

FY16 SNEP RFP Projects

1. Aquidneck Island Planning Commission

Island Waters: The Aquidneck Island Water Quality Initiative

Partners: Cities of Newport, Middletown, Portsmouth; Aquidneck Land Trust; Clean Ocean Access

SNEP Priorities: Strategic Collaboration and Regional Impact; Integrating Habitat and Water Quality

Region: Rhode Island, Narragansett Bay

The inter-municipal group will work together to reduce nutrient pollution from storm water and agricultural runoff; restore coastal, surface, ground and drinking water quality; restore habitat and ecosystem functions; and enhance economic opportunity and jobs related to clean water. Water quality restoration measures will prioritize and install BMP's and other measures, focusing on nutrient pollution. Sites will be chosen through a prioritization model, resulting in 10-20 installed BMP's, illicit connection detection, and training for DPW staff. A large communication campaign will be developed to reach the Island's residents and document economic and environmental benefits of water quality restoration through a public report. The program will also include a cost-benefit analysis of the work done, and develop a finance and implementation plan for a 5 and 10 year horizon with identification of high-priority projects, estimated load reductions, and other quantitative measures.

2. Barnstable County Department of Health and Environment/Massachusetts Alternative Septic System Test Center

Full Scale Assessment of Non-Proprietary Passive Nitrogen Removing Septic Systems

Partners: University of Rhode Island; Buzzards Bay Coalition; Hazen and Sawyer

SNEP Priorities: Innovative Restoration and Protection Approaches; Strategic Collaboration and Regional Impact

Region: Cape Cod, Buzzards Bay

The project from the MASSTC seeks to demonstrate the efficacy of using a modified soil treatment area to remove up to 90% of nitrogen in a passive manner from residential septic systems. Septic systems are thought to be responsible for nearly 80% of anthropogenic nitrogen in marine embayments. The project seeks to design and implement a non-proprietary technique for amending soil treatment options in residential septic systems. The partners will work to identify and recruit residential pilot sites, including installation and monitoring of their performance in a real-world setting. The project also seeks the development of specifications to facilitate the technique for Regional approval, allowing for other New England states to adopt the STA technique into regulations. Finally, the project will institute a management tool to relieve municipalities of the tasks of tracking the various operation and maintenance features of advanced onsite wastewater treatments systems, working to expand and adapt a tool currently in use at the MASSTC.

3. Association to Preserve Cape Cod

Assessment, Prioritization, Design and Installation of Stormwater Retrofits in Three Bays Watershed in Barnstable, MA

Partners: Town of Barnstable Department of Public Works (DPW), Three Bays Preservation, Inc.,

SNEP Priorities: Strategic Collaboration and Regional Impact

Region: Cape Cod

The four phases of this project seek to improve coastal water quality by reducing or eliminating pollutant loadings from stormwater runoff and fertilizer use through remediating high-priority stormwater outfalls that discharge directly to the Three Bays embayment. The project will conduct a detailed GIS analysis to identify potential retrofit sites for GI. Two or more of the highest rated sites will be selected for design and installation, targeting sites with runoff from 4-6 acres of impervious surface. Outreach will occur to provide public education to town residents and Town Council, including a rain garden training workshop followed by the installation of a demonstration garden. Two additional workshops will be held on site to cover operations and maintenance for the Barnstable DPW (with invitations to the rest of the Cape) focusing on the below-ground inspection, and the second for community volunteers will focus on above-ground maintenance and monitoring of vegetation, sediment buildup, and other visual indicators of performance. Pre- and post-construction water quality monitoring will be completed by Three Bays Preservation, and DPW staff will conduct stormwater sampling at installation sites. To determine the effectiveness of individual retrofits, installation will include automated samplers to measure flow and volume reduction to calculate reduction in pollutant loadings.

4. Massachusetts Audubon Society

Integrating Ecosystem Services Functions and Values into Land-Use Decision Making in the Narragansett Bay Watershed

Partners: University of Rhode Island; Stanford University

SNEP Priorities: Connectivity and Ecosystem Services and Functions

Region: Narragansett Bay Watershed, Bi-State

This project will develop and demonstrate innovative science methods to enhance effective decision making using a bi-state watershed approach to integrate socio-economic and biophysical processes that link the watershed and Narragansett Bay, including selected ecosystem services. A set of predictive ecosystem service models will be developed based on scenarios identified by key stakeholders to analyze conservation and watershed protection options, with the objective of contributing to long-term planning and decision making by identifying cost effective investments in watershed and coastal ecosystem services. A full economic valuation of key ecosystem services from the Narragansett Bay and its estuaries will be performed. InVEST ecosystem service modeling software will then be adapted to hydrologic models and used to model sediment and nutrient retention as part of a process towards providing optimized conservation portfolios in the Narragansett Bay watershed.

5. Town of Charlestown, RI

Charlestown Coastal Watershed Protection and Restoration Program

Partners: University of Rhode Island; Save the Bay; Salt Ponds Coalition

SNEP Priorities: Innovative Restoration and Protection Approaches; Integrating Habitat and Water Quality

Region: Rhode Island

The Town of Charlestown will create a nutrient reduction program within the town and watershed, targeting nitrogen pollution from onsite wastewater treatment systems through quarterly sampling of up to 50 nitrogen reducing systems over three years in critical zones within the watershed. This information will help to guide and establish a funding program to upgrade 15 substandard or unpermitted older OWTS to N-reducing technology by developing a model to best predict final effluent Nitrogen concentrations, resulting in a reduction of over 150 pound of N/year. Model development will focus on using a low number of data inputs to ease the transferability and monitoring requirements for other municipalities to adopt the process. Charlestown will also develop a town-recommended landscaper process and use it to install 6 demonstration rain gardens on town properties. Two surface water sampling stations in Green Hill Pond to track nutrient impacts will be added to a current monitoring program, as it is the most heavily impacted salt pond in the town.

6. The Ecosystem Center, Marine Biological Laboratory

Assessing climate effects on watershed and stormwater nitrogen loading and vulnerabilities in meeting TMDLs in Buzzards Bay and Cape Cod

Partners: Buzzards Bay National Estuary Program; Massachusetts Coastal Zone Management; Buzzards Bay Action Committee Stormwater Collaborative

SNEP Priorities: Integrating Habitat and Water Quality; Collaboration and Regional Impact; Connectivity and Ecosystem Services and Functions

Region: Cape Cod and Buzzards Bay

The proposed project seeks to better define relationships between watershed loading and estuary water quality in Buzzards Bay and Cape Cod in the face of a changing climate. Work in the Wareham River, Buttermilk Bay, and Waquoit Bay will be directed to define how water quality, namely nitrogen loading, is affected by decadal shifts in land use and climate variables. The project will evaluate how changing climate drivers (rain fall, atmosphere deposition, higher temperatures) alter the timing and amount of nitrogen discharged from watersheds into receiving estuaries. A seasonal and event-driven sampling effort will be added to ongoing efforts from the BBAC and BBC to extend the season, with the number of specific sites and their locations determined through a statistical analysis. In the three embayments, MBL will statistically evaluate water quality data to synthesize relationships between nutrient content in water columns, changes in climate-related and land cover-related variables. Models created from this analysis will account for land use and climate change, including groundwater lag time, allowing for adaptive management of TMDL's to meet resource goals. The results from these embayments will then be applied to the 23 years of data collected by the BBC to expand the range of the analysis.

7. The University of Massachusetts-Dartmouth – School for Marine Science and Technology

Quantifying potential for oyster aquaculture and impacts on estuarine nitrogen related water quality: Cockeyeast Pond and the East Branch of the Westport River.

Partners: Westport River Watershed Alliance; Town of Westport; Town of Westport Shellfish Department

SNEP Priorities: Integrating Habitat and Water Quality; Collaboration and Regional Impact; Connectivity and Ecosystem Services and Functions

Region: Buzzards Bay

As communities across Southeast New England seek new approaches to lessen the impact and impairment from nitrogen enrichment, oyster aquaculture is a commonly-identified approach that is gaining momentum across the region. While the plans to use aquaculture continue to grow, there has been almost no quantification of the effectiveness of the approach. To address this gap, this proposal will analyze Cockeyeast Pond – a saltwater pond with a high level of nitrogen enrichment – by assessing baseline conditions from 9 years of monitoring, deploying and supporting an oyster population, and monitoring the resulting habitat and water quality, the project will assess and quantify the ability of aquaculture as a method. In a second phase, the technique would be applied to the East Branch of the Westport River to re-establish oysters reefs and further quantification of nitrogen mitigation method.

8. Wampanoag Tribe of Gay Head

Tribal Commonlands Ecological Enhancements and Resiliency Project in Partnership with the Town of Aquinnah, Massachusetts

Partners: Town of Aquinnah

SNEP Priorities: Innovative Restoration and Protection Approaches; Strategic Collaboration and Regional Impact

Region: Cape Cod and the Islands/Martha's Vineyard

This project will restore dunes, vegetation, and infrastructure that were lost or damaged during Hurricane Sandy through culvert restructuring, beach restoration, and planting. Using an innovative and cost-effective methodology, the tribe will implement road drainage solutions and collaborate with the Town of Aquinnah on Martha's Vineyard to address nutrient impacts and the anticipated impacts of climate change by: 1) repairing a damaged culvert with one that is designed to trap nutrients and sediments and is scaled to account for climate change impacts; 2) nourishing, replanting and enhancing a barrier beach; and 3) repairing the damaged road that runs parallel to the beach.