

**Maine Sea Grant College Program  
Annual Report  
2010**

*Submitted to the Vice President for Research  
University of Maine  
15 August 2011*

**Maine Sea Grant College Program Annual Report**  
**1 February 2010 - 31 January 2011**

**Introduction**

This report summarizes the major accomplishments of the Maine Sea Grant College Program for the period between February 1, 2010 and January 31, 2011. This has been a productive year. The program was reviewed successfully by the National Sea Grant Office, and we completed some planned hiring and changes to the management team. Members of the Marine Extension Team continue to provide impactful programming to Maine coastal communities and they are highly sought after by the many partners we have cultivated over the years. Highlights of these programs as well as the investments in research and program development are also provided in this report.

Initiatives in climate change adaptation, community engagement related to the University's research and development efforts in offshore wind energy, and some significant new funding for sustainable aquaculture are just a few of the new programs developed in this reporting cycle. We also connected with many other units at the University of Maine and our reputation continues to improve as they seek our involvement in academic and outreach endeavors. Maine Sea Grant is also making significant strides in communications as we pursue the right combination of tools for engaging the public and sharing our knowledge in ways that recognize the increasing reliance of the public on the Internet and digital media.

State and federal budgets remain in flux and the program continues to pursue other funding sources and partnerships to grow programmatic initiatives. We are pleased to report our success in leveraging core University funds in 2010 at a ratio of approximately 8:1. We leveraged \$244,348 allocated to Maine Sea Grant from the Maine Economic Improvement Fund to gain \$212,015 in fringe and indirect from the University and \$1,588,994 in other sources.

## Membership Determination

Staffing	# individuals	# FTEs (SG)	# FTEs (MEIF)	Additional MEIF	Cooperative Extension
Administrative	4	0.89	2.28	0.08	0.00
Communications	3	1.46	0.92	0.12	0.00
Extension	5	3.26	0.30	0.35	0.60
Education	1	0.47	0	0.04	0.0
Research	7	0.94	unknown	n/a	

## Return on Investment

### Sponsored Research Activity

Project Description	Source	Direct Cost	Indirect Cost	Total Award	# years
2010 Omnibus (inc. research)	NOAA	\$850,150	\$240,602	\$1,090,752	1
Omnibus Match	Cooperative Extension	\$49,838	\$9,908	\$59,746	1
2010 Omnibus Match	UMaine, MEIF (SG staff)	\$311,744	\$81,425	\$393,169	1
Aquaculture Extension	NOAA Sea Grant	\$242,147	\$57,853	\$300,000	3
Climate Resiliency	NOAA Sea Grant	\$23,659	\$6,341	\$30,000	1
Knauss Fellowships	NOAA Sea Grant	\$88,000		\$88,000	1
MOSAC Admin. Fee	Maine DEP	\$12,500		\$12,500	1
Oyster Gardening	Donald Huffmire	\$55		\$55	1
	John Swenson	\$55		\$55	1
	John Waldman	\$55		\$55	1
	Thomas Shippee	\$55		\$55	1
Tenants Harbor II	Davis Foundation	\$8,569	\$1,431	\$10,000	1
Taunton Bay II	ME Comm. Fdn.	\$25,642	\$4,282	\$29,924	1
Southern Maine Beach Profiling	Kennebunk	\$700		\$700	1
	Ogunquit	\$700		\$700	1
	Saco	\$1,400		\$1,400	1
	Scarborough	\$1,400		\$1,400	1
	South Portland	\$700		\$700	1
	Wells	\$2,100		\$2,100	1
	York	\$700		\$700	1
Trade Adj. Assistance	USDA/U of MN	\$27,000	\$3,000	\$30,000	1
Additional MEIF	UMaine MEIF	\$56,741	\$13,117	\$69,858	1
Working Waterfront Access	Sea Grant Law Center	\$21,483	\$5,821	\$27,304	1
Working Waterways & Waterfronts National Symposium on Water Access	Maine Coastal Program	\$3,500		\$3,500	1
	Maine Coastal Program	\$1,500		\$1,500	1
	MIT Sea Grant	\$1,000		\$1,000	1
	MN Sea Grant	\$500		\$500	1
	MS/AL Sea Grant	\$2,000		\$2,000	1

	National Fisherman	\$1,000		\$1,000	1
	Nat'l Marine Manufacturers Assoc.	\$2,500		\$2,500	1
	NC Sea Grant	\$1,000		\$1,000	1
	NH Sea Grant	\$1,000		\$1,000	1
	OH Sea Grant	\$500		\$500	1
	Recreational Boating and Fishing Foundation	\$2,000		\$2,000	1
	States Organization for Boating Access	\$500		\$500	1
	UMass Boston	\$500		\$500	1
	VIMS	\$2,500		\$2,500	1
	Virginia Sea Grant	\$2,500		\$2,500	1
Vital Venture	GMRI	\$7,539	\$2,020	\$9,559	1
APPELRUNS	Acadia Partners	\$27,248	\$7,302	\$34,550	2
Downeast Institute	NSF/UMM Year 2	\$7,850	\$2,104	\$9,954	1
Totals:		\$1,790,530	\$435,206	\$2,225,736	

### Peer-Reviewed Publications

#### *Journals (8)*

Basti, D., I. Bricknell, E.S. Chang, and D. Bouchard. 2010. Biochemical reference intervals for the resting state in the adult lobster *Homarus americanus*. *Journal of Shellfish Research* 29:1013-1019. R-06-04

Brzezinski, D.T., J. Wilson, and Y. Chen. 2010. Voluntary participation in regional fisheries management council meetings. *Ecology and Society* 15(3):2. R-08-04

Holland, D.S., and G. Herrera. 2010. The benefits and risks of increased spatial resolution in management of fishery metapopulations under uncertainty. *Natural Resource Modeling* 23(4):494-520. R-08-02

Jordaan, A., Y. Chen, D.W. Townsend, and S. Sherman. 2010. Identification of ecological structure and species relationships along an oceanographic gradient in the Gulf of Maine using multivariate analysis with bootstrapping. *Canadian Journal of Fisheries and Aquatic Sciences* 67:701-719. R-04-01

Newell, C.R., F. Short, H. Hoven, L. Healey, V. Pachang, and G. Cheng. 2010. The dispersal dynamics of juvenile plantigrade mussels (*Mytilus edulis* L.) from eelgrass (*Zostera marina*) meadows in Maine, U.S.A. *Journal of Experimental Marine Biology and Ecology* 394:45-52.

Singhal, G., V.G. Panchang, and J.L. Lillibridge. 2010. Reliability assessment for operational wave forecasting system in Prince William Sound, Alaska. *Journal of Waterway, Port, Coastal, and Ocean Engineering* 136(6):337-349. R-04-05

Wilson, K.R., J.T. Kelley, B.R. Tanner, and D.F. Belknap. 2010. Probing the origins and stratigraphic signature of salt pools from north-temperate marshes in Maine, USA. *Journal of Coastal Research* 26:1007-1026. R-06-02

Zhang, Y., Y. Chen, and Y.-J. Chang. 2011. Estimating biological reference points using individual-based per-recruit models for the Gulf of Maine American lobster, *Homarus americanus*, fishery. *Fisheries Research* 108:385-392. R-06-04

### *Conference Proceedings (3)*

Gannon, D. 2010. Symposium on National Ocean Policy. Brunswick, ME: Bowdoin College.

Maine Department of Marine Resources. 2010. Coastal Fishery Research Priorities: Rockweed (*Ascophyllum nodosum*). Augusta, ME: DMR.

Working Waterways and Waterfronts National Symposium on Water Access. 2010. Sense of the Symposium. Orono, ME: Maine Sea Grant College Program.

### Other Publications/Communications Products (43)

#### *Technical Reports*

Clifford, M. 2010. Calendar Islands Lobster Company: final report, market and competitive analysis. Orono, ME: Maine Business School.

Dixon, M. 2010. Memorandum: Tax-based opportunities and challenges for working waterfront protection. Portland, ME: University of Maine School of Law.

Gerlach, S.R. 2010. Memorandum: Working waterfront tax strategies. Portland, ME: Bernstein Shur.

Lindberg, K. 2010. Annual Report to US Environmental Protection Agency. Augusta, ME: Maine Healthy Beaches Program.

Palmer, S., and R. Theriault. 2010. Maine Shellfish: An Analysis of the Market and an Exploration of Trade-based Associations. Orono, ME: University of Maine School of Business.

Springuel, N., and H. Clossey. 2010. Downeast Nature-based Tourism Initiative Regional Final Report. Cherryfield, ME: Sunrise County Economic Council.

White, S., K. Grant, K. Leyden, and E. Stancioff. 2010. Climate Variability and Coastal Community Resilience: Developing and Testing a National Model of State-based Outreach. Orono, ME: Maine Sea Grant College Program. MSG-TR-10-05

### *Outreach publications*

Beard, R., ed. 2010. Talk of the Towns: Aquaculture on the Maine coast, 22 January 2010, Blue Hill, ME: WERU.

Beard, R., and N. Springuel, eds. 2010. Talk of the Towns: Sustainable business program at College of the Atlantic, 11 June 2010, Blue Hill, ME: WERU.

Beard, R., and N. Springuel, eds. 2010. Talk of the Towns: Protection for working waterfronts, 11 December 2010, Blue Hill, ME: WERU.

Compass Light Productions. 2010. The Last Sardine Cannery [video and photographs]. New York, NY: *The New York Times* and Searsport, ME: Penobscot Marine Museum.

Davis, M.E., and A.S. Backus. 2010. FishSafe Maine, <http://www.fishsafeme.org>. Medford, MA: Tufts University.

Deese, H., and C. Schmitt. 2010. Fathoming: what are the marine impacts of offshore wind turbines? *The Working Waterfront*, January 2010.

Deese, H., and C. Schmitt. Fathoming: what we know about rockweed. *The Working Waterfront*, February 2010.

Deese, H., and C. Schmitt. Fathoming: baitfish bet: pondering pogies, hedging on herring. *The Working Waterfront*, 22 April 2010

Deese, H., and C. Schmitt. Fathoming: tiny plankton, big problems. *The Working Waterfront*, June 2010

Deese, H., and C. Schmitt. Fathoming: one fish, two fish: the virtual reality of counting lobsters. *The Working Waterfront*, July 2010.

Deese, H., and C. Schmitt. Fathoming: oil in the Gulf of Mexico: not as far away as you think. *The Working Waterfront*, August 2010.

Deese, H., and C. Schmitt. Fathoming: ancient fish, modern methods. *The Working Waterfront*, September 2010.

Deese, H., and C. Schmitt. Fathoming: Maine fish and birds in hot water? *The Working Waterfront*, October 2010.

Deese, H., and C. Schmitt. Fathoming: taking the temperature of the shrimp fishery. *The Working Waterfront*, November 2010.

Deese, H., and C. Schmitt. Fathoming: an acid test for fisheries. *The Working Waterfront*, 14 December 2010.

Lazur, A., G. Flimlin, and D. Morse. 2010. Small Scale Marketing Opportunities for Aquaculture Products in the Northeast, NRAC Publication No. 205-2010. College Park, MD: Northeast Regional Aquaculture Center.

Lindberg, K. 2010. Municipal Guide to Clean Water: Conducting Sanitary Surveys to Improve Coastal Water Quality. Orono, ME: Maine Sea Grant College Program.

Maine Department of Environmental Protection and The Nature Conservancy. 2010. People and Nature Adapting to a Changing Climate: Charting Maine's Course, A summary of the report presented to the Joint Standing Committee on Natural Resources of the 124<sup>th</sup> Maine Legislature. Brunswick, ME: The Nature Conservancy.

Maine Healthy Beaches Program. 2010. Use your head, pump it don't dump it! (flyer). Orono, ME: Maine Sea Grant College Program.

Maine Sea Grant. 2010. Maine Sea Grant Facts at a Glance 2010. Orono, ME: Maine Sea Grant College Program.

Maine Sea Grant. 2010. NOAA on Maine's Coast. Orono, ME: Maine Sea Grant College Program.

Maine Sea Grant. 2010. Maine Sea Grant Strategic Plan 2009-2013 (Summary). Orono, ME: Maine Sea Grant College Program.

Maine Sea Grant. 2010. Annual Report 2009. Orono, ME: Maine Sea Grant College Program.

Maine Sea Grant. 2010. Maine's Working Waterfronts 2011 Calendar. Orono, ME: Maine Sea Grant College Program.

Maine Sea Grant. 2010. Planning, Implementation & Evaluation Site Review Briefing Book, 8-9 June 2010. Orono, ME: Maine Sea Grant College Program.

Maine Sea Grant. 2010. Building a resilient coast: Maine confronts climate change, 14 and 17 August 2010, Maine Public Broadcasting Network.

Maine Sea Grant. 2010. Hadley Point: Eelgrass, Clams, and a Community Resource (poster). Orono, ME: Maine Sea Grant College Program.

Maine Sea Grant. 2010. Maine Sea Grant Alumni (poster). Orono, ME: Maine Sea Grant College Program.

Morse, D. 2010. Workshop Proceedings and References for Marketing Aquaculture Shellfish Products (Resource CD). Orono, ME: Maine Sea Grant College Program.

Schmitt, C. and K. Tenga-Gonzalez. 2010. Fitz Eugene Dixon Research Fellowship Catalog. Orono, ME: Maine Sea Grant College Program.

Schmitt, C., ed. 2010. Maine's Climate Future: Coastal Vulnerability to Sea-Level Rise. Orono, ME: Maine Sea Grant College Program.

Schmitt, C. Returning alewives to North Haven. *The Working Waterfront*, July 2010.

Schmitt, C. 2010. Maine's first lake. *Friends of Acadia Journal*: Spring.

Schmitt, C. The opportunity of disaster. *The Working Waterfront*, 14 December 2010.

Schmitt, C. 2010. A History of Maine Sea Grant (web content). Orono, ME: Maine Sea Grant College Program.

Schmitt, C. 2010. *Salarius*: a Maine Sea Grant blog about seafood, science, and the sea (web content). Orono, ME: Maine Sea Grant College Program.

Shook, R. 2010. Maine Sea Grant at 30. *UMaine Today Online*. Orono, ME: University of Maine.

Springuel, N. 2010. Research in Focus: The Newfoundland Cod Crisis and the Role of Tourism in Community Revitalization, Vol. 5, April. Orono, ME: Maine Sea Grant College Program.

Springuel, N. VRC Outlook (Vacationland Resources Committee digital newsletter). Winter 2010. Cherryfield, ME: Sunrise County Economic Council.

Springuel, N. VRC Outlook (Vacationland Resources Committee digital newsletter). Spring 2010. Cherryfield, ME: Sunrise County Economic Council.

Springuel, N. VRC Outlook (Vacationland Resources Committee digital newsletter). Summer 2010. Cherryfield, ME: Sunrise County Economic Council.

Stancioff, E., C. Schmitt, and C. Eves-Thomas, eds. 2010. Maine Climate News, Winter Update. Orono, ME: University of Maine Cooperative Extension.

Stancioff, E., C. Schmitt, and C. Eves-Thomas, eds. 2010. Maine Climate News, Fall Update. Orono, ME: University of Maine Cooperative Extension.

Presentations/Creative Shows (80 total; 6,026 total attending)

*State, Regional, National, and International Meetings (41 total; 1,910 attending)*

Bartlett, C., and P. Vickery. Bird surveys in Cobscook Bay in relation to Tide Gen deployment off North Lubec. Ocean Renewable Power Company Agency Workshop, 5 October 2010, Eastport, ME. (45)

Bisson, B. Marine ecotourism in Maine and beyond: the role of Sea Grant extension. Sea Grant Week, 16 October 2010, New Orleans, LA. (30)

Boss, E. Using technology to assess the invasive sea squirt, *Didemnum vexillum*. Massachusetts Institute of Technology, September 2010, Cambridge, MA. (20).

Brawley, S.H. *Porphyra*: crop to model system (invited plenary). 20<sup>th</sup> International Seaweed Symposium, 26 February 2010, Ensenada, Mexico. (360)

Chang, J.-H., Y. Chen, W. Halteman, and R. Wahle. Impact of spatial scale on estimating stock-recruitment relationship. International Council for the Exploration of the Sea, 20-24 September 2010, Nantes, France. (50)

Coghlan Jr., S.M., J. Zydlewski, R.A. Wathen, C. Gardner, S. Ratten, R. Hogg, and K. Simon. Penobscot River research summary. Penobscot Science Exchange/Diadromous Species Restoration Research Network, 26 January 2010, Orono, ME. (30)

Coghlan Jr., S.M., S. Ratten, C. Gardner, R. Hogg, J. Zydlewski, and K. Simon. 2010. Barrier removal and range expansion in sea lamprey: quantifying habitat conditioning in small streams. Maine Sea Grant Research Symposium, 22 March 2010, Orono, ME. (54)

Davis, M. Maine safety study. Maine Fishermen's Forum, 6 March 2010, Rockland, ME. (25)

Davis, M.E. Safety and compliance in the Maine commercial fishing industry. Society for Risk Analysis, 8 December 2010, Salt Lake City, UT. (20)

Davis, M.E. Safety and compliance in the Maine commercial fishing industry. National Marine Fisheries Service, 3 November 2010, Woods Hole, MA. (30)

Davis, M.E. Safety and compliance in the Maine commercial fishing industry. University of Maine School of Economics, 10 December 2010, Orono, ME. (25)

Deese, H. Mapping Maine's working waters. American Chemical Society, 24 August 2010, Boston, MA. (50)

Grant, K. Successful strategies: field-tested tools for addressing working waterfront issues. Working Waterways and Waterfronts National Symposium on Water Access, 29 September 2010, Portland, ME. (23)

Grant, K. Coastal access and working waterfronts in Maine. Maine Sea Grant Research Symposium, 22 March 2010, Orono, ME. (54)

Grant, K. Implications of tax policy on working waterfront preservation, Working Waterfront Coalition, 8 December 2010, Augusta, ME. (15)

Hogg, R., S.M. Coghlan Jr., S.A. Ratten, C. Gardner, J. Zydlewski, and K. Simon. Barrier removal in Sedgeunkedunk Stream: sea lamprey colonization and implications for salmon habitat restoration, Atlantic Salmon and Their Ecosystems Research Forum, 6-7 January 2010, Orono, ME. (100)

Holland, D.S., and G. Herrera. The benefits and risks of increased spatial resolution in management of fishery metapopulations under uncertainty, NOAA Northeast Fisheries Science Center, 5 May 2010, Woods Hole, MA. (35)

Holland, D.S., and G. Herrera. Management of fishery metapopulations under uncertainty: the role of age structure and asymmetry in migration. NOAA Northwest Fisheries Science Center, 18 November 2010, Seattle, WA. (20)

Hoyt, S. Lessons learned from the Taunton Bay Pilot Project. Maine Scallop Advisory Council, 18 October 2010, Ellsworth, ME. (30)

Johnson, T.R. 2010. Assessing vulnerability and resilience in Maine fishing communities. Maine Sea Grant Research Symposium, 22 March 2010, Orono, ME. (54)

Koopman, H.N. Possible reproductive senescence in American lobsters (*Homarus americanus*). Benthic Ecology Meeting, 10-13 March 2010, Wilmington, NC. (30)

Lindberg, K. The Maine Healthy Beaches Program in 2010. Maine Healthy Beaches Interagency Advisory Committee, 24 March 2010, Augusta, ME. (17)

Lindberg, K. Maine Healthy Beaches Program update. US EPA Region 1, 13 April 2010, Boston, MA. (27)

McCarron, P. Mitigating risk to whales from lobster fishing: research update. North Atlantic Right Whale Consortium Annual Meeting, 3-4 November 2010, New Bedford, MA. (200)

McCarron, P. Mitigating risk to whales from lobster fishing: research update. Massachusetts' Lobstermen's Association, 20-23 January 2011, Hyannis, MA. (15)

Moffet, C., C. Chen, M. Hunter, and J. Wilson. Northern shrimp fishery trap bycatch in the Gulf of Maine, American Fisheries Society, 12-17 September 2010, Pittsburgh, PA. (40)

Morse, D. Controlling the mud blister worm (*Polydora websteri*) in oyster aquaculture. Northeast Aquaculture Conference and Expo, 2 December 2010, Plymouth, MA. (30)

Morse, D. Update on the National Sea Grant Fisheries Focus Team. Northeast Regional Sea Grant Meeting, 13 May 2010, Staatsburg, NY. (50)

Morse, D. Deterring eider predation on a Maine mussel farm. Maine Sea Grant Research Symposium, 22 March 2010, Orono, ME. (54)

Probst, E., and H.N. Koopman. Egg size and development rates in American lobsters: relationship to female size. Benthic Ecology Meeting, 10-13 March 2010, Wilmington, NC. (30)

Schmitt, C. Climate change adaptation and coastal resiliency projects. Northeast Regional Sea Grant Meeting, 15 May 2010, Staatsburg, NY. (50)

Springuel, N. Coastal access and working waterfronts in Maine. Maine Association of Sea Kayak Guides and Instructors, 28 January 2010, Augusta, ME. (25)

Springuel, N. Marine ecotourism in Maine and beyond: the role of Sea Grant extension. Community-based Coastal Area Management through Sea Grant, 2-5 September 2010, Jeju National University, Republic of Korea. (56)

Springuel, N. Working waterfronts: leading a national initiative. Sustainable Island Living, 5 November 2010, Rockland, ME. (40)

Springuel, N. Report from the Vacationland Resources Committee. Downeast Resource Conservation & Development Council, 12 December 2010, Steuben, ME. (12)

Stancioff, E., *et al.* Adapting to climate change in Maine's coastal communities and the statewide stakeholder process. Sustainability Solutions Initiative, 18 October 2010, Orono, ME. (22)

Stancioff, E. National perspectives on climate change adaptation: a panel discussion of climate change adaptation efforts in diverse coastal regions of the United States. The Coastal Society 22nd International Conference, 14 June 2010, Wilmington, NC. (25)

Stancioff, E. Climate communication: applying climate communication research to be more effective. Northeast climate change adaptation training for municipal officials and state agencies, 21 October 2010, Narragansett, RI. (28)

Stancioff, E., and M. Burson. Case studies on adaptation. Northeast climate change adaptation training for municipal officials and state agencies, 22 October 2010, Narragansett, RI. (28)

Stancioff, E. Communicating about climate change and adaptation tools, resources and case studies. NOAA and Sea Grant Climate Exchange Training Program, 12 May 2010, Narragansett, RI. (36)

Wahle, R. 2010. Developing genetic fingerprinting techniques for lobster seeding trials in New England. Alaska Interagency Crab Meeting, Anchorage, AK, 14-17 December 2010. (25)

*Poster presentations (8 total; 1,205 attending)*

Bisson, B. VitalVenture Watershed Education Curriculum. Northern Maine Children's Water Festival, 12 October 2010, Orono, ME (700) and Maine Sea Grant Research Symposium, 22 March 2010, Orono, ME (54).

Grant, K. Southern Maine beach profile monitoring: volunteers mapping the State of Maine's beaches since 1999. Maine Sea Grant Research Symposium, 22 March 2010, Orono, ME. (54)

Gray, A., S. Jain, and E. Stancioff. Adaptation strategies in a changing climate: Maine's coastal communities. Maine EPSCoR Conference, 8 November 2010, Orono, ME. (75)

Hogg, R., S.M. Coghlan Jr., J. Zydlewski, K. Simon, C. Gardner, and S. Ratten. Barrier removal in Sedgeunkedunk Stream: sea lamprey recolonization and implications for Atlantic salmon habitat restoration. 140th Annual Meeting of the American Fisheries Society, 13-16 September 2010, Pittsburgh, PA. (60)

Kanwit, J.K., T.C. DeGraff, C. Bartlett, and T. Bennett. Application methods, retention rates and preliminary results for two types of electronic tags used to study Atlantic halibut (*Hippoglossus hippoglossus*) in the Gulf of Maine. Maine Sea Grant Research Symposium, 22 March 2010, Orono, ME. (54)

Lindberg, K. Maine Healthy Beaches special studies for the improvement of beach management. Maine Sea Grant Research Symposium, 22 March 2010, Orono, ME. (54)

McGovern, B., and T. Johnson. 2010. Vulnerability, resilience and risk in fishing communities. School of Marine Sciences Capstone Project Symposium, April 2010, Orono, ME. (100)

Stancioff, E., K. Grant, S.K. White, and K. Leyden. Building a resilient coast: Maine confronts climate change. Maine Sea Grant Research Symposium, 22 March 2010, Orono, ME. (54)

*Public presentations to lay audiences (30 total; 2,920 attending)*

Bisson, B. Signs of the Seasons: A Maine Phenology Project. Master Gardener Program, 8 March 2010, Orono, ME. (20)

Coghlan Jr., S.M. Sea lamprey in Sedgeunkedunk Stream. Sedgeunkedunk Stream Symposium and Celebration, 17 September 2010, Holden, ME. (30)

Deese, H. Mapping Maine's working waters. 4 August 2010, North Haven, ME. (50)

Dority, A., E. Smith, H. Eaton, and K. Quinby. A community supported fishery for groundfish, Eat Local Foods Coalition CSA/ CSF fairs, February 2010, Belfast and Bangor, ME. (100)

Hoyt, S. Community-based natural resource management: two case studies. Georges River Land Trust, 11 November 2010, Thomaston, ME. (15)

Lindberg, K. Maine Healthy Beaches Program. Hall of Flags, 11 March 2010, Augusta, ME. (50)

Lindberg, K. Camden Harbor boater's education campaign and No Discharge Area designation. Camden Yacht Club, 28 July 2010, Camden, ME. (23)

Lindberg, K. Municipal Guide to Clean Water: Conducting Sanitary Surveys to Improve Coastal Water Quality. Septic System Workshop/Kennebec Estuary Clam Flat Partners, 6 August 2010, Bath, ME. (33)

Lindberg, K. Ogunquit Beach and Ogunquit River Watershed Special Study & Sanitary Survey Meeting, 24 August 2010, Ogunquit, ME. (17)

Lindberg, K. Maine Healthy Beaches Program: working together to improve coastal water quality. Maine Sea Grant Policy Advisory Committee, 22 September 2010, Orono, ME. (15)

Lindberg, K. The state of Casco Bay water quality. Casco Bay Estuary Partnership State of the Bay Conference, 21 October 2010, South Portland, ME. (40)

Lindberg, K. Maine Healthy Beaches Program: working together to improve coastal water quality. Cape Neddick River Water Quality Meeting, 16 November 2010, York, ME. (15)

Morse, D. Aquaculture Seminar, 10 February 2010, New Haven, CT. (65)

Morse, D. Shellfish aquaculture in Maine and Atlantic Canada. Castine Public Library, 2 August 2010, Castine, ME. (10)

Morse, D. Shellfish aquaculture in Maine and Atlantic Canada. University of New England, 20 April 2010, Biddeford, ME. (30)

Morse, D. Fishing gear past and present. Maine Maritime Museum, 22 June 2010, Bath, ME. (15)

Morse, D. Shellfish aquaculture in Maine and Atlantic Canada. Dirigo Pines Retirement Community, 8 July 2010, Orono, ME. (30)

Morse, D. Shellfish aquaculture. Damariscotta River Association's Camp Mummichug, 12 July 2010, Damariscotta, ME. (12)

Morse, D. The Kennebec Celebration. Blessed Hope Church, 14 April 2010, Waterville, ME. (40)

Morse, D., and B. Bisson. How to grow oysters. Great Salt Bay School, 18 February 2010, Damariscotta, ME. (20)

Morse, D. The USDA Trade Adjustment Assistance Program. 7 meetings, October-December 2010, statewide. (800)

Morse, D., and B. Bisson. How to grow oysters. Great Salt Bay School, 20 January 2011, Damariscotta, ME. (30)

Schmitt, C. When facts are not enough: understanding risk perception and belief in science, Molecular and Biomedical Sciences, 15 March 2010, Orono, ME. (20)

Schmitt, C. A Coastal Companion: A Year in the Gulf of Maine from Cape Cod to Canada, Scarborough Library, 16 May 2010, Scarborough, ME. (5)

Schmitt, C. Sargent Mountain Pond: Maine's first lake, College of the Atlantic, 22 July 2010, Bar Harbor, ME. (10)

Schmitt, C. A Coastal Companion: A Year in the Gulf of Maine from Cape Cod to Canada, Wiscasset Library, 25 September 2010, Wiscasset, ME. (8)

Stancioff, E. Living with coastal hazards. Lincolnville Betterment Association, July 2010, Lincolnville, ME. (42)

Springuel, N. The Downeast Fisheries Trail. Maine Fishermen's Forum, 6 March 2010, Rockport, ME. (25)

Springuel, N. The role of tourism in fisheries crises: the case of Newfoundland and applications to Maine. NOAA Brown Bag, 19 April 2010, Silver Spring, MD. (50)

Springuel, N. Natural history of the western Caribbean. A Prairie Home Companion, March 2010, Gulf of Mexico. (1,300)

Number of Spin-Out Companies

0

Number of Patents and Other Forms of Intellectual Property

0

Number of Jobs Funded (Created or Retained)

20

Revenue Generated

\$651.00 (from book sales)

**Summary of Accomplishments for the Year**

Research Accomplishments

**Sea Grant model shows interactions of cod and lobster in the Gulf of Maine**

Recognizing that management of one species can greatly affect the dynamics of other species in the same ecosystem, fisheries management strategies are trending away from species-specific plans toward “spatially explicit” approaches that focus on ecosystems and geographies. An example of species interactions within the Gulf of Maine is provided by Dr. Yong Chen of the University of Maine. Chen evaluated seasonal and annual variations in the distribution of the fish community in the coastal Gulf of Maine, and quantified the dynamics of the American lobster ecosystem in the Gulf of Maine from 1985 to 2007. Results from this modeling effort suggest that heavy fishing pressure on cod in the 1980s might have contributed to the high lobster stock biomass in recent years, and such interactions should be considered in future fishery management efforts. (R-08-04)

**Sea Grant research maps different uses of marine waters**

The Island Institute is working with three pilot communities to identify and delineate valued fishing and other working areas along the coast of Maine. Combining place names, direct observations, and amended navigational charts into a geographic information system (GIS) yields a visual representation that can then be used in coastal and marine spatial planning efforts (as promoted by the National Ocean Policy). For example, participatory maps developed as part of this project were used in meetings about offshore wind development, informing discussions with visual layers of compact and accurate data that had been generated by, instead of presented to, the audience. The Island Institute intends to communicate the results to decision-makers to ensure that the maps of marine uses and the communities they represent are included in planning and management initiatives. (R-10-05)

**Sea Grant science documents effects of dam removals on stream ecosystems**

Dr. Stephen Coghlan’s ongoing study of a restoration project on Sedgeunkedunk Stream, a tributary of the Penobscot River, documented dramatic and rapid improvements in fish

abundance and diversity following dam removal, including upstream range expansion by Atlantic salmon juveniles, alewife, and sea lamprey. Sea lamprey nesting increased more than four-fold within the restored stream system following dam removal, and the lamprey's spawning activity increased stream habitat diversity. The Sedgeunkedunk Stream study is providing the scientific scrutiny and evidence that is so often lacking in river restoration projects. The effort is also providing a model for outreach and engagement of the watershed community, through interactions with neighbors, presentations, and media outreach. (R-10-03)

### Program Development Accomplishments

#### **Sea Grant feature articles among most widely read**

In 2010, Sea Grant initiated a new science and technology feature, "Fathoming," in *The Working Waterfront* newspaper (circulation 40,000) and electronic publications (monthly page views 20,000). This collaborative effort with the Island Institute quickly became one of the most popular features, read by three-quarters of the paper's subscribers. Project development funds of \$5,000 awarded in March 2010 by Maine Sea Grant for publication costs leveraged an additional \$20,000 from private foundations in support of staff time and editorial costs for the "Fathoming" series. This success led to continued partnership in 2011.

#### **Sea Grant research prevents losses in the cod aquaculture industry**

Working with Great Bay Aquafarms, a cod aquaculture company, and Micro Technologies Inc., an aquatic animal biotechnology company located in Richmond, Maine, the Maine Animal Health Laboratory evaluated the efficacy of an injectable vaccine for a specific *Vibrio anguillarum* strain responsible for valuable stock loss that was isolated from Great Bay Aquaculture's marine grow-out site. Based on the trial results, Great Bay Aquaculture likely will change their vaccination strategy for cod stocked into the Sorrento, Maine site. Further, Micro Technologies will be able to use these data to support other vaccination efforts and use it as a basis for future research within the company. The fundamental research completed with Sea Grant development funds sets the ground work for economic gain for both companies and cod aquaculture as a whole.

#### **Sea Grant builds capacity for community-supported fisheries**

For 10 weeks between January and March, 2010, Penobscot East coordinated the shrimp community supported fishery (CSF) with five fishermen in Stonington, Bar Harbor, and Southwest Harbor, and over 100 customers from towns including Stonington, Blue Hill, Ellsworth, and Bar Harbor. This project supported the local fishery in several ways. First, it generated more revenue for a portion of the fishermen's catch. Second, it placed an emphasis on the development of a local market as a way to diversify the stream of income for fishermen. Third, it fostered connections between local fishermen and local seafood customers, and generated enthusiasm for a fresh, local product. The impetus for starting a shrimp community supported fishery was as a trial run for a future groundfish CSF.

### Extension Accomplishments

*Resulting from the work of the Marine Extension Team, a partnership between Maine Sea Grant and University of Maine Cooperative Extension.*

#### **Sea Grant landed \$9.1 million and business training for Maine lobstermen**

In 2009, the value of Maine lobster declined by more than 15%, in part because of increased foreign imports. Maine Sea Grant worked with the Maine Lobstermen's Association to apply on behalf of all Maine lobstermen to the US Department of Agriculture's Trade Adjustment Assistance Program, which targets commodities that have experienced reduced revenue and negative impacts from imports. More than 2,600 lobstermen, their spouses, and sternmen successfully applied to participate in this business development and financial assistance program, which has the potential to provide \$9.1 million to Maine's fishing families by the end of the program in 2013. Through the Trade Adjustment Assistance Program, Maine Sea Grant's facilitation of educational programs and business development services will boost the economic vitality and longevity of the lobster industry, the most important commercial fishery in Maine.

#### **Sea Grant evaluating energy from the tides in eastern Maine**

Cobscook Bay is home to the first in-stream tidal generation units in the United States. Maine Sea Grant is working with Ocean Renewable Power Company to evaluate the social and ecological implications of this alternative energy technology. Maine Sea Grant helped the University of Maine School of Marine Sciences and the Cobscook Bay Resource Center interview community members to identify public interests and concerns, such as job creation and the potential competition for space with commercial fishermen. On the ecological side, Maine Sea Grant and the Center for Ecological Research implemented a monitoring program in August 2010 to assess bird populations at proposed tidal energy development sites, and Maine Sea Grant is also assisting researchers monitoring fish populations in the vicinity of the energy sites. Assessment will continue through 2012 as tidal generators are installed on the ocean floor in Cobscook Bay.

#### **Sea Grant keeping fishing heritage alive**

Since 1980, Maine has lost most of its groundfish fleet. As a result, processing and vessel support infrastructure have also declined. In an effort to halt and reverse this trend, Maine Sea Grant worked with local fishermen to form the nonprofit Midcoast Maine Fishing Heritage Alliance. The Alliance hires fishermen to conduct research and public education in exchange for credit vouchers to help them maintain their vessels in a safe and seaworthy condition. In the first six months, the Alliance paid \$3,500 to nine fishermen, helping to retain those jobs and preserving the working fishing community of Port Clyde.

#### **Sea Grant continuing national leadership on working waterfront issues**

In a demonstration of Maine's continued leadership in national working waterfront issues, Maine Sea Grant was selected to coordinate and host the second Working Waterways and Waterfronts National Symposium on Water Access in Portland, Maine, in September 2010. More than 220 attendees and nearly 100 speakers from across the country gathered in Portland to learn from each other about waterfront access best practices, and from Maine's model policies and approaches. Keynote speakers included US Representative Chellie Pingree and Dr. Larry Robinson, Deputy Administrator of the National Oceanic and Atmospheric Administration. At the symposium's conclusion, attendees launched a commitment to advancing working waterfronts through a new national coalition dedicated to research, outreach, and policy development. Both Sea Grant and the State of Maine hold leadership positions in this new national effort.

### **Sea Grant created space for resolving conflict, preserving beach access**

Wolfe Tone works for the Trust for Public Land. In 2006, at a coastal access forum hosted by Maine Sea Grant in southern Maine, he met a member of Surfrider's Northern New England chapter who expressed concern about conflicts over access to Higgins Beach in Scarborough, a popular place for surfers as well as striped fishermen and beach visitors. In 2010, with funding from the Land for Maine's Future Program, the Trust for Public Land negotiated agreements with landowners and the town, and purchased 12 acres valued at \$1.44 million, securing permanent public access to the beach. Tone credited Sea Grant with providing the format and space for waterfront users to share ideas, the kinds of ideas which eventually lead to success stories like the one at Higgins Beach in Scarborough.

### **Sea Grant helped boaters and town officials clean up Camden Harbor**

In 2010, the Maine Healthy Beaches Program, coordinated by Maine Sea Grant and University of Maine Cooperative Extension in partnership with US EPA and Maine Department of Environmental Protection, launched a Boater's Education Campaign in Camden Harbor to reduce pollution impacting the beach and boating areas. Partly as a result of this campaign, the town recorded an increase in the volume of boat sewage pumped out by boats and thus not discharged to coastal waters. At the same time, Maine Sea Grant worked with the town to identify and fix two illegal sewer connections to the storm drain network. As a result of these actions, the harbor will be cleaner for the 2011 boating and beach season.

## Communications Accomplishments

### **Sea Grant targeted communications to local legislators**

A graduate assistant supported by University of Maine Cooperative Extension researched and made recommendations for enhancing the communications strategies of the Marine Extension Team. Focusing on one target audience, the Maine Legislature, the research documented the media habits and communication needs and preferences of the Legislature's Marine Resources Committee and Natural Resources Committee. As a result of this work, members of the Marine Extension Team reached out to new and continuing legislators in November 2010, establishing themselves as both a local and statewide resource for science-based information, expanding and strengthening the University of Maine's network on the Maine coast.

### **Sea Grant history recorded in multimedia formats**

In 2010, the University of Maine celebrated 30 years of being a designated Sea Grant institution, as the Maine Sea Grant College Program was established in 1980. As part of this observance, communications staff recorded the history of the program, incorporating institutional knowledge of the people who have known Maine Sea Grant since the first Sea Grant awarded to UMaine in 1971. This history was recorded, archived, and published in multiple formats, including physical exhibits, slideshows, an animated timeline, and a documentary video short. Highlights from our history have been incorporated into the website, and appeared in the University's magazine *UMaine Today*.

### **Sea Grant's new blog increased website traffic and visibility**

In October 2010, Maine Sea Grant launched *Salarius*, a blog focused on seafood, science, and the sea. The blog began in parallel with Sea Grant Week, and provided an outlet to communicate Sea Grant's role in the response to the Deepwater Horizon oil disaster and recent hurricanes. With promotion via social media websites, the blog quickly became one of the most popular sections of the website, increasing visitors and serving as a portal to Sea Grant's information and extension services.

## Education Accomplishments

### **Sea Grant citizen science programs benefit students, scientists, and communities**

Landscape-scale environmental research questions require data from vast geographic areas over many years, and carry a price tag that is often beyond the scope of available funding. Meanwhile, K-12 classrooms and community volunteer groups want educational opportunities that also contribute to authentic scientific research. Maine Sea Grant is working with partners throughout Maine and beyond to engage students, scientists, and communities in citizen science research projects that benefit each equally. *Acadia Learning* is a watershed research program led by the Schoodic Education and Research Center Institute at Acadia National Park, in partnership with Maine Sea Grant, and the University of Maine Senator George J. Mitchell Center. Now in its fourth year, the program has provided over 1,000 high school students across New England with opportunities to deepen their understanding of watershed science and develop data literacy skills, while collecting data that help University of Maine scientists understand mercury bioaccumulation patterns across the landscape. The student-gathered data has served as the basis for several presentations at academic research conferences, and supported a proof-of-concept study that leveraged additional grant funds for ongoing research. In 2010, Maine Sea Grant and the University of Maine Cooperative Extension also launched a new citizen science research effort, *Signs of the Seasons*, which is focused on understanding local-scale climate variability through observations of plant and animal phenology (seasonal changes) made by K-12 students, outdoor professionals, and community volunteers.

### **Sea Grant engages and supports students at the University of Maine**

In 2010, Maine Sea Grant expanded support for undergraduate and graduate students in an effort to help more Maine graduates find jobs in natural resource management fields. Maine

Sea Grant provided three internships to MBA candidates in the Maine Business School for projects related to the seafood industry; initiated the Marine Science Undergraduate Scholarship with a \$1,000 award to an outstanding student in the School of Marine Sciences; created a Sea Grant Scholar program that will provide full one-year scholarships to two new entrants to the School of Marine Sciences' dual degree program in marine science and marine policy beginning Fall 2011; created three paid summer internship positions; and began planning for a three-credit graduate course titled, "Maine's Working Coast: The Intersection of Science, Policy and Community."

### **Sea Grant-supported education programming helps retain exceptional science teachers**

The *Acadia Learning* watershed research program, led by the Schoodic Education and Research Center Institute with Maine Sea Grant and the Senator George J. Mitchell Center and sponsored by NOAA's Bay, Watershed, Education, and Training (B-WET) program, has engaged high school science teachers throughout Maine in all phases of their careers over the past four years. At the close of the 2010-2011 school year, when many school administrators faced stark budget realities, a first-year teacher in the program reported that she believed her participation in *Acadia Learning* and the authentic scientific research her students completed through the project was what allowed her to keep her position for the coming year, though she had less seniority than many of her colleagues. Maine Sea Grant is proud to provide opportunities for Maine science teachers to innovate and excel in their field.

### **Sea Grant publications support college curricula from New England to Florida**

College students in resource management courses need practical, locally-relevant examples to understand the depth and complexity of coastal policy issues and management theory and practice. Two of Maine Sea Grant's recent outreach publications have served this purpose in college classrooms. *Building a Resilient Coast*, a five-part documentary produced in partnership with Oregon Sea Grant that explores Maine's efforts to understand and adapt to climate variability and coastal hazards, is now used in academic courses from the University of New Hampshire, to Allegheny College in Pennsylvania and Nova Southeastern University in Florida. Likewise, students as far away as Florida are using a 2005 publication, *Access to the Waterfront: Issues and Solutions across the Nation*, to inform their studies related to recreation management and development in the coastal zone.

#### *Theses and dissertations (3)*

Chankwon Jeong, PhD Texas A & M University, "Estimation of extreme wave height for coastal applications." (R-04-05)

Kristin Wilson, PhD University of Maine, "Maine salt pools: stratigraphic description, ecophysical characterization, and discussion of their role in estuarine landscape change." (R-06-02)

Yuying Zhang, PhD University of Maine, "Assessment and management control rules of American lobster fisheries in the Gulf of Maine." (R-08-04)

*Graduate students supported (6 PhD; 14 Masters)*

Jie Cao, PhD Marine Sciences, University of Maine (R-10-02)  
Peter Hayes, PhD Ecology & Environmental Science, University of Maine (Sea Grant-NMFS Fellow)  
Wayne Slade, PhD Marine Sciences, University of Maine (R-10-06)  
Samuel Truesdell, PhD Marine Biology, University of Maine (Sea Grant-NMFS Fellow)  
Carl Wilson, PhD Marine Sciences, University of Maine (R-10-06)  
Yuying Zhang, PhD Marine Sciences, University of Maine (R-08-04)  
Jackie Bort, MPhil Human Ecology, College of the Atlantic  
Megan Clifford, MBA, University of Maine  
Erik DaSilva, MS Teaching, University of Maine  
Michael Dixon, JD, University of Maine School of Law  
Alexander Gray, MS Ecology & Environmental Science, University of Maine  
Anna Henry, MS Marine Science/MS Marine Policy, University of Maine (R-10-04)  
Robert Hogg, MS Ecology & Environmental Sciences, University of Maine (R-10-03)  
Margot Mansfield, MS Earth Sciences, University of Maine (R-10-01)  
Marius Mutel, MS Montpellier Universit  Polytechnique, France (visiting international scholar)  
Megan Palmer, MBA, University of Maine  
Nora Seitz, MS Communication, University of Maine  
Firas Eugen Taso, MS Urban and Environmental Policy and Planning, Tufts University (R-08-03)  
Ryan Theriault, MBA, University of Maine  
Cameron Thompson, MS Marine Science/MS Marine Policy, University of Maine (R-10-04)

*Undergraduate students supported (12)*

Abigail Andrews, BS Marine Sciences, University of Maine  
Nikkilee Carlton, University of Southern Maine  
Lou Fournier, Southern Maine Community College  
Sandra Goff, University of Southern Maine  
Thomas Leeuw, BS Marine Sciences, University of Maine  
Lauren Mac, University of Maine  
Megan Partridge, BS Ecology & Environmental Sciences, University of Maine  
Emily Probst, BS, University of North Carolina-Wilmington  
Zachary Siders, BS, University of North Carolina-Wilmington  
Hedda Steinhoff, University of Southern Maine  
Gabe Vachon, BS Ecology & Environmental Sciences, University of Maine  
Thea Youngs, University of Southern Maine

Program Management Accomplishments

**Sea Grant excelled in national review**

The NOAA National Sea Grant Office and the National Sea Grant Advisory Board completed a favorable review of the Maine Sea Grant College Program in June 2010. This two-day site review highlighted program connections with the University and our many stakeholders. The reviewers could find no problems with the program and made no substantive recommendations for improvement, a testament to the strength, relevance, and effectiveness of Maine Sea Grant. The program took advantage of this opportunity to bring important stakeholders to campus for the review and held a 30<sup>th</sup> anniversary celebration event one evening during the site visit.

### **Sea Grant works across campus boundaries**

Maine Sea Grant continues to connect with several departments and programs throughout the University of Maine, the University of Maine System, and other research and higher education institutions in Maine. In addition to the academic links already described, other new partnerships include the Sustainability Solutions Initiative, the DeepCwind Consortium, the University Research Council, Climate Change Institute, Aquaculture Research Institute, Department of Communications and Journalism, Center on Aging, Center for Research and Evaluation, and the Gulf of Maine Research Institute.

### **Sea Grant activities resulted in changes in legislation and policy**

A continuing strategic goal and measure of performance is the number of changes in legislation, policy, or rules, based on Sea Grant-supported research results or extension activities. The following policy actions and changes occurred in 2010:

- ❖ Northern Shrimp Management Plan, Atlantic States Marine Fisheries Commission
- ❖ ME LD 1601, An Act to Create the Lincolnville Sanitary District
- ❖ ME LD 1573, An Act To Improve Water Quality through the Phaseout of Overboard Discharges and the Improvement of the Boat Pump-out Laws
- ❖ ME local “ad-hoc” scallop committees adopted by the Maine Department of Marine Resources and Scallop Advisory Council to help engage fishermen in scallop management
- ❖ VA HB 2263, A Bill to amend the Code of Virginia relating to state and local tax, fee, and regulatory relief for the preservation of commercial fisheries
- ❖ US HR 4914, Coastal Jobs Creation Act of 2010

### Awards

Best Student Paper, New England Estuarine Research Society (K. Wilson)

Outstanding PhD Student Research, University of Maine (K. Wilson)

Best Graduate Student Paper, Eastern Section Society for Sedimentary Geology (K. Wilson)

Area-wide Project of the Year, Downeast Resource Conservation & Development (N. Springuel)

President’s Award, Sea Grant Association (P. Anderson)

### **Changes from Previous Year**

Major changes to the Maine Sea Grant management team in 2010 allowed for more stability in program oversight. These changes included hiring a part-time Assistant Director for Research (Dr. James McKenna of Maine Maritime Academy) and completing transition of the assistant director for outreach and education (Beth Bisson).

The most significant change confronted over this past year was the shift in leadership in Maine state government. Many state agencies are long-standing partners or clients of Sea Grant. Most of these partnerships continued, but at weaker levels of commitment, engagement, and support. These changes demanded patience and fortitude from the Marine Extension Team as they worked to maintain programs that serve Maine's coastal communities. At the institutional level, these changes provided the opportunity to reflect on Maine Sea Grant's roles and responsibilities in these types of partnerships. Similar dynamics are at play in the national political arena, which affects the nature and level of support from NOAA and the National Sea Grant Office, especially on strategic initiatives such as climate change adaptation.

## **Goals for Next Year**

### *Hazard Resiliency in Coastal Communities*

- As laid out in the five-year outreach plan: continue communications and education activities related to the *Building a Resilient Coast* DVD; publish peer-reviewed journal article on research findings; launch, promote, and evaluate the *Maine Property Owner's Guide to Flooding, Erosion, and other Coastal Hazards* website; implement state agency and legislative listening sessions on social science research findings; implement hazard mitigation demonstration projects workshops; co-lead the development and coordination of the Climate Change Adaptation Resource Providers network for the state.
- Continue working on partnership projects with the Sustainability Solutions Initiative at the University of Maine, providing community linkages for current problems.
- Continue working with fisheries and aquaculture stakeholders and others to understand issues related to ocean acidification and other climate-related changes in Maine's coastal waters. Assist with the development of community-based monitoring and engage the science community in these developments.
- Deliver and manage the "Signs of the Seasons" phenology program and expand its scope and purpose commensurate with available resources.
- Develop a partnership project with a coastal municipality on climate change adaptation and apply for competitive funds anticipated from the National Sea Grant Office in 2011.
- Maintain support for Maine Climate News, and identify a sustainable source of funding and secure editorial oversight.

- Coordinate the design, implementation, and evaluation of the 2011 Maine Beaches Conference, and track related outcomes.
- Continue to explore opportunities for partnerships that could lead to overall management of the Southern Maine Volunteer Beach Profile Monitoring Program by another agency or organization.

### *Sustainable Coastal Development*

- Assist with the community engagement and outreach related to the University's test site off Monhegan Island with focused workshops in the Midcoast area in spring and summer 2011.
- Continue to provide local support to researchers working on ocean-related energy projects including the ORPC tidal power project in Cobscook Bay, and the offshore wind energy test site at Monhegan.
- Launch and promote the Downeast Fisheries Trail.
- Forge mutually beneficial partnerships and conversations between fisheries and tourism industries.
- Present findings of working waterfront tax policy research to key stakeholders and facilitate action planning based on these results.
- Continue to enhance [www.accessingthemainecoast.com](http://www.accessingthemainecoast.com) with additional information on working waterfront tax policy, improved user tracking, and work with new applicants to adapt the resource for their state.
- Facilitate the formation of the National Working Waterfront Coalition through initial participation on the Research and Education working group.
- Implement the 2011 regional workforce housing charrette in partnership with the Workforce Housing Coalition of the Greater Seacoast.
- Work at the national level to advance the Sustainable Coastal Community Development agenda through the focus team and the national extension network.

### *Safe and Sustainable Seafood Supply*

- Continue to deliver and assess the Trade Adjustment Assistance (TAA) program for the lobster industry: deliver orientation meetings, develop a workshop curriculum, serve a coordinating function for colleagues in state and region, begin to deliver intensive workshops, work with Maine Lobstermen's Association on implementation of all the above.

- Pursue the integration of fisheries and aquaculture programs into the K-12 environment including the migration of the Oyster Gardening Program to the Damariscotta River Association, the development and delivery of aquaculture education programs for the third grade class of Great Salt Bay School, and work on mechanisms to extend this program to other schools.
- Continue several education and management-related programs on fisheries, including the annual Kennebec Celebration, Maine Scallop Advisory Council, and the national Safe and Sustainable Seafood Supply Focus Team through 2013.
- Work with Coastal Enterprises, Inc. to extend results of the “Energy in Fisheries” conference to users in Maine through targeted workshops and informational materials.
- Participate in extension role in the Sea Grant-funded Integrated Multi-trophic Aquaculture project led by Dr. Ian Bricknell, and work with the new aquaculture extension associate to investigate the challenges and opportunities with seaweed aquaculture and integrated multi-trophic aquaculture.
- Continue to expand and support innovative programming with coastal fishing communities including the Port Clyde Fresh Catch project, the Midcoast Maine Fishing Heritage Alliance, the Tenants Harbor trap density study, interlocal clam management efforts, and the Taunton Bay Pilot Project on ecosystem-based management.
- Publish article on sustainable seafood information in *Maine Policy Review*, and expand seafood-related communications efforts.

#### *Management and Program Sustainability*

- Provide staff training on time management and communications tools to help ensure the program is focusing on its strategic goals and maximizing program outcomes.
- Develop and reinforce guidance on effective and efficient extramurally-funded initiatives to take advantage of our administrative capacity and our niche, while maximizing the return on these transactional costs.

#### *Education and Workforce Development*

- Continue working with SERC Institute and Senator George J. Mitchell Center to expand curriculum and teacher participation, and strengthen data literacy aspects of the Acadia Learning Participatory Watershed Research project for high school and middle school teachers and students.
- Complete one additional curriculum unit for VitalVenture Watershed Education Curriculum.
- Develop and co-host summer teachers’ institutes for Acadia Learning and VitalVenture with partner organizations.

- Continue working with University of Maine Cooperative Extension and other Signs of the Seasons: A Maine Phenology Project partners to develop and implement phenology monitoring trainings, and accompanying K-12 education activities, educational seminars, and resource guides for volunteer monitors throughout Maine.
- Continue working with partners at the Darling Marine Center, Herring Gut Learning Center, Great Salt Bay School, in Damariscotta, and the Aquaculture Research Institute to formalize and expand the K-12 oyster gardening curriculum.
- Continue to support workforce development opportunities for Maine undergraduate and graduate students through the following activities: research and program development grants; recruiting applicants for NOAA fellowship and scholarship opportunities; supporting the Maine Sea Grant Undergraduate Scholarship in Marine Sciences and the new Maine Sea Grant Scholar program; making student summer and academic semester internship positions available; and supporting student involvement in Sea Grant-supported professional meetings, workshops, and conferences.

### **Challenges and Solutions**

As a publicly-funded entity, Maine Sea Grant will continue to strive to achieve increased societal impact through all elements of the program. Over the past year we have modified planning, management, and decision-making structures to encourage integration where possible between the program's research and outreach components. This approach requires support from the entire management team and a strong grounding in our strategic goals. Through this lens, we are working with Marine Extension Team staff through training and plan-of-work development to identify and encourage synergies with other programmatic investments and between team members. The overall management goal is to be as strategic as possible in meeting planned objectives, while maintaining a balanced capacity for responsiveness. Through adaptive management and regular communication we hope to prevent the common predicament of being "a mile wide and an inch deep." We are encouraged that our recent program evaluations have been very positive and our focus on this element of program success is proactive yet timely.

Maine Sea Grant has several initiatives that comingle under the heading of food security and sustainability. Primarily within the fisheries and aquaculture sectors, this interest and societal need is echoed with our partners at Cooperative Extension, and we plan to engage faculty experts in our efforts to inform and enable a more sustainable approach to marine aquaculture in Maine. Not only are healthy seafood options needed in the local, regional, and national marketplace, but the economic opportunities are huge for the production and processing sectors. We also are exploring some interesting linkages between seafood production and cultural heritage and nature-based tourism that can help Maine to become both a culinary destination and a source of high-quality products.

Since our program is sponsored both nationally and locally, we are always balancing our programming towards local needs and impact with the national priorities. Two Marine Extension Team members are formal members of two of the four national focus area teams, and this is providing the means to be closely involved with, and potentially affect, national goals and objectives. It is critical that the Maine Sea Grant College Program and the 32 Sea Grant programs across the nation interact and network effectively to continue to improve contributions to NOAA and to garner support from the US Congress.

### Long Term Priorities

1. An adaptive management style that is attentive to changing needs and priorities of Maine coastal communities that helps to maximize prosperity and long-term sustainability.
2. Expanded programming in the areas of sustainable seafood, coastal resiliency, and climate change adaptation.
3. Continued pursuit of a scientifically literate workforce by nurturing the opportunities to connect educators and students at all levels to coastal and ocean themes and applied challenges.
4. Sustainable funding that grows incrementally to meet both staffing and competitive granting needs of the Maine Sea Grant College Program.

Appendix A. NOAA National Sea Grant Performance Measures and Metrics

**Sea Grant sponsored/organized workshops, meetings, and conferences (# attending)**

*Events sponsored with program development funds (31 total; 2,955 attending)*

International Lobstermen's Exchange, 23 events total coastwide, 4-15 March 2010 (400)

Marine Mammal Stranding Conference, 6-9 May 2010, Bar Harbor, ME (75)

Kennebec Celebration, 12 June 2010, Augusta, ME (1,600)

Penobscot River Revival, 10 July 2010, Bangor, ME (500)

Sedgeunkedunk Stream Symposium & Celebration, 17-18 September 2010, Holden, ME (30)

Symposium on National Ocean Policy, 15-16 October 2010, Brunswick, ME (100)

And Then There Were None: The Rise and Fall of the Maine Sardine Industry, Penobscot Marine Museum Annual History Conference, 22-23 October 2010, Searsport, ME (50)

International Conference on Shellfish Restoration, 17-20 November 2010, Charleston, SC (200)

*Events facilitated/coordinated by Sea Grant staff (96 total; 3,788 total attending)*

Maine Healthy Beaches Program

Interagency Meetings, 10 in two communities (68)

Regional Beach Management Meetings, seven (7) in seven (7) communities (52)

Special Study/Problem Solving Meetings, 11 in seven (7) communities (104)

Field Trainings, 21 in 13 communities (182)

Laboratory Trainings, two in one community (8)

Maine Marine Invasive Species Working Group, quarterly, Portland, ME (10)

Signs of the Seasons: A Maine Phenology Project, 10 January 2010, Belfast, ME. (10)

Maine Solutions Community Forum, 9 February 2010, Gouldsboro, ME (23)

Rockweed Research Symposium, 10 February 2010, Orono, ME (34)

Shellfish Working Group, 17 February 2010, Walpole, ME (25)

Sustainability Solutions Initiative Municipal Official Interview, March 2010, Lincolnville, ME (2)

An Experimental Summer Shrimp Fishery, Maine Fishermen's Forum, 4-6 March 2010, Rockport, ME (30)

Changes in Scallop Management, Maine Fishermen's Forum, 4-6 March 2010, Rockport, ME (25)

Saving energy, saving money, satisfying buyers with sustainable practices, Maine Fishermen's Forum, 4-6 March 2010, Rockport, ME (50)

From Fisheries To Tourism, Maine Fishermen's Forum, 6 March 2010 (50)

Use of Upwellers in Cultured Shellfish, 11 March 2010, Belfast, ME (20)

Communicating Water Resources, Maine Water Conference, 17 March 2010 (30)

Marine Research that Matters: Maine Sea Grant Research Symposium, 22 March 2010, Orono, ME (54)

Frenchman Bay Stakeholders, 30 March 2010, Bar Harbor, ME (45)

Downeast Fisheries Trail, four (4) focus group meetings in four (4) communities, March-April 2010 (51)

Diadromous Species Restoration Research Network, research planning meeting, 1-2 April 2010, Orono, ME (23)

Sustainability Solutions Initiative Municipal Officials Focus Group Discussion, April 2010, Portland ME (11)

Marketing Cultured Shellfish, 8 April 2011, Portland, ME (55)

Midcoast Scallop Management, three (3) meetings, 27 April, 5 August, and 30 September 2010, Rockland, ME (24)

NOAA and Sea Grant Climate Exchange Training Program, 12 May 2010, Narragansett, RI (30)

Maine Sea Grant 30<sup>th</sup> Anniversary Celebration, 8 June 2010, Orono, ME (110)

Coastal Community Resilience Advisory Committee, 24 August 2010, Augusta, ME (12)

Coastal and Marine Ecosystem Research Collaborative, 8-10 September 2010, Portsmouth, NH (50)

Technology Transfer: Oyster Culture in New Brunswick, Canada, 13-17 September 2010, New Brunswick, Canada (4)

Salt of the Earth, 22 September 2010, Orono, ME (100)

Shrimp Gear and Management Meeting, 23 September 2010. Portland, ME (25)

Working Waterways and Waterfronts National Symposium on Water Access, 27-30 September 2010, Portland, ME (220)

USDA Trade Adjustment Assistance Registration Meetings, 7 total between October-December 2010, statewide (800)

Northern Maine Children's Water Festival, 12 October 2010, Orono, ME (700)

Maine Scallop Advisory Council, 18 October 2010, Ellsworth, ME (30)

Recent Developments in Size-Sorting Trawl Gear for Northern Shrimp in the Gulf of Maine, 5 November 2010, Portland, ME (25)

Energy in Fisheries Symposium, 14-17 November 2010, Seattle, WA (200)

Scallop Research Priorities, 18 November 2010, Machias, ME (15)

Climate Literacy Training Workshop in the New England Region: a Partnership between NOAA's North Atlantic Regional Team and the Sea Grant Network, 27 October 2010, Gloucester, MA (50)

Northeast Aquaculture Conference and Exposition, 3-4 December 2010, Plymouth, MA (240)

Offshore Wind Energy: Tools and Information for Coastal Stakeholders, 14 December 2010, Belfast, ME (160)

Bar Harbor Chamber of Commerce Annual Board Retreat, December 2010, Bar Harbor, ME (12)

Maine Beaches Conference Steering Committee, two (2) meetings, 17 December 2010 and 18 January 2011, South Portland, ME (19)

### **Education Metrics**

*Programs for children and families (11 total; 263 attending)*

Oyster Biology and Oyster Aquaculture, Great Salt Bay School, 18 March 2010, Damariscotta, ME (65); 20 January 2011 (65)

*Acadia Learning* at Old Town High School, Maine Department of Inland Fisheries and Wildlife, 10 May 2010, Bangor, ME (25)

Great Salt Bay School Oyster Gardening Field Trip, Darling Marine Center, 18 May 2010, Damariscotta, ME (30); 14 June 2010 (30)

Downeast Institute Field Day, 28 August 2010, Beals, ME (60)

Acadia B-WET Invertebrate Sampling in Kenduskeag Stream, Bangor High School, 6 October 2010, Bangor, ME (31)

Acadia B-WET Invertebrate Sampling in Sunkhaze National Wildlife Refuge, Old Town High School, 7 October 2010, Milford, ME (33)

Acadia B-WET Eel Sampling in Kenduskeag Stream, Bangor High School, 8 October 2010, Bangor, ME (33); John Bapst High School, 22 October 2010 (47)

VitalVenture Watershed Activity Sessions, Northern Maine Children's Water Festival, 12 October 2010, Orono, ME (85)

*Professional development sessions for educators (8 total; 53 total attending)*

Signs of the Seasons: A Maine Phenology Project Train-the-Trainer Session, 10 January 2011, Belfast, ME

Smelt Project, Perry Elementary School, Perry, ME

Oyster Gardening, Great Salt Bay School, 21 July 2010, Damariscotta, ME

Acadia Learning Eel Pilot Project Development Session, 1 March 2010

Smelt Project, Eastport High School, 28 May 2010, Eastport, ME

Southern Maine Volunteer Beach Profiling Training, Wells National Estuarine Research Reserve Teachers on the Estuary, 9 June 2010, Wells, ME

Acadia B-WET Teacher Workshop, Bangor High School, 8 November 2010 & 24 January 2011, Bangor, ME

Acadia B-WET Teacher Workshop, John Bapst High School, 16 December 2010, Bangor, ME