

Maine Sea Grant
Annual Report to the Vice President for Research
15 June 2017

Executive Summary

This report contains information regarding Maine Sea Grant's performance during the period February 1, 2016 through January 31, 2017.

Major Accomplishments

Members of the Sea Grant-Cooperative Extension Marine Extension Team continued their commitment to excellence in serving the people of Maine in 2016. Here are some selected highlights from their work:

- Esperanza Stancioff co-founded the Northeast Coastal Acidification Network (NECAN) for the synthesis and dissemination of regional ocean acidification data and information. NECAN is assisting states in the Northeast including Maine's Ocean and Coastal Acidification Partnership and wild harvest and aquaculture shellfish industry members. NECAN has also provided a model for three other regional coastal acidification networks.
- Since Sea Grant helped initiate Aquaculture in Shared Waters in 2013, more than 60 fishermen from communities across the coast have received training in aquaculture products, processes, and business operations. To date, 13 have secured leases and a total of 30 are now involved in aquaculture to some degree.
- Working with the Workforce Housing Coalition of the Greater Seacoast, the Town of Berwick, and community members, Kristen Grant led a planning process that has provided the town with resource people, new ideas, and a vision for redevelopment made possible by a record \$600,000 EPA Brownfields grant.
- More than 40 constituents, including Maine DEP and municipalities, used data from the Healthy Beaches Program, coordinated by Keri Kaczor, to manage beaches, prioritize upgrades to sewer and stormwater infrastructure, establish setback requirements, procure grant and bond funding, and launch public education campaigns. Pollution source identification, analysis, and remediation activities resulted in documented water quality improvements in Camden, Old Orchard Beach, York, and Kittery.
- Sea Grant investment in sea scallop management and research has resulted in 15 scallop farms involved in product development and stock enhancement, including experimentation with "ear-hanging," a new approach to cultivation that results in high yield and faster growth. Trials are underway in the experimental lease site at the Darling Marine Center.

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 2016:

- The American Lobster Settlement Index, hosted by UMaine researcher Rick Wahle, is a key annual indicator of present conditions and possible future landings, used by state and federal agencies and fishermen to understand the lobster population in space and time. With recent data suggesting a continued decline in the number of juvenile lobsters settling to traditional bottom habitat, Wahle is looking for juveniles in deeper water. Sea Grant funds supported graduate student Jesica Waller's research on juvenile survival under temperature increases, published in *ICES Journal of Marine Science*.
- UMaine researcher Hamish Greig's study of salmon, native brook trout, and invasive smallmouth bass in freshwater habitat under changing climate scenarios has created an outreach opportunity for Greig and his students to make connections between healthy stream wildlife and water quality for the public as well as those concerned with fisheries. The Sea Grant project, still in its first year, has helped Greig become an integral participant in statewide networks and projects related to salmon ecosystems and riparian management.
- Alice Kelley has successfully applied a rapid, non-invasive technique to evaluate coastal shell middens, unique resources that hold a record of human occupation and coastal adaptation but are disappearing under rising seas. By request, she is assisting the National Park Service in assessing vulnerable properties.
- Sea Grant facilitated the formation of the Alliance for Maine's Marine Economy, a multi-institutional public-private partnership that is overseeing the expenditure of \$14M in infrastructure investment in the seafood industry.
- UMaine researcher Yong Chen and postdoctoral research associate Jie Cao developed a new model to better capture shrimp's complex life history, the seasonal nature of fishing, and environmental conditions. The model was tested in 2016 and is set to be adopted by the ASMFC in 2017.
- Two program development grants to American Unagi LLC have helped business owner Sara Rademaker advance U.S. based culture of adult American eels and earn \$49,400 from USDA's Value-Added Producer Grant.
- Sea Grant supported the International Network on Offshore Renewable Energy symposium at UMaine and presented a workshop illustrating how connecting people from different backgrounds and fields of expertise can enhance the success of coastal initiatives, raising awareness among the engineering community of how much social and environmental groundwork is needed in advance when introducing a new technology to coastal waters.

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. A National Sea Grant Performance Review Panel found Maine to be meeting or exceeding the standards of a Sea Grant College.

Mission

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

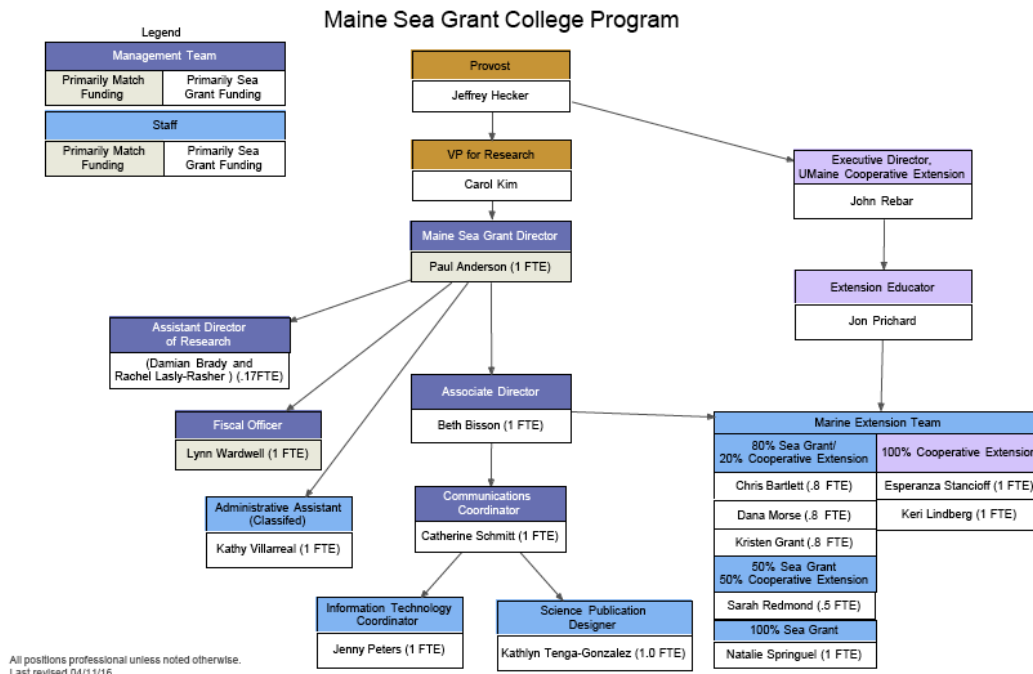
Vision

Our vision, from our current strategic plan, is a Maine where thriving coastal communities and ecosystems are supported by an engaged public and informed decision-makers.

Status of strategic plan

Maine Sea Grant began its 2018-2021 strategic planning process in November 2015 and completed it in October. The final plan, approved in April 2017 by the National Sea Grant Office and in alignment with the national NOAA Sea Grant plan, reflects our intent to advance our efforts 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 near future.

Administration and staffing structure



All positions professional unless noted otherwise.
Last revised 04/11/16.

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 connects scientific researchers, information resources, and coastal stakeholders. The specific communities and partner organizations engaged in Sea Grant programming vary from year to year, but typically number in the hundreds. See Appendix A. In addition, Maine Sea Grant produced 58 print and digital outreach publications, including fact sheets, websites, interpretive panels, radio programs, podcasts, videos, and articles, all intended for non-scientific audiences and based on community information needs.

Economic Development

Economic impact	Businesses created	Businesses retained	Jobs created	Jobs retained
\$33,976,160	5	33	2	31

Sea Grant's total economic impact for 2016 includes

- \$18M in bonds and grants resulting from our leadership in the Alliance for Maine's Marine Economy;
- \$11.2M in bonds and grants to support clean water infrastructure procured with assistance from the Maine Healthy Beaches Program; and
- \$3.7M for the Maine AquaVentus offshore wind project; Sea Grant assisted in research and outreach.

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 2016 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 2016, we were honored to have a Maine applicant selected for the National Sea Grant John D. Knauss Fellowship in Marine Policy, Class of 2017. Emily Chandler, ('16 UMaine, M.S. in Earth and Climate Sciences), began her Knauss Fellowship position with the Office of the Oceanographer of the Navy in February 2017.

Collaborations with UMaine System Campuses

➤ **University of Southern Maine (4)**

Research funding to K. Wilson, "Variation in habitat use by juvenile river herring in the Penobscot River."

Program development funding for Maine Coastal Observing Alliance

Extension involvement in Maine Marine Invasive Species Collaborative

Undergraduate Scholarship in Marine Science

➤ **University of Maine at Machias (9)**

Research funding to B. Beal, "Arctic surf clam: A new candidate species to diversify and advance sustainable domestic aquaculture in Maine and the Northeast U.S."

Program development funding to J. Nettleton for a kelp nursery system

Program development funding for temperature logger network

Beal and Nettleton are members of the NSF EPSCoR SEANET Bioregion 3 Team

Machias Bay Initiative

Research Reinvestment Fund grant to R. Wahle for lobster collector work

Participation in Signs of the Seasons Phenology Program

Undergraduate Scholarship in Marine Science

MET representation on DEI board

Collaborations with other outside institutes/organizations

A list of partners from 2016 is attached in [Appendix A](#).

Financial Sustainability

<i>E&G Support</i>	n/a
<i>MEIF Support</i>	\$777,795 (includes fringe benefits and indirect)
<i>Research Awards</i>	\$25,378 NOAA Penobscot Habitat Blueprint \$46,859 NSF EPSCoR SEANET (Sea Grant portion)
<i>Brief overview of each major new award, w/ links to press coverage</i>	Funding during 2016 was omnibus year three, including Maine Sea Grant administration, communications, extension, and climate change-related projects. Re: Press Coverage – See Appendix B.
<i>Return on Investment</i> External Awards Received / University Funding	<p>\$1,891,683 Total Awards</p> <p>\$1,028,678 NOAA Base/Core/CCD Funding</p> <p>\$153,088 NOAA Merit Funding</p> <p>\$30,000 NOAA Climate Adaptation</p> <p>\$19,786 NOAA Resiliency Funding (Signs of the Seasons)</p> <p>Research and Outreach Leveraged with NOAA SG Funds (Awarded)</p> <p>\$25,378 NOAA Penobscot Habitat Blueprint</p> <p>\$75,023 Broad Reach Fund - Aquaculture Extension Capacity</p> <p>\$56,600 NOAA Knauss Fellowship - Emily Chandler</p> <p>\$200,000 NOAA Larval Lobsters and Ocean Acidification</p> <p>\$18,692 NOAA Oyster Trail of Maine</p> <p>\$277,435 NOAA New Species for Aquaculture in Maine</p> <p>\$7,000: town contributions for Beach Profile Monitoring Program</p> <p><i>Submitted-funded</i></p> <p>\$19,786 Signs of the Seasons: Resilience NSI funding</p> <p>\$25,378 NOAA Penobscot Habitat Blueprint</p> <p>\$75,023 Broad Reach Fund - Aquaculture Extension Capacity</p> <p>\$56,600 NOAA Knauss Fellowship - Emily Chandler</p> <p>\$200,000 NOAA Larval Lobsters and Ocean Acidification</p> <p>\$18,692 NOAA Oyster Trail of Maine</p> <p>\$277,435 NOAA New Species for Aquaculture in Maine</p> <p><i>Submitted-not funded</i></p> <p>Aquaculture Production and Security: Developing a Safe, Reliable Seed Catalog for the Sea Vegetable Farming Industry</p> <p>Technical Assistance to Small and Emerging Fisheries and Aquaculture Business in Maine's Downeast Coastal Counties</p> <p>Community Monitoring of Sandy Beach Profiles from Maine to Micronesia</p> <p>Fiscal Year 2017 National Sea Grant College Program Dean John A. Knauss Marine Policy Fellowships (Johnston, Watson)</p>

Revenue Centers

n/a

Private Giving/Alumni Cultivation

n/a

Initiatives to Increase Fiscal Efficiency

Maine Sea Grant's funding includes federal and non-federal funds, thus financial management processes are governed by both federal and UMaine rules; these are largely the same, with occasional and subtle differences. Fiscal management is coordinated by a full-time Fiscal Officer (Lynn Wardwell) who is highly skilled with the management of complex federal grants, and is considered an expert at UMaine on the NOAA-related portfolio. Maine Sea Grant expects all program delivery staff (Extension/Education) to attract two months of salary support from external sources through partnerships and sponsored research awards. This practice is largely successful across the Marine Extension and Communications Teams, thereby allowing for fiscal solvency.

Culture of Excellence

Faculty and staff achievements

- Sea Grant Association Research to Application Award: P. Anderson, S. Redmond, D. Morse, S. Brawley, and N. Brown
- Workforce Housing Coalition Visionary Award: K. Grant
- National Sea Grant Extension Assembly Superior Outreach Programming Award: S. Redmond
- Acadia Road Scholars, highest-ranked Road Scholar provider in the world in 2016: C. Schmitt
- ICES Working Group on Data-Poor Diadromous Fishes: K. Wilson, co-chair

Research and scholarship summary (see Appendix C for complete listing)

In 2016, Maine Sea Grant staff and researchers created

- 16 peer-reviewed publications, 1 journal special issue, and 1 book chapter;
- 1 book (*Historic Acadia National Park* by Catherine Schmitt);
- 15 technical reports/proceedings;
- 58 print and digital outreach publications, including fact sheets, websites, interpretive panels, radio programs/podcasts, videos, and articles;
- 169 presentations to professional and public audiences, attended by approximately 20,000 people; and
- 207 Sea-Grant sponsored or organized workshops, meetings, and conferences attended by approximately 200,000 people.

Curricular Innovations/Integration with the UMaine Education Mission Program

- Catherine Schmitt taught ENG 212, Persuasive and Analytical Writing, in Spring 2016. Schmitt's book, *The President's Salmon*, was used as a text in SMS Fisheries Management History; *Historic Acadia National Park* was used in EES 489. Schmitt presented seminars on campus about communicating science.
- Damian Brady, assistant professor in the School of Marine Sciences, taught SMS 484, Estuarine Oceanography, in 2016.
- Beth Bisson is a member of the UMaine K-12 Outreach Network.

Student Engagement, Student Success

Undergraduate student research, scholarship or creative activities

Maine Sea Grant supported a total of 37 undergraduate students, 8 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 25 graduate students, 20 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

- Ji Cao, UMaine College of Natural Sciences, Forestry, and Agriculture Graduate Research Award
- Catherine Frederick, Graduate Student Conference Scholarship Award
- Catherine Frederick, Sea Lice International Conference Scholarship Award
- Nicole Ramberg-Phil, Atlantic Salmon Federation Olin Fellowship
- Charlotte Royer, NSF EAPSI Fellowship
- Jessica Waller, 2016 Edith Patch Award
- Dongmei Xie, Chase Distinguished Research Assistantship
- Dongmei Xie, Michael J. Eckardt Dissertation Fellowship Award

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 2016, 15 UMaine students (10 undergraduate and 5 graduate) received degrees.

Highlighted student profile

Nicole Rahmberg-Pihl, is a doctoral student in Ecology and Environmental Science (EES), working with Hamish Grieg, Stephen Coglan, and Joseph Zydlewski on their Sea Grant-supported research project. Ramberg-Phil and her undergraduate research assistants spent the summer of 2016 preparing experimental tanks in the UMaine Aquaculture Research Center to resemble artificial stream environments with different water temperatures and velocities, and then installed a camera system to record how Atlantic salmon respond to different conditions when in the presence of competitors such as smallmouth bass. She and the team are currently integrating these lab experiments with modeling and field validation, and have begun connecting with forest managers, private landowners, and forestry companies to share information and discuss research needs for Maine's forested ecosystems. Ramberg-Pihl's master's research at Plymouth State University looked at the influence of predatory smallmouth bass on the distribution of crayfish in New Hampshire lakes, and her current research has allowed her to broaden her focus on ecology and animal behavior, to include climate-related influences on species interactions.

Preserving-Restoring Infrastructure

Renovation or Construction Projects Initiated/Completed

n/a

Renovation/Construction Projects Planned for Coming Year

n/a

Summary of Anticipated Challenges

The most significant challenge faced in the coming year is the Trump Administration's proposed elimination of the National Sea Grant College Program from the federal budget beginning with Fiscal Year 2018. Advocacy efforts, led by the Sea Grant Association, successfully restored funding for FY2017 (through January 2018) and those efforts continue in hopes that the Congress will restore Sea Grant in the 2018 federal budget.

Maine Sea Grant continues to be over-subscribed. Sea Grant staff are seen as desirable partners with a reputation for getting things done. 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 among our partners. This pressure on fiscal resources results in a more focused approach to programming and to be as strategic as possible in selecting partnerships and programs to support. Part of the solution to this challenge is to look to

grantsmanship and external funding sources and to maximize the leveraging our own resources and time to secure those funds. In 2016, the program was successful in leveraging new resources in several areas, such as applied research and professional training in aquaculture in general, and seaweed aquaculture more specifically. 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. Uncertainty in the federal budget and the unwillingness of government leadership to confront the challenges of climate change exacerbate this problem.

Finally, the program will also undergo a change in leadership with the departure of Director Paul Anderson in August 2017. A search for a new Director is in progress and an interim strategy is in place. The new Director inherits a strong Sea Grant program and an excellent Marine Extension Team. University leadership should re-emphasize the importance of the Sea Grant program, recognize the workload associated with managing the program well, and allow for the new director to prioritize time on Sea Grant rather than being spread across other units of the University of Maine. The organizational structure of the Management Team may also shift depending on the new Director's skill set, particularly with respect to managing the research element.

Summary of New Initiatives

The program will be involved in a National Network Visioning effort with other Sea Grant programs, coordinated and funded by the National Sea Grant Office. This effort follows on a successful planning exercise that Maine contributed to in forming a national vision and implementation plan for marine aquaculture in 2016-17. For this new initiative, Maine Sea Grant will participate in 3-4 "communities of practice" that will emerge around high priority themes for the nation. Likely issues for Maine's involvement will include Innovations in Fisheries, Climate Change, Ocean Acidification, Traditional Ecological Knowledge and others. Outcomes from this effort will help to inform future investments at the national level and will be based upon user needs as identified by the state Sea Grant programs.

The Alliance for Maine's Marine Economy, a group of approximately 20 private and public institutions from academia, research and industry, 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. Primary investments are in place and a capitol improvement grant program is being conducted in 2017 to allocate nearly \$2M in infrastructure investment in the marine economy. Organizational development is underway utilizing a grant from the University's RRF program to contract with a consultant. Governance, structure and an implementation framework will be completed in 2017. Maine Sea Grant's role is uncertain, but the new hire will likely benefit from joining the Marine Extension Team.

APPENDIX A: MAINE SEA GRANT PARTNERS, 2016-2017

Acadia National Park
American Unagi, LLC
Atlantic States Marine Fisheries Commission
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
Dalhousie University
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 Historic Preservation Commission
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
Project SHARE
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 Forestry Research Unit
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: MEDIA COVERAGE

UMaine Extension, Sea Grant to offer aquaculture training course. 26 January 2017, *Mount Desert Islander*.

Weaver, A. The 7 weirdest beers from the sea. 26 January 2017, *Hop Culture*.

Goad, M. Here's how to buy and store Maine oysters for your New Year's party. *Portland Press Herald*, 25 December 2016.

Practice facilitation skills at UMaine Extension, Maine Sea Grant workshop. *Sun Journal*, 21 December 2016.*

Wrigley, J. National Working Waterfront Network Conference -Tampa FL. NOAA Voices From the Fisheries Newsletter.

Acadia National Park 2116 Time Capsule. December 2016, WERU Community Radio electronic newsletter.

Rudalevige, C. Plenty of sustainable fish in the sea for Christmas Eve feast. *Maine Sunday Telegram*, p. S6, 18 December 2016.

Kahl, E. A Century in Acadia. *UMaine Today* 16(2):38-49, Fall/Winter 2016.

Schmitt, C. Exploring Eden. *UMaine Today* 16(2):40-41, Fall/Winter 2016.

n.a. In hot water. *UMaine Today* 16(2):6, Fall/Winter 2016.

n.a. Sea fellows. *UMaine Today* 16(2):4-5, Fall/Winter 2016.

Clark, A. Farming the sea. *UMaine Today* 16(2):10-19. Fall/Winter 2016.

Citizen guide to shorelines. *UMaine Today* 16(2):59, Fall/Winter 2016.

Valuing Maine seafood. *UMaine Today* 16(2):64, Fall/Winter 2016.

9 Maine agricultural producers win grants. *Bangor Daily News*, p. C1-C2, 14 November 2016.

Frenchman Bay Conservancy. If you missed the WERU radio spot. 11 November 2016, Frenchman Bay Conservancy electronic newsletter.

Rapport, S. The shortest route between Maine and Japan: scallops. *Ellsworth American*, p. B13, 10 November 2016.

Waterman, M. Lobster larvae give hints about the future. *Landings* 24(11), November 2016.

Schmitt, C. Penobscot River restoration. *Maine Boats, Homes & Harbors* 143:62-66, November/December 2016.

Whose beach is it? 19 October 2016, Maine Outdoor Heritage Fund newsletter.

Children's Water Festival. 12 October 2016, *Bangor Daily News*.

Rudalevige, C. Reel 'em in with redfish. 9 October 2016, *Maine Sunday Telegram*, p. S2.

Valigra, L. Maine fisheries experts head to Japan to learn scallop practices, buy machinery. 3 October 2016, *Mainebiz*.

Maine residents vs. Acadian Canada. October 2016, *Fishermen's Voice*, V. 21 No. 20, pp. 6-7.

Rising ocean temperatures threaten baby lobsters. October 2016, *Fishermen's Voice*, V. 21 No. 20, pp. 13, 22.

Whittle, P. Baby lobsters struggle as ocean water warms. 25 September 2016, *Maine Sunday Telegram*, p. B8.

Springuel to talk about Gulf. 6 September 2016, *Mount Desert Islander*.

Fishing communities need to prepare for gentrification challenges, say UMaine researchers. 23 August 2016, University of Maine.

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APPENDIX C: SEA GRANT COMMUNICATIONS & OUTREACH 2016

Peer-reviewed journal articles (16 + 1 special issue)

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Phippen, S. 2016. MDI Pet Waste Brochure. Bar Harbor, ME: Community Environmental Health Laboratory at the MDI Biological Laboratory.

Redmond, S., S. Belknap, and R.C. Uchenna. 2016. Aquaculture in Shared Waters Fact Sheet: Kelp Aquaculture. Rockland, ME: Island Institute.

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Schmitt, C., and S. Hartin. 2016. Marine Sciences at the University of Maine. *Maine History* 50(2):61-75.

Schmitt, C. Penobscot River Restoration. *Maine Boats, Homes & Harbors* 143 (Nov/Dec 2016):62-66.

Schmitt, C. Exploring Eden. *UMaine Today* 16(2):40-41, Fall/Winter 2016.

Springuel, N., P. Anderson, and C. Schmitt. Coastal Conversations public affairs radio programs (5,000 estimated):

January 27, 2017: Health insurance for lobstermen

December 23, 2016: Waterfront communities prepare for climate change impacts

October 28, 2016: Land Conservation in Downeast Maine

September 23, 2016: Young Mariners Lead the Fishing Industry

August 26, 2016: Young Mariners Go to College/Graduate School

July 22, 2016: Young Mariners Go to Camp

May 27, 2016: World Fish Migration Day and Local Stream Restoration

June 24, 2016: Leave No Trace in Acadia National Park, Stewardship for the Next 100 Years

April 8, 2016 (special show date): Gulls and Seabirds in the Gulf of Maine: How are They Doing?

March 31, 2016: Penobscot Watershed

February 26, 2016: Experience Maritime Maine

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Wahle, R. American Lobster Settlement Index public portal. Orono, ME: University of Maine School of Marine Sciences. <https://umaine.edu/wahlelab/american-lobster-settlement-index-alsi/american-lobster-settlement-index/>

Workforce Housing Coalition. 2017. Workforce Housing Design Charrette in Kennebunkport, Maine. Dover, NH: Workforce Housing Coalition.

Zipf, L. Salt marsh transplants in Acadia. Boston, MA: Boston University. <http://primacklab.blogspot.com/2016/06/salt-marsh-transplants-in-acadia.html>

Presentations (169; 19,609 attendees)

Anderson, P.S. Sea Grant and marine aquaculture in Maine. Friends of Belfast Bay, 18 February 2016, Belfast, ME. (20)

Anderson, P.S., et al. What's new on ocean acidification in Maine and beyond? Maine Fishermen's Forum, 4 March 2016, Rockport, ME. (80)

Anderson, P.S. Marine aquaculture in Maine. Northeast Agriculture and Biological Engineering Conference, 2 August 2016, Orono, ME. (150)

Anderson, P.S. Sea Grant and a Weather Ready Nation. North Atlantic Regional Team, 26 September 2016, Wells, ME. (30)

Anderson, P.S. Getting to the creative no and the articulate yes. Sea Grant Week, 12 October 2016, Newport, RI. (30)

Anderson, P.S. An overview of Maine Sea Grant (keynote). INORE Symposium, 30 October 2016, Orono, ME. (60)

Anderson, P.S. Public health issues in aquaculture (moderator). Northeast Aquaculture Conference and Exposition, 11-14 January 2017, Providence, RI. (300)

Bartlett, C. Creating successful partnerships and collaborations for research and outreach. University of Maine Student Outreach Workshops, 29 April 2016, Orono, ME. (8)

Bartlett, C. River herring biology, ecology, and management. Beals Elementary School, 10 May 2016, Beals, ME. (44)

Bartlett, C. River herring biology, ecology, and management. Jonesport Elementary School, 19 May 2016, Jonesport, ME. (51)

Bartlett, C. River herring biology, ecology, and management. Edmunds Consolidated School, 23 May 2016, Edmunds, ME. (27)

Bartlett, C. River herring biology, ecology, and management. Pembroke Elementary School, 24 May 2016, Pembroke, ME. (16)

Bartlett, C. River herring biology, ecology, and management. Youth Conservation Corp, Moosehorn National Wildlife Refuge, 8 August 2016, Baring, ME. (30)

Bartlett, C. Comparing tidal power company engagement efforts in Cobscook Bay. North American Symposium- International Network on Offshore Renewable Energy, 31 October 2016, Orono, ME. (60)

Boenish, R. 2016. Estimating Atlantic cod by-caught and discarded in the Gulf of Maine lobster fishery. American Fisheries Society, 21-25 August 2016, Kansas City, KS. (25 est.)

Brawley, S.H. 2017. Seaweed Farmers Forum. Northeast Aquaculture Conference and Exposition, January 2017, Providence, RI. (200)

Brawley, S.H. 2016. Sea vegetable aquaculture. Maine Science Festival, March 2016, Bangor, ME. (25)

Cannon, J. Marine hazards and the clouds-to-coast model. York County Emergency Managers Meeting, 11 May 2016, York, ME. (20)

Cannon, J. Wave run-up activities in Maine. Weather Ready Nation, 27 September 2016, Wells, ME. (32)

Cannon, J. "Clouds-to-Coast" project. Ocean Literacy Summit, 4 November 2016, Portland, ME. (200)

Cannon, J. Coastal hazard resiliency efforts in Maine. Dedication of the new tide gage located in Saco, Maine, 15 November 2016, Saco, ME. (20)

Cannon, J. On December 7, 2016, John Cannon presented wave runup and coastal flood projects. NERACOOS annual meeting, 7 December 2016, Portsmouth, NH. (50)

Cleaver, C. The effect of small-scale closed areas on *Placopecten magellanicus* populations in Maine. Benthic Ecology Meeting, 17 March 2016, Portland, ME. (25 est.)

Daigle, C., E. Stancioff, S. Gallo, and M. Shannon. Exploring climate change education and citizen science for Maine's lakes, ponds and streams. Maine Environmental Education Association Conference, 23 March 2016, Waterville, ME. (50 est.)

Frederick, C. Scratching the surface: An exploration of sea louse infectious pressure in Cobscook Bay using sentinel cages and hydrodynamic models. Sea Lice International Conference, 26 September 2016, Westport, Ireland. (150)

Frederick, C. A sentinel exploration of sea louse infestations in Cobscook bay, Maine. Northeast Aquaculture Conference & Exposition, 11 January 2017, Providence, RI. (100)

Goldstein, J.S. A fishery in flux: claw removal and its impacts on survivorship, behavior, and physiological stress in the Jonah crab (*Cancer borealis*). Society for Integrative and Comparative Biology, 4-8 January 2017, New Orleans, LA. (1,500)

Goldstein, J.S. 2016. Fisheries and conservation in an emerging Jonah crab fishery. Wells NERR Lunch and Learn Lecture Series, 19 September 2016, Wells, ME. (25)

Goldstein, J.S., J. Carloni, and R. Kibler. 2016. A fishery in flux: claw removal and its impacts on survivorship and physiological stress in the Jonah crab (*Cancer borealis*). RARGOM, 13 October 2016, Portsmouth, NH. (100)

Grant, K. Southern Maine Volunteer Beach Profile Monitoring Program. Ogunquit Women's Club, 3 February 2016, Ogunquit, ME. (25)

Grant, K. Beach profile monitoring. Wells Reserve Home School Education Program, 8 February 2016, Wells, ME. (6)

Grant, K. Engaging stakeholders in flood defense in the Netherlands and New England, USA. Deltares, 29 June 2016, Delft, Netherlands. (15)

Grant, K. Engaging stakeholders in flood defense in the Netherlands and New England, USA. Deltares, 1 July 2016, Utrecht, Netherlands. (13)

Grant, K. Engaging the Sea Grant Network to build a Weather Ready Nation. NOAA North Atlantic Regional Team, 26 September 2016, Wells, ME. (33)

Greig, H.S. 2017. Integrating food-web processes into salmon restoration: examples from the top and the bottom of freshwater food webs. Atlantic Salmon Recovery Framework, 31 January 2017, Machias, ME. (50)

Greig, H.S. 2016. Improving assessment of critical habitat for Atlantic salmon in a rapidly-changing climate. Maine Sea Grant Research Symposium, 14 April 2016, Orono, ME. (60)

Greig, H.S. Common aquatic insects of Maine. Cabin Fever Reliever, February 2016, Brewer, ME. (20)

Greig, H.S. Maine's rivers in a changing climate. Climate Change Impacts on Wabanaki Tribal Planning Symposium, June 2016, Presque Isle, ME. (20)

Greig, H.S. Maine's streams and rivers: the interplay between water, rocks and biology. Kennebec Land

Trust Annual Lyceum, 17 March 2016, Wayne, ME. (80)

Hagan, J.M., M.D. McMahan, and J. Taggart. From soft-shell clams to soft-shell crabs: two practical solutions for adapting to a warming Gulf of Maine. Bowdoin College Arts and Culture Series, 14 February 2017, Brunswick, ME. (50)

Kaczor, K. Turbulence and triumph: tackling the complex challenges related to healthy coastal beaches. Maine Legislative Coastal Caucus, 18 February 2016, Augusta, ME. (25)

Kaczor, K. Digging in: understanding the causes, impacts, and how best to address excessive seaweed accumulation on Maine's coastal beaches. New England Association of Environmental Biologists Conference, 25 March 2016, Rockport, ME. (25)

Kaczor, K., and J. Walker. Informing beach advisories: using data visualization techniques to explore and better understand the Maine Healthy Beaches dataset. Maine Water and Sustainability Conference, 29 March 2016, Augusta, ME. (30)

Kaczor, K. Tackling the sources of fecal contamination impairing coastal water quality in the bay. Penobscot Bay Watershed Conference, 9 April 2016, Northport, ME. (40)

Kaczor, K. The Maine Healthy Beaches Program at a glance. TORCH Conference, 10 April 2015, Damariscotta, ME. (100)

Kaczor, K. Digging in: understanding the causes, impacts, and how best to address excessive seaweed accumulation on Maine's coastal beaches. U.S. EPA Recreational Waters Conference, 13 April 2016, New Orleans, LA. (200)

Kaczor, K. The Maine Healthy Beaches Program at a glance. Maine State Park Lifeguard Academy, 8 June 2016, Phippsburg, ME. (14)

Kaczor, K. The Maine Healthy Beaches Program at a glance, Biddeford Parks and Recreation Annual Meeting, 16 June 2016, Biddeford, ME. (50)

Kaczor, K. Bacterial pollution in Camden Harbor...and what can be done about it. Camden Conservation Commission, 29 June 2016, Camden, ME. (11)

LaBonte, G., K. Wilson, and A. Webb. The use of natural markers to investigate habitat use and growth of juvenile alewife (*Alosa pseudoharengus*). Atlantic Salmon and Their Ecosystems Forum, January 2016, Orono, ME. (200)

Labonte, G., and K. Wilson. Use of natural markers to investigate habitat use and growth of juvenile alewife. New England Estuarine Research Society, 16 April 2016, York Harbor, ME. (25 est.)

Lasley-Rasher, R. Characterizing the Penobscot River estuarine transition zone during Atlantic salmon smolt migration. Atlantic Salmon & their Ecosystems Forum, 6 January 2016, Orono, ME. (180)

Lasley-Rasher, R. Life in transition: Characterizing small guys with big impacts in the estuarine transition zone (ETZ). Penobscot Watershed Conference, 9 April 2016, Northport, ME. (75)

Lasley-Rasher, R. It takes guts to locate elusive crustacean prey, ASLO Ocean Sciences Meeting, 24 February 2016, New Orleans, LA. (50)

Lasley-Rasher, R. Using fish guts to sample elusive crustacean prey over long temporal scales. Benthic Ecology Meeting, 17 March 2016, Portland, ME. (40)

Lasley-Rasher, R. Using fish guts to sample elusive crustacean prey over long temporal scales. Graduate Exchange, 2 April 2016, Walpole, ME. (30)

Maxwell, E. Soft-shell clam management in Maine. SMS230: Introduction to marine policy and fisheries management, 11 October 2016, Orono, ME. (90)

Maxwell, E. History and ecology of the Neches River. Lamar University Honors College, 21 October 2016, Beaumont, TX. (10)

Maxwell, E. Soft-shell clam management in Maine: the role and implication of pollution. SMS491: Marine Pollution Policy, 15 November 2016, Orono, ME. (25)

Mazur, M., Chen, Y. and T. Johnson. An assessment of efficiency and social resilience in the Maine lobster fishery. Poster presented. Maine Sea Grant Research Symposium, 14 April 2016, Orono, ME (75)

Mazur, M., Chen, Y. and T. Johnson. An assessment of efficiency and social resilience in the Maine lobster fishery. Poster presented. University of Maine Graduate Student Government Symposium, April 2016, Bangor, ME. (500)

Mazur, M. and T. Johnson. Assessing social resilience in the Maine lobster fishery. Poster presented. American Fisheries Society Annual Meeting, 22 August 2016, Kansas City, MO. (400 est.)

Mazur, M., Li, B., Chang, J.H. and Y. Chen. Evaluating efficiency in the Maine lobster fishery: An individual-based model approach. American Fisheries Society Annual Meeting, 23 August 2016, Kansas City, Missouri. (1,200)

Mazur, M. and Y. Chen. 2016. Evaluating fishing effort levels in the Maine lobster fishery: an individual-based model approach. Poster presented at RARGOM Annual Science Meeting. Regional Association for Research on the Gulf of Maine (RARGOM) Annual Science Meeting, October 2016, Portsmouth, NH. (75)

Mignone, A. Parameterizations to forecast overtopping discharge volume for the seawalls in Scituate and Hull Massachusetts. Environment Canada, 21 March 2016, Halifax, Nova Scotia. (10 est.)

Mignone, A. Parameterizations for overtopping discharge volume for the Seawall located at the Wave Energy Research Center (WERC) in Lord's Cove, Newfoundland. NOAA-Environment Canada Bi-Lateral Marine Focus Area Workshop, 3-5 May 2016, Ann Arbor, MI. (15 est.)

Mignone, A. Incorporation the parameterizations to predict overtopping discharge volume into the National Weather Services Nearshore Wave Prediction System. NOAA Center for Weather and Climate Prediction, 11-14 July 2016. (15 est.)

Mignone, A. Overtopping discharge volume using data obtain during storm events at the Seawall in Scituate, Massachusetts. VLab, 20 July 2016 (webinar). (15 est.)

Mignone, A. Parameterizations used to predict the overtopping of seawalls incorporating output from the National Weather Service's Nearshore Wave Prediction System, 26-27 September 2016, Wells, ME. (32)

Morse, D. Scallop aquaculture update. Maine Fishermen's Forum, 5 March 2016, Rockport, ME. (50 est.)

Morse, D. Opportunities for fishermen in aquaculture. Isle au Haut Fishermen, 4 April 2016, Isle au Haut, ME. (15)

Morse, D. Aquaculture in Maine. Penobscot Watershed Conference, 9 April 2016, Northport, ME. (40)

Morse, D. Shellfish aquaculture in Maine. Penobscot Bay Stewards, 10 May 2016, Belfast, ME. (30)

Morse, D. Scallop aquaculture in Maine. Maine Sea Grant Policy Advisory Committee, 17 June 2016, Orono, ME. (20)

Morse, D., and C. Davis. Shellfish production workshop. Techniques in Shellfish Aquaculture, 23 June 2016, Walpole. (12)

Morse, D., C. Davis, and S. Belle. Damariscotta River tour. U.S. Senator Angus King site visit, 5 August 2016, Walpole, ME. (10)

Morse, D. Aquaculture. Harpswell Heritage Land Trust, 11 August 2016, Harpswell, ME. (20)

Morse D., and H. Cowperthwaite. Scallop spat collection. Tenant's Harbor Fishermen's Cooperative, 12 August 2016, Tenant's Harbor, ME. (15)

Morse, D., and C. Schmitt. Shellfish farming. Pemaquid Oyster Festival, 25 September 2016, Damariscotta, ME. (2,000)

Morse, D. Shellfish aquaculture. Eastern Maine Skippers Program, 7 November 2016, Walpole, ME. (80)

Morse, D. Aquaculture production in Maine. University of Wisconsin, 17 November 2016, Milwaukee, WI. (25)

Morse, D. Shellfish production. Introduction to Aquaculture UMaine class, 22 November 2016, Orono, ME. (20)

Morse, D. Introduction to aquaculture. Vine Street School, 29 November 2016, Bangor, ME. (50)

Morse, D. Shellfish aquaculture. Eastern Maine Skippers Program, 1 December 2016, Blue Hill, ME. (7)

Morse, D. Scallop aquaculture. Northeast Aquaculture Conference and Exposition, 11-13 January 2017, Providence, RI. (35)

Morse, D. Aquaculture in Shared Waters. Northeast Aquaculture Conference and Exposition, 11-13 January 2017, Providence, RI. (30)

Quigley, C., Redmond, S. & S. H. Brawley. 2017. Temperature tolerance of a candidate sea vegetable crop *Alaria esculenta*. NACE 2017. Providence, RI (200 people?)

Ramberg-Pihl, N. Unraveling the impacts of competition in a rapidly changing climate on juvenile Atlantic salmon (*Salmo salar*) performance. IGERT Retreat, 9 September 2016, University of Maine, Orono, ME. (35)

Ramberg-Pihl, N. Unraveling the impacts of competition in a rapidly changing climate on juvenile Atlantic salmon (*Salmo salar*) performance. School of Biology & Ecology Seminar Lightning Talks, 4 November 2016, Orono, ME. (50)

Ramberg-Pihl, N., H.S. Greig, S. Coghlan, and J. Zydlewski. Unraveling the impacts of temperature, flow, prey availability, and competition on juvenile Atlantic salmon (*Salmo salar*) performance in a rapidly changing climate (poster). Climate Change Institute Borns Symposium, 14 April 2016, Orono, ME. (100)

Reardon, E. Mount Desert Island's freshwater fisheries: a historical view. Human Ecology Forum, 1 June 2016, Bar Harbor, ME. (30)

Rodrigue, M. Developing a sentinel longline survey for groundfish in the eastern Gulf of Maine. The International Council for the Exploration of the Seas Annual Science Council, 20 November 2016, Riga, Latvia. (100)

Schmitt, C. Science communication. Sea Grant Student Workshop, 26 February 2016, Orono, ME. (10)

Schmitt, C. Studying salmon: Maine's tradition of fisheries science. Maine Science Festival, 19 March 2016, Bangor, ME. (25)

Schmitt, C. Science in Acadia National Park. Maine Science Festival, 19 March 2016, Bangor, ME. (25)

Schmitt, C. The presidential salmon: fit for a king. Maine Atlantic Salmon Museum Annual Meeting, 25 March 2016, Eddington, ME. (20)

Schmitt, C. The presidential salmon: fit for a king. Trout Unlimited Sebago Chapter, 2 April 2016, Scarborough, ME. (80)

Schmitt, C. Scientific communication vs. science communication. American Fisheries Society Student Chapter, 5 April 2016, Orono, ME. (10)

Schmitt, C. Atlantic salmon of the Penobscot. Penobscot Watershed Conference, 9 April 2016, Northport, ME. (30)

Schmitt, C. Atlantic salmon. College of the Atlantic, 22 April 2016, Bar Harbor, ME. (20)

Schmitt, C. Talking about Acadia's changing climate with visitors, Acadia National Park Staff Training, 27 April 2016, Bar Harbor, ME. (40)

Schmitt, C. Reading of creative work, Poets Speak, 27 April 2016, Bangor, ME. (50)

Schmitt, C. The Atlantic salmon: fit for a president. Penobscot Bay Stewards, 17 May 2016, Stonington, ME. (30)

Schmitt, C. History of Kenduskeag Stream, World Fish Migration Day, 20 May 2016, Bangor, ME. (10)

Schmitt, C. Examples of framing science from Maine Sea Grant, a publicly funded boundary organization, UMaine Climate Change Course, 20 May 2016, Orono, ME. (20)

Schmitt, C. Talking about Acadia's changing climate with visitors, Acadia National Park Staff Training, 26 May 2016, Bar Harbor, ME. (35)

Schmitt, C. The Atlantic salmon: fit for a president. Downeast Lakes Land Trust, 14 June 2016, Grand Lake Stream, ME. (20)

Schmitt, C. Artists & scientists working together in Acadia, Mount Desert Island Biological Laboratory, 20 June 2016, Bar Harbor, ME. (55)

Schmitt, C. The Atlantic salmon: fit for a president, Southwest Harbor Public Library, 12 July 2016, Southwest Harbor, ME. (10)

Schmitt, C. The Atlantic salmon: fit for a president. Pembroke Public Library, 15 August 2016, Pembroke, ME. (12)

Schmitt, C. The Champlain Society: Science and the origins of conservation in Acadia. Centennial Lecture Series, Mount Desert Island Historical Society, 18 August 2016, Northeast Harbor, ME. (60)

Schmitt, C. The Champlain Society on Mount Desert Island. Big Summer Adventure Cruise, 21 August 2016, Bar Harbor, ME. (100)

Schmitt, C. Atlantic salmon of the Penobscot. Maine Maritime Academy Ocean Studies, 12 September 2016, Castine, ME. (56)

Schmitt, C. Historic Acadia National Park. College of the Atlantic Core Curriculum Lecture, 14 September 2016, Bar Harbor, ME. (110)

Schmitt, C. The Atlantic salmon: fit for a president. Stockton Springs Library, 21 September 2016, Stockton Springs, ME. (10)

Schmitt, C. Communicating science to public audiences. Sea Grant Week, 13 October 2016, Newport, RI. (7)

Schmitt, C. Science in Acadia National Park: Early history and its role in conservation. Road Scholars, 20 October 2016, Bar Harbor, ME. (20)

Schmitt, C. Communicating science to public audiences. Department of Communication and Journalism Colloquium, 31 October 2016, Orono, ME. (12)

Schmitt, C. Communicating science to public audiences. Department of Wildlife, Fisheries and Conservation Biology, 14 November 2016, Orono, ME. (18)

Schmitt, C. Communicating science to public audiences. NOAA Fisheries, 15 November 2016, Orono, ME. (20)

Sims, M., and K. Kaczor. Best practices for disposing of pet waste and improving water quality, April Stool's Day, 23 April 2016, South Portland, ME. (50)

Sims, M., and K. Kaczor. How stormwater impacts beach water quality. Willard Fest, 9 July 2016, South Portland, ME. (50)

Sims, M., and K. Kaczor. The status of pollution source tracking efforts in the Goosefare Brook. Ocean Park Conservation Society Meeting, 15 July 2016, Old Orchard Beach, ME. (20)

Sims, M., and K. Kaczor. Microbial source tracking in the Goosefare Brook, Maine. ME DEP Watershed Roundtable, 9 November 2016, Augusta, ME. (25)

Snyder et al. Oyster aquaculture site selection using Landsat 8-derived sea surface temperature, turbidity, and chlorophyll-a.' Ocean Optics, October 2016, Victoria, Canada. (40)

Springuel, N., et al. 11 Coastal Conversations public affairs radio programs, WERU-FM, East Orland, ME. (5,000 est.)

Springuel, N. Tourism opportunities for fishermen and aquaculturists. Maine Fishermen's Forum, 3 March 2016, Rockport, ME. (35)

Springuel, N. Introduction to the Downeast Maine region: history and fisheries. College of the Atlantic, 29 March 2016. Bar Harbor, ME. (15)

Springuel, N. Tourism opportunities for aquaculture, Aquaculture in Shared Waters, 7 April 2016, Thomaston, ME. (30)

Springuel, N. The Downeast Fisheries Trail: culture-based recreation in the watershed, part I. Penobscot Watershed Conference, 9 April 2016, Northport, ME. (30)

Springuel, N. MDI's working waterfront. Mount Desert Island Historical Society, 21 April 2016, Somesville, ME. (35)

Springuel, N. Introduction to navigation at sea. College of the Atlantic Family Nature Camp, 29 July 2016, Bar Harbor, ME. (18)

Springuel, N. Alaska's marine mammals; Alaska's seafaring explorers and naturalists: from Bering to Muir, Steller to Dall; The Gulf of Alaska: life beneath our wake; and The bountiful catch: Alaska's commercial fisheries, from hook to fork. A Prairie Home Companion Cruise to Alaska and British Columbia, August 2016, Alaska and British Columbia. (500)

Springuel, N. The changing Gulf of Maine. Southwest Harbor Library, 13 September 2016, Southwest Harbor, ME. (40)

Springuel, N. Responding to coastal community needs in Downeast Maine. Hancock County Cooperative Extension Annual Meeting, 15 September 2016, Ellsworth, ME. (30)

Springuel, N. Large landscape conservation in the Downeast Region: views of the future, where do we go from here? (moderator). Down East Research and Education Network's Convergence, 4 October 2016, Winter Harbor, ME. (65)

Springuel, N. Experience Maritime Maine. Down East and Acadia Regional Tourism Symposium, 10 November 2016, Winter Harbor, ME. (50)

Stancioff, E., and S. Tuler. Promoting climate awareness and adaptive planning in three Atlantic fisheries communities using the VCAPS process and system dynamics model. NOAA Increasing Resilience of Fishing Communities in a Changing Climate Workshop, 3-5 May 2016, Silver Spring, MD. (45)

Stancioff, E. University of Maine Extension/Maine Sea Grant/NECAN, Strategies for Advancing Science and Engagement of Coastal Acidification in the Northeast Coastal Acidification Network Regions. NOAA Social Coast Forum. 2016. Charleston, SC. (65)

Stancioff, E. Promoting climate change awareness and adaptive planning in Atlantic fisheries communities using dialogue-based participatory vulnerability analysis, mapping, and collaborative systems dynamic modeling. National Adaptation Forum, 13-14 May 2016, St Louis, MO. (120)

Stancioff, E. Building Sea Grant's resilience toolbox: Maine lobster community based system dynamics model, Sea Grant network meeting, 11 May 2016, St. Louis, MO. (35)

Stancioff, E. Northeast Coastal Acidification Network: understanding the science of coastal and ocean acidification. Northeast Aquaculture Conference and Exposition, 16 January 2016, Portland, ME. (45)

Suskiewicz, T.S., F. Ferrario, C.A. Narvaez, D.B. Rasher, and R.S. Steneck. Dynamic times in the Gulf of Maine: predicting the future when the present isn't anything like the past. Bowdoin College, 1 December 2016, Brunswick ME. (100)

Wahle, R.A., K. Reardon, C. Brown, N. Lemieux, M. Parkhurst. 2016. Revealing deepwater lobster settlement across thermal gradients in the Gulf of Maine. Maine Sea Grant Research Symposium, 14 April 2016, Orono, ME. (60)

Wahle, R.A. 2016. American Lobster Settlement Index Update 2016. Fishermen's Climate Roundtable, 1 March 2017, Rockland, ME. (25)

Wahle, R.A., and K. Reardon. American Lobster Settlement Index and deepwater settlement. Maine Fishermen's Forum, 4 March 2016, Rockport, ME. (100)

Wahle, R. Predicting the future of the American lobster fishery in the Gulf of Maine and Southern New England: Trouble on the horizon? Benthic Ecology Meeting, 19 March 2016, Portland, ME. (50 est.)

Waller, J. Linking ocean acidification and warming to the larval development of the American lobster (*Homarus americanus*). Benthic Ecology Meeting, 17 March 2016, Portland, ME. (50 est.)

Waller, J. Linking rising pCO₂ and temperature to the larval development, physiology and gene expression of the American lobster (*Homarus americanus*). ASLO Ocean Sciences Meeting, 26 February 2016, New Orleans, LA. (50)

Webb, A., and K. Wilson. Feeding habits of juvenile alewife (*Alosa pseudoharengus*) in the Penobscot Estuary. Atlantic Salmon and Their Ecosystems Forum, January 2016, Orono, ME. (200)

Webb, A., K. Wilson, R. Lasley-Rasher, and G. LaBonte. Feeding habits and movement of juvenile alewife (*Alosa pseudoharengus*) in the Penobscot Estuary. New England Estuarine Research Society, 16 April 2016, York Harbor, ME. (30 est.)

Webber, H.M., and C. Cleaver. Hot rocks, hot water: Northeastern Coastal Stations Alliance intertidal temperature data, Summer 2016. Acadia Science Symposium, 5 October 2016, Winter Harbor, ME. (120)

Wilson, K. The food web of the Penobscot Estuary: the fish. Penobscot Watershed Conference, 9 April 2016, Northport, ME. (75)

Wilson, K., and T. Willis. River herring: the once and future fish. Bowdoin College Speakers Series, 1 November 2016, Brunswick, ME. (30 est.)

Xie, D.M., and Q.P. Zou. Coastal flooding in the Gulf of Maine in a changing climate. EFRaCC workshop, 13-16 June 2016, Swansea, Wales, UK. (50)

Xie, D.M. and Zou, Q.P. Effect of wave-current interaction on waves and circulation over Georges Bank during storm events. International Conference on Coastal Engineering, 17-22 July 2016, Istanbul, Turkey. (1,000)

Zou, Q.P. Overview of coastal flooding research at UMaine. EFRaCC workshop, 13-16 June 13-16, Swansea, Wales, UK. (50)

Zipf, L. 2016. Population ecology of East Coast salt marsh grasses. Boston University Marine Science Association, November 2016, Boston, MA. (30)

Meetings, workshops, etc. (207; 195,324 attending)

93 Maine Healthy Beaches Program (444 attendees)

42 water quality meetings with towns, researchers, watershed groups, etc. (142)

34 field trainings (224)

8 interagency collaboration meetings (22)

7 beach managers meetings (48)

2 laboratory trainings (8)

19 meetings related to The Beaches Conference 2017, February 2016 to January 2017, Wells, ME. (107)

14 meetings of the Infectious Salmon Anemia Technical Board (140)

12 Signs of the Seasons New England Phenology Program trainings, March-September 2016, Cape Elizabeth (2), Falmouth (2), Belgrade, Portland, West Boothbay, Wiscasset, Waterville, Orono. (138)

9 Southern Maine Volunteer Beach Profile Monitoring Program Volunteer Trainings, February-December 2016, various locations. (52)

3 USA National Phenology Network, Phenology Network Coordinators' Webinar Presentations, April and September 2016, January 2017. (15)

2 Maine Marine Invasive Species Collaborative Meetings, February and October 2016. (16)

Maine Invasive Species Network Meeting, 2 February 2016, Hallowell, Maine. (85)

Shellfish Working Group, 10 February 2016, East Boothbay, ME. (40)

World Aquaculture, 20-26 February 2016, Las Vegas, NV. (5,000)

Maine Fishermen's Forum, 3-5 March 2016, Rockport, ME. (3,000)

Benthic Ecology Meeting, 15-16 March 2016, Portland ME. (500)

Maine Science Festival, 18-20 March 2016, Bangor, ME. (10,000)

6 Downeast Maine Fisheries, Fishermen, and Fishing Communities College of the Atlantic course field trips, 29 March-3 June 2016, Bar Harbor, ME. (15)

150 Frenchman Bay Partners Rockweed Meeting, 2 April 2016, Sullivan, ME. (80)

Experience Maritime Maine Stakeholder Meeting, 7 April, 2016, Rockland, ME (40)

Penobscot Watershed Conference, 9 April 2016, Northport, ME. (400)

Maine Sea Grant Research Symposium, 14 April 2016, Orono, ME. (100)

New England Estuarine Research Society Spring Meeting, 14-16 April 2016, York Harbor, ME. (100 est.)

Maine Farm Service Agency and University of Maine Cooperative Extension: Programming for shellfish growers, 25 April 2016, Belfast, ME. (30)

College of the Atlantic Island Committee retreat, 25 April 2016, Somesville, ME. (10)

Ocean Technology in New England and Atlantic Canada, 27-28 April 2016, Orono, ME. (80)

National Adaptation Forum Joint Summit of the Sea Grant Sustainable Coastal Communities and Sea Grant Climate Networks, 11 May 2016, St Louis, MO. (35)

Damariscotta River Tour for Aquaculture in Shared Waters students, 13 May 2016, Damariscotta, ME. (15)

College of the Atlantic Island Committee meeting, 18 May 2016, Bar Harbor, ME. (10)

Orland Dam Forum, 1 June 2016, Orland, ME. (150)

Southern Maine Beach Profiling Program Planning, 9 June 2016, Wells, ME. (3)

Preserving the Working Waterfront, Stories from the Nation's Coast (webinar), 22 June 2016. (55)

Maine Association of Sea Kayak Guides and Instructors incident management meeting, 7 July 2016, Bar Harbor, ME. (12)

Maine Association of Sea Kayak Guides and Instructors incident management meeting, 20 September 2016, Bar Harbor, ME. (15)

Sea Grant Association Capitol Hill Briefing on Economic Resilience, 21 September 2016, Washington, DC. (60)

Oyster Trail of Maine, 26 September 2016, Darling Marine Center, Walpole. (30)

Engaging the Sea Grant Network to Build a Weather Ready Nation, 26-27 September 2016, Wells, ME. (32)

Kennebunkport Workforce Housing Listening Session, 28 September 2016, Kennebunkport, ME. (95)

Acadia National Park Intertidal Zone Management, 6-7 October 2016, Winter Harbor, ME. (30)

Northern Maine Children's Water Festival, Orono, ME, 11 October 2016. (700)

Addressing emergent threats to the Maine lobster fishery through an expanded and improved community based systems dynamic model co-developed by lobster harvesters, 20 October 2016, Walpole, ME. (8)

International Network on Offshore Renewable Energy (INORE) North American Symposium, 30 October – 2 November 2016, Orono, ME. (60)

Maine Climate Change Adaptation Providers Network Annual Meeting/NH Coastal Adaptation Working Group. 2 November 2016, Portland, ME. (45)

Northeast Regional Penology Network Meeting, 17-18 November 2016, AMC Highland Center, Bretton Woods, NH. (45)

Biosecurity and Aquaculture, 30 November 2016, Belfast, ME. (25)

Maine Lobster Leadership Institute, 2 January 2017, Northport, ME. (17)

Northeast Aquaculture Conference and Expo, 11-13 January 2017, Providence, RI. (450)

Sea Grant NMFS Aquaculture Conclave, 12 January 2017, Providence, RI. (50)

New Hampshire Sea Grant Beach Profile Monitoring Program Meeting, 26 January 2017, Wells, ME. (7)