaningful involvement of K-16 and graduate students in research; and professional training for both students and adult professionals through involvement in Sea Grant extension, education, and communications programs. Training subjects include outreach skills such as facilitation, science communication, and community engagement, aquaculture methods, and business planning.

Opportunities for undergraduate and graduate students facilitate multiple interactions and support for students as they complete their academic degree programs and gain professional experiences. The Maine Sea Grant Scholar program, initiated in 2011, supports a student's first year in UMaine's dual master's degree program in marine policy and science. The annual Maine Sea Grant Undergraduate Scholarship in Marine Sciences serves students from five public and private undergraduate institutions in Maine that have committed to matching \$500 in Sea Grant scholarship funding for any successful applicant from their own institution. Scholarship funds may be used for academic research, tuition, professional development, or other academic expenses related to awardees' marine or coastal studies. (See undergraduate student award section below for 2015 recipients). In addition, Sea Grant informal education and citizen science programs involve stakeholders of all ages in research and stewardship, and Marine Extension Team activities typically include support for graduate and undergraduate students in addition to providing professional training to stakeholders.

Maine Sea Grant recruits applicants for several NOAA fellowship programs each year. In 2015, we were honored to have two Maine students selected for the National Sea Grant John D. Knauss Fellowship in Marine Policy, Class of 2016. They are: Noah Oppenheim (Jan '16 UMaine Dual Master of Marine Biology and Marine Policy), and Karen Pianka (Dec '15 UMaine Dual Master of Marine Biology and Marine Policy).

See Appendix C for a list of Sea Grant-supported students in 2015.

Collaborations with UMaine System Campuses

- Karen Wilson of **University of Southern Maine**, research funding, "Variation in habitat use by juvenile river herring in the Penobscot River."
- Jessica Muhlin of **Maine Maritime Academy**, Signs of the Seasons Phenology Program.
- Brian Beal of **University of Maine at Machias**, research funding, "Spatial and temporal variation in growth of soft-shell clams." Additional projects include Signs of the Seasons, ocean acidification, Downeast Institute Board of Directors, rockweed working group.
- Jeremy Nettleton of **University of Maine at Machias**, Sea Grant funds to support development of a kelp nursery system.
- Beal and Nettleton of **University of Maine at Machias** are members of the NSF EPSCoR SEANET Bioregion 3 Team.
- Leonore Hildebrandt, **University of Maine at Machias**, *The Catch* editorial board.

Collaborations with other outside institutes/organizations

A list of partners from 2015 is attached in [Appendix A](#).

Financial Stability

<i>E&G Support</i>	n/a
<i>MEIF Support</i>	\$752,838 (includes fringe benefits and indirect)
<i>Research Funding</i>	<p>Awarded:</p> <ul style="list-style-type: none"> \$25,379: NOAA Penobscot Habitat Blueprint \$56,590: SEANET (Sea Grant portion) \$452,397: Building Out Capacity for Aquaculture Innovation (MTAF/MAIC) \$25,000: Field Trials of Sea Vegetables in Aquaculture (MTI Seed Grant) <p>Submitted:</p> <ul style="list-style-type: none"> \$8,568: USDA, A Maine based biophysical and economic analysis of ear hanging techniques for sea scallops \$14,667: Northeast Sustainable Agriculture Research and Education, Pilot aquaculture production of sea scallops in Maine using the established Japanese technique of ear hanging \$299,662: NOAA Climate Program, Developing and applying a generalizable policy model for natural resource valuation to promote adaptive action, and fishing communities' resilience
<i>Brief overview of each major new award, w/ links to press coverage</i>	<p>Funding during 2015 was omnibus year two, including Maine Sea Grant administration, communications, extension, and climate change-related projects.</p> <p><i>Re: Press Coverage – Sea Grant work is featured in numerous articles each year. Please contact Catherine Schmitt for a list of press on any project.</i></p>
<p><i>Return on Investment</i></p> <p>External Awards Received / University Funding (University funding to include any E&G and MEIF, that is not revenue, supporting department operations, salaries and their benefits)</p>	<p>\$1,614,531 Total NOAA Funds</p> <ul style="list-style-type: none"> \$905,000 NOAA Base/Core/CCD Funding \$128,000 NOAA Merit Funding \$30,000 NOAA Climate Adaptation \$98,678 NOAA (increase in Core Funding) \$25,088 NOAA (increase in Merit Funding) \$200,306 NOAA Developing remote sensing capabilities for the aquaculture community of Maine \$227,459 NOAA A modular, collaborative approach to marine aquaculture training <p>Research and Outreach Leveraged with NOAA SG Funds - <i>Awarded</i></p> <ul style="list-style-type: none"> \$200,000: Intertidal aquaculture of soft-shell clams (MEIF) \$87,824: An environmental decision tool for Penobscot Bay (MEIF) \$63,800: Genetic identification and practical culture of kelp (MEIF) \$229,326: Improving survivability of cusk and Atlantic cod bycatch discarded in the Gulf of Maine lobster trap fishery (NOAA S-K)

	<p>\$174,434: Improving Northern shrimp stock assessment (NOAA FATE) \$7,000: town contributions for Beach Profile Monitoring Program \$3,000: sponsorships for the Maine Beaches Conference</p> <p><i>Submitted</i> \$291,419: An ecologically and economically viable northern shrimp (Pandalus borealis) fishery in a changing Gulf of Maine (NOAA S-K)</p>
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Revenue Centers

n/a

Private Giving/Alumni Cultivation

n/a

Initiatives to Increase Fiscal Efficiency

Maine Sea Grant continuously strives to make the most effective use of its limited funding dollars and to be as efficient as possible without sacrificing the quality of our work.

Culture of Excellence

Faculty & staff achievements

- Brian Beal, National Shellfisheries Association Neil Bourne-Kenneth Chew Award
- K. Kaczor/Maine Healthy Beaches Program, Senator George J. Mitchell Center Award for Outstanding Contribution by an External Partner to Sustainability Research
- Esperanza Stancioff/Northeast Coastal Acidification Network Steering Committee, Northeast Sea Grant Consortium Outstanding Outreach Achievement Group Award
- Sarah Redmond, Northeast Sea Grant Consortium Outstanding Outreach Achievement Individual Award
- O’Chang Studios, National Science Foundation Visualization Challenge People’s Choice Award (Nomination)

Research and scholarship summary

In 2015, Maine Sea Grant activities resulted in

- 14 peer-reviewed publications.
- 46 print and digital publications, including technical reports, fact sheets, websites, interpretive panels, radio programs, videos, and articles.
- 151 presentations to professional and public audiences, attended by approximately 18,750 people.
- 175 Sea-Grant sponsored or organized workshops, meetings, and conferences attended by more than 40,000 people.

Curricular Innovations/Integration with the UMaine Education Mission Program Integration

- Catherine Schmitt is an adjunct in the English Department. She taught ENG 212, Persuasive and Analytical Writing, in Fall 2015. Schmitt's book, *The President's Salmon*, was used as a text in two courses: SMS Fisheries Management History (Langton) and CMJ Environmental Communication (McGreavey).
- Damian Brady is an Assistant Professor in the School of Marine Sciences. He taught Estuarine Oceanography, SMS 484, for the Semester by the Sea at the Darling Marine Center in 2015.
- Beth Bisson is a member of the UMaine K-12 Outreach Network, which works to identify and leverage opportunities to collaborate on multidisciplinary educational programming and maximize engagement of K-12 teachers and students in STEM learning opportunities and resources supported by UMaine.

Student Engagement, Student Success [see Appendix C]

Undergraduate student research, scholarship or creative activities

Maine Sea Grant supported a total of 21 undergraduate students, 11 from UMaine, through internships, scholarships, program development awards, and research, outreach, and monitoring activities associated with Marine Extension Team research and extension programs.

Undergraduate student awards

n/a

Graduate student research, scholarship or creative activities

Maine Sea Grant supported a total of 21 graduate students, 19 from UMaine, through research and program development awards, the Maine Sea Grant Scholar Program, NOAA and Sea Grant graduate fellowship programs, and opportunities related to Marine Extension Team programs.

Graduate student awards

- Noah Oppenheim, John F. Down Graduate Excellence Award
- Jie Cao, Graduate Research Excellence Award and Chase Distinguished Research Assistantship
- Jesica Waller, University of Maine Canadian-American Center Fellowship and National Science Foundation Visualization Challenge People's Choice Award
- Dongmei Xie, Chase Distinguished Research Assistantship

Retention and graduation numbers, initiatives

n/a

Degrees granted

Maine Sea Grant does not grant degrees directly, but we count the numbers of Sea Grant-supported students who earn undergraduate or graduate degrees during each reporting period. In 2015, 12 UMaine students (nine undergraduate and three graduate) received degrees.

Highlighted student profile

Maine's resource-based economy depends on the health of its coastal resources, as tourism, fishing, and aquaculture are its primary drivers. Therefore, Maine must recruit and retain a workforce that is both literate in the academic disciplines critical to the ecological health, economic vitality, and resilience of its coastal communities, and adept at the outreach and community engagement skills required to foster effective communication and trust between diverse stakeholders. A "Sea Grant Family" of undergraduate and graduate students and marine professionals are involved with and supported by Maine Sea Grant in many different capacities, empowering students to take steps to reduce barriers to communication between and among academic and industry circles in Maine. For example, Jocelyn Runnebaum, a Sea Grant Scholar and doctoral student in Yong Chen's lab, participated in a series of Sea Grant training workshops in science communication and facilitation in 2015. Through these opportunities, and through her Sea Grant-supported research on bycatch in the American lobster fishery, Runnebaum observed that distrust and poor communication between researchers and industry professionals hinders information exchange that can help to identify urgent research needs, and ensure more timely and effective communication of research findings. In response, Runnebaum and several other Sea Grant-supported graduate students organized and led the first annual Maine Marine Resources Exchange, in which 40 student researchers and 40 industry professionals and resource managers spent a full day exchanging information, ideas, and perspectives on current research, data gaps, and opportunities for collaboration. Runnebaum is currently working with Sea Grant, the UMaine Graduate School, and the School of Marine Sciences to plan for the future of the Maine Marine Resources Exchange.

Preserving-Restoring Infrastructure

Renovation or Construction Projects Initiated/Completed

n/a

Renovation/Construction Projects Planned for Coming Year (i.e., vetted with Facilities Management)

n/a

Summary of Anticipated Challenges

Maine Sea Grant continues to be over-subscribed. We are desirable partners with a reputation for getting things done. Our Marine Extension Team members are highly productive, as demonstrated in this annual report, and often find themselves in the difficult position of having to limit new projects and programs due to time constraints. Meanwhile, the availability of program funds from various sources continues to dwindle, and therefore the Sea Grant Program Development funds have also become very competitive. This pressure on our resources causes us to focus more and be as strategic as possible in selecting partnerships and programs to support. The challenge associated with these constraints is that we are also promoting engagement and the application of science in decision-making. These efforts help to foster the need for more resources by our staff and by our partners. Part of the solution to these types of challenges is to apply creative thinking to the identification of external funding sources and to maximize the leveraging our own resources and time to secure those funds. In 2015, we were successful in leveraging new resources in several areas, such as applied research and professional training in aquaculture, and for marine and coastal infrastructure, collaboration, and business development through the new Alliance for Maine's Marine Economy (which we have learned will advance in 2016). However, there are other areas such as climate change adaptation planning, science information content, and requests for outreach to and support for K-12 audiences, in which the

demand for our time continues to far outstrip our current staff capacity and available federal funding opportunities. We will continue to seek new sources of external funds and partnerships in these areas, and for ways to grow our staff.

As we look ahead in our 2018-2021 strategic planning process, we have chosen to streamline strategic priorities and focus on initiatives that address demonstrated stakeholder needs, and leverage both core strengths of the Sea Grant model and the specific skills and expertise of our staff and Marine Extension Team. Our commitment of service to our constituents, and to the missions of NOAA and the University of Maine will continue to be our highest priorities. These are occasionally different from what our partners are seeking, but we have found that when we are willing to hold the course and say “no” to requests for involvement at the margins of our mission, our impacts are greater. At the same time, we will continue to allow for creativity in responding to emerging needs and opportunities that fit into our portfolio.

Summary of New Initiatives

Sea Grant staff and Marine Extension Team members developed a series of five **outreach and engagement skills workshops** to provide Sea Grant-supported students with an introduction to the practical skills and applied theory behind successful outreach programs for a wide variety of audiences. Workshop topics offered in 2015 included science communication, facilitation skills, and community engagement, with additional sessions focused on partnership development, and outreach project planning and budgeting organized for 2016.

Maine Sea Grant co-led the coordination and facilitation of the formation of the **Alliance for Maine's Marine Economy**, a group of approximately 20 private and public institutions from academia, research and industry. The Alliance applied for (and ultimately received) a \$7M state of Maine bond award to improve infrastructure that supports expansion of Maine's marine economy primarily in the seafood industry. The Alliance proposal included approximately \$11M in matching funds making this an \$18M investment that will be implemented and supported over the next 10 years. Part of the match includes investment by the University of Maine to fund a new member of the Marine Extension Team who will specialize in business development linking the public-private investments to economic impact. Plans are underway to secure enabling funds to support the planning and organizational development of the Alliance.

Due to an overwhelming positive response, Maine Sea Grant is pursuing development of the **Oyster Trail of Maine** as part of our continued leadership in linking the tourism, fisheries, and aquaculture industries.

In 2015, Maine Sea Grant began a partnership with O'Chang Comics, a local animation studio, to produce a **short cartoon on climate change**. “A Climate Calamity in the Gulf of Maine, Part 1: The Lobster Pot Heats Up,” based on information in the Sea Grant-produced report, *Maine's Climate Future: 2015 Update*. The video has more than 15,000 views on YouTube to date, is being used by K-12 educators and others in Maine and across the country, and was nominated for a Vizzie Award. The partnership with a Maine-based creative company enabled Sea Grant to reach new audiences, further advancing our position as a leading provider of climate change information. The partnership continued into 2016.

Maine Sea Grant was recruited by NOAA and The Nature Conservancy to provide communications support to the **Penobscot River Watershed Habitat Focus Area**, one of ten such areas designated by NOAA nationwide. The goal of the Habitat Focus Area is to restore diadromous species habitat in the Penobscot watershed. Our work includes working with communities that are evaluating barrier removal, and developing outreach materials on the benefits of free-flowing rivers.

Another new initiative is our emphasis on **multimedia storytelling**, including Working Waterfront oral histories produced with the National Working Waterfront Network, and Coastal Conversations, a monthly public affairs program on WERU-FM.

APPENDIX A: MAINE SEA GRANT PARTNERS, 2015-2016

Acadia National Park
American Unagi, LLC
Atlantic States Marine Fisheries Commission
Atlantic University
Baxter State Park
Bigelow Laboratory for Ocean Sciences
Blue Hill Bay Mussels
Boothbay Regional Land Trust
Bowdoin College
Cape Neddick River Association City of Saco
Casco Bay Estuary Project
City of Biddeford
City of Eastport, ME
City of Ellsworth, ME
City of Guilford, CT
City of Portland, ME
City of Portsmouth, NH
City of Saco, ME
City of South Portland, ME
Clark University
Coastal Enterprises, Inc.
Coastal Maine Botanical Gardens
Cobscook Community Learning Center
College of the Atlantic
Community Wellness Coalition
Connecticut Sea Grant
Cooke Aquaculture
Cornerstones of Science
Damariscotta River Association
Downeast and Acadia Regional Tourism
Downeast Dayboat
Downeast Institute
Downeast Resource Conservation and Development
Downeast Salmon Federation
Drummon Woodsum Law Firm
E+K Shellfish
Farm Service Agency (USDA)
FB Environmental
F/V Lindsay Marie
F/V Rachel
F/V Oddball
Federal Energy Regulatory Commission
Fisheries and Oceans Canada
Friends of Casco Bay
Friends of the Boat School (Eastport)
Frenchman Bay Partners
Georges River Tidewater Association
GRB Maritime Realty

Gulf of Maine Council's EcoSystem Indicator Program
Gulf of Maine Research Institute
Herring Gut Learning Center
Hurricane Island Foundation
International Pectnid Workshop
Island Institute
Kennebec Estuary Land Trust
Lobster Institute
Long Cove Oyster Company
Maine Aquaculture Association
Maine Aquaculture Innovation Center
Maine Association of Realtors
Maine Assoc. of Sea Kayak Guides and Instructors
Maine Atlantic Salmon Museum
Maine Audubon
Maine Beaches Association
Maine Boats, Homes & Harbors Magazine
Maine Botanical Gardens
Maine Bureau of Parks and Lands
Maine Climate Adaptation Providers Network
Maine Coast Heritage Trust
Maine Coast Sea Vegetables
Maine Coastal Islands National Wildlife Refuge
Maine Coastal Observing Alliance
Maine Coastal Program
Maine Commercial Fishermen (9
Maine Community Foundation
Maine Conservation Corps (AmeriCorps)
Maine Cooperative Extension Service
Maine Cooperative Fish and Wildlife Research Unit
Maine Department of Agriculture, Conservation and Forestry
Maine Department of Environmental Protection
Maine Department of Health
Maine Department of Inland Fisheries and Wildlife
Maine Department of Marine Resources
Maine Department of Revenue Services
Maine Department of Transportation
Maine EPSCoR (NSF)
Maine Fishermen's Forum
Maine Fresh Sea Farms
Maine Geological Survey
Maine Health Laboratory
Maine Island Trail Association
Maine Lobstermen's Association
Maine Mariculture Company
Maine Maritime Academy
Maine Office of Tourism
Maine Organic Farmers and Gardeners Association
Maine Outdoor Heritage Fund
Maine Research Internships for Teachers and Students

Maine Scallop Company
Maine Seafood Network
Maine Seaweed
Maine Soft-shell Clam Advisory Council
Maine State Legislature
Maine Tidal Power Initiative
Maine Writers & Publishers Alliance
Maine Working Waterfront Coalition
Maryland Department of Natural Resources
Massachusetts Institute of Technology
Medomak Valley Land Trust
Micro Technologies
Midcoast Fishermen's Association
Midcoast Maine Fishing Heritage Alliance
Middle Peninsula Chesapeake Bay Public Access Authority
Minnesota Sea Grant
Mississippi-Alabama Sea Grant Consortium
Monhegan Boat Lines
Mount Desert Biological Laboratory
National Centers for Coastal Ocean Science (NOAA)
National Fish and Wildlife Foundation
National Fisherman
National Marine Manufacturers Association
National Park Service
National Safe Boating
National Science Foundation
National Working Waterfront Network
New Brunswick (Canada) Department of Tourism, Heritage, and Culture
New England Aquarium
New Hampshire Climate Adaptation Workgroup
New Hampshire Coastal Program
New Hampshire Sea Grant
New York Sea Grant
Newfoundland and Labrador Department of Fisheries and Aquaculture
Normandeau Associates
North American Kelp
Northeast Algal Society
Northeast Center for Risk Management Education
Northeast Sea Grant Consortium
Northeastern Regional Aquaculture Center
Northeastern University
Northwest Atlantic Marine Alliance
Nova Scotia Department of Fisheries and Aquaculture
O'Chang Studios
Ocean Approved, LLC
North American Kelp
Ocean Organics
Ocean Park Conservation Society
Ocean Renewable Power Company
Oceanville Seafood

Office of International Affairs (NOAA)
Ogunquit Conservation Commission
Ogunquit Sewer District
Ohio Sea Grant
Oregon Sea Grant
Peaks Island Shellfish
Pemaquid Mussel Company
Penobscot East Resource Center
Penobscot Marine Museum
Pine Point Oysters
Rhode Island Sea Grant
Rockport Conservation Commission
Roosevelt Campobello International Park
Scallop Advisory Council
Schoolic Education and Research Center
Sea Grant Association
Sheepscot Valley Conservation Association
Shoals Marine Laboratory
Social and Environmental Research Institute
SOS Maine
Source, Inc.
Southern Maine Community College
Southern Maine Regional Planning Commission
Spruce Creek Association
State University of New York, College of Environmental Science and Forestry
St. Joseph's College
Stonington Clam Committee
Sunrise County Economic Council
Surfrider Foundation
Syracuse University
Texas A&M University
The Lobster Conservancy
The Nature Conservancy
Town of Barrington, NH
Town of Berwick, ME
Town of Camden, ME
Town of Cape Elizabeth, ME
Town of Deer Isle, ME
Town of Gouldsboro, ME
Town of Hancock, ME
Town of Harpswell, ME
Town of Kennebunk, ME
Town of Kennebunkport, ME
Town of Kittery, ME
Town of Lincolnville, ME
Town of Ogunquit, ME
Town of Old Orchard Beach, ME
Town of Old Saybrook, CT
Town of Orrington, ME
Town of Prospect Harbor, ME

Town of Rockport, ME
Town of Scarborough, ME
Town of Saco, ME
Town of South Thomaston, ME
Town of Stonington, ME
Town of Sullivan, ME
Town of Thomaston, ME
Town of Wells, ME
Town of Winter Harbor, ME
Town of York Harbor, ME
Town of York, ME
Trust for Public Land
Tufts University
University of Connecticut
University of Maine
UMaine Advanced Structures & Composites Center
UMaine Aquaculture Research Institute
UMaine Center for Cooperative Aquaculture Research
UMaine Center for Research in STEM Education
UMaine Climate Change Institute
UMaine Cooperative Extension
UMaine Department of Biochemistry, Microbiology and Molecular Biology
UMaine Department of Communications and Journalism
UMaine Department of English
UMaine Law School and Center for Law and Innovation
UMaine Office of the Vice President for Innovation
UMaine School of Marine Sciences
UMaine Senator George J. Mitchell Center
University of Maine at Machias
University of Massachusetts at Boston
University of Minnesota
University of New Brunswick
University of New England
University of New Hampshire
UNH Cooperative Extension
UNH Cooperative Institute for Coastal and Estuarine Environmental Technology
UNH Jackson Estuarine Laboratory
University of Prince Edward Island
University of Rhode Island
University of Rhode Island Cooperative Extension University of Rhode Island Department of Fisheries, Animal and Veterinary Sciences
University of Southern Maine
Urban Harbors Institute
US Army Corps of Engineers
US Coast Guard
US Department of Agriculture
US Department of Commerce
 Economic Development Administration
National Oceanic and Atmospheric Administration (NOAA)
NOAA Fisheries

NOAA National Ocean Service
NOAA National Weather Service
NOAA Office of Coastal Management, Economics: National Ocean Watch Program
National Sea Grant (NOAA)
National Sea Grant Law Center
Wells National Estuarine Research Reserve
Massachusetts Sea Grant
Michigan Sea Grant
North Carolina Sea Grant
Texas Sea Grant
US Representative Chellie Pingree (ME)
U.S.A. National Phenology Network
US Department of Energy
US Department of Interior
National Park Service
Fish & Wildlife Service
US Economic Development Administration
US Environmental Protection Agency
Virginia Institute of Marine Science
Virginia Sea Grant
Virginia State Legislature
Vitamin Seaweed
Walsh Engineering
Washington County Community College
Washington County Council of Governments
Washington Sea Grant
West Coast Governor's Alliance
Wild Ocean Aquaculture
Woods Hole Oceanographic Institution
Workforce Housing Coalition
Works of Hand Gallery
Wright-Pierce Engineers
York Conservation Commission

APPENDIX B: SEA GRANT COMMUNICATIONS & OUTREACH 2015

Peer-reviewed publications

Carrier *et al.* 2015. Gene expression changes associated with the developmental plasticity of sea urchin larvae in response to food availability. *Biological Bulletin* 228(3):171-180.

Dhakal, N., S. Jain, A. Gray, M. Dandy, and E. Stancioff. 2015. Nonstationarity in seasonality of extreme precipitation: A nonparametric circular statistical approach and its application. *Water Resources Research* 51, doi:10.1002/2014WR016399.

Dzwonkowski, B., N.R. Pettigrew, and S.R. Knapp. 2015. Spatial and temporal variability of the velocity and hydrographic structure in a weakly stratified system, Broad Sound, Casco Bay, Maine. *Journal of Geophysical Research Oceans* 120: doi:10.1002/2014JC010481.

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Books & Book Chapters

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Springuel, N., W.B. Leavenworth, and K. Alexander. 2015. From wealth to poverty: the rise and fall of cod around Mount Desert Island. *Chebacco* XVI: 66-91.

Stancioff, E., and B. Bisson. 2015. Signs of the Seasons: A New England Phenology Program building partnerships to advance climate research and increase climate literacy (poster). Orono, Maine: University of Maine.

Stancioff, E., S. Birkel, C. Schmitt, and I.J. Fernandez. 2015. Maine Climate News. Orono, ME, umaine.edu/maineclimateneews.

Wells National Estuarine Research Reserve. 2015. Sandy Dialogues: Lessons from a Superstorm (video). Wells, ME, youtu.be/zwIkJmifLJ4.

Presentations (151 total, 18,741 attending)

Anderson, P. Marine science in Maine (panel). Maine Science Festival, 27 March 2015, Bangor, ME. (25)

Bamford, L., A. Bass, C. Byron, and G. Waring. A parasite-pinniped-fisheries interaction: codworm (*Pseudoterranova*) in Atlantic cod (*Gadus morhua*) in relation to seal distribution in the Gulf of Maine (poster). 21st Biennial Conference on Marine Mammals, 14-18 December 2015, San Francisco, CA. (100)

Bamford, L., A. Bass, C. Byron, and G. Waring. A parasite-pinniped-fisheries interaction: codworm (*Pseudoterranova*) in Atlantic cod (*Gadus morhua*) in relation to seal distribution in the Gulf of Maine. Northeast Fisheries Observer Program Seminar Day: Seals and Fisheries, 30 October 2015, Falmouth, MA. (20)

Bartlett, C. Birds and marine life of Machias Seal Island and Head Harbor Passage. Downeast Spring Birding Festival, 25 May 2015, Eastport, ME. (20)

Bartlett, C. Monitoring alewife in the Pennamaquan River. Pembroke Elementary School, 8 June 2015, Pembroke, ME. (25)

Bartlett, C. Monitoring river herring in the Pennamaquan River. Downeast Fisheries Partnership, 22 June 2015, Pembroke, ME. (30)

Bartlett, C. Introduction to gull identification. Fundy Chapter of Maine Audubon, 30 January 2016, Eastport, ME. (10)

Bayer, S. The first field evidence of fertilization success in the giant sea scallop. International Pectinid Workshop, 23 April 2015, Galway City, Ireland. (100)

Beal, B.F., C. Coffin, C. Goodenow, S. Randall, K. Pepperman, G. Protopopescu, B. Ellis, and C. Jourdet. A tale of two extremes in the Harraseeket River, Freeport, Maine: interactive effects of location, stocking density and crab trapping on juvenile clam growth and survival. Maine Fishermen's Forum, 5 March 2015, Rockport, ME. (50)

Belknap, D.F., and K.R. Wilson. Effects of invasive green crabs on salt marshes in Maine. Geological Society of America Northeastern Section, 23-25 March 2015, North Conway, NH. (30)

Bisson, B. Marine invasive species research, outreach, and monitoring efforts in Maine. Maine Invasive Species Network Meeting, 25 February 2015. (75)

Bisson, B. Developing an early detection and rapid response plan for the Chinese mitten crab. Maine Harbormasters' Annual Meeting, 19 March 2015, Castine, ME. (50)

- Bisson, B. Signs of the Seasons Phenology Monitoring Program (exhibit). Maine Science Festival, 21 March, Bangor, ME. (2,000)
- Bisson, B. Developing an Early Detection and Rapid Response Plan for the Chinese Mitten Crab. Maine Shellfish Working Group Meeting, 6 May 2015, Patten Free Library, Bath, ME. (35)
- Bisson, B. Opportunities in Environmental Science: Critical Environmental Data, Lifelong Learning, and Community Connections, University of Maine Aging Initiative Workshop. 22 June 2015, Orono, ME. (100)
- Bisson, B., C. Casals, and J. Miller. Monitoring Maine's Marine Invaders. Maine Beaches Conference, Southern Maine Community College, 17 July 2015, South Portland, ME. (300)
- Bisson, B., C. Casals, and J. Miller. Interactive Exhibit on Marine Invasive Species Identification. Maine Beaches Conference, Southern Maine Community College, 17 July 2015, South Portland, ME. (300)
- Bisson, B. Monitoring Loon Phenology on Maine Lakes with the Signs of the Seasons Program, Gilsland Farm Audubon Center, 23 July 2015, Falmouth, ME. (15)
- Bisson, B. Signs of the Seasons Volunteer Training: Challenges, Lessons Learned, and Ideas to Share, USA National Phenology Network Partner Showcase Webinar, 8 September 2015, online. (25)
- Bisson, B., E. Stancioff, and E. Koskela. Signs of the Seasons Phenology Monitoring Program. Acadia Science Symposium, 7 October 2015, Winter Harbor, ME. (150)
- Bisson, B. Signs of the Seasons Phenology Monitoring Program Data Analysis and Lessons Learned. USA National Phenology Network, Partner Network Coordinators, 6 November 2015. (8)
- Bisson, B. Maine Sea Grant Citizen Science Programs and Partnerships. National Sea Grant Educators Network Webinar, 19 January 2016, online. (25)
- Blouin, N., S. Prochnik, A. Grossman, and S. Brawley. The *Porphyra umbilicalis* genome: studies on the path from genome to grocery store. European Phycological Congress VI, 30 August 2015, London, UK. (200)
- Brasili, A. Port Clyde Fisheries Trail. Maine Association for Middle Level Educators Conference, 23 October 2015, Northport, ME. (15)
- Brawley, S.H. The golden age of algal genomes. Rutgers University Department of Ecology & Evolution, 5 February 2016, New Brunswick, NJ. (60)
- Brawley, S.H. *Porphyra umbilicalis*: from genome to grocery store. Joint Genome Institute Seminar Series, March 2015, Walnut Creek, CA. (50)

Brawley, S.H. Developing *Porphyra umbilicalis* for aquaculture. Japanese Phycological Society, 19 March 2015, Fukuoka, Japan. (200)

Brawley, S.H., S. Redmond, C. Quigley, G. York, N. Brown, S. Eddy, and N. Blouin. Developing sea vegetable aquaculture in Maine. Japanese Phycological Society, 21 March 2015, Fukuoka, Japan. (200)

Brochu, S. The contribution of rockweed reproductive subsidies within a nearshore temperate ecosystem. Sixth European Phycological Congress, 23-28 August 2015, London, UK. (400)

Cannon, J.W. Clouds-to-coast modeling results. Maine Fishermen's Forum, 1 March 2015, Rockport, ME. (30)

Cannon, J.W. Coastal hazard resilience. National Weather Service Media Workshop, 13 April 2015, Gray, ME. (20)

Cannon, J.W. "Clouds-to-Coast" project. East Coast Coastal Hazards Workshop, April 2015, Suffolk, VA. (50)

Cannon, J.W. UMaine "Clouds-to-Coast" research. Annual Emergency Preparedness Conference, 10 June 2015, Manchester, NH. (50)

Cannon, J.W. Coastal inundation, wave run-up and sea-level rise in the Gulf of Maine. Regional Association for Research on the Gulf of Maine (RARGOM), 14 October 2015, Portsmouth, NH. (100)

Cannon, J.W. Coastal inundation and wave research. National Weather Service Annual Winter Weather Meeting, 2 December 2015, Taunton, MA. (25)

Cannon, J.W. Hindcasting results from Patriots Day Coastal Flood Event. New Hampshire Coastal Adaptation Workgroup, 10 December 2015, Portsmouth, NH. (20)

Cleaver, C. Lower Muscle Ridge Collaborative Scallop Project. International Pectinid Workshop, 22-28 April 2015, Galway, Ireland. (100)

Flimlin, G., D. Morse, and S. Redmond, Shellfish Aquaculture in Maine. Maine Farm Service Agency, 20 August 2015, Bangor, ME. (35)

Grant, K. Building a Resilient Coast. Coastal Erosion Conference, 9 April 2015, Portland, ME. (75)

Grant, K. Workforce Housing Charrette Report. Berwick Board of Selectmen, 19 January 2016, Berwick, ME. (27)

Grant, K. Your working waterfront economy roundtable session. National Working Waterways and Waterfronts Symposium, 18 November 2015, Tampa, FL. (18)

Grant, K. National Working Waterfront Network's oral history collection: preserving the working waterfront. National Sea Grant Law Center, 12 January 2016, online. (40)

Kaczor, K. Addressing the challenges for Maine Healthy Beaches. Maine Healthy Beaches Technical Advisory Committee Meeting, 27 February 2015, Augusta, ME. (30)

Kaczor, K. The Maine Healthy Beaches Program at a glance. Maine Water and Sustainability Conference, 31 March 2015, Augusta, ME. (30)

Kaczor, K. Maine Healthy Beaches: working together to share resources and solve problems. Coastal Watersheds Working Group, 15 April 2015. Augusta, ME. (10)

Kaczor, K. The Maine Healthy Beaches Program at a glance. Midcoast Stewards Program, 7 May 2015, Damariscotta, ME. (17)

Kaczor, K. What you can do to keep our coastal beaches healthy. Maine State Park Lifeguard Academy, 10 June 2015, Phippsburg, ME. (30)

Kaczor, K. Addressing the challenges for Maine Healthy Beaches. New England Sustainability Consortium (NEST) ME-NH meeting, 9 July 2015, Orono, ME. (25)

Kaczor, K. Addressing the challenges for Maine Healthy Beaches. Maine Beaches Conference, 17 July 2015, South Portland, ME. (35)

Kaczor, K. Excessive seaweed accumulation on Maine's coastal beaches, Maine Marine Species Collaborative Meeting, 22 September 2015, Portland, ME. (12)

Lasley-Rasher, R. It takes guts to locate elusive crustacean prey. Benthic Ecology Meeting, March 8-11th, 2015, Quebec City, Canada (400)

Lasley-Rasher, R. Characterizing features of the estuarine transition zone and challenges to migrating salmon smolts in the Penobscot estuary. Atlantic Salmon & their Ecosystems Forum, 6 January 2016, Orono, ME. (200)

Lindenfeld, L. Seafood Links Project. University of Dundee, February 2015, Dundee, Scotland. (30)

Lindenfeld, L. Seafood Links Project. The Knowledge Network for Enabling Transformation (KNET), February 2015, Dundee, Scotland. (20)

Morse, D. Aquaculture 101 for fishermen. Maine Fishermen's Forum, 5-7 March 2015, Rockport ME. (50)

Morse, D. Update on scallop aquaculture in Maine. Maine Fishermen's Forum, 5-7 March 2015, Rockport, ME. (60)

Morse, D., and C. Schmitt. Display at the Pemaquid Oyster Festival, 27 September 2015, Damariscotta, ME. (3,000)

- Morse, D., C. Schmitt, N. Springuel, and S. Belle. The Maine Oyster Trail. The International Oyster Symposium, 23 October 2015, Falmouth, MA. (150)
- Morse, D., and C. Newell. Tour of the Damariscotta and sea farms. SEANET Aquaculture Boot Camp, 7 November 2015, Walpole, ME. (20)
- Morse, D. An overview of shellfish and seaweed production in Maine. University of Maine SEANET, 17 November 2015, Orono, ME. (20)
- Morse, D. An overview of shellfish and seaweed production in Maine. University of Maine, 19 November 2015, Orono, ME. (22)
- Morse, D. A review of scallop aquaculture in Maine. Maine Sea Grant Policy Advisory Committee, 17 December 2015, Orono, ME. (15)
- Morse, D., and R. Clime. Aquaculture in Shared Waters. St. George Regional Shellfish Committee, 7 December 2015, Thomaston, ME. (15)
- Morse, D., S. Belle, D. Clime, C. Davis, and S. Redmond. Aquaculture in Shared Waters, 9 December 2015, Thomaston, ME. (32)
- Morse, D., M. Brewer, N. Perry, P. Stocks, M. Green, K. Scott, and E. Young. Scallop aquaculture in Maine. Northeast Aquaculture Conference and Expo, 16 December 2015, Portland, ME. (45)
- Morse, D., M. Brewer, N. Perry, P. Stocks, M. Green, K. Scott, and E. Young. Scallop aquaculture in Maine. Maine Aquaculture R+D Forum, 7 January 2016, Belfast, ME. (225)
- Morse, D., C. Bartlett, S. Belle, B. Bisson, D. Clime, C. Davis, S. Redmond, C. Schmitt, and N. Springuel. Aquaculture in Shared Waters. Maine Aquaculture R+D Forum, 7 January 2016, Belfast, ME. (225)
- Muhlin, J., S. Brochu, H. Webber, A. Powers, J. Colangelo, E. Koskela, E. Stancioff, and B. Bisson. Rockweed phenology: Establishing an intertidal monitoring program with citizen scientists and re-evaluating a historical model for gamete release. 6th European Phycological Congress, London, England, 23 August 2015. (200)
- Muhlin, J., S. Brochu, H. Webber, A. Powers, J. Colangelo, E. Koskela, E. Stancioff, and B. Bisson. Rockweed phenology: Establishing an intertidal monitoring program with citizen scientists and re-evaluating a historical model for gamete release. Acadia Science Symposium, 7 October 2015, Winter Harbor, ME (150)
- Redmond, S. Aquaculture for fishermen: sea vegetables. Maine Fishermen's Forum, 7 March 2015, Rockport, ME. (40)
- Redmond, S., H. Krapf, S. Barker, S. Domizi, and G. Seaver. Maine seaweed industry session. Maine Fishermen's Forum, 7 March 2015, Rockport, ME. (30)

Redmond, S., and S. Eddy. US-Korean Aquaculture Exchange Field Trip. Center for Cooperative Aquaculture Research, Franklin, ME. (8)

Redmond, S. Aquaculture for fishermen: sea vegetables. Harpswell/Brunswick Aquaculture in Shared Waters, 12 March 2015, Harpswell, ME. (15)

Redmond, S. Seaweed aquaculture. Sustainable Ecological Aquaculture (SEANET) Aquaculture Boot Camp, 27 April 2015, Walpole, ME. (40)

Redmond, S. Maine seaweeds. LL Bean Employee Day, 18 June 2015, Freeport, ME. (40)

Redmond, S., and H. Krapf. All about Maine seaweeds. Maine Fare, 27 June 2015, Belfast, ME. (30)

Redmond, S. Edible seaweeds of Maine. Hermit Island Campground, 8 July 2015, Phippsburg, ME. (30)

Redmond, S. Maine seaweed industry overview. Acadia National Park, 13 July 2015, Bar Harbor, ME. (30)

Redmond, S., and H. Krapf. Maine seaweeds. Maine Beaches Conference, 17 July 2015, South Portland, ME. (50)

Redmond, S. Seaweed aquaculture facility tour and overview. Sustainable Ecological Aquaculture Research (SEANET) Students, 18 August 2015, Franklin, ME. (25)

Redmond, S. Seaweed aquaculture facility tour and overview. Passamaquoddy Tribal Representatives, 19 August 2015, Franklin, ME. (5)

Redmond, S. Seaweed aquaculture in Maine. Farm Service Agency Training Meeting for Aquaculture, 20 August 2015. (30)

Redmond, S., and H. Krapf. Maine seaweeds. Whole Foods Workshop, 21 August 2015, South Portland, ME. (12)

Redmond, S. Maine seaweed aquaculture year in review: 2014-2015. Seaweed Scene at the Maine Seaweed Festival, 29 August 2015, South Portland, ME. (50)

Redmond, S. Seaweed aquaculture facility tour and overview. Senator Angus King and Staff, 2 September 2015, Franklin, ME. (20)

Redmond, S. Cooking with New England seaweeds. Lets Talk About Food Festival, 3 October 2015, Boston, MA. (60)

Redmond, S. Maine seaweeds. Unity College Marine Botany Class, 7 October 2015, Unity, ME. (18)

Redmond, S. Maine sea vegetable aquaculture. Sustainable Ecological Network (SEANET) Graduate Seminar, 3 November 2015, Orono, ME. (12)

Redmond, S. Seaweed aquaculture. Sustainable Ecological Aquaculture (SEANET) Aquaculture Boot Camp, 7 November 2015, Walpole, ME. (30)

Redmond, S. Kelp aquaculture in Maine. Downeast Lobstermen's Association Meeting, Ellsworth, ME. (10)

Redmond, S. Maine seaweeds. Maine Maritime Marine Botany Class, 20 November 2015, Castine, ME. (10)

Redmond, S. Seaweed aquaculture breakout session. Aquaculture R + D Forum, 7 January 2016, Belfast, ME. (30)

Redmond, S. Sea vegetable aquaculture in Maine. Milford Aquaculture Seminar, 13 January 2016, Shelton, CT. (100)

Runnebaum, J.M., and Y. Chen. Utilizing "fishermen scientists" to evaluate survival from barotrauma for bycatch species of low abundance. ICES Annual Science Conference, 22 September 2015, Copenhagen, Denmark. (1,000)

Schmitt, C. Communication skills for drinking water professionals. Maine Water Utilities Association Annual Meeting, 3 February 2015, Portland, ME. (30)

Schmitt, C. Science writing for students. Maine Sea Grant, 29 April 2015, Orono, ME. (10)

Schmitt, C. Science in Acadia: early history and its role in conservation. Road Scholars, 3 June 2015, Bar Harbor, ME. (30)

Schmitt, C. Orland river fisheries restoration (display). Orland River Day, 27 June 2015, Orland, ME. (100)

Schmitt, C. The Eliot family's Calf Island camp. Mount Desert Island Historical Society Big Summer Adventure, 9 August 2015, Bar Harbor, ME. (175)

Schmitt, C. What to talk about when you can't talk about fish. American Fisheries Society, 20 August 2015, Portland, OR. (50)

Schmitt, C. Science in Acadia: early history and its role in conservation. Road Scholars, 4 September 2015, Bar Harbor, ME. (30)

Schmitt, C. Science in Acadia: early history and its role in conservation. Road Scholars, 11 September 2015, Bar Harbor, ME. (30)

Schmitt, C. The President's Salmon: Restoring the King of Fish and its Home Waters. Road Scholars, 16 September 2015, Lubec, ME. (20)

Schmitt, C. The President's Salmon: Restoring the King of Fish and its Home Waters. Jesup Memorial Library, 17 September 2015, Bar Harbor, ME. (20)

Schmitt, C. Science in Acadia: early history and its role in conservation. Road Scholars, 14 October 2015, Bar Harbor, ME. (30)

Schmitt, C. Rachel Carson in Maine. Northeast Sea Grant Regional Meeting, 27 October 2015, Kennebunkport, ME. (15)

Schmitt, C. Science writing. Sea Grant Extension & Communications Meeting, 3 December 2015, Mystic, CT. (50)

Schmitt, C. Atlantic salmon in the 20th Century: the POTUS perspective. Atlantic Salmon & their Ecosystems Forum, 6 January 2016, Orono, ME. (200)

Shen, H., G.B. Zydlewski, H. Viehman, and G. Staines. Estimating the probability of fish encountering a marine hydrokinetic device. Third Marine Energy Technology Symposium, 27-29 April 2015, Washington, DC. (600)

Sims, M., and K. Kaczor. Goosefare Brook water quality: strategies and sources. Goosefare Brook Public Meeting, 18 June 2015, Old Orchard Beach, ME. (35)

Sims, M., and K. Kaczor. An update on Goosefare Brook water quality. Ocean Park Conservation Commission, 5 August 2015, Old Orchard Beach, ME. (25)

Snyder, J. Remote sensing for oyster aquaculture in Maine. Damariscotta River Association, 8 January 2016, Damariscotta, ME. (50)

Springuel, N., K. Wynn, B. Martens, and J. Wrigley. Fishermen's knowledge and oral histories in Maine. Maine Fishermen's Forum, 6 March 2015, Rockland, ME. (30)

Springuel, N. The Downeast Fisheries and Roosevelt Campobello International Park Signage Project. A Celebration of the Sea, 1 June 2015, Campobello Island, New Brunswick, Canada. (100)

Springuel, N. Experience Maritime Maine and fisheries: what's the connection? Experience Maritime Maine Biannual Stakeholder meeting, 12 November 2015, Stonington, ME. (30)

Springuel, N. Tropical Paradise Revealed: Marine Habitats and Fauna of the Caribbean Sea; Humpback Whales and the Grand Migration to the Caribbean Banks; Multiple Naturalist on Deck programs. A Prairie Home Companion Cruise to the Caribbean Sea, August 2015. (500)

Springuel, N. Maine's Downeast Fisheries Trail: stories, identity, heritage. Great Lakes Fisheries Heritage Conference, 22 September 2015, Marinette, WI. (45)

Springuel, N., S. Todd, and students. This marvelous, terrible place, Newfoundland. College of the Atlantic Human Ecology Forum, 20 October 2015, Bar Harbor, ME. (40)

Springuel, N., and D. Morse. From research to outreach: overcoming barriers for fishing/aquaculture tourism. Northeast Regional Sea Grant Meeting, 26-28 October 2015, Kennebunkport, ME. (80)

Springuel, N. The National Working Waterfront Network, Working for You (panel). National Working Waterfronts and Waterways Symposium, 16-19 November 2015, Tampa, FL. (250)

Springuel, N. Oral histories, radio style. National Working Waterfronts and Waterways Symposium, 16-19 November 2015, Tampa, FL. (30)

Staines, G., G.B. Zydlewski, H. Viehman, H. Shen, and J. McCleave. Changes in vertical fish distributions near a hydrokinetic device in Cobscook Bay, Maine, USA. 11th European Wave and Tidal Energy Conference, 6-11 September 2015, Nantes, France. (600)

Stancioff, E., B. Bisson, and E. Koskela. Signs of the Seasons Phenology Monitoring Program. Citizen Science Association, 11 February 2015, San Jose, CA. (600)

Stancioff, E., and E. Koskela. Signs of the Seasons Phenology Monitoring Program. Expanding Your Horizons Conference, 19 March 2015, Orono, ME. (62)

Stancioff, E., B. Bisson, and E. Koskela. Signs of the Seasons Phenology Monitoring Program. Maine Environmental Education Association Meeting, 20 March 2015, Wiscasset, ME. (25)

Stancioff, E., et al. Design and implementation of strategies for stakeholders and policymakers in the Northeast on ocean and coastal acidification. Maine Sustainability and Water Conference, 31 March 2015, Augusta, ME. (50)

Stancioff, E., B. Bisson, and E. Koskela. Citizen science phenology and ecosystem sustainability. Maine Sustainability and Water Conference, 31 March 2015, Augusta, ME. (50)

Stancioff, E. What we're doing about it. Maine's Economy and Climate Change: Challenges and Opportunities Summit, Brunswick, ME. (150)

Stancioff, E., B. Bisson, and E. Koskela. Signs of the Seasons Phenology Monitoring Program. Sustainability and Water Conference, 31 March 2015, Augusta, ME. (50)

Stancioff, E. Signs of the Seasons and Climate Science. UMaine Cooperative Extension Master Gardener Program, April 2015, Waldoboro, ME. (26)

Stancioff, E. Signs of the Seasons and Climate Science. UMaine Cooperative Extension Master Gardener Program, April 2015, Springvale, ME. (28)

Stancioff, E. Signs of the Seasons Coastal Phenology, Downeast Institute, May 2015, Beals, ME. (24)

Stancioff, E. Climate Change in Maine and the Signs of the Seasons Phenology Monitoring Program. Maine Master Naturalists' Conference, Viles Arboretum, 12 September 2015, Augusta, ME. (25)

Stancioff, E. Sea Grant Sustainable Coastal Communities and Sea Grant Climate Networks building Sea Grant's resilience toolbox: promoting climate change awareness and adaptive

- planning in Atlantic fisheries communities using collaborative systems dynamic modeling. National Adaptation Forum, 11 May 2015, St. Louis MO. (35)
- Stancioff, E. Engaging coastal communities: successes and lessons learned from Sea Grant Climate Extension. National Adaptation Forum, 13 May 2015, St. Louis, MO. (40)
- Stancioff, E. Planning for a changing climate: a participatory approach to fishing community adaptation. National Adaptation Forum, 14 May 2015, St. Louis, MO. (50)
- Viehman, H., and G.B. Zydlewski. Using temporal analysis techniques to optimize hydroacoustic surveys of fish at MHK devices. 11th European Wave and Tidal Energy Conference, 6-11 September 2015, Nantes, France. (600)
- Viehman, H., G.B. Zydlewski, G. Staines, and H. Shen. What about the fish? Studying effects of tidal power turbines in the USA. University of Aberdeen, 17 September 2015, Aberdeen, Scotland. (20)
- Wahle, R.A. An American lobster in a changing ecosystem. Marine Biological Laboratory Science Café, 22 June 2015, Bar Harbor, ME. (100)
- Waller, J.D, R. Wahle, S. Greenwood, and D. Fields. 2015. Linking ocean acidification and warming to the larval development of the American lobster (*Homarus americanus*). The American Lobster In A Changing Ecosystem II: A US-Canada Science Symposium, 5 November 2015, Charlottetown, PEI. (100)
- Webber, H., A. Powers, J. Colangelo, E. Koskela, E. Stancioff, B. Bisson, S. Brochu, and J. Muhlin.
Rockweed phenology: establishing an intertidal monitoring program with citizen scientists and re- evaluating a historical model for gamete release. Sixth European Phycological Congress, 23-28 August 2015, London, UK. (400)
- Webler, T., S. Tuler, J. Whitehead, E. Stancioff, E. Fly, B. Seitzman, and J. Davis. Using participatory modelling to help seafood producers on the United States East Coast identify ways to adapt to a changing climate. National Shellfisheries Association, 22-26 March 2015, Monterey, CA. (80)
- Wilson, K.R., E. Davey, J. Aman, J. Miller, and D.F. Belknap. 2015. European green crabs in Maine: trapping, peat stability measurements, and computer aided tomography of cores reveal marsh impacts. Geological Society of America Northeast Section Meeting, 23-25 March 2015, Breton Woods, NH. (30)
- Wynne, M.P., C. Schmitt, R. Saunders, and G. Aponte-Clarke. Penobscot River Restoration Project monitoring: examining ecosystem response to large-scale restoration. American Fisheries Society, 20 August 2015, Portland, OR. (80)
- Xie, D.-M., Q.-P. Zou, and J.W. Cannon. Tide-surge and wave modeling in the Gulf of Maine during the Patriot's Day storm. 3rd IMA International Conference on Flood Risk, 30-31 March 2015, Swansea, UK. (50)

Xie, D.M., Q.P. Zou, and J.W. Cannon. Coastal flooding at the Gulf of Maine during the Patriot's Day Storm. COPRI Coastal Structures & Solutions to Coastal Disasters Joint Conference, 9-11 September 2015, Boston, MA. (300)

Zou, Q., and D.-M. Xie. *Forecasting wave, flooding, and erosion potential*. Maine Beaches Conference, 17 July 2015, South Portland, ME. (50)

Zou, Q.P. Mitigate storm damage using kelp farms. Maine Seaweed Festival, 29 August 2015, South Portland, ME. (100)

Zou, Q.P., D.M. Xie, and J.W. Cannon. Wave, tide and surge interaction in the Gulf of Maine during the Patriot's Day Storm. 14th International Workshop on Wave Hindcasting and Forecasting and 5th Coastal Hazards Symposium, 8-13 November 2015, Key West, FL. (200)

Zydlewski, G.B. Fish assessment study team update. Ocean Renewable Power Company Cobscook Bay Tidal Energy Project Adaptive Management Team, 19 November 2015, Bangor, ME. (10)

Zydlewski, G.B., G.J. Staines, H.A. Viehman, H. Shen, J.D. McCleave, J. Vieser, and A. Jensen. Fish behavior, presence, and distribution in relation to the Cobscook Bay Tidal Energy Project. Atlantic Salmon & their Ecosystems Forum, 6-7 January 2016, Orono, ME. (200)

Meetings, Conferences, Events, etc. organized, sponsored, or facilitated by Sea Grant (175 total, 24,361 attending)

Southern Maine Volunteer Beach Profile Monitoring Program: 5 (31)

Wells NERR Volunteer Fair, 24 February 2015, Wells, ME. (10)

Volunteer Training, 26 June 2015, Wells, ME. (1)

US EPA Region 1, program equipment consultation, 14 October 2015, Wells, ME. (5)

Ogunquit Conservation Commission, program consultation, 20 May 2015. (8)

Ogunquit Conservation Commission, data consultation, 26 July 2015. (7)

2015 Workforce Housing Charrettes: 22 (369)

10 Planning committee meetings, February-November 2015, Berwick, ME. (90)

6 Charrette-related meetings, April-December 2015, Berwick, ME. (153)

6 Charrette-related meetings, October 2015, Barrington, NH. (126)

Maine Healthy Beaches Program: 78 (424)

33 field & laboratory trainings, May-August 2015, coastwide. (160)

18 Community-specific meetings, February 2015-January 2016, coastwide. (70)

15 technical/research meetings, February 2015- January 2016, statewide. (120)

6 state/regional beach managers meetings, May 2015, coastwide. (44)

6 interagency collaborations, March 2015-January 2016, regionwide. (30)

9 Signs of the Seasons New England Phenology Program trainings, March-September 2015, York, Falmouth, Harpswell, Boothbay, Waldoboro, Bangor, Holden, Skowhegan. (100)

6 NECAN Ocean and Coastal Acidification Workshops, Northeast Region. (233)

5 Rockweed Working Group meetings, February-August 2015, Bangor, ME. (125)

5 Eastport Harbor Committee meetings, March 2015-January 2016, Eastport, ME. (67)

Maine Marine Invasive Species Collaborative Meetings, March/September 2015, Portland, ME. (20)

Maine Fishermen's Forum, 5-7 March 2015, Rockport, ME. (3,000)

Maine Science Festival, 28 March 2015, Bangor, ME. (10,000)

A Participatory Approach to Fishing Community Adaptation, 26 April 2015, South Thomaston, ME. (8)

Maine Shellfish Working Group, 6 May 2015, Bath, ME. (22)

Fish Assessment Study Team of the Maine Tidal Power Initiative public meeting, 22 May 2015, Eastport, ME. (20)

Phenology in Acadia National Park, 30 May 2015, Bar Harbor, ME. (10)

A Celebration of the Sea, 1 June 2015, Campobello Island, New Brunswick, Canada. (100)

3 SEANET Bioregion 3 meetings, July-October 2015, Trescott, ME. (38)

Maine Beaches Conference, 17 July 2015, South Portland, ME. (225)

12 Maine Beaches Conference Steering committee/co-chair meetings, February-July 2015, South Portland, ME. (88)

Lobstering & the Maine Coast Exhibit Opening, 25 July 2015, Bath, ME. (20,500)

Downeast Institute Field Day, 8 August 2015, Beals, ME. (100)

Maine Seaweed Scene, 29 August 2015, South Portland, ME. (50)

Maine Seaweed Festival, 29 August 2015, South Portland, ME. (3,000)

Office of Senator Angus King Marine Research Tour, 2 September 2015, Franklin, ME. (20)

Alliance for Maine's Marine Economy, 9 October 2015, Walpole, ME. (15)

Mini-workshop on overwintering oysters, 15 October 2015, Walpole, ME. (8)

Northeast Sea Grant Regional Meeting, 26-28 October 2015, Kennebunkport, ME. (65)

Waterfront Adaptation Plan Community Meeting, 5 November 2015, Stonington, ME. (15)

National Working Waterfronts & Waterways Symposium, November 2015, Tampa, FL. (210)
4 National Working Waterfront Network Outreach & Education Committee Meetings. (28)
5 Local economic impact assessment meetings. (70)

Maine Marine Resources Exchange, 8 January 2016, Belfast, ME. (50)

APPENDIX C – STUDENT DATA

Sea Grant Student Support: 1 February 2015 – 31 January 2016			
Graduate Students (21); Degrees Received in 2015-2016 Reporting Year (3 – *marked with asterisk)			
New PhD Support			
Name	School	Degree Program	Project/Type of Support
Skylar Bayer	UMaine, SMS	PhD, Marine Biology, Wahle Lab	Scallop Travel Support (Broad Reach, and regular PD)
Catherine Frederick	UMaine, SMS	PhD, Bricknell Lab	Fish health - sea lice NSGO AQ Research NSI (Bricknell), "The infection dynamics of the salmon louse (<i>Lepeoptherius salmonis</i>) on Atlantic salmon (<i>Salmo salar</i>) in Cobscook Bay, Maine, USA.
Katherine Thompson	UMaine, SMS	PhD, Chen Lab	Northern shrimp
Amalia Harrington	UMaine, SMS	PhD, Marine Biology, Wahle Lab	2016-2018 Wahle Lobster project (climate, range shift, etc.)
Charlotte Carrigan Quigley	UMaine, SMS	PhD, Brawley Lab	Brawley/Redmond, Sea Vegetable phenology and culture methods project
Nicole Rahmberg-Pihl	UMaine, SMS	PhD, Climate Change Institute, IGERT Fellow	2016-2018 Grieg Research project (salmon predation/climate)
Dongmei Xie	UMaine, SMS	PhD (with Qingping Zou)	Qingping Zou Wave Runup Project
Continuing PhD Support			
Name	School	Degree Program	Project/Type of Support
Sam Belknap	UMaine Dept of Anthropolgy; Climate Change Institute	PhD	PhD Candidate, Dept of Anthropology and Climate Change Institute (IGERT). Working on Participatory Lobster Project (NOAA COCA); Esperanza Stancioff is on his committee

Jie Cao*	UMaine, SMS	PhD, Chen Lab; Post Doc – received April 2015, Chen Lab	Northern Shrimp/Herring Research project, Chen – Evaluating Performance of Stock Assessment Models for Northern Shrimp and Atlantic Herring, R-14-02; Evaluate lobster monitoring programs in Maine
Jocelyn Runnebaum	UMaine, SMS	PhD, Marine Biology, Chen Lab; MS, Marine Policy, Wilson?	SG Scholar, Cusk and Cod Bycatch/Barotrauma research
Brianne Suldovsky	UMaine, Communication and Journalism	PhD	Seafood Links Project (Lindenfeld, R-12-05)
Haley Viehman	UMaine, SMS	Interdisciplinary PhD, Ocean Engineering	McCleave/Zytlewski Research project – impacts of tidal energy turbines on fish; 2016 PD project for ocean energy conference she's organizing
New MA/MS Support			
Name	School	Degree Program	Project/Type of Support
Elisabeth Maxwell	UMaine, SMS	MS/MP Dual Degree Program	SG Scholar; Clam flat co-management and ocean acidification
Bai Li	UMaine, SMS	MS, Chen Lab	Evaluating the performance of conservation measures in the management of American lobster in the Gulf of Maine

Amy Webb	USM	MS, K. Wilson Lab "Using otolith microchemistry and stable isotope analysis to determine differences between juvenile alewife (<i>Alosa pseudoharengus</i>) in estuary and marine habitats"	Karen Wilson SG Herring Research Project
Greg LaBonte	USM	MS, K. Wilson Lab "Life history strategies, migration patterns and habitat use of alewives in coastal Maine"	Karen Wilson SG Herring Research Project
Mackenzie Mazur	UMaine, SMS	MS/MP Dual Degree program, Chen Lab	Sea Grant Scholar, research on effort and efficiency in lobster industry
Jordan Snyder	UMaine, SMS	Master's Degree program, Brady Lab	Primary Productivity Mapping/Habitat Suitability for AQ in Damariscotta River Estuary, NSGO AQ NSI (Brady)
Jessica Waller	UMaine, SMS	MS, Marine Biology, Wahle Lab	2014-2016 Wahle Lobster project (settlement index)
Continuing MA/MS Support			
Name	School	Degree Program	Project/Type of Support
Noah Oppenheim*	UMaine, SMS	MS/MP Dual Degree Program	SG Scholar; Awarded Knauss Fellowship for 2016
Karen Pianka*	UMaine, SMS	MS/MP Dual Degree Program	Research Assistant, AQ in Shared Waters Project; Awarded Knauss Fellowship for 2016
Jeffrey Vieser	UMaine, SMS	MS/MP Dual Degree Program, "Collaborative Research on Finfish in Cobscook Bay, Maine"	SG Scholar; 2015 Knauss Fellow

Other Professional Degree Student Support			
Name	School	Degree Program	Project/Type of Support
Lianna James	Maine School of Law, USM	JD	Research Associate for John Duff PD Proposal, "Public Shoreline Access in Maine: Evolving Laws and Lessons"; 2015 Knauss Fellow
Andrew Strosahl	Maine School of Law, USM	JD	2015 Knauss Fellow
Undergraduate Students (21); Degrees Received in 2015-2016 Reporting Year (9 – *marked with asterisk)			
New Undergraduate Support			
Name	School	Degree Program	Project/Type of Support
Chase Brunton	UMaine	BA, English	Orono Office Science Communication Assistant
Kyle Capistrant-Fossa	UMaine	BS, Marine Biology	Brawley/Redmond, Sea Vegetable phenology and culture methods project
Marina Cucuzza	COA	BS, Human Ecology (Marine Science Focus)	15-'16 Undergraduate Scholarship Recipient
Patricia Dunford	MMA	BS, Marine Biology	15-'16 Undergraduate Scholarship Recipient
Andrew Goode	UMaine	BS, Marine Science, concentration in Marine Biology with a Minor in Fisheries Science	15-'16 Undergraduate Scholarship Recipient
Kathryn Liberman	UMaine	BS, Marine Science, aquaculture minor	15-'16 Undergraduate Scholarship Recipient
Alyssa Murad	COA	BS, Human Ecology (Marine Science Focus)	15-'16 Undergraduate Scholarship Recipient
Alexandra Pergerson	UMaine	BS, Marine Biology	Brawley/Redmond, Sea Vegetable phenology and culture methods project
Lauren Rice	UMaine	BS, Marine Science, Minor in Geology	15-'16 Undergraduate Scholarship Recipient
Tyler Van Kirk	UMaine	BS, Marine Sciences,	15-'16 Undergraduate Scholarship Recipient
Continuing Undergraduate Support			
Name	School	Degree Program	Project/Type of Support
Tyler Carrier*	UMaine, SMS	BS, Marine Biology	14-'15 Undergraduate Scholarship Recipient; PD recipient

Jordan Desousa*	UNE	BS, Marine Biology	14-'15 Undergraduate Scholarship recipient
Shelby Hartin*	UMaine, Communication and Journalism	BA	Science Communications Assistant (paid internship)
Kristina Kelley*	MMA	BS, Marine Biology	14-'15 Undergraduate Scholarship recipient
Roshni Mangar	COA	BA, Human Ecology	14-'15 Undergraduate Scholarship recipient
Mackenzie Mazur*	UMaine, SMS	BS, Marine Biology, entering MB/MP Dual Degree program, Fall 2015	14-'15 Undergraduate Scholarship recipient; SG Scholar, beginning in fall 2015
Madeline Motley*	COA	BA, Human Ecology	14-'15 Undergraduate Scholarship recipient
Eliza Oldach*	COA	BA, Human Ecology	14-'15 Undergraduate Scholarship recipient
Jillian Perron*	MMA	BS, Marine Biology	14-'15 Undergraduate Scholarship recipient
Benjamin Reed	UMaine, SMS	BS, Marine Science/Aquaculture	14-'15 Undergraduate Scholarship recipient
Zachary Vetack*	UMM	BS, Marine Biology	14-'15 Undergraduate scholarship recipient