Massachusetts Bays National Estuary Program

Proposed Workplan
July 1, 2014 to June 30, 2015

June 17, 2014

The Massachusetts Bays National Estuary Program (MassBays) is pleased to submit this application for funding to implement our 2014 - 2015 Workplan. We look forward to another successful year, building on our accomplishments of the past year, including:

- Providing critical interagency coordination and recruited hundreds of volunteers to conduct surveys, monitoring, stormwater management, and outreach and education, leading to restoration and enhancement of more than 200 acres of estuarine habitat.
- Advancing the process to revise our Comprehensive Conservation and Management Plan, with a comprehensive literature review and one-on-one stakeholder interviews.
- Awarding $75,000 in grant dollars as technical assistance for research and planning programs that advance our strategic goals.
- Building on our baseline of $513,000 EPA §320 funding, securing $576,000 in matching resources and leveraging more than $1 million in additional resources.
- Expanding MassBays' Management Committee membership to include representation from industry and business.

Funding and technical support provided by EPA has been invaluable to this success. The 50 communities of our region, with their more than 1500 miles of coastline encompassing 47 embayments, consistently indicate their support and appreciation as well.

Thank you for your continued commitment to our work in the Massachusetts and Cape Cod Bays. Please do not hesitate to contact us if you have any comments, suggestions, or concerns regarding the workplan.

Sincerely,

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Acronyms and Abbreviations

APCC	Association to Preserve Cape Cod
CCMP	Comprehensive Conservation and Management Plan
CRC	Coastal Resources Committee (Barnstable County)
CSCR	Cohasset Center for Student Coastal Research
CZM	Office of Coastal Zone Management
DCR	Department of Conservation and Recreation
DEP	Department of Environmental Protection
DER	Division of Ecological Restoration
DFG	Department of Fish and Game
DMF	Division of Marine Fisheries
DOT	Department of Transportation
EEA	Executive Office of Energy & Environmental Affairs
EPA	Environmental Protection Agency
GMRTF	Great Marsh Revitalization Task Force
JRWA	Jones River Watershed Association
LID	Low Impact Development
MAPC	Metropolitan Area Planning Commission
MassBays	Massachusetts Bays Program
MET	Massachusetts Environmental Trust
MIT	Massachusetts Institute of Technology
MORIS	Massachusetts Ocean Resources Information System
MVPC	Merrimack Valley Planning Commission
MWRA	Massachusetts Water Resources Authority
NEP	National Estuary Program
NERACOOS	Northeast Association of Coastal and Ocean Observing Systems
NFWF	National Fish and Wildlife Foundation
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NPS	Non-point source pollution
NROC	Northeast Regional Ocean Council
NSRWA	North and South Rivers Watershed Association
RC	Regional Coordinator
RSP	Regional Service Provider
SSCW	Salem Sound Coastwatch
SWIM	Safer Waters In Massachusetts
TNC	The Nature Conservancy
UHI	Urban Harbors Institute
UNH	University of New Hampshire
USFWS	United States Fish & Wildlife Service
USGS	US Geological Survey

Contents

A. Summary

2013 - 2014 Progress

Over the past year, MassBays met its ambitious targets for habitat restoration with more than 200 acres restored, distributed more than $70,000 in grant funding to local research and planning efforts, and leveraged more than 50% of EPA's investment in the program. Our regional and Boston-based staff, interns, and Management Committee members have contributed to completion of Phase One of our CCMP revision, concurrent with efforts to develop monitoring, fiscal, and outreach plans that will be folded into that document. We await final word on two proposals for additional Federal funding, one to NOAA under the Coastal Zone Projects of Special Merit grant program, and another under the National Fish and Wildlife Federation's Hurricane Sandy grant program.

2014 - 2015 Goals

Completing revision of our CCMP is a primary goal for the first half of this fiscal year, and that product in turn will inform goals for the latter half of our workplan. Accordingly, we propose the following Program-wide goals and corresponding outcomes for this fiscal year:

1. *Advance estuarine restoration and protection*
   Regional Coordinators (RCs) will continue their work with municipalities and partners across the five MassBays regions, based on our 2009-2014 Strategic Plan. The program priorities are:

   EH: Protect and restore estuarine habitat
   SF: Expand temporal and spatial extend of open shellfish beds
   WQ: Improve estuarine water quality
   MI: Manage marine invasive species
   CC: Adapt for projected impacts of climate change

   MassBays central staff will connect these on-the-ground sub-regional efforts to initiatives at the regional, state, Gulf of Maine, Northeastern, and national scales, lending context for these activities and contributing to the broader state of knowledge and practice.

2. *Complete CCMP revision*
   The MassBays planning area will benefit from renewed priorities grounded in local needs, articulated in a way that facilitates outcomes measurement. This year, work on the CCMP revision will result in:

   - Complete, 5- to 8-year strategic action plan.
   - Region-wide monitoring plan.
   - Detailed communications and outreach plan.
   - Draft fiscal plan.

3. *Establish MassBays' "voice" in Massachusetts and the Northeast*
   While MassBays has a long history of accomplishments in Massachusetts Bay and Cape Bay, meetings with stakeholders over the past year reveals that many do not realize that MassBays and EPA's support bring about those successes. Over the next year, and especially with the completion of our new CCMP, we will take advantage of opportunities to highlight our work, both through our regional service providers (RSPs) and Boston-based initiatives. For example, we will:

   - Convene state agency representatives to highlight our priorities and identify partnerships and ongoing efforts that complement our work.
   - Contribute to existing Northeastern U.S./Gulf of Maine collaborations, through NROC, NERACOOS, and join NEP projects, among others.
   - Hold a State of the Bays Symposium.
   - Publish a 2014 Annual Report
   - Co-sponsor regional workshops and events

4. *Ensure effectiveness of the Research & Planning Grant Program*
   This year marks the fifth round of grant-making to municipalities and nonprofit organizations to advance MassBays priorities. With the revised CCMP in hand, we will be able to closely tie grant awards to our priorities. This anniversary also provides an opportunity to evaluate the program's effectiveness in leveraging resources to meet our objectives.

Staffing

Executive Director Pam DiBona is responsible for the overall management of the program, including administration of grants and contracts, including reports to EPA and other funders; staff supervision, including oversight of Regional Service Providers in line with contracts; and organizational development, including strategic planning through the CCMP update, work with the Management Committee to set priorities for the program, and developing partnerships that result in diversified funding for the program.

Staff Scientist Prassede Vella works half time with MassBays and half time with our host agency, CZM, as an Ocean Management Specialist. Ms. Vella is responsible for coordination of the Research and Planning Grant Program, staffs the Science and Technical Advisory Subcommittee to our Management Committee, and serves as technical expert for MassBays planning and reporting efforts.

Special Projects Coordinator Lisa Engler has primary responsibility for MassBays communications and outreach efforts, including weekly reports, newsletters and social media, website management, and staffing the Outreach Subcommittee to the Management. Ms. Engler also serves as Regional Coordinator (RC) for the Metro Boston Region, engaging a coalition of stakeholders around this complex sub-region. *Regional Service Providers* connect MassBays with our region's communities. Under grants from MassBays (awarded through a competitive bidding process), each RSP designates a Regional Coordinator, in turn responsible for identifying regional priorities consistent with the CCMP and the Strategic Plan, and developing strategies for implementing the annual Workplan at the local level. RSPs are hosted by regional planning agencies or nonprofit organizations. For FY2015, grants are being awarded to the following regional organizations:

- The Merrimack Valley Planning Commission: Upper North Shore Region
- Salem Sound Coastwatch: Lower North Shore Region
- The North and South Rivers Watershed Association: South Shore Region
- The Association to Preserve Cape Cod: Cape Cod Region.

Budget Overview

A detailed budget request and narrative are included in Section D; a summary is included here.

Massachusetts Bays National Estuary Program Proposed Expenditures and Confirmed Non-Federal Match		
Personnel (incl. Massachusetts STEP increase)		
Executive Director, 1.0FTE	$	88,275
Outreach/Boston Harbor Regional Coordinator, 0.8FTE	$	54,486
Staff Scientist, 0.5FTE	$	33,455
salaries	$	176,216
Fringe		
Fringe @ 28.86% (salaries)	$	50,856
subtotal, salaries & fringe	**$**	**227,072**
Travel (see detail, budget page 2)	$	4,396
subtotal, travel	**$**	**4,396**
Contractual - Subgrants		
Regional Service Providers	$	243,750
Research and Planning Grants	$	30,000
subtotal, subgrants	**$**	**273,750**
Other Expenses		
meeting supplies	$	1,500
shared agency expenses	$	4,000
subtotal, other expenses	**$**	**5,500**
Indirect		
Indirect Charges @ 15.48% (salaries)	**$**	**27,278**
Total Request, FFY15	**$**	**537,996**
Matching Funds		
Direct Match from RSPs	$	176,448
Direct Match from R&P Grant recipients	$	7,500
Direct Project Match	$	358,319
Total Match, FFY15		**$542,267**

B. Completed Major Projects/Activities

MassBays has many successes to report from the past year of grant funding. Major projects are summarized here.

Region-wide/Central Office Accomplishments

Literature review
MassBays contracted with the Urban Harbors Institute (UHI) of the University of Massachusetts Boston to conduct a review of papers, presentations, reports, and other relevant material produced from 1996

(the last CCMP) to present, to inform MassBays' CCMP revision. The review focused on five priority topics (water quality, invasive species, climate change/vulnerability, continuity of estuarine habitat, and estuarine habitat protection) in the 47 nearshore estuaries and embayments identified in the 2012 "Estuary Delineation and Assessment" prepared by Geosyntec Consultants.

UHI cataloged 539 resources, reviewed 270 of them, and for each of these prepared brief descriptions of the purpose, data used, findings, and recommendations. A *final memo* (and *DVD* containing electronic copies of all literature identified) was submitted in December 2013; it describes the methods used to identify and review the various resources, provides a *summary of the resources and findings* by topic (i.e., water quality, invasive species, climate change/vulnerability, continuity of estuarine habitat, and estuarine habitat protection), and offers observations and *recommendations* for MassBays CCMP priority-setting and action plans. These documents will be compiled in electronic format on the MassBays website and made available via an *interactive map viewer*. Outcomes include better-informed strategic action plans within the CCMP, as well as new availability of research and management documents for multiple audiences (natural resource managers, consultants, and permittees).

Stakeholder interviews
As part of our CCMP revision effort, MassBays intern Josh Wrigley conducted one-on-one interviews with 33 individuals from the Upper North Shore, Salem Sound, Metro Boston, South Shore, and the Cape Cod regions. The views expressed in the interviews are compiled in a *comprehensive memo*, and included a range of priorities, concerns, needs, ambitions, resource perspectives, ideas of progress, faults in the state system, environmental necessities, limitations of office, reference to area-specific duties, perspectives on constituent/mission conflicts, virtues and limitations of legal and state apparatuses, projections for the future, and overall descriptions of area environmental patterns. The primary outcomes are insights into local priorities regarding coastal natural resources and MassBays' role.

Inventory of ongoing and planned salt marsh and shellfish habitat restoration projects
MassBays intern Josh Wrigley compiled two inventories to support strategic action planning under our CCMP revision. The first is a *memo* that identifies successful urban shellfish restoration and aquaculture programs in the Northeast, and assesses their applicability to MassBays' region; the second is a *series of maps* locating restoration sites planned by DER and the Natural Resources Conservation Service in the MassBays region. With additional interpretation, this document will result in increased awareness of the potential for shellfish restoration in Massachusetts.

Funding proposal submissions
MassBays Executive Director wrote a proposal to NOAA under their Coastal Zone Projects of Special Merit Grant Program. The project has been *recommended for funding*; upon a final decision at NOAA, MassBays Special Projects Coordinator will play a primary role to select a contractor to locate and conduct field assessments of tide gates across the MassBays planning area. MassBays will recruit staff from CZM, DOT, and DER to serve as advisors, and Regional Coordinators will assist in ensuring that the assessment is robust and comprehensive.

MassBays played a significant role in developing a *joint proposal with Northeastern University* under NFWF's Hurricane Sandy grant program. If funded, the project will build on the tide gate inventory described above to develop model tide gate management protocols, develop and demonstrate remote alerts and electronic gate controls.

The primary outcome of these successful proposals is our ability to continue the Research and Planning Grant Program in light of federal budget cuts.

Research and Planning Grant program
Since 2011, MassBays has awarded more than $400,000 toward 22 projects investigating everything from specific local causes of coastal habitat degradation, to funding options for stormwater management, to testing new habitat restoration approaches. In 2013, we funded six projects; final reports are posted on our website (www.massbays.org).

- The Massachusetts Division of Marine Fisheries received $8,120 to study the shading impacts of small docks and piers on salt Marsh vegetation. Preliminary results from the dock matrix field study conducted in Marshfield, MA, indicate the need to maintain at least a 1:1 height to width ratio in order to minimize shading impacts. Further monitoring was recommended to apply a more rigorous test to existing guidelines. Permitting agencies including the U.S. Army Corps of Engineers are excited about the promising guidelines that will better inform the permitting system for such structures along Massachusetts waterways and that will serve to better protect vulnerable estuarine ecosystems.

- The University of New Hampshire was awarded $20,000 to test-transplant eelgrass at the most suitable sites in Plum Island Sound as identified by a site-suitability model. Results indicate that shoots transplanted in the summer did not survive whereas shoots transplanted in the fall are still thriving. Moreover, areas to the south of the Sound seemed more conducive to eelgrass survival. Multiple stressors including poor water clarity are thought to be the cause for these mixed results. Additionally, a hyper-abundant population of the invasive European green crab is thought to play a role in the degradation of transplanted shoots. The report concluded with recommendations to: (1) extend test-transplanting for a second year, focusing on more promising locations in Plum Island Sound as well as Essex Bay, and (2) develop a study of population structure of the European green crab to better inform eelgrass management in the future.

- Friends of Herring River, Wellfleet/Truro, Inc. received $20,000 to identify the conceptual level design for tide gates to be fitted in a proposed open span dike structure at the mouth of the Herring River as part of an extensive tidal restoration project, spanning over 1,000 acres of degraded estuarine habitat, making it the largest project of its kind in New England. As part of this design process, various options to provide the highest level of tidal control for the adaptive restoration approach were evaluated. The modeling defined the upper and lower bounds of various key physical parameters to develop a design which would allow any desired water level and salinity level combination in the adaptive management process, while minimizing the number (and thus cost) of required tidal gates. The selected conceptual design was then evaluated for a number of potential adaptive management scenarios to provide some preliminary guidance on restoration targets, including storm conditions and sea lever rise.

- Neponset River Watershed Association received $7,500.00 to develop an action plan and management recommendations to address the estuarine section of the Neponset River, evaluating water quality conditions and understanding the potential for short and long-term restoration initiatives. A comprehensive assessment of management programs in the area identified gaps and opportunities for restoration potential including water quality improvement, salt marsh restoration, conditional opening of commercial shellfish beds, reestablishment o historic anadromous fish runs, and eelgrass restoration. The study served to cultivate partnerships among organizations to maximize efficiencies in light of increasing funding constraints, which will be important for implementing management recommendations outline in the management plan.

- Cohasset Center for Student Coastal Research received $10,600.00 to study the incidence of anadromous fish in the Gulf River estuary and conduct water quality monitoring and substrate assessment. The information will help inform herring population restoration efforts and is linked to the Hunters Pond dam and fish weir restoration projects. Although no anadromous fish were observed in Hunters Pond during this survey, further monitoring is required to establish the presence of herring in this system. Preliminary results indicate that further studies are necessary to better understand the dynamics of the system and inform management actions to improve water quality, prevent the onset of eutrophic conditions, and rebuild a robust anadromous fish population.

- Provincetown Center for Coastal Studies was awarded $14,922.53 to characterize and quantify sediment flux within the littoral cells of Cape Cod Bay from the Truro-Wellfleet shoreline to Jeremy Point in order to gain an understanding of historic conditions and predict future changes

to the position, shape and extent of the shoreline. Combining the results of this work with that of studies conducted in 2012 and 2013 the team characterized the natural dynamics of this system and provided a quantitative assessment of sediment transport and sediment budget calculations for approximately 25 km (15.5 miles) of the Cape Cod Bay coast. These data can be used to reduce the vulnerability of communities and ecological systems to the impacts of a changing climate and rising sea levels.

Regional Major Completed Projects

The Major Completed Projects described below are transferable, model efforts from across the MassBays region. Additional completed projects are listed by region below these highlighted success stories. Note that Section 320 funds were applied to RC salaries to complete the projects; four Regional Service Providers (all except Metro Boston) received $61,000 over the course of the fiscal year to complete programs listed here and under "other completed projects," listed following.

Stony Brook salt marsh restoration
The Cape Cod RC submitted the *final monitoring report* for a major salt marsh and fish passage restoration project in Brewster. The project began in 2007 with a feasibility study funded by the Gulf of Maine Council and NOAA's Restoration Center. MassBays' RC was assistant project manager, playing a primary role in the effort.

Impacts of sea level rise on Cape Cod's aquifer
Partnering with the U.S. Geological Survey, Cape Cod Commission, Barnstable County Coastal Resources Committee, and The Nature Conservancy, the Cape Cod Regional Coordinator served as the primary host of the first of several workshops to examine the impacts of rising sea level on the region's groundwater and ponds, lakes and streams, which are fed by groundwater. The *first regional workshop* (broadcast live via the web; recording available at http://new.livestream.com/barnstablecounty/sealevelriseworkshop) was held May 29, 2014. Partner scientists presented USGS's approach to modeling the effects of sea level rise on the water table, stream baseflow, and the saltwater-freshwater interface below the Cape's surface.

Tack Factory Dam assessment, Third Herring Brook
The South Shore RC convened stakeholders, who have agreed that stream restoration and dam removal will improve habitat and water quality and quantity in the Third Herring Brook. With the RC playing a significant role, an *application for dam removal* was submitted to the Executive Office of Energy and Environmental Affairs in April 2014.

Climate change lecture series and workshops
Hosted by RSPs in Salem Sound, South Shore, and Cape Cod regions and their partners, public events exposed citizens across the MassBays region to information about climate change impacts and potential responses. All together, *more than 1200 community members were directly engaged* by MassBays-supported lectures and workshops, with MassBays RCs playing primary roles in facilitating the education and outreach.

Boston Harbor habitat coalition
The Metro Boston RC was the primary convener of a *coalition of 40 organizations* working on habitat issues in Boston Harbor and the Harbor Islands. Over the course of the past year the group contributed to priority setting for the CCMP update, and produced outreach materials highlighting the resources mapped on last year's habitat atlas.

Planning for climate change impacts on the North River
Recognizing that the City of Peabody's traditional pipe-oriented plan for stormwater management would not be effective in light of increased precipitation and sea level rise predictions for the North River, the Salem Sound RC initiated a series of conversations with and presentations to local and state elected officials. Due in large part to this intervention, the Mayor requested peer review of the engineering plan, and in their evaluation, the consulting engineers reported that the proposed plan indeed would not solve flooding problems over the longer term. A new plan is in the scoping stages.

Merrimack River estuary hydrodynamic modeling
The Upper North Shore RC played a primary role in convening partners to develop a comprehensive proposed research and restoration project to improve the marsh's health. If funded, the resulting *major grant proposal to NFWF* will bring $3 million to restore priority coastal habitats, assess hydrological infrastructure barriers and model hydrodynamic sediment transport to inform future implementation actions, and facilitate community risk reduction by working with coastal municipalities to develop roadmaps for near-term and long-term resiliency activities.

Danger on the Marsh documentary
The Upper North Shore RC, with funding from *a successful Kickstarter campaign*, played a significant role in producing a series of video documentaries about the impact of *Phragmites* on salt marsh health. To watch these videos, visit: http://goo.gl/P9DAxi

Other Completed Projects/Activities

Region-wide
- Finalized vision and mission statements for MassBays work, and began CCMP priority-setting.
- Quarterly Management Committee meetings, with at least 25 attendees each. Four new members, representing business, a state-wide nonprofit organization, and the state Department of Transportation joined the Committee.
- Re-established a Science and Technology Advisory Subcommittee to the Management Committee, staffed by the Staff Scientist.

Cape Cod region
- Two public-information videos to increase awareness of wastewater management needs.
- Critical habitat (e.g., a sea-level fen (the first in Massachusetts), frost-bottom community, black gum swamp, forest seep community, sandplain grassland, coastal plain pondshore) mapping completed for Upper and Mid-Cape.
- Fish ladder restored at Santuit Pond.
- Second annual Cape Cod Coastal Conference re: coastal water quality and adaptation to climate change and sea level rise.
- Convened group of stormwater managers to explore forming a Cape Cod Stormwater Managers Group to act as a forum for technical assistance and information sharing.
- Monitored annual herring migration at six runs in Cape Cod Bay.

South Shore region
- Monitored horseshoe crab populations for seventh consecutive year in Duxbury.
- Monitored for marine invasive species with volunteers at seven locations.
- Submitted grant proposal to the NFWF Coastal Resiliency funding opportunity to fund the feasibility and design of two dam removals on the South River.

Metro Boston region
- Engaged Metro Boston partners in two Boston Harbor Habitat Coalition meetings to discuss and plan for the protection and restoration of the natural resources in Boston Harbor.

Salem Sound region
- Monitored for marine invasive species with volunteers at eight locations.
- Planned and held series of four lectures about Salem Sound. Topics included winter waterfowl, history of the seafloor, climate change impacts on fisheries, and local shellfish trends.
- Performed vegetation monitoring at potential salt marsh restoration site.

Upper North Shore region

- Partnered with regional and local organizations to hold Great Marsh Sea Level Rise Symposium.
- Submitted grant proposal to the Department of Interior National Fish and Wildlife Federation Coastal Resiliency funding opportunity with local and regional partners to protect the Great Marsh ecosystem through dune, eelgrass, and salt marsh restoration.
- Monitored for marine invasive species with volunteers at seven locations.

Publications and Presentations

Region-wide/State/National dissemination

- *Annual Report:* An overview of accomplishments in 2013, presented in concise and engaging language, will be released in electronic version in June 2014. Sections provide insights into MassBays work, from monitoring to outreach and communications; fiscal reporting is included.

- *Fact sheets:* Produced about MassBays subregions, highlighting connections to region-wide goals; the importance of eelgrass and conservation moorings as a means for protecting that habitat; the Research and Planning Grant program.

- *Research and Planning Grant web pages:* All grants awarded, with the grant amount, goals, and outcomes, are now available on the MassBays website. By June 30, a Google map of funded projects, with links to those pages, will be uploaded as well.

- Mass Bays e-Newsletter, delivered September 2013, November 2013, March 2014, May 2014.

- "Avoiding and Minimizing Impacts to Eelgrass through the Use of Low-Impact Floats and Moorings" Fact Sheet. March 2014.

- "Avoiding and Minimizing Impacts to Eelgrass through the Use of Low-Impact Floats and Moorings" Presenter: Lisa Engler, MassBays with Tay Evans from the MA Division of Marine Fisheries and Kristin Uiterwyk from the Urban Harbors Institute at the Massachusetts Association of Conservation Commissions Annual Conference. March 2014.

Cape Cod Region

- "Stony Brook Salt Marsh and Fish Passage Restoration Project, Brewster, Massachusetts." Annual Monitoring Report for 2013. Submitted to the Town of Brewster by Jo Ann Muramoto and Tara Nye December 2013.

- "Evaluation of environmental effects of the Pilgrim Nuclear Power Facility" March 2014. Memo prepared for the Board of Directors, Association to Preserve Cape Cod.

- Produced video entitled "Saving Paradise: Cape Cod's Water at Risk". Video on the need for clean water and wastewater management. 2013.

- Produced video entitled "Saving Paradise: Oysters for Water" on the pros and cons of using shellfish aquaculture for wastewater management. June 5, 2014.

- Hosted workshop entitled "Effects of Sea Level Rise on Cape Cod's Groundwater System" May 29, 2014. Barnstable MA.

- Hosted workshop entitled "Environmental Summit, Cape Cod" June 5, 2014. Cape Cod Community College, West Barnstable MA.

- Moderated conference session entitled, "It's Not All About Wastewater: Managing Stormwater with Green Infrastructure". Second Annual Cape Coastal Conference, June 5-6, 2014. Cape Cod Community College, West Barnstable MA.

- Hosted workshop entitled, “Using Conservation Moorings and Stormwater Management to Improve Water Quality” August 15, 2013. Falmouth, MA.

South Shore Region

- “A 'Summer Student Academy' Approach to Data Collection” May 3, 2014.
- New England Estuarine Research Society Spring Meeting, Salem, MA.
- “From Headwaters to Harbor – Restoration and Research in the Gulf River” January 16, 2014. Cohasset Center for Student Coastal Research Lecture Series, Cohasset, MA.
- “Balancing the needs of water and people in Scituate”, presentation at Scituate Conservation Commission meeting, April 16, 2014.
- “Ecology and Restoration of River Herring” October 9, 2013. Gulf River Watershed Association Annual Meeting, Cohasset, MA.
- "Watersheds and Water Quality", presentations at Notre Dame Academy, Hingham, MA, October 17, 2013 and February 28, 2014.
- “Watersheds and Water Quality” April 11, 2014. Massasoit Community College Sustainability Task Force Second Fridays Lecture Series, Brockton, MA.
- “Balancing the needs of water and people: Scituate's Story” September 27, 2013. Metropolitan Area Planning Council South Shore Coalition "Walk and Talk", Scituate, MA.
- “North and South Rivers Herring Counts” presentation at volunteer appreciation party, July 11, 2013.
- Analysis of Summer Water Use and Irrigation Restriction Effectiveness in Scituate. July 2013. Author: Dr. Sara Grady, South Shore Regional Coordinator for the Massachusetts Bays Program.

Salem Sound Region

- “Good Harbor Marsh Walk and Talk” September 14, 2013 for Friends of Good Harbor, Gloucester MA.
- “Salt Marsh Walk and Talk” September 28, 2013 for Essex National Heritage Commission’s Trails and Sails, Old Creek marsh, Salem, MA.
- "Flooding in Peabody: Causes and Solutions" October 24, 2013. North Shore Sigma Xi Chapter, Gordon College, Wenham MA.
- “Oceans and Climate Change” September 24, 2013. "Climate Change in New England" - a 5-part lecture series co-sponsored by Salem Sound Coastwatch and National Park Service, Salem Maritime National Historic Park.
- “Oceans and Climate Change” presentation repeated for Maritime Gloucester, March 6, 2014 and March 21, 2014 for Salem State University Explorers Life-long Learners.
- “Adopt a Beach Training” November 25, 2013 at Salem State University; May 22 at Beverly Farms Library and May 27 at the Marblehead Charter School.
- “Shellfish, Shellfish Everywhere and Not a Clam to Eat” lecture presentation, April 28, 2014, Salem Sound Coastwatch and Marblehead Abbot Library lecture series “Underwater in Salem Sound”

- "Considerations for Successful Citizen Science Programs" May 3, 2014. New England Estuarine Research Society Spring Meeting, Salem, MA.

- "Marine Invasive Species: up close and personal" May 15, 2014. Winter Island, Salem MA.

Upper North Shore Region

- "Upper Great Marsh *Phragmites australis* Mapping and Control" December 2013, MA marine Fisheries In-Lieu of Fee Grant (report)

- "Creating the Basis for A Successful Eelgrass Restoration in the Great Marsh: The Green Crab Component" April 14, 2014 (presentation)

- "Community Risk Reduction through Comprehensive Community Resiliency Enhancement for the Great Marsh Ecosystem" March 3, 2014, January, January 6, 2014 (presentation)

- Danger in the Reeds (video), March 2014

Travel expenditures, July 1, 2013 - June 30, 2014

Date(s) of Travel	Person Traveling	Location	Purpose of Travel	Amount
7/11/13	Executive Director (ED)	Revere MA	Section 319 Review Committee	$3.60
7/16/13	ED	Georges Island	CZM off-site staff meeting	$15.00
9/12/13	ED, Outreach Coordinator/ Metro Boston RC	East Boston	RC meeting attendance	$6.65
9/16/13	Staff Scientist	Wellfleet	Research and Planning Grant project – site visit	$68.40
10/9/13	Outreach Coordinator/ Metro Boston RC	Essex	Eelgrass monitoring	$24.80
10/17/13	ED	Harwich	RSP (APCC) Annual Meeting	$77.40
10/23/13	ED, Outreach Coordinator/ Metro Boston RC	Falmouth	Regional Ocean Education meeting at WBNERR	$63.00
10/25/13	ED	Newburyport	Meeting with Gulf of Maine NEP Directors; site visit	$43.20
11/1/13	ED	Norwell	RSP (NSRWA) Annual Meeting	$21.15
11/14/13	Outreach Coordinator/ Metro Boston RC	Ipswich	Great Marsh Symposium	$30.15
12/4/13	Outreach Coordinator/ Metro Boston RC	Hingham	Weir River Watershed Association Annual Meeting	$17.10
12/15/13-12/16/13	Outreach Coordinator/ Metro Boston RC	Orono, ME	Maine SeaGrant Green Crab Summit	$428.62
1/15/14	ED	Newburyport	Meeting with Gulf of Maine NEP Directors; site visit	$43.20
2/4/14	ED	Barnstable	Cape Cod RSP (APCC) meeting	$63.45
2/6/14	ED	Petersham	EEA Land Trust Retreat	$63.50

Date(s) of Travel	Person Traveling	Location	Purpose of Travel	Amount
2/6/14	Outreach Coordinator/ Metro Boston RC	Nahant	Dorothy Cove – site visit with UNH and EPA	$12.15
2/11/14	ED	Norwell	South Shore RSP (NSRWA) meeting	$21.15
2/14/14	ED	Salem	Upper North Shore and Salem Sound RSPs meetings	$30.60
2/18/14 – 2/22/14	ED	Charleston, SC	Social Coastal Forum	$1194.69
2/25/14 – 2/27/14	ED	Washington DC	ANEP National Meeting	$1115.84
3/7/14	ED	Newburyport	Meeting with Mass Audubon; site visit (Manchester, MA)	$46.35
3/12/14	Outreach Coordinator/ Metro Boston RC	Hingham	Weir River Forum – Water Use	$14.40
3/13/14	ED	Barnstable	Barnstable County Coastal Resources Commission meeting	$63.45
3/25/14	ED	Gloucester	Meeting with CZM North Shore Regional Coordinator	$34.20
4/9/14	ED	Gloucester	Great Marsh site visit; meeting with Gloucester Planning Dept.	$47.25
4/22/14	ED, Outreach Coordinator/ Metro Boston RC, Staff Scientist	Essex	Essex eelgrass planting and Gloucester site visit	$34.65
6/5/14	ED	Barnstable	Cape Cod Coastal Conference	$60.75
6/5/14	Outreach Coordinator/ Metro Boston RC	Canton	Meeting with Neponset River Watershed Association	$16.20
6/10/14	Outreach Coordinator/ Metro Boston RC	Rye, NH	Green Crab monitoring training	$53.10
6/13/14	ED	Portland, ME	Gulf of Maine NEPs meeting	$97.65
6/13/14	Staff Scientist	Duxbury	Horseshoe crab monitoring	$33.30
6/18/14	Outreach Coordinator/ Metro Boston RC	Essex	Essex eelgrass planting	$31.05
6/25/14	Outreach Coordinator/ Metro Boston RC	Duxbury	Horseshoe crab monitoring	$33.30
			Total	**$4,040.25**

C. New and Ongoing Projects

New and ongoing projects are categorized according to priorities identified in the Strategic Plan:

i. Protect and restore estuarine habitat (EH)
ii. Expand temporal and spatial extend of open shellfish beds (SF)
iii. Improve estuarine water quality (WQ)
iv. Manage marine invasive species (MIS)
v. Adapt for projected impacts of climate change (CC)

Region-wide, Cross-cutting Projects

Revise CCMP (Ongoing)
§320 funds: $40,000 (salaries & fringe)
Project Match: $8000 (in-kind)

MassBays enters its second year of work to revise our CCMP. Our objective is to complete the document by the end of this grant period. To do this, we will develop action plans to reach goals and objectives set by our Management Committee and informed by groundwork completed this year (see above). Partners will include representatives from state agencies and larger nonprofits that share our vision, who can help MassBays determine the best role for our program in ongoing efforts.

Milestones: confirmed priorities (summer 2014), meeting with agencies to scope out MassBays role (fall 2014), draft action plans for each priority (winter 2014), meetings with Management Committee subcommittees to draft monitoring and communications plans (winter 2015), Management Committee endorsement (spring 2015)
Deliverables: Completed CCMP including strategic action plans for each focus area, new partnerships for joint funding proposals, and frameworks for strategic fiscal, monitoring, and communications plans.
Long-term outcomes: improved coordination and significant advances toward MassBays vision and long-term goals.
CWA core area: Protecting coastal waters through the National Estuary Program

State of the Bays Symposium (New)
§320 funds: $20,000 (salaries & fringe), $1500 (supplies)

MassBays has traditionally published a State of the Bays report every five years; the next is due in 2015. Rather than another publication to follow on the heels of the CCMP, however, we propose a Symposium, at which we can present the new CCMP and invite speakers from multiple partners to present their data regarding the condition of Massachusetts Bay and Cape Cod Bay. RSPs will contribute region-specific data, e.g., Lower North Shore RC will present information on water quality trends in Salem Sound; the Upper North Shore RC will prepare a trends analysis of the extent of invasive *Phragmites* and pepperweed in the Great Marsh.

Milestones: date and location secured (July 2014); format and speakers identified (August 2014), finalized (October 2014); announcement published (November 2014)
Deliverables: A one-day symposium for 120 attendees in metropolitan Boston; agenda, handouts and other supplemental materials; synopsis of the event posted on the MassBays website.
Long-term outcomes: Shared understanding and cross-sector collaboration to promote the health of the Bays.
CWA core area: Protecting coastal waters through the National Estuary Program

Tide gate inventory (New)
§320 funds: $0
§309 funds: $148,000

MassBays and CZM applied for funding under NOAA's 2014 Projects of Special Merit Competition to conduct an inventory of tide gates within the 47 coastal embayments of

Massachusetts and Cape Cod Bays. Poorly managed, mismanaged, and abandoned tide gates adversely affect coastal ecosystems' ability to buffer coastal infrastructure and development from sea level rise and storm surge impacts. The project brings CZM, MassBays, and other state agency partners together with local infrastructure managers and other stakeholders to gain on-the-ground knowledge of these legacy structures to initiate, inform, and prioritize management for ecological benefit and hazard mitigation in the face of sea level rise projections, ongoing floodplain encroachment, and aging infrastructure.

Milestones: detailed in our proposal to NOAA, including: contractor scope of work determined (August 2014), grant award papers signed and advisory committee convened (October 2014), RFR posted (November 2014), field protocol and metadata parameters finalized (June 2015)
Deliverables: list of advisors; scope of work, database, and protocol to produce a map/inventory of tide gates in MassBays planning area including ownership and photo and narrative documentation of gate type, condition, and surrounding natural habitat and infrastructure.
Long-term outcomes: Increase in active, informed tide gate management that takes into account surrounding natural resources, abutting development, and rising sea levels.
CWA core area: Protecting wetlands

National Coastal Condition Assessment 2015 (New); Regional monitoring plan
§320 funds: $4,000 salaries & fringe
§106 funds: $156,000
Project Match (in-kind): $5000

MassBays will coordinate the National Coastal Condition Assessment for Massachusetts. Working closely with EPA, over the next few months MassBays will be finalizing the exact location of 52 sampling stations in Massachusetts state waters for water quality, sediment, and fish tissue sample collection. Data collected will not only be in line with and provide information for the NCCA program, but will also help frame monitoring efforts under our new CCMP. The Management Committee's Science and Technical Advisory Subcommittee will play a vital role in the development and coordination of this program, providing expert advice to ensure that the program is beneficial to MassBays goals as well as the requirements of the national coastal program. Over the summer of 2014, MassBays will publish an RFR to secure the services of a contractor who will be responsible for the collection of water and sediment samples and the preparation and delivery of samples to EPA for distribution to relevant laboratories for analyses. Probably during late fall, MassBays will participate alongside the contractor in QA/QC and field sampling training courses conducted by EPA. DMF will collect fish tissue samples, providing some in-kind services. Collection of all samples will take place during the summer of 2015.

In parallel, MassBays will develop a bays-wide monitoring plan that links to both local and regional monitoring efforts. MassBays will continue to collaborate with the Northeast Sentinel Monitoring Program, Northeast Coastal Acidification Network, and Gulf of Maine NEPs to connect MassBays to the larger region. As a demonstration for nested subregion-scale monitoring, the Lower North Shore RC will work with MassBays' staff scientist and local and subregional partners to identify data gaps, determine monitoring parameters, and develop a 5-year Marine Monitoring Plan.

Milestones: NCCA sampling locations finalized with EPA ORD (October 2014), NCCA scope of work and RFR posted (January 2015), MassBays and Lower North Shore monitoring plans drafted for review by advisors (May 2015)
Deliverables: Map of MassBays-EPA determined sampling locations, subcontract for conducting water quality sampling, interagency service agreement to conduct fish tissue sampling, and attendance at EPA training workshop; 5-year monitoring plans for MassBays and Lower North Shore with associated cost estimates and funding plans.
Long-term outcomes: More-frequent, long-term water quality and fish tissue monitoring in MassBays, in the larger national and regional context.
CWA core area: identifying polluted waters and developing plans to restore them

Handbook on Green Infrastructure for Stormwater Treatment (Ongoing)
§320 funds: $4000 (salaries & fringe)

EPA contractor TetraTech is developing, with MassBays input, a handbook for municipal officials about implementing green infrastructure to treat stormwater prior to its entering coastal habitats.

Milestones: detailed in scope of work with TetraTech; hold train-the-trainers workshop and handbook review session (July 2014), host regional training workshops (September 2014)
Deliverables: A handbook for distribution throughout the MassBays region, and beyond; at least three training workshops for the intended audience.
Long-term outcomes: New initiatives in MassBays communities to implement green infrastructure stormwater management options, facilitated and guided by MassBays RCs.
CWA core area: addressing diffuse, nonpoint sources of pollution

Greenscapes (Ongoing)
§320 funds: $6000 (RC salaries & fringe)
Project match: $28,800 (cash)

Under agreement with 15 to 20 municipalities in the Upper and Lower North Shore subject to Phase II Stormwater Permit, MassBays RSPs Merrimack Valley Planning Commission and Salem Sound Coastwatch, in partnership with the Ipswich River Watershed Association and Safer Waters in Massachusetts, formed the Greenscapes North Shore Coalition. Conducting the public outreach portion of the Phase II permits, the Coalition will conduct public education to increase awareness of the importance of reducing stormwater through infiltration, LID, and environmentally friendly landscaping.

Milestones: schedule of outreach efforts (September 2014), timely Greenscapes Coalition meetings for cross-region planning (ongoing)
Deliverables: Greenscapes website and Greenscapes outreach and brochure/mailing insert(s) for distribution by municipalities; hands-on stormwater education program to member community elementary schools.
Long-term outcomes: Reduced nonpoint source pollution, increased adoption of low-impact behavior and construction.
CWA core area: addressing diffuse, nonpoint sources of pollution

Research and Planning Grants (New)

- *Grant Program Evaluation*
  §320 funds: $1000 (Staff Scientist salary & fringe)

  With the fifth round of grant-making to municipalities and nonprofit organizations approaching, MassBays will conduct an informal, qualitative evaluation of the program's effectiveness in leveraging resources to meet our objectives.

  Milestones: survey of past grantees (October 2014), summary of accomplishments (December 2014), revision and announcement of RFR (January 2015)
  Deliverables: report on outcomes from previous years of grants; revised RFR and announcement; list of successful applicants, project titles, and funding requests.
  Long-term outcomes: progress on CCMP priorities and action plans
  CWA core area: Protecting coastal waters through the National Estuary Program

MassBays distributed $74, 980 §320 funds to six new projects to be completed by the close of calendar year 2014. Deliverables and milestones are specified in contracted scopes of work for each project. The grant recipients, projects descriptions and anticipated outcomes, and committed match are:

- *MA Division of Marine Fisheries*: *Environmental Impacts of Docks and Piers on Salt Marsh Vegetation Across Massachusetts Estuaries – A Quantitative Field Survey Approach*
  §320 funds: $15,500
  Project Match: $5,704 (27%)

  Proliferation of small docks and piers in salt marsh habitats poses potential cumulative impacts on this ecosystem through shading and displacement of marsh vegetation. In 2013 with funds from the MassBays Research and Planning Grant Program, a study was initiated to provide information on dock shading effects and test existing guidelines. Preliminary results provide cautious support for the current guidelines and further monitoring is recommended for more rigorous testing (2 more years). Building on this effort, the proposed project will involve sampling of vegetation under existing docks and piers across the MassBays planning area. Together with the ongoing dock matrix study conducted in the Town of Marshfield in 2013 results will be used to assess the effectiveness of existing regulations and serve to inform potential revisions to refine construction standards.

- *Friends of Herring River, Wellfleet/Truro*: *Site Reconnaissance, Survey and Development of Conceptual Design Option for Fish Passage Restoration, Upper Herring River Watershed, Wellfleet*
  §320 funds: $20,000
  Project Match: $10,000 (33%)

  The Herring River Restoration Project strives to restore more than 1,000 acres of degraded estuarine habitat from various alterations to the river's natural hydrology during the last century. Rigorous hydrologic modeling and ecological analyses show that this will restore tidal hydrology and salinity to the majority of the historic estuary, greatly improving wildlife habitat conditions and fish access in the lower estuary. However, the project does not address impaired fish passage in the upper watershed and populations have declined drastically. This project will involve preliminary evaluation of two existing undersized culverts, and recommendations for replacement culvert design based on criteria presented in the Massachusetts River and Stream Crossing Standards (DER) to improve passage of river herring, American eel and other fish.

- *Town of Essex: Building a Resilient Eelgrass Population in the Waters of the Great Marsh ACEC*
  §320 funds: $20,000
  Project Match: $6,550 (25%)

  The importance of eelgrass beds is at the forefront of management initiatives in Massachusetts and recent efforts have been initiated to restore this vital habitat. The Great Marsh Area of Critical Environmental Concern (ACEC) includes Plum Island Sound and Essex Bay which historically harbored lush, thriving eelgrass beds that were wiped out in the mid-1900s. With funding from the MassBays Research and Planning Grant Program in 2012, a site suitability model was developed and identified areas in the Sound suitable for re-establishment of eelgrass. Test-transplanting in 2013 resulted in low success rates attributed to a variety of stressors leading to recommendations to continue the efforts for a second year in the southern part of the Sound and to expand into Essex Bay where a new self-established bed, the first in the ACEC in over 75 years, has been identified. This project will also strive to work with local fishermen to address the impacts of a hyper-abundant green crab population in the area that may jeopardize restoration initiatives. Efforts are underway to identify the best strategies to minimize the threat posed by green crab predation and to address the stressors identified through the 2013 work and bring a thriving eelgrass population back to the waters of the Great Marsh ACEC.

- *Jones River Watershed Association: Integrating New Technologies into a Cost-effective, Community-based Method for Monitoring Salt Marshes in a Changing Climate*
  §320 funds: $19,480
  Project Match: $10,420 (35%)

  Following intensive storm episodes over the last few years, increased erosion, subsidence and overall deterioration of the salt marsh along the Jones River and Kingston Bay have been observed. There is a need to assess the causes and rates of erosion and identify potential and remediation activities that may be implemented. With funding from the MassBays Research and Planning Grant Program the proponents will partner with MIT Sea Grant, UMass Boston, and the North and South Rivers Watershed Association to monitor geological, biological, and chemical

conditions in local salt marshes using a combination of remote sensing and traditional on-the-ground techniques. In particular the team will focus on issues such as sea level rise, regional salt marsh dieback and invasive species. Building on work previously conducted in the North and South Rivers, the team will assess long-term changes in salt marsh systems in the North River and South River as well as start collecting similar data in the Jones River. This will help improve understanding of coastal processes taking place in salt marshes, and develop and implement policies/projects to address habitat degradation, and promote salt marsh migration and restoration efforts.

Region- and topic-specific projects

The projects below will be funded with up to $61,000 per region, primarily for salaries (see Regional Service Provider budgets, Section D).

Priority EH: Protect, restore and enhance estuarine habitat to help rebuild coastal ecosystems and threatened populations.

Task EH1. Salt marsh restoration and protection. (Ongoing)

RCs in all sub-regions will assist towns, state and federal restoration agencies, and other organizations with project development, management, monitoring, outreach and/or other services needed to implement salt marsh restoration projects, for example project development, coordination, and management.

- On Cape Cod, the RC will work with partners to identify, evaluate and prioritize salt marsh restoration projects to seek funding for implementation; activities to include meetings with partners to identify projects, conducting site visits, developing project descriptions, ranking and prioritizing projects, updating restoration plans, providing outreach to promote funding and restoration.
- The Metro Boston RC will work specifically on restoring the degraded 4 acre Key Marsh salt marsh in Revere, supporting associated outreach efforts including interaction with the neighborhood, planning informative walks and developing flyers/signage.
- Specific projects in the Lower North Shore region include monitoring at Good Harbor Marsh (Gloucester) and Juniper Cove (Salem).
- As timing and opportunity converge, the Upper North Shore RC will assist with Town Creek restoration, Larkin Mill Dam removal, Castle Neck Creek restoration, Ipswich River dam removals, marsh runnel modification in the Great Marsh, and any other coastal marsh restoration projects identified in the Great Marsh Coastal Wetlands Restoration Plan.
- The South Shore RC will provide technical support for permitting and final design of the Hunters Pond Dam removal, including coordinating local monitoring and data collection as needed, part of a larger Tidmarsh Farm (Plymouth) project that will restore cranberry bogs and natural wetland systems.

Partners: DER, USFWS, NOAA, CZM, regional nonprofits, local municipalities
Deliverables: Project-dependent; may include grant applications, reports, monitoring reports, outreach materials or other. Photo documentation of monitoring work. Inventory of potential projects, with description and priority ranking for Cape Cod region. Draft citizen science protocol to monitor long-term impacts of climate change on salt marshes.
Long-term outcomes: More salt marsh is restored and protected, expanding storm protection, flood impact dampening, and habitat functions provided by salt marshes
CWA core program area(s): protecting wetlands; protecting coastal waters through the National Estuary Program

Task EH2. Anadromous and diadromous fish habitat restoration and protection. (Ongoing)

RCs will continue to support restoration and protection of anadromous and diadromous fish habitat by assisting partners with restoration, coordination, obtaining resources and monitoring and other assistance as requested. Cape Cod and South Shore RSPs will partner with the Herring Warden Network to recruit and train volunteers for herring counts, and provide data to DMF. On Cape Cod, the RSP will work with partners to identify, evaluate and prioritize fish run restoration

projects in order to seek funding for implementation. In the South Shore region, specific projects include First Herring Brook (Scituate) restoration to improve flow and modify existing fish ladders, South River (Marshfield and Duxbury) to remove dams and improve management of existing fish ladders, and partnering with the Jones River Watershed Association to improve habitat and fish passage in the Jones River, Herring Brook, and Taunton River through a modeling effort to inform the City of Brockton's management of Silver Lake.

Partners: DMF, NOAA, USGS, NOAA, Herring Warden Network, local municipalities, regional nonprofits
Deliverables: Volunteer training sessions for fish counts and use of fish run software, workshop or other presentation, fish count data management, data summaries, proposals or other services as needed to advance restoration. Cape Cod inventory of potential projects, with description and priority ranking. South Shore progress reports on site-specific projects.
Long-term outcomes: More fish habitat is restored and protected, with progress evaluated using fish monitoring data as applicable.
CWA core program area(s): protecting wetlands; protecting coastal waters through the National Estuary Program

Task EH3. Eelgrass bed restoration and protection

RCs in the North Shore regions will work to replace/restore eelgrass beds through planting, and protect existing beds by promoting conservation moorings as a viable alternative to traditional moorings.

Partners: volunteers, municipalities, University of New Hampshire, DMF, harbormasters, local and regional nonprofits
Deliverables: Report on outcomes of restoration efforts, outreach materials and presentations, number of traditional moorings replaced.
Long-term outcomes: increased awareness and application of conservation moorings, recovery of already-impacted eelgrass beds.
CWA core program area(s): protecting wetlands; protecting coastal waters through the National Estuary Program

Task EH4: Third Herring Brook Restoration (Hanover and Norwell). (Ongoing)

To improve habitat and water quality and quantity in the Third Herring Brook through stream restoration and dam removal, the South Shore RSP will work with partners to facilitate the removal of the Mill Pond Dam and final design and permitting of the removal of the Tack Factory Pond Dam, and provide community education on the project. NSRWA will also monitor vegetation, including purple loosestrife, at the former Mill Pond impoundment site and release and monitor *Galerucella* loosestrife beetle. NSRWA will also continue to monitor instream flow in Third Herring Brook through the RIFLS program to evaluate any impacts from water withdrawals

Partners: municipalities, DER, South Shore YMCA, Cardinal Cushing Centers, NOAA
Deliverables: Newsletter article on Mill Pond Dam removal, photo documentation of *Galerucella* beetle "ranching," submission of proposal to fund removal of Tack Factory Dam
Long-term outcomes: improved water quality and quantity in Third Herring Brook to support natural systems.
CWA core program area(s): protecting wetlands; protecting coastal waters through the National Estuary Program

Task EH8: Marine Benthic Invertebrate Monitoring (Ongoing)

Contributing to the Atlantic States Marine Fisheries Commission's understanding of the effectiveness of horseshoe crab fishery regulations in protecting local horseshoe crab populations and inform habitat protection in Duxbury Bay, the South Shore RC will conduct horseshoe crab spawning surveys in Duxbury Bay in May and June. Activities include scheduling and recruiting volunteers and reporting results to natural resource managers at DMF.

Partners: Town of Duxbury, Duxbury Bay Management Commission, DMF

Deliverables: Number of volunteers engaged in horseshoe crab survey, summary of horseshoe crabs pawning survey data, including trends
Long-term outcomes: increased and sustainable horseshoe crab population densities
CWA core program area(s): protecting wetlands; protecting coastal waters through the National Estuary Program

Task EH14. Adopt-a-Beach Program (Ongoing)

The Lower North Shore RC will train volunteer beachkeepers to remove marine debris and monitor their adopted area for resource degradation. Adopted areas include beaches, islands and river banks. In addition, MassBays will sponsor a public Coastsweep event in association with the state-wide effort in September 2014.

Partners: 350 trained beachkeepers, municipalities, SWIM, CZM
Deliverables: Dates of training sessions and number of volunteers at each, number of Coastsweep and other clean up events held; map of beaches, islands, and river bank, and estimate of linear miles cleaned.
Long-term outcome: increased public awareness of and responsibility for marine debris.
CWA core program area(s): protecting wetlands; protecting coastal waters through the National Estuary Program

Priority SF. Expand temporal and spatial extent of open shellfish beds.

Task SF1. Restore and protect shellfish beds and shellfish habitat (New & ongoing)

RCs in the South Shore and Cape Cod region will support and promote regional efforts to open or extend opening of shellfish beds. Activities include site visits with partners to identify, evaluate and prioritize stormwater projects to seek funding for implementation (Cape Cod), initiate a demonstration to grow mussels in protective bags in the North and South Rivers (South Shore).

Partners: NRCS, DMF, regional entities, municipalities, The Nature Conservancy
Deliverables: Inventory of potential projects for funding, results of restoration efforts, report on mussel-growing demonstration project.
Long-term outcomes: Improve water quality to expand temporal and spatial extent of open shellfish beds and ensure long-term water quality.
CWA core program area(s): addressing diffuse, nonpoint sources of pollution; protecting wetlands; protecting coastal waters through the National Estuary Program

Priority WQ. Promote effective strategies for coastal water quality improvement.

Task WQ1. Convene Stormwater Managers. (New)

MassBays RCs will support newly formed Cape Cod Stormwater Managers Group and Upper North Shore Merrimack Valley Stormwater Management Collaborative to assist stormwater managers. Activities in Cape Cod will include conducting meetings, provide outreach, share lessons learned, identify needs, obtain resources to address needs, and prepare outreach mechanisms and materials; in the Upper North Shore activities include devising a framework for community-level stormwater utilities, standardizing stormwater codes, policies, and procedures for operating and maintaining municipal stormwater systems, implementing stormwater "good housekeeping" practices at the community level, and preparing a "Sustainability Plan" to ensure the Collaborative's viability and effectiveness over the long term.

Partners: municipal stormwater managers, regional planning agencies, regional nonprofits, private contractors
Deliverables: meeting agendas and outcomes, outreach materials and activities, grant-writing assistance, support letters from participants.
Long-term outcomes: Stormwater management helps to improve water quality that supports healthy coastal ecosystems and sustainable human uses.
CWA core program area(s): addressing diffuse, nonpoint sources of pollution; protecting wetlands; protecting coastal waters through the National Estuary Program

Task WQ2. Promote effective stormwater management. (Ongoing)

All RCs will promote stormwater best management practices, especially green infrastructure alternatives (see Handbook, above). For example:

- Lower North Shore: provide the City of Salem with technical assistance for state-funded LID projects: Commercial Street LID implementation and two new design projects at Kernwood Marina and Winter Island Park.
- Cape Cod: Provide technical assistance, grant-writing support, outreach via the Stormwater Managers Group and the Barnstable County Coastal Resources Commission.

Partners: municipalities, regional nonprofits
Deliverables: grants submitted by municipalities with RC assistance, report on LID education outreach (e.g., list of contacts made or potential projects), outreach materials describing successful implementation
Long-term outcomes: Stormwater management helps to improve water quality that supports healthy coastal ecosystems and sustainable human uses.
CWA core program area(s): addressing diffuse, nonpoint sources of pollution; protecting wetlands; protecting coastal waters through the National Estuary Program

Task WQ3. Lower North Shore water quality monitoring (Ongoing)

The RC will:

- conduct biweekly summer water testing for Enterococcus at 14 to 22 outfalls and streams throughout the Lower North Shore and notify the appropriate authorities of the results;
- monitor water temperature to document changes within the harbor when seawater is no longer being extracted and returned at a higher temperature by the Salem Harbor Power Station (closed May 31, 2014).
- working with Salem State University (SSU) Geological Sciences Department to assess water quality in Salem Harbor to determine the nature and causes of reduced water clarity.

Partners: Clean Beaches & Streams Network, volunteers, Sea Station Inc., SSU Geological Sciences Department and Geography weather station, DMF, EPA water quality staff
Deliverables: QAPP for EPA approval and sharing with DEP NPS program, Salem Harbor Turbidity Final Report; recommendations for further study and resource management; results of a Meeting of partners and interested stakeholders to discuss results; comparison of Salem Harbor temperatures from 2010 to 2015 presented to broader audiences.
Long-term outcomes: improved conditions to support healthy shellfish and eelgrass habitat.
CWA core program area(s): addressing diffuse, nonpoint sources of pollution; protecting wetlands; protecting coastal waters through the National Estuary Program

Task WQ4. Cape Cod wastewater management planning (Ongoing)

Cape Cod is in the midst of comprehensive wastewater planning. The Cape Cod RC will participate in and support the scientific, planning, and public processes associated with this effort. For example:

- Communities are interested in using a variety of methods (e.g., shellfish aquaculture, salt marsh restoration, others) to reduce nutrients in order to improve water quality. RC will work with partners to promote a science-based approach to evaluating wastewater management options.
- Convening the Environmental Summit on Wastewater, a group of 35 NGOs that met in 2012 to build consensus on wastewater management.

Partners: regional planning agencies, CRC, municipalities,
Deliverables: Outreach materials, treatment alternatives reviews and evaluations,
Long-term outcomes: comprehensive wastewater management improves water quality, which in turn supports healthy coastal ecosystems.
CWA core program area(s): addressing diffuse, nonpoint sources of pollution; protecting wetlands; protecting coastal waters through the National Estuary Program

Task WQ5. TMDL for Pathogens Workshop (New)

The Lower North Shore RSP will organize and host an informational workshop on the Pathogen TMDL for the North Coastal Watershed. Though the TMDL was finalized in October 2012, local managers are not aware of its significance.

Partners: North Shore town and municipal staff, NGOs such as SWIM, Ipswich River Watershed Association and Eight Towns and the Great Marsh, DEP and EPA
Deliverables: Invitation to workshop, sign-in sheet, highlights, and agreed-upon next steps
Long-term outcomes: application of the TMDL for water quality improvements.
CWA core program area(s): establishing water quality standards; identifying polluted waters and developing plans to restore them (total maximum daily loads),

Task WQ6. Merrimack River Geographic Response Plan (New)

The Upper North Shore RC will work with EPA and its consultant to develop a Geographic Response Plan (GRP) for the Merrimack River. The GRP will be map-based plans tailored to protect specific sensitive environmental areas from oil spill impacts, locating sensitive areas for first responders and placement of oil spill protection resources to protect those areas.

Partners: Merrimack River municipalities, DEP, EPA, Merrimack River Watershed Council, Nuka Research and Planning Group (contractor), and other riverine stakeholders
Deliverables: a map of regions and links to five individual GRP plans for strategically chosen regions along the river.
Long-term outcomes: oil-spill related impacts on natural resources prevented
CWA core program area(s): addressing diffuse, nonpoint sources of pollution; protecting wetlands; protecting coastal waters through the National Estuary Program

Priority MI. Manage Marine Invasive Species

Task MI1: Coastal Habitat Invasive Species Monitoring (Ongoing)

North Shore RCs will contribute to the state-wide MIMIC program, specifically:

- Lower North Shore RSP and its trained volunteers will monitor 3 docks and 5 rocky shore areas for non-native species. Citizen science data are provided to CZM MIMIC program to be placed on MORIS. Public trainings and monitoring increases public understanding of the transport, population dynamics, and impacts of invasive species while providing a cadre of people able to help with early detection of newly arriving invasive species.
- Upper North Shore RC will organize, train, and assist volunteers in the identification of marine invasive species in the Eight Towns and the Bay region. Currently seven monitoring sites will be monitored monthly in the FY15 field season. Data are submitted to CZM.

Partners: CZM MIMIC, MIT Sea Grant, Gulf of Maine Research Institute, volunteers, local residents
Deliverables: Photo documentation of monitoring of the docks and rocky shore, data submission form sent to CZM MIMIC coordinator, list of public education trainings and events locations and number of participants.
Long-term outcomes: trend information regarding invasives informs natural resource management and research
CWA core program area(s): protecting wetlands; protecting coastal waters through the National Estuary Program

Task MI2. Pepperweed Monitoring and Control (Ongoing)

Upper and Lower North Shore RCs will continue the in-the-field monitoring of pepperweed in Massachusetts' North Shore estuaries. Activities include mapping via boat surveys, foot surveys, geolocating stands, and prioritizing control techniques; pulling and chemical treatment, and outreach and education for landowners and volunteers.

Partners: Massachusetts Audubon Society, Parker River National Wildlife Refuge, U.S.

Fish and Wildlife Service, New England Wildflower Society, Northeast Massachusetts Mosquito Control, MA NH ME Invasive Group, SWIM, Saugus River Watershed Association, property owners, volunteers
Deliverables: maps of known pepperweed locations in the Great Marsh and Salem Sound, remapped pepperweed sites, total acres subject to treatment/removal actions, dates and number of attendees at educational forums.
Long-term outcomes: eradication of pepperweed from North Shore estuaries
CWA core program area(s): protecting wetlands; protecting coastal waters through the National Estuary Program

Task MI3. Phragmites Monitoring and Control (New and Ongoing)

The Upper North Shore RC will conduct treatment and post-treatment monitoring in the Newbury/Newburyport section of the Great Marsh (ongoing) and lower Salisbury marsh (new). Salisbury marsh, located immediately north of the mouth of the Merrimack River, is infested with *Phragmites* and has been prioritized for monitoring and control by the LGC. Activities include obtaining permits, chemical treatment efforts for approximately 15 acres of Phragmites in the Great Marsh; in Salisbury marsh, RC will obtain permits, seek treatment permissions from owners of property previously identified to contain *Phragmites* stands, electromagnetic induction (EMI) mapping for stand prioritization, and hiring a contractor to conduct treatment.

Partners: municipalities, Northeast Mosquito Control and Wetlands Management District, USFWS, Parker River National Wildlife Refuge, Essex County Greenbelt Association, Great Marsh Revitalization Task Force. property owners in Salisbury, Massachusetts Audubon Society, University of New Hampshire/Jackson Estuarine Laboratory, Eight Towns and the Great Marsh Committee
Deliverables: results of intermediate-monitoring treatment efforts and a map showing treated/remaining *Phragmites* stands in the Great Marsh, listing of property owners and permission status for *Phragmites* treatment, EMI mapping of several hundred acres of salt marsh and salinity contour maps, treatment of approximately 50 acres of salt marsh, and mowing of all treated *Phragmites* in the Salisbury marsh.
Long-term outcomes: restored and sustainable marsh ecosystem functions
CWA core program area(s): protecting wetlands; protecting coastal waters through the National Estuary Program

Task MI4. Monitor and Control Invasive Green Crab (New)

Massachusetts scientists and shellfishermen have observed an increase in invasive green crabs. MassBays RCs in the Upper North Shore, Metro Boston, and South Shore will participate in ongoing efforts to characterize the extent and impact of green crabs on shellfish, eelgrass, and salt marsh habitats. Activities include working with researchers to monitor and characterize the green crab populations, join with stakeholders to develop a management plan to reduce the impacts of crab population, and secure funding for control measures as needed and identified.

Partners: CZM, DMF, regional nonprofits, shellfish wardens, municipalities, clammers
Deliverables: data submitted to state and regional resource managers
Long-term outcomes: green crab populations controlled to numbers that minimize adverse impacts.
CWA core program area(s): protecting wetlands; protecting coastal waters through the National Estuary Program

Priority CC. Build coastal resiliency by promoting understanding of the potential impacts of climate change and sea level rise on coastal ecosystems and communities and promoting adaptation measures.

Task CC1. Promote climate change adaption measures to increase coastal resiliency of ecosystems and communities (Ongoing)

In addition to the major, region-wide effort to inventory and assess tide gates as a vulnerability to climate change impacts (see description, page 14), RCs in all regions will work with communities and natural resource managers to promote adaptation to climate change and sea level rise. Specifically:

- The Cape Cod RC will work with the USGS and partners on a 3-year project to model and evaluate the potential effects of rising sea level on the mid-Cape's groundwater system and to provide adaptive measures.
- To detect potential changes in salt marsh vegetation due to sea level rise, The South Shore RC will monitor sentinel monitoring stations established in 2000, and assist the Jones River Watershed Association with establishing and monitoring sentinel stations in the Jones River.
- The Metro Boston RC will lead the Tide Gate Inventory and Assessment project described above, and will work with constituents to increase awareness of the need for repairs, replacement, and/or proper management of structures to respond to sea level rise scenarios.
- Having served on the City of Salem working group to complete a Vulnerability Study FY14, the Lower North Shore RC will provide technical assistance on the next phase of Climate Adaptation Planning. The RC will implement the outreach component of a Coastal Community Resilience Grant awarded to the city by CZM.
- The Lower North Shore RC will provide technical assistance to municipalities and public outreach to encourage risk-based planning and watershed-wide stormwater management using climate change scenarios to determine effective flood mitigation strategies. Particular focus will be on the Sawmill Brook Assessment Project in Manchester-by-the-Sea, Salem's Rosies Pond South River Canal Street Drainage Project and Peabody and Salem North River.
- The Upper North Shore RC is the project lead for several project components of a major grant submittal to the Fish and Wildlife Foundation, "Community Risk Reduction Through Comprehensive Community Resiliency Enhancement For The Great Marsh Ecosystem." The $3.2M proposal submitted by the National Wildlife Federation, coauthored by MVPC and the Great Marsh Restoration Partnership, is a multifaceted approach to protect local community infrastructure in the Great Marsh communities from sea level rise and storm surge flooding while enhancing the natural flood protection capacity of the marsh ecosystem.
- The Upper North Shore RC will collaborate with local partners to host a Sea Level Rise Adaptation Workshop to educate area stakeholders and inform Great Marsh community officials and volunteer board members on the local threat from sea level rise and potential mitigation measures. This year's workshop (the 3rd Annual) will be focused on resilience of natural systems and resiliency planning and green infrastructure, natural system protection functions, and marsh migration case studies.
  Partners: USGS, regional planning agencies, LGCs, The Nature Conservancy, MassAudubon, CZM, Boston University, Marine Biological Laboratory- WHOI, University of New Hampshire, Parker River National Wildlife Refuge, National Wildlife Federation, Northeastern University, DER.
  Deliverables: project-specific, including reports, outreach materials, presentations, municipal plans, recommendations, and other documentation important to habitat-conscious responses to climate change and sea level rise.
  Long-term outcomes: Adaptation measures increase resiliency of communities and ecosystems.
  CWA core program area(s): addressing diffuse; nonpoint sources of pollution, protecting wetlands; protecting coastal waters through the National Estuary Program

D. Budget

Budget Narrative

Assumptions
Section 320 funding allocation to MassBays is $538,000.

MassBays will receive supplemental funds from at least two additional sources, making §320 funds available for other purposes. Specifically:

- A Project of Special Merit Grant from NOAA, which will provide supplemental funding for salaries, fringe, and indirect charges. Our proposal has been recommended for funding; we expect final word on the grant award in October 2014.

- National Coastal Condition Assessment funds will also be applied to salaries, fringe, and indirect charges. We have negotiated an Interagency Service Agreement with DEP; that agency is awaiting final word on the funding award from EPA.

Proposed Spending

Salaries and Fringe for three staff: Executive Director (1.0FTE), Staff Scientist (0.5FTE), and Outreach/Boston Harbor Coordinator (0.8FTE). These include annual STEP (union-negotiated) increases for MA FY2015. Fringe rate is 28.86% of salaries.

Contractual - sub-grants

- Regional Service Providers. Similar to past years, up to $61,000 is allocated to each of the four RSPs, a total of $243,750 to come from the Section 320 base grant monies. MassBays has worked closely with its regional partners to identify sources of match for the program. These funding sources are linked directly to the implementation of the CCMP as well as the 2009-2014 Strategic Plan. Each of our RSPs has identified a substantial cash and in-kind match as detailed above. Funding sources from the RSPs include revenue from membership, state and local grants, local donors, etc., as well as the work of staff within these organizations on projects specifically related to our estuarine restoration and conservation efforts.

- Research & Planning Grants. The proposed budget funds a fifth year of Research and Planning Grants. Total Research and Planning Grant funding is anticipated to be $30,000, a 70% cut from last year, when we were able to apply more than $85,000 in carry-over funds from the previous year to the grant program. The Research and Planning Grant Program requires a minimum 25% match of the total project cost (or 33.3% of the MassBays contribution)

Travel

- Director travel: Annual National Estuary Program (NEP) Spring meeting in DC (required by EPA), two meetings at each RSP for CCMP and workplan development, and three Region 1 NEP meetings (in Portland ME, Narragansett RI, and Durham NH).

- Outreach/Metro Boston Regional Coordinator travel: Association of National Estuary Programs meeting (Fall 2014) in Washington DC, three Region 1 NEP meetings, and multiple trips within the Metro Boston region.

- Staff Scientist travel: Green Infrastructure handbook training sessions in the MassBays region, three Region 1 NEP meetings, and multiple Research and Planning Grantee site visits.

- Professional Development/Regional Conferences: The Executive Director, Outreach Coordinator, and Staff Scientist will take advantage of recurring professional development opportunities offered by EPA, NOAA (especially through the National Estuarine Research Reserves), and the Commonwealth.

Other Expenses

- Meeting supplies: The budget includes a modest allocation of $1500 to support a region-wide State of the Bays Symposium, planned for Spring 2015.

- Shared Agency Expenses. The current budget provides $4000 to our host agency, CZM, to offset costs of services including program-level fiscal management, computers and phones, day-to-day printing capacity, and internet access. Note the difference between this and Indirect Charges, below.

Indirect Charges

Indirect charges (15.48% on salaries and subcontracts) allocate monies directly to the Commonwealth, to support state-level administrative and overhead costs.

Matching Funds
RSPs have committed $176,448 in direct institutional match to their scopes of work. A minimum 25% match is required of all Research and Planning Grant applications, a total of $7500 for this year. In addition, specific project work to be carried out under the current proposal has been matched by $358,319 from private foundations, municipalities, and state monies.

Overall Program Budget

Details for the travel budget and matching funds are provided on page 28.

Massachusetts Bays National Estuary Program Proposed Expenditures and Confirmed Non-Federal Match		**Supplemental funds**	***Source***
Personnel (incl. Massachusetts STEP increase)			
salaries	$ 176,216	$ 14,160	
Fringe			
Fringe @ 28.86% (salaries)	$ 50,856	$ 4,087	*NCCA, NOAA*
subtotal, salaries & fringe	**$ 227,072**	**$ 18,247**	
Travel	$ 4,396		
subtotal, travel	**$ 4,396**		
Contractual - Subgrants			
Regional Service Providers	$ 243,750		
Research and Planning Grants	$ 30,000		
subtotal, subgrants	**$ 273,750**		
Other Expenses			
meeting supplies	$ 1,500		
shared agency expenses	$ 4,000		
subtotal, other expenses	**$ 5,500**		
Indirect			
Indirect Charges @ 15.48% (salaries)	**$ 27,278**	$ 2,192	*NCCA, NOAA*
Total Request, FFY15	**$ 537,996**	**$ 20,439**	***Total***
Matching Funds			
Direct Match from RSPs (see p. 28)	$ 176,448		
Direct Match from R&P Grant recipients	$ 7,500		
Direct Project Match (see p. 27)	$ 358,319		
Total Match, FFY15	**$542,267**		

Travel Detail

destination (# travelers)	airfare	meals	ground transportation	lodging	registration
NEP national meetings					
Spring (EPA) (Washington DC), 4d (1 traveler)	250	70	100	600	400
Fall (ANEP) (Washington DC), 4d (1 traveler)	250	70	100	600	400
Other PD/Regional Conferences		70	215	250	200
Regional meetings and site visits for CCMP development, Green Infrastructure workbook training, etc.			***1 car @ $.45/mi***		
Salem x2	0	20	36		
Newburyport x2	0	20	72		
Kingston x2	0	20	64.8		
Wellfleet x2	0	20	183.6		
NE Regional NEP meetings (3 travelers)			***1 car @ $.45/mi***		
Portland ME	0	51	99	0	
Narragansett RI	0	51	72	0	
Durham NH	0	51	60	0	
subtotals	$ 500	$ 443	$ 1,003	$ 1,450	$ 1,000
Total Travel	**$ 4,396**				

Project-Specific Match Detail
MassBays RSPs have secured non-federal matching funds for several projects, as indicated below.

Task(s)	Match Amount	Purpose	Match Type	Match Source
EH2, SF1, WQ1, WQ4,	$115,000	general operating support; information technology support; materials, supplies.	cash	Private foundation grants to Cape Cod RSP
CC1	$32,394	Assess impact of sea level rise on Cape Cod aquifer	cash	State, private, and financial institution grants to Cape Cod RSP
EH4	$57,625	Third Herring Brook restoration support and outreach	cash	Non-federal partners (South Shore)
WQ1, Greenscapes	$60,800	Improve stormwater management	cash	Municipal funds, other non-federal monies (North & South Shores)
WQ3	$12,500	Salem Harbor turbidity study	cash	State award to Lower North Shore RSP
WQ5	$20,000	City of Salem climate change adaptation study	cash	Municipal funds, state grant subaward to Lower North Shore RSP
WQ5	$60,000	Town of Essex climate change adaptation planning	cash	Private foundation grant to Upper North Shore RSP