

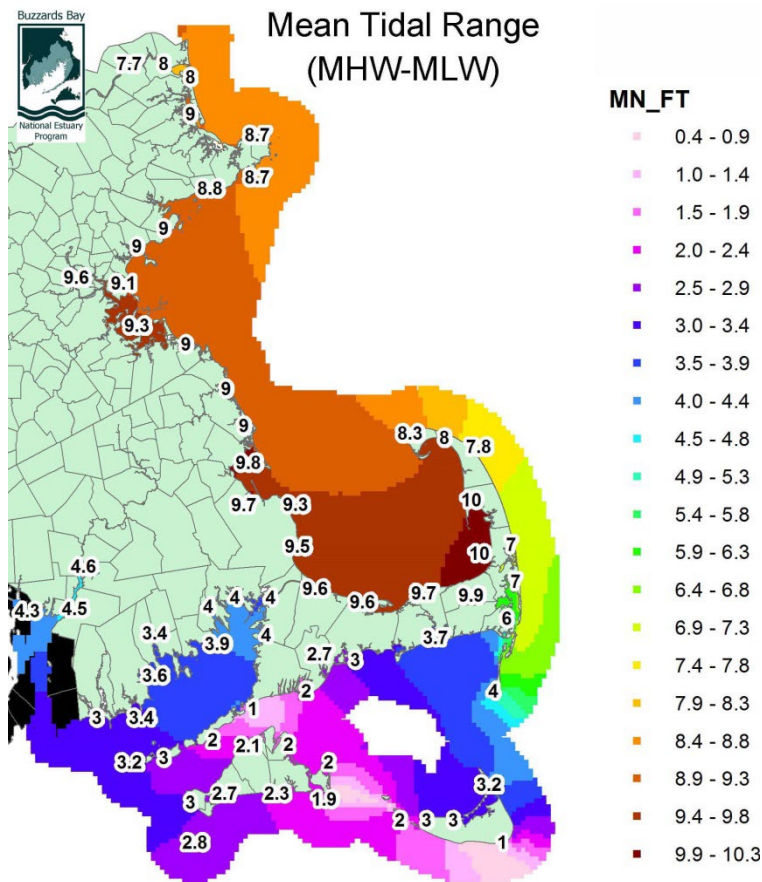
Buzzards Bay National Estuary Program

Implementation Activities

Federal FY18 Funds Work Plan and Budget

Pursuant to Section 320 funding under
A Cooperative Agreement with the U.S. EPA

For work beginning July 1, 2018 to June 30, 2020
Last modified: June 27, 2018



Mean tidal range (MN = MHW -MLW) in feet around Massachusetts (for more info visit: <http://buzzardsbay.org/bnep-posts-tidal-datums/>)

Table of Contents

Table of Contents.....2
Section 1: Introduction and Overview.....3
Section 2: FY17 Outcomes: Highlights and Accomplishments July 1, 2017 to June 30, 2018 ...4
Section 3: FY18 Funds: Proposed Work Plan Activities July 1, 2018 to June 30, 2019.....23
Section 4: Budget Summary and Explanation.....48
Section 5: Match to the Cooperative Agreement.....51
Section 6: Reprogramming of FY17 Funds.....53
Section 7: Buzzards Bay NEP Staff.....54
Appendix 1. Index of Tasks.....55

Section 1: Introduction and Overview

Since the completion of the watershed management plan titled *Buzzards Bay Comprehensive Conservation and Management Plan* (CCMP) in 1991, the ongoing focus of the Buzzards Bay National Estuary Program (NEP) has been to facilitate implementation of the recommendations contained in this CCMP. This mission was affirmed when the Buzzards Bay NEP Steering Committee approved the *Buzzards Bay Comprehensive Conservation and Management Plan 2013 Update* on November 26, 2013.

This year, the U.S. EPA has made available to the Buzzards Bay National Estuary Program \$600,000 in Clean Water Act Section 320 funds and \$500,000 in SNEP program funds, and a Headquarters Salt Marsh Monitoring grant, for a total of \$1,125,000. A summary of previous Buzzards Bay NEP funding since 2008 is shown in Fig. 1. Section 3 of this work plan outlines the activities planned with the use of these funds in meeting the program's goals.

When reviewing this work plan it is important to recognize that this U.S. EPA Cooperative Agreement to the Commonwealth does not fund all tasks described in the workplan, or utilize the full NEP allocation of funds. Specifically, at the request of the Buzzards Bay NEP, the U.S. EPA is awarding \$30,000 of the \$1,125,000 in Section 320 funding directly to the non-profit Buzzards Bay Coalition, for specific tasks in the Baywatchers Monitoring Program. Thus, the Cooperative Agreement with the Commonwealth for this work plan will total \$1,095,000 (\$1,125,000-\$30,000). The Buzzards Bay Coalition is directly providing the match for their \$30,000 award under their separate grant agreement with the U.S. EPA.

Any grants or assistance from the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) or Massachusetts Office of Coastal Zone Management (CZM) mentioned in this

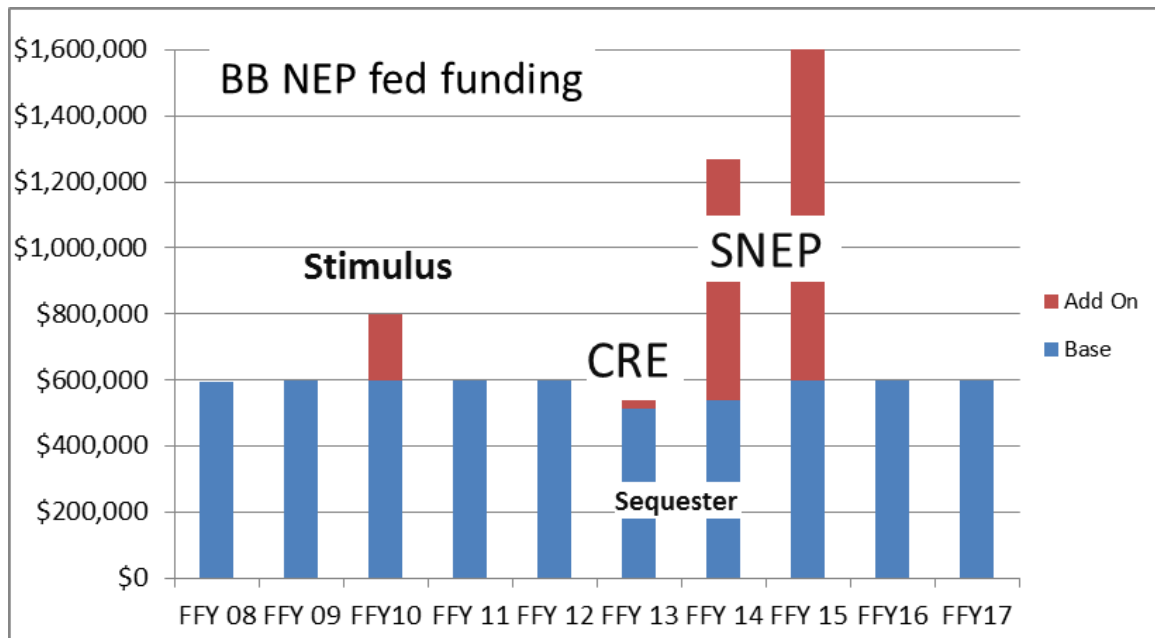


Fig. 1 Past Buzzards Bay NEP Section 320 base funding (blue) and various add-ons (red). In FY14 and FY 15, the Buzzards Bay NEP administered \$728,000 and \$1,000,000 in SNEP grant funds at the request of the U.S. EPA.

work plan are not considered match to this award unless expressly identified in the “Match to Cooperative Agreement” section in the final Cooperative Agreement. Mention of any non-match efforts by other agencies in this work plan are meant to demonstrate the collaborative or coordinating role of the Buzzards Bay National Estuary Program in achieving specific goals contained in the Buzzards Bay CCMP.

Section 2: FY17 Outcomes: Highlights and Accomplishments July 1, 2017 to June 30, 2018

Status of FY17 Workplan, July 1, 2017 to present

This section summarizes the status of tasks in last year's workplan and a description of some key accomplishments by the Buzzards Bay NEP and our partners. This FY17 work plan Cooperative Agreement is ongoing because the grants awarded under that work plan have not yet closed. While this section summarizes many of the specific actions achieved, it is important to stress that our support of the Stormwater Collaborative represented the single largest commitment of staff resources.

FY17 Workplan Task 1 - Wetland Restoration and Open Space Protection and Restoration

As we have done in the past, the Buzzards Bay NEP continued to work and collaborate with the Buzzards Bay Coalition, area land trusts, and municipalities in our ongoing effort to protect and restore valuable wetlands and upland wildlife habitat throughout the Buzzards Bay watershed. Through this effort, the Buzzards Bay NEP provided maps, helped develop state and federal grant applications, wrote letters of partnership and support to granting agencies, conducted land use analyses, and through the municipal grant program, provided minigrant funds that help meet match requirements for leveraging grants from other programs. The success of Buzzards Bay municipalities, the Coalition, and the area land trusts can be seen in the acres of open space and habitat protect or restored in which the Buzzards Bay NEP was appreciably involved through funding or technical assistance (Fig. 2).

The Buzzards Bay Coalition again had great success in the past year coordinating grant efforts on several projects in the Buzzards Bay watershed, many of which received supporting funding or technical support by the Buzzards Bay NEP in the last or previous fiscal years. One Coalition success recognized here is the permanent protection of 114-acre Ocean View Farm in the Town of Dartmouth.

This project was the result of a partnership between the Town of Dartmouth, Dartmouth Natural Resources Trust, the Buzzards Bay Coalition, the Department of Agriculture Natural Resources Conservation Service, U.S. Fish and Wildlife Service, and the Buzzards Bay NEP.

The protection of Ocean View Farm was part of a larger land conservation initiative on Allens Pond, which has been recognized as one of southern New England’s most significant coastal habitats. The larger Allens Pond Conservation Completion Project is expected to protect an additional 100 neighboring acres of forests, wetlands, and active farmland. The Dartmouth Natural Resources Trust opened a new public trail on a waterfront portion of Ocean View Farm so members of the public can discover the land’s magnificent views and abundant wildlife.

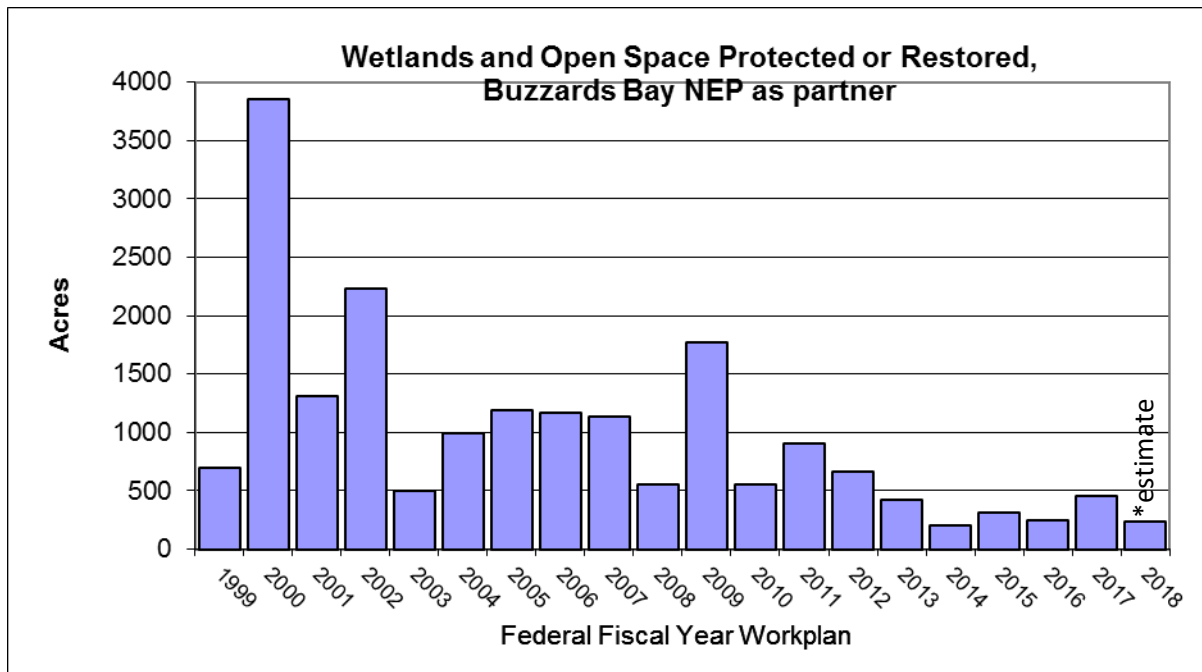


Fig. 2 Total wetlands and open space protected or restored as reported in past GPRA submissions to EPA. Listed here are only those projects in which the Buzzards Bay NEP played some sort of supporting role to the municipalities, Buzzards Bay Coalition, or area lands trusts in their efforts.

FY17 Workplan Task 2 - Stormwater Remediation and Technical Assistance

In 2015, the Buzzards Bay Action Committee (BBAC, a non-profit) established the Buzzards Bay Stormwater Collaborative in partnership with five municipalities (Dartmouth, Acushnet, Fairhaven, Mattapoisett, and Wareham, Fig. 4) and the Buzzards Bay National Estuary Program (NEP). The initiative was funded by the U.S. EPA through a \$200,000 Healthy Communities grant in support of the Southeast New England Program for Coastal Watershed Restoration (SNEP). In 2017, EPA awarded supplemental funds through a \$25,000 amendment to the

original award and a \$32,000 NEP monitoring support grant. In addition, the participating towns contributed a total of \$25,000 to the program. This subsequent funding enabled another season of stormwater monitoring by the Stormwater Collaborative and mapping work through January 2018. This initiative represented a major commitment of Buzzards Bay NEP staff time during the past year. The NEP was not only one of the leads in founding the project, we were responsible for many tasks under the BBAC grant such as QAPP update, training, GIS support and data management. During the past year the Buzzards Bay NEP updated the QAPP, the monitoring guidance document, made presentations on the effort, updated the stormwater information website, developed a draft technical report on the findings, and continued to guide BBAC staff in their activities. Other NEP support to the stormwater collaborative was covering costs of laboratory testing services in support of the program. The Buzzards Bay NEP and BBAC are continuing to work toward developing a sustainable Buzzards Bay Stormwater Collaborative.

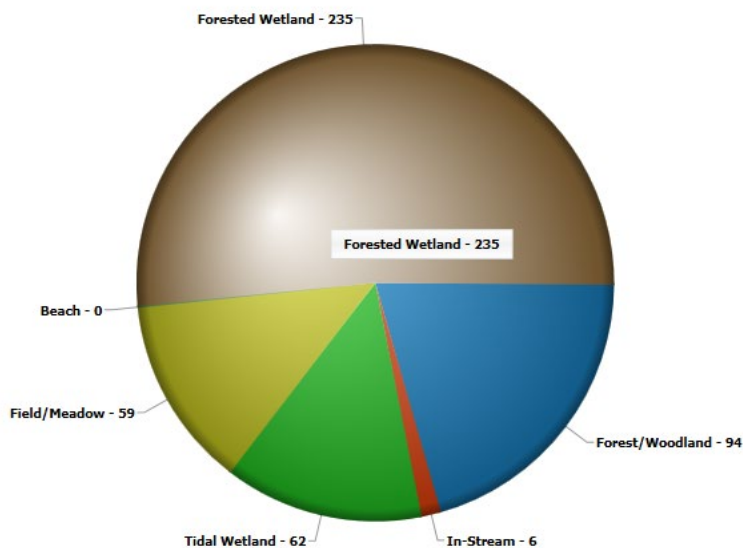


Fig. 3 Types of habitat protected or restored as reported in the 2017 GPRA report to EPA. The total 456 acres shown represent only those projects in the watershed in which the Buzzards Bay NEP provided some supporting role, mostly in the form of technical or financial assistance.

The stormwater collaborative team conducted 547 site visits, 659 water samples, and performed 724 no-flow, no-sample observations over the life of the project. The dry condition inspections were to identify potential illicit connections to the stormwater networks. Sample results are shown in Fig. 5.

The Buzzards Bay NEP is preparing a 270-page discharge report summarizing the findings collected under the EPA grants. The core of the document is a summary page for each discharge that includes a description of the discharge, a map of its location, sampling locations, and data collected. Areas of concern will be identified which will enable towns to focus remediation efforts on priority discharges. Fig. 5 shows a representative summary page for a discharge located in the Town of Dartmouth. These discharge summaries are also made available on the [Stormwater Collaborative Interactive Map](#) available online so that the public and government officials can navigate to any location and display information about the discharge.

The Buzzards Bay NEP director worked with the part-time BBAC project manager and BBAC stormwater specialist in overseeing and managing this grant. Meetings were held in conjunction with regular BBAC meeting to discuss program progress, review invoices and general grant management. More immediate issues were discussed via teleconference on an as needed basis.

The Buzzards Bay NEP stormwater specialist is the primary staff person guiding and participating in the stormwater monitoring program. The stormwater specialist updated the QAPP, field guide, training program, and monitoring protocols used for the program. The stormwater specialist also reviewed all results and site visit data in order to establish which stormwater structure would need further investigation.

In addition, the Buzzards Bay NEP stormwater GIS specialist made adjustments to and maintained the stormwater mapping elements of the program creating a stormwater database that tracks site visits and stormwater analysis data for each stormwater structure visited. This data has been related to the GIS data. This allows for an instant click and point result of all data pertaining to a specific stormwater structure.

The Buzzards Bay NEP manages the Stormwater Collaborative water quality database, enters the data, and ensures that it conforms to EPA database management standards. The NEP also provides

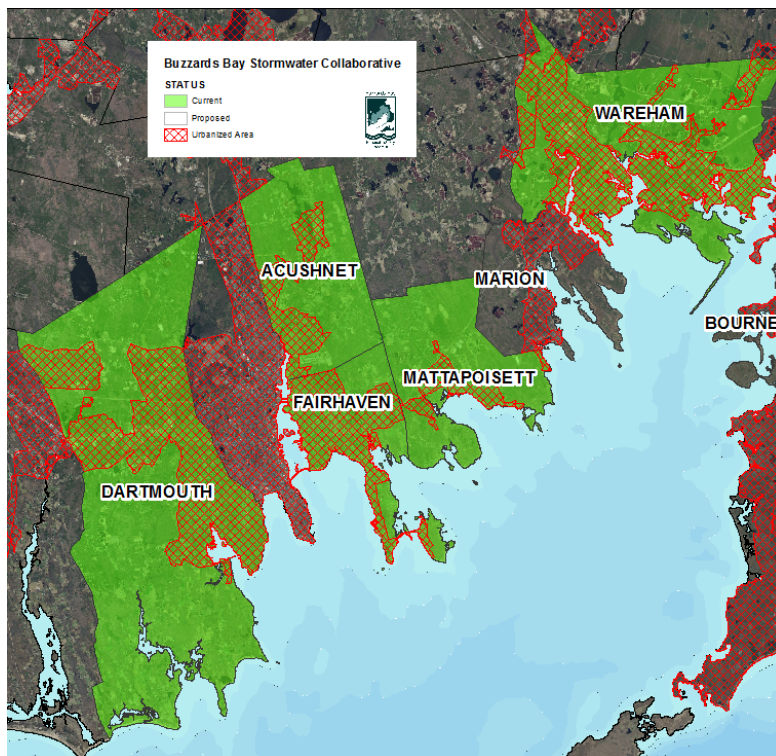


Fig. 4 Municipal participants in the Buzzards Bay Stormwater Collaborative (highlighted in green), with areas subject to MS4 permits highlighted in red crosshatch.

BBAC Stormwater Project Report
Discharge Number APB1037PI
in the Town of Dartmouth

Water St opposite Prospect St

Water Body: Qualifier:

Urbanized: Sewered: Class: Category:

MS4 Ranking:

Status:

DW: no issues. WW Mod to high levels of Bact and elevated Nitrates, Amm, and Surf. WW rank Bact (2), Nitrates/Amm/Surf (1 ea), Tot 5. App Bay Impair: Bact and N



2 'No Sample Visits'



Ranking, Status, and Recommendation based on the opinion of the BBNEP.

Report Created on: 4/5/2018

FacilityID	SampleDate	SampleID	Sample Type	Water Classification	Last Rain	12 hr. Rain	pH	Temp	Salinity	Ammo	Nitrate	Surfact	Enterococcus	Fecal Coliform
APB1309MH	8/8/2016	6DA08AUG04-A	pipe	Fresh Water	38 hrs	0 in	7.66	26.1	0.15	0.00	4.40	0.100	10	10
APB1309MH	8/10/2016	6DA10AUG06-A	pipe	Fresh Water	0 hrs	0.18 in	7.08	23.8	0.05	0.35	4.40	0.750	2800	1600
APB1309MH	8/22/2016	6DA22AUG07-A	pipe	Fresh Water	3 hrs	0.45 in	7.30	26.7	2.75	0.25	2.64	2.000	126000	39000
APB1309MH	9/1/2016	6DA01SEP07-A	pipe	Fresh Water	0 hrs	0.1 in	6.96	23.1	0.03	3.00	2.64	1.000	6800	

Fig. 5 Sample report for a stormwater discharge.

GIS support and maintains a GIS database incorporating the field investigations and transferring of plan data into the GIS database.

This initiative targets resources to benefit communities surrounding Buzzards Bay, a southeast New England coastal watershed of national significance. This initiative will also help municipal governments and residents assess, understand, and reduce environmental and human health risks associated with stormwater discharges to shellfish beds, swimming beaches, and other impaired priority waters. By combining the strengths of each of the entities, we plan to build institutional and community capacity to understand and solve environmental and human health impairments caused by stormwater discharges. The initiative also has a strong public outreach component to educate the public about how their actions can reduce stormwater pollution, encourage homeowners to prevent roof runoff from entering municipal stormwater networks, and includes a crowdsourced smartphone app to find unmapped infrastructure or identify stormwater network maintenance issues.

Besides the Stormwater Collaborative support, the Buzzards Bay National Estuary Program provides assistance to towns on stormwater issues in a number of ways. First, we review stormwater designs proposed by towns for remediation projects, or at the request of a town board as part of local permitting or site plan review. Second, we help towns prepare grant applications for federal monies to help fund remediation of priority sites. Third, we assist towns to develop and implement stormwater management plans, like the Phase II MS4 NPDES municipal plans. Finally, we work with town boards to adopt local stormwater regulations and LID strategies.

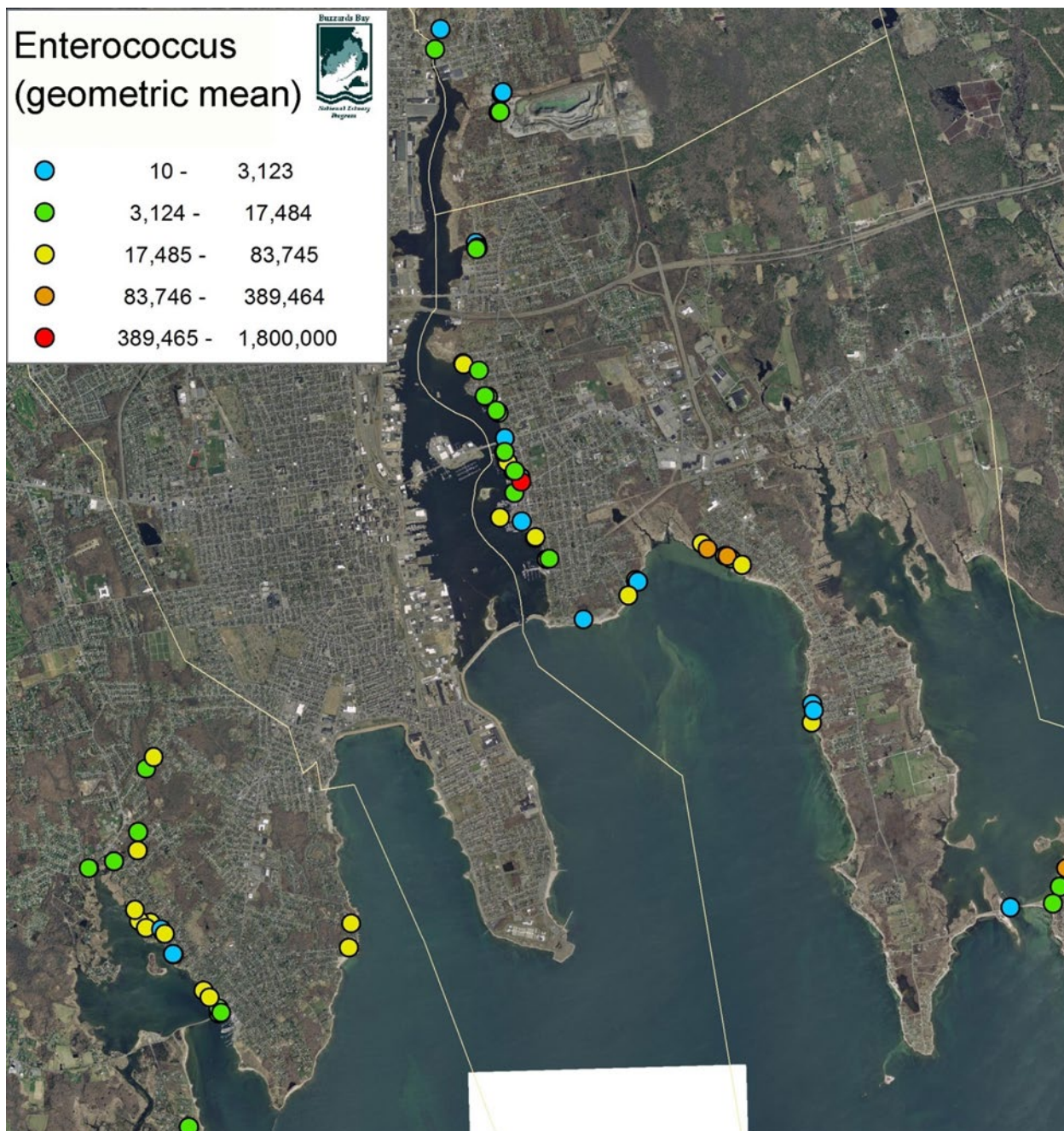


Fig. 6 Geometric means of Enterococcus concentrations of stormwater during wet weather.

FY17 Workplan Task 3 - NEP Technical Assistance and Municipal Grant Program

Through our grant and technical assistance programs, the Buzzards Bay NEP helps municipalities and our other partners achieve the goals and objectives of the Buzzards Bay CCMP. With respect to our grant program, the Buzzards Bay NEP ran three grant rounds during the cooperative agreement period. As noted in Fig. 1, base funding to the Buzzards Bay NEP has remained at or below \$600,000 annually since 2008, exclusive of SNEP add-ons, which were dedicated to SNEP grant program awards. Where additional add-on funds have been received, these funds have been directed to municipal grants or contracts in support of municipal needs. In practical terms, due to cost of living increases and other budget pressures, base program funding available for the Buzzards Bay

NEP's municipal grants has declined so that no funds were available for municipal grants. As has always been the policy, any unspent grant funds from previous grant awards were rolled over into the municipal grant program. In the summer of 2017, the Buzzards Bay NEP had two grant solicitations open: one for our FY18 Municipal Mini-grant Program (\$128,274 available), and the other to provide support for Inter-municipal and regional Water Quality Monitoring Programs (\$45,000 available).

The following grants were awarded:

- The Town of Acushnet received \$35,000 to work with its partner, the Buzzards Bay Coalition, to protect 38-acres in the Towns of Acushnet and Fairhaven. The project will protect land that benefits water resources associated with Tripps Mill Brook and the Mattapoissett River. It will also protect wildlife habitat, expand trail-based recreational opportunities and protect a large contiguous undeveloped block of forest.
- The Town of Mattapoissett received \$35,000 to work with its partners, Mattapoissett Land Trust and Buzzards Bay Coalition, to protect a 53-acre property, also in the Mattapoissett River Valley, designated as habitat for rare species. The property also contains an old historic quarry with deep ties to New England history and culture. The Town and its partners intend to use the property for environmental and historical educational purposes.
- The Town of Rochester received \$35,000 to work with its partners, Rochester Land Trust and Buzzards Bay Coalition, to permanently protect a 78.6-acre property, which contains extensive wetlands, including an Atlantic white cedar swamp. The property, located in a large undeveloped forest area near the dividing line of the Mattapoissett and Sippican River watersheds, will provide trail-based recreational opportunities for the public.
- The Buzzards Bay Coalition received \$35,000 to support an additional season of monitoring of the Baywatchers program. Baywatchers is a comprehensive volunteer-based water quality monitoring program, which has been in existence for 25 years. With the help of trained volunteers, basic water quality measurements of dissolved oxygen, temperature, salinity and water clarity will be made at approximately 150 stations in and around Buzzards Bay. The water quality data collected will be used to track nutrient pollution effects and will be made available to federal, state and local decision makers.

The Buzzards Bay NEP issued a second grant round in March 2018, to expend remaining funds unspent in a few SNEP and municipal grant rounds. These grants will be awarded in July 2018, and necessitated an extension of a previous Cooperative Agreement.

Through technical assistance programs, the Buzzards Bay NEP often assists municipalities and non-profits to secure additional funds for projects that meet CCMP goals. This assistance includes project development and application preparation. Sometimes this assistance may be in the form of map and document preparation, or data analysis used in an application. Sometimes the Buzzards Bay NEP commits to specific tasks should a partner be funded, and this support is identified in our partner's proposal or commitment letters prepared by the Buzzards Bay NEP.

Much of the day-to-day work of Buzzards Bay NEP staff revolves around technical assistance on specific projects. Such projects might include helping a town develop stormwater treatment designs

to treat a stormwater discharge contributing to shellfish bed closures, developing funding and implementation strategies for specific projects, evaluating environmental impacts of specific activities, reviewing projects for compliance with local regulations, or helping develop local bylaws and regulations.

The Buzzards Bay Stormwater GIS Specialist in cooperation with the Town of Wareham IT Department conducted an ArcGIS Hands On Training class for the Town of Wareham during the winter of 2018. This three-day hands-on training class gave attendees a basic understanding of GIS and instruction on how to compose maps and do some data query and manipulation. Additional discussed topics included GIS terminology, GPS technology, projections and coordinated systems, the Town of Wareham GIS dataset, using ArcMap and ArcCatalog, using tables, working with CAD drawings, metadata, georeferencing plans, and editing.

As part of our technical assistance program, the Buzzards Bay National Estuary Program's Regional Planner also produced over 340 new or revised maps and fulfilled dozens of requests for data, calculations, or graphics to be used for newsletters, grants, etc. Numerous maps and GIS evaluations were prepared for the Buzzards Bay Coalition, area land trusts, and municipalities. Examples include municipal open space maps, Buzzards Bay Coalition fundraising maps and maps for their website, maps used by municipalities in open space reports and their grant applications, and for other purposes.

The Buzzards Bay NEP's grant and technical assistance programs continue to fund or advance progress on EPA's Clean Water Act core programs. For example, until the previous workplan the Buzzards Bay NEP directly contributed \$25,000 to the citizen water quality monitoring program through a separate EPA Cooperative Agreement with a holdback of NEP Section 320 funds. During the past year, we instead provided a grant to the Buzzards Bay Coalition in support of the water quality monitoring program. The Coalition's Baywatchers program is not only one of the most effective volunteer based water quality monitoring programs in the country, the data is being used as the basis for updates to the state's water quality assessment and integrated list of waters standards. It is also being used in models to develop watershed nitrogen Total Maximum Daily Loads (TMDLs) in Buzzards Bay embayment watersheds by the Massachusetts DEP's Massachusetts Estuaries Project. This work, together with efforts to help towns identify problem stormwater discharges and to support efforts to treat problem stormwater discharges through technical assistance and grants directly supports EPA goals to better control non-point source pollution on a watershed basis.

The Buzzards Bay NEP continues to maintain the Buzzards Bay Action Committee (BBAC) website buzzardsbayaction.org (created by the Buzzards Bay NEP in 2012). At the request of the BBAC, the Buzzards Bay NEP Director posts documents, meeting announcements, presentations, and videos.

FY17 Workplan Task 4 - Program Oversight and Administration

The Buzzards Bay National Estuary Program Executive Director and Administrative Assistant and MCZM Fiscal Officer ensure administration of the EPA and other grants and ISAs awarded to the Buzzards Bay NEP.

In September 2017, the Buzzards Bay National Estuary Program submitted Government Perform-

mance Results Act (GPRA) report information to EPA as specified in the EPA Funding Guidance. The GPRA report for NEPs includes annual estimates of habitat and wetlands protected or restored, and annual estimates of funds leveraged in some way by the NEP. As a requirement of this agreement, the Buzzards Bay NEP will provide information on the GPRA performance measures to EPA by their required date.

FY17 Workplan Task 5 - Buzzards Bay Citizens' Water Quality Monitoring

In the fall of 2017, the Coalition submitted a data report and disk for the 2017 year. Altogether 166 volunteers participated in the Buzzards Bay Water Quality Monitoring Project's 25th water quality sampling season between May and September. The Coalition's effort was supported by the Buzzard Bay NEP, Commonwealth of Massachusetts, citizens, dues and other sources. The Buzzards Bay Coalition's nationally recognized water quality monitoring program costs roughly \$250,000 annually. The Buzzards Bay National Estuary Program provides technical support, and this year provided a \$40,000 grant to support the program. As described above, the Buzzards Bay National Estuary Program and the Coalition use the data collected by the Coalition's program to advocate for nitrogen management in Buzzards Bay watershed communities, and DEP's Massachusetts Estuaries Project uses the data in development of TMDLs.

The Buzzards Bay NEP director continues to participate with the Buzzards Bay Coalition's Science Advisory Committee to evaluate the potential impact of climate change on water quality, and to help publish reports using the data sets.

FY17 Workplan Task 6 - Environmental Indicators and Outcomes Tracking

The Buzzards Bay NEP tracks various environmental indicators on its website including shellfish bed closures (buzzardsbay.org/enjoy-buzzards-bay/shellfish/shellfish_closures_buzzards_bay/ and Fig. 7) and eelgrass abundance. The Buzzards Bay eelgrass estimates are based on DEP databases, and our own photointerpretation of aerial photographs in areas not covered by DEP's analysis. These data are also used during the Coalition's triennial State of the Bay reports. In the spring of 2016, the Buzzards Bay NEP again assisted the Buzzards Bay Coalition in the development of its State of the Bay report, which was issued in May 2016.

During 2017, the Buzzards Bay NEP worked with the Division of Marine Fisheries staff to collate old shellfish sanitary survey reports in order to overhaul the Buzzards Bay NEP's shellfish closure GIS database in order to more accurately quantify historical shellfish bed closures in each embayment. This data is being used by the Buzzards Bay NEP to support the Buzzards Bay Coalition's State of the Bay report which tracks shellfish bed closure acreage for July 1 of each year. This revised dataset was used by a Woods Hole graduate student evaluating the economic impacts of water quality degradation (paper presented at CERF 2017). In addition, the Buzzards Bay NEP restructuring of the Baywatchers database and supporting algorithms and linked spreadsheets greatly facilitated the development of calculations and graphics preparation for the Coalition's [interactive water quality website](#), which is updated each winter.

The Buzzards Bay NEP has been a member of the Buzzards Bay Coalition's Science Advisory Committee (SAC) since its creation in 2014. An SAC priority is to identify research and monitoring program priorities, and to assist in Coalition grant application development. The group has also been working to define need water quality and habitat monitoring to support a permit application by the Town of Wareham to relocate the municipal wastewater facility outfall to the Cape Cod Canal.

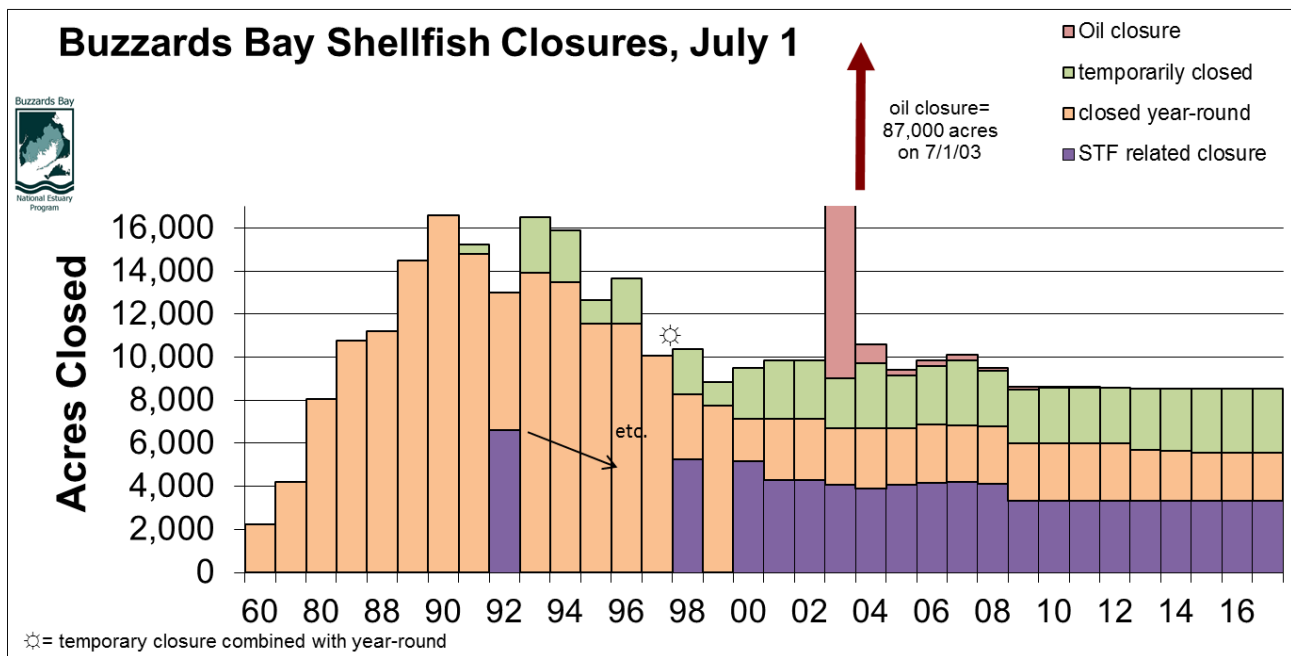


Fig. 7 Long-term shellfish bed closure trends for Buzzards Bay through 2017.

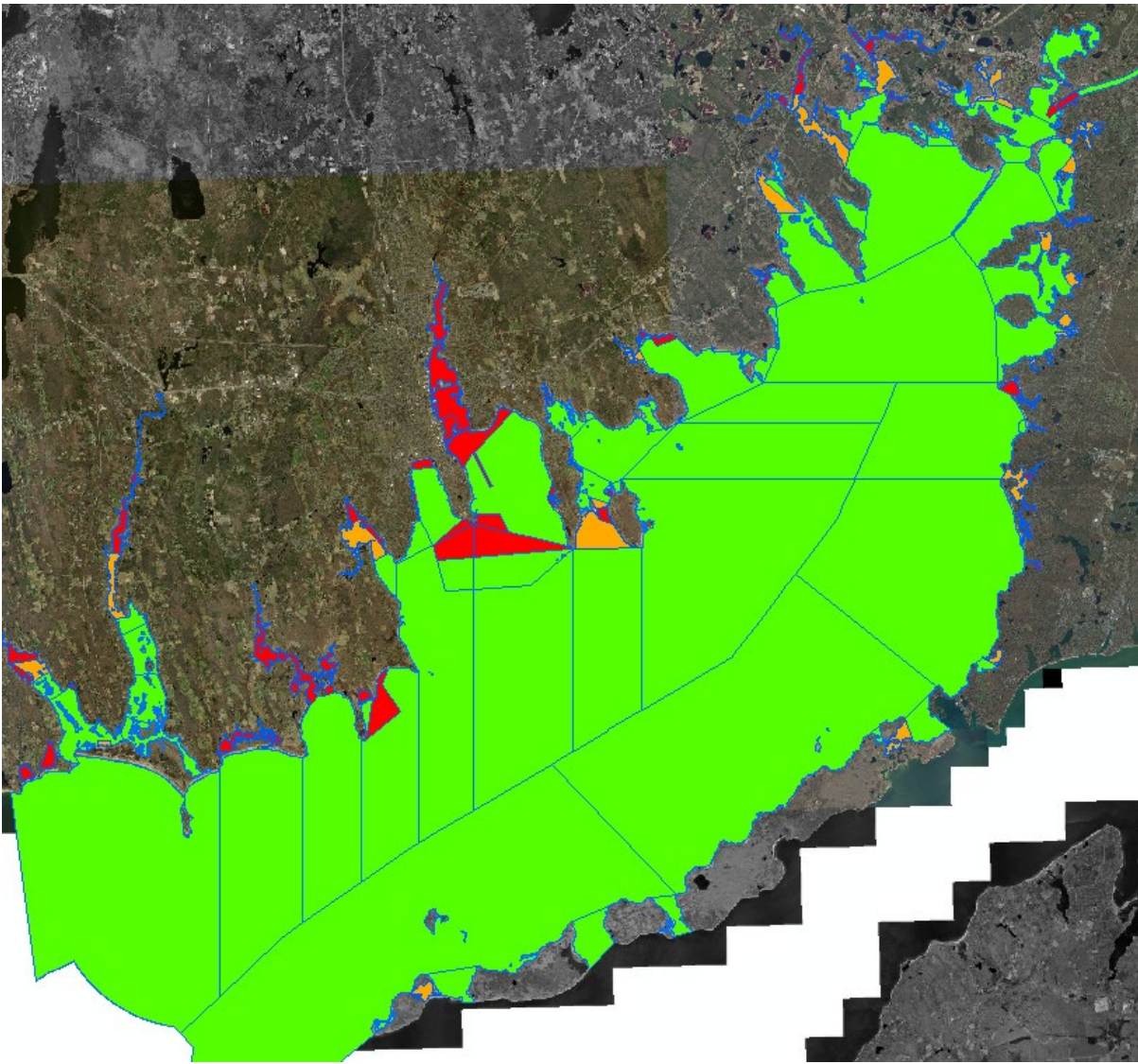


Fig. 8 Shellfish bed closure areas in Buzzards Bay on July 1, 2017. Red shaded areas are closed year-round; yellow shaded areas are seasonal closures.

FY17 Workplan Task 7 - Outreach and Education

As a partner to the Buzzards Bay NEP on our workplan, the Buzzards Bay Coalition is the principal entity that targets outreach and education to the public. The Buzzards Bay Coalition undertook outreach and education activities highlighting the condition and state of Buzzards Bay, progress toward restoration and protection goals, and collaboration with the Buzzards Bay National Estuary Program in their activities. These activities included the June 2017 Swim Buzzards Bay event, their annual meeting, press events, and various publications including the annual report to their members.

The Coalition also produces brochures, fact sheets, press releases, and other events about citizen action to protect and restore Buzzards Bay. Some information on these events is at <http://www.savebuzzardsbay.org/events/>.

On June 24, 2017, the Coalition held their Swim Buzzards Bay event. For only the second time in its 24-year history, the [2017 Buzzards Bay Swim](#) was cancelled due to unsafe weather conditions as

the stormy remnants of Tropical Storm Cindy passed over Buzzards Bay. But that didn't stop more than 350 dedicated swimmers from raising \$130,000 for clean water at this signature outdoor fundraising event. The Swim drew 353 registrants from 21 states, including as far as away as Alaska, Washington, and North Carolina, as well as Canada. The youngest swimmer was Emma Whittaker of Rochester, who was turning 11, while the oldest was 77-year-old Nancy Smith of Dartmouth, who has participated in 18 Buzzards Bay Swims.

Even though the on-the-water activities were called off, swimmers still gathered at Fort Phoenix State Reservation to celebrate their fundraising accomplishments.

The Coalition and safety personnel from the Massachusetts Environmental Police, the U.S. Coast Guard and the New Bedford and Fairhaven police, fire and harbormaster departments surveyed the weather forecast for the 1.2-mile open-water course across outer New Bedford Harbor and deemed conditions unsafe for swimmers and boaters.

The Buzzards Bay Coalition held the 11th Annual Watershed Ride on Sunday, October 1, 2017. The 76-mile Ride, which drew 226 adventurous cyclists, begins at Horseneck Beach in Westport ending in Woods Hole. Perfectly timed to take advantage of the spectacular autumn foliage, the cool days of early fall, and the quiet off-season roads, the Ride is one of the best outdoor events of the season.

For the past five years, the Coalition has been leading weekly beach walks as part of [Sea Lab](#), a marine science studies program funded through the New Bedford Public Schools. Over the course of each year, Coalition environmental educators guide every fourth-grade class in New Bedford – more than 1,200 students in all – on a walk on this beach as part of Sea Lab. Some students also take a second Sea Lab-sponsored trip with the Coalition to [The Sawmill](#) in Acushnet, where they learn about aquatic life along the Acushnet River – where the waters of outer New Bedford Harbor begin their downstream journey toward Buzzards Bay.

Fall Equinox Sunset Stroll

Participants marked the autumnal equinox with a casual sunset guided walk at [The Knob](#), one of Buzzards Bay's most beautiful and special coastal places. This free event is offered by the Buzzards Bay Coalition in partnership with the [Quissett Harbor Preservation Trust](#) and the [Salt Pond Areas Bird Sanctuaries](#).

Bay Scallop Discovery Day

During a free discovery day hosted by the Buzzards Bay Coalition and [The Nature Conservancy](#) participants learned about the bay scallops that swim below the surface of Squeteague Harbor in Bourne. Participants explored the shore for shellfish and saw a restoration project working to increase the harbor's bay scallop population.

Learn to Quahog: Onset Bay

Participants learned how to dig their own quahogs (hard clams) from Buzzards Bay. During this free event at Burgess Point in Onset with the Buzzards Bay Coalition, the [Wareham Land Trust](#), and the town of Wareham, they were taught the basics of local quahogging: what you need, how to do it, and where to go. Participants traveled on a boat from Onset Pier to Burgess Point. This was a fun and educational activity for the whole family.

Sunday Stroll: Gooseberry Island

A Sunday Stroll at [Gooseberry Island](#) in Westport led by a Southcoast Health medical professional and a Buzzards Bay Coalition outdoor educator held one Sunday each month offered participants fresh air and exercise while learning how to maintain a healthy, active lifestyle and explore the outdoors.

Itty Bitty Bay Explorers: Beach

Little ones discovered the outdoors during Itty Bitty Bay Explorers, a series of four free outings on Wednesdays in July with the Buzzards Bay Coalition. Through fun games and hands-on activities, families learned about Buzzards Bay's animals, plants, and habitats. Itty Bitty Bay Explorers is recommended for families with children five and younger.

New Bedford Harbor Kayak Expedition

Paddlers learned about the history and ecology of outer New Bedford Harbor on this kayak expedition with the Buzzards Bay Coalition and [Osprey Sea Kayak Adventures](#). The tour left from the beach next to The Edge Seafood & Lounge in New Bedford's South End and journeyed to the waters off [Fort Taber Park](#) before returning to The Edge. The expedition was open to paddlers of all experience levels.

Decision Makers Workshops

Approximately 70 local government officials and septic system installers from around the Buzzards Bay region came together at two free workshops in April to learn about the results of the Coalition's on-the-ground pilot projects to reduce nitrogen pollution from septic systems.

Traditional septic systems are the biggest source of harmful nitrogen pollution to Buzzards Bay. Upgrading your home septic system to a nitrogen-reducing system is the number one thing you can do to protect clean water.

The Coalition is continuing to advance nitrogen-reducing septic system technology across the region by working with towns and homeowners to install more systems and assess their performance. One of the [Decision Makers Workshop](#) series showcased technology, results, and lessons learned from two septic system demonstration projects.

At the April 4 workshop, participants got a detailed look at septic system upgrades in West Falmouth, where the Coalition partnered with the town of Falmouth to upgrade 20 septic systems in 2016. These systems used several different nitrogen-reduction technologies. Data collected in 2017 show that these new systems are reducing nitrogen by 78%.



Fig. 9 Local government officials hear the results of nitrogen removal pilot projects.

During 2017, the Buzzards Bay NEP continued to update and streamline the navigation of its website and subdomains, climate.buzzardsbay.org and restore.buzzardsbay.org. New pages and information related to stormwater pollution, nitrogen loading, habitat protection, and climate ready adaptation efforts in the Buzzards Bay watershed were added. This website was established because of EPA's unanticipated request to help manage funds for the Southern New England Coastal Watershed Restoration Program. This initiative commenced when EPA received funding to bring together public and private stakeholders to collaborate on initiatives to protect, enhance and restore watersheds along southeastern New England. The geographic area of the Program includes the coastal waters and watershed lands spanning from Westerly, Rhode Island to Pleasant Bay, Massachusetts. The watersheds of Narragansett Bay, Buzzards Bay, the south side of Cape Cod, and the Islands face similar opportunities and challenges. The Program's goal is to help promote and develop innovative and effective approaches to preserve and restore the region's critical resources. The Buzzards Bay NEP established the restore.buzzardsbay.org website to promote and support program activities in the Buzzards Bay watershed. In partnership with EPA, and the Narragansett Bay Estuary Program, we developed a request for proposals and an application process. The Buzzards Bay NEP also established a new subdomain website Stormwater.BuzzardsBay.org to educate the public, and encourage crowdsourcing of photographs of stormwater discharges, described in more detail in FY15 Workplan Task 2.

The Buzzards Bay Action Committee continues to be a strong partner with the Buzzards Bay NEP in guiding the Buzzards Bay municipal grant program and in holding monthly meetings on special topics. Speakers at the BBAC monthly meetings during 2017 included:

- **September 28, 2017.** EPA staffer, Newton Tedder, gave an updated presentation on EPA's proposed new MS4 permit requirements for Southeastern Massachusetts communities. Download [Newton Tedder's October 2017 presentation](#).
- **April 27, 2017.** Joy Duperault, CFM Director, Flood Hazard Management Program Presentation on NFIP. Download Joy's presentation [NFIP-overview-outreach-presentation.pdf](#).



Fig. 10 At a September 2017 BBAC meeting, Newton Tedder, of the U.S. EPA, gave a presentation on EPA's proposed new MS4 permit for Massachusetts.

- **December 12, 2017.** Buzzards Bay NEP's Kevin Bartsch gave a presentation on land protection tools and economics.

Meeting information can be found on the BBAC's website buzzardsbayaction.org, which is managed and maintained by the Buzzards Bay NEP.

In collaboration with the Stormwater Collaborative, the NEP prepared a lessons learned document that will be a resource for others developing stormwater collaboratives to map and monitor stormwater discharges.

Since 1989, Buzzards Bay National Estuary Program has been training Conservation Commission members on how to delineate wetlands in cooperation with the Massachusetts Association of Conservation Commissions, [MACC](#). These two one-day workshops, focused on soils and vegetation. The Basic Wetland Delineation (BVW): Soils workshop had 14 attendees focusing on hydric soils, indicators of wetland hydrology, and understanding the DEP BVW Delineation Field Data Form: Section II. Basic Wetland Delineation (BVW): Vegetation workshop had 18 attendees and focused on wetland vegetation and understanding the DEP BVW Delineation Field Data Form: Section I. Vegetation. An additional course was held that was limited to 10 Massachusetts Department of Conservation and Recreation staff.


The Buzzards Bay Action Committee Presents

Tools in Conservation and the Economics of Open Space Protection

Kevin Bartsch
Buzzards Bay National Estuary Program

Topics include:

- Open Space versus Protected Open Space
- Common Tools for Protection
- Financing Conservation Land
- Economic Impacts of Conservation Land
- Cost and Benefits of Open Space to a Municipality
- Process of Choosing Lands for Protection
- Overview of Conservation Organizations



Free
Appropriate for all Municipal Staff

Tuesday, December 12th 2017 - 9 to 10AM
Room 320, Wareham Multi Service Center
48 Marion Road, Wareham






Fig. 11 Presentation flyer for open space protection and economics.

FY17 Workplan Task 8 - Other Specialized Technical Assistance

In 2017 the NEP director submitted a TMDL analysis article to a peer reviewed journal describing how simple mass balance equations can approximate complex TMDL models. The article is under a second round of peer review. The approach provides managers with a first estimate of needed load reductions, elucidates the significance of keystone variables, enables sensitivity analyses, and can help define TMDL margins of safety for processes affecting total nitrogen (e.g. climate drivers). The effort involved time from both the Director and Administrative Assistant. This effort continued in 2017 and is expected to continue in 2018.

The Buzzards Bay NEP continues to provide technical guidance on nitrogen management issues to the towns and Buzzards Bay Coalition. Of particular note was the fact that the Buzzards Bay NEP continues to work with the Buzzards Bay Coalition on water quality monitoring database issues and

Excel algorithms and formulas to facilitate and expedite the generation of graphics and data analysis for the Coalition's health index reporting.

The Buzzards Bay NEP has been assisting the new SNEP grant coordinator with the transfer of the grant program. Lessons learned from managing a portion of the SNEP program, forms, processes and procedures have all been shared.

The Buzzards Bay NEP collaborated with a research group in Woods Hole led by Ken Foreman on a SNEP 2018 grant application assessing the potential of using permeable barrier technology in a controlled assessment using wastewater from the Wareham Wastewater treatment facility. The grant application was not funded, but the work set the groundwork for continued collaborations.

The Buzzards Bay NEP continues to distribute various specialized GIS datasets through its website to the municipalities and engineering firms.

The NEP Executive Director participated in the U.S. Coast Guard Buzzards Bay Ports and Waterways Safety Assessment (PAWSA).

“The Ports and Waterways Safety Assessment (PAWSA) process grew out of tremendous changes that took place during the 1990s in the United States Coast Guard (USCG) Vessel Traffic Service (VTS) program. Through the 1997 Appropriations Bill, the Coast Guard was directed to “identify minimum user requirements for new VTS systems in consultation with local officials, waterways users and port authorities” and also to review private / public partnership opportunities in VTS operations. As a result of this Congressional direction, the Coast Guard established the Ports and Waterways Safety System (PAWSS) to address waterway user needs and place a greater emphasis on partnerships with industry to reduce risk in the marine environment.

As part of PAWS, the USCG immediately convened a national dialogue group (NDG) comprised of maritime and waterway community stakeholders to identify the needs of waterway users with respect to Vessel Traffic Management (VTM) and VTS systems. Those stakeholders, representing all major sectors of the U.S. and foreign-flag maritime industry, port authorities, pilots, the environmental community, and the USCG, were tasked to (1) identify the information needs of waterway users to ensure safe passage; (2) assist in establishing a process to identify candidate waterways for VTM improvements and VTS installations; and (3) identify the basic elements of a VTS. The NDG was intended to provide the foundation for the development of an approach to VTM that would meet the shared government, industry, and public objective of ensuring the safety of vessel traffic in U.S. ports and waterways, in a technologically sound and cost effective way.

From the NDG came the development of the PAWSA process, which was established to open a dialogue with waterway users and stakeholders to identify needed VTM improvements and to determine candidate VTS waterways. PAWSA provides a formal structure for identifying risk factors and evaluating potential mitigation measures through expert inputs. The process requires the participation of professional waterway users with local expertise in navigation, waterway conditions, and port safety. In addition, stakeholders are included in the process to ensure that important environmental, public safety, and economic consequences are given appropriate attention as risk interventions are selected.”

FY17 Workplan Task 9 - Technology Transfer to Other Estuaries

The Executive Director attended the spring ANEP meeting in Washington DC in March of 2018. The Director also worked with EPA to guide the non-profit Restore America's Estuaries in the management of the SNEP program.

The Buzzards Bay NEP Executive Director and Administrative Assistant participated in beta testing [Massachusetts Coastal Zone Management Grant Viewer](#). The CZM Grant Viewer is an interactive map of grants awarded by CZM, the Buzzards Bay National Estuary Program (NEP), and the Massachusetts Bays National Estuary Program (MassBays). It includes grants awarded throughout the Massachusetts Coastal Zone and Coastal Watershed, representing a strong investment in clean estuaries, resilient coasts, and healthy habitats.

The Buzzards Bay NEP Executive Director continues to participate in meetings on the Southeast New England Program for Coastal Watershed Restoration, to help guide its re-organization, structure, and committee function, as well as to identify funding needs of the region.

At the request of the CZM north shore coordinator and the conservation agents served, the NEP conducted a state-wide analysis of tidal elevations and tidal datums throughout Massachusetts (cover photo, and the project is described at <http://buzzardsbay.org/technical-data/tidal-datums-ma/>). The interactive map shows tidal datum elevations along the coast of Massachusetts. Users can zoom in and click on any point and a table of elevations will pop up for that location. The tidal datum elevations shown are mean high water (MHW), mean low water (MLW), local mean sea level (LMSL), mean tide level (MTL, average of MHW and MLW, and very close to LMSL), mean higher high water (MHHW), mean lower low water (MLLW), mean tidal range (MN), and salt marsh range (MARSH RNG), based on the formula HTL-LMSL. The study was presented to CZM regional coordinators in the summer of 2017.

In the fall of 2017, the Buzzards Bay NEP Director gave a webinar on TMDL methods to EPA region 1, Long Island Sound Study staff, and contractors using a simple mass balance equation screening tool that approximates more complex TMDLs used in Massachusetts.

FY17 Workplan Task 10 - Website Maintenance and Innovation

The Buzzards Bay National Estuary Program continued to maintain an independent website to assist the Buzzards Bay NEP to promote new approaches, receive feedback, communicate successes, track trends in water quality, monitor performance of government in implementing the CCMP, express the views and concerns of the NEP Steering Committee, create a forum for new initiatives and ideas of our partners, and support other obligations and tasks identified in this work plan. The website is also used to post results of the bay indicators and documents relating to the oil spill, and post procurement notices and grant announcements. The Buzzards Bay NEP has also been systematically scanning all old Buzzards Bay NEP reports and gray literature related to Buzzards Bay and posting it on our website.

As noted in the outreach and education task in more detail, the Buzzards Bay NEP continues to maintain three new subdomain websites. The first was the climate.buzzardsbay.org, launched in June 2013 to consolidate the NEP's climate related initiatives on one website. The second subdomain website was restore.buzzardsbay.org, launched in April 2014 in support of SNEP. This web-

site was established on a fast track to support and expedite the release of grant funds for the Southern New England Coastal Watershed Restoration Program. The third, <http://stormwater.buzzardsbay.org/>, is the subdomain for the Buzzards Bay Stormwater Collaborative that was launched in 2016.

The Buzzards Bay NEP Director and Administrative Assistant continue to maintain and update the program's WordPress website (buzzardsbay.org). Sample posts in 2017 to 2018 include announcements about Buzzards Bay and SNEP grants, an article on water borne commerce across Buzzards Bay, and an interactive map of grants awarded by the Buzzards Bay NEP back to 2006.

In addition to our own websites, the Buzzards Bay NEP continues to maintain the Buzzards Bay Action Committee's website, buzzardsbayaction.org. Their page is updated with stories, photos, videos, and presentations at the request of the BBAC to meet the needs of that organization, including Stormwater Collaborative activities.

Buzzards Bay Action Committee
The BBAC: Communities united to preserve and protect Buzzards Bay.

HOME LAWNS STORMWATER MEETINGS ABOUT US CONTACT US SLIDE SHOW STORMWATER ARTICLE

Select Language

BBAC Stormwater Collaborative Program Manager, and Monitoring Program Coordinator Have Busy Summer

In January, the BBAC hired on a part time basis, Jeff Osuch, former Town Administrator of the Town of Fairhaven, as the project manager for the Stormwater Collaborative. In April, the BBAC hired Betsy White as its monitoring program coordinator. By July, four interns were hired and the Buzzards Bay Stormwater Collaborative was launched. Despite the drought, BBAC staff were able to collect wet and dry weather samples and map stormwater features in the five participating communities. On September 16, 2016 at, Betsy gave a poster on the Collaborative's efforts at an EPA meeting to announce this year's SNEP grant awards. View the [BBAC poster](#).

CAPE COAST

BBAC Earth Day 2017 event

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News

[BBAC Presents poster at EPA SNEP event](#)

BBAC stormwater monitoring program coordinator, Betsy White, presented a poster at EPA's program launch and FY16 grant announcement held September 16, 2016 at the Rhode Island Audubon Society in Bristol, RI. The meeting was hosted by EPA Regional Administrator Curt Spalding and Senator Jack Reed in Bristol RI. The BBAC's stormwater collaborative

Fig. 12 The BBAC website homepage.

FY17 Workplan Task 11 - Analysis of Climate Change Vulnerability of Nitrogen TMDLs

The Buzzards Bay NEP continued past efforts to collaborate with area scientists and publish results from the previous year's climate tasks including assessing impacts of climate change on water quality.

2017 Leveraged Funding (Federal FY17 Workplan funds)

Each September, the Buzzards Bay National Estuary Program submits to EPA, as part of our Government Performance Reporting Act requirements, a summary of state, federal and local dollars and in-kind services leveraged by the Buzzards Bay NEP, or leveraged by our partners with technical support by the Buzzards Bay NEP, in support of the implementation of the Buzzards Bay CCMP. Some funds are leveraged through the municipal grant program; other funds are leveraged through other grant programs with our partners. For the period October 1, 2016 to September 30, 2017, the Buzzards Bay NEP's leveraged funds in the primary or support category totaled \$13,671,302.00 and \$8,097,400.00 respectively.

Table 1. Summary of NEP role in leveraged funds

NEP Role (primary, significant, or support)	Total
Primary	\$13,671,302.00
Support	\$8,097,400.00
Grand Total	\$21,768702.00

We will report our FY17 2017-2018 leveraged estimates to EPA in the fall 2018.

Section 3: FY18 Funds: Proposed Work Plan Activities July 1, 2018 to June 30, 2019.

In the sections below, we provide details of the specific tasks and actions expected in the coming year. Highlights of these activities include 1) closing out past grants and reissuing any residual grant funds, 2) continuing technical and financial support for Buzzards Bay Stormwater Collaborative, 3) technical assistance to municipalities on MS4 and other issues, 4) continued collaboration with area scientists, the Coalition, and other partners on land use and water quality data sets to guide management action.

We have organized the work plan narrative summary using our past work plan structures for the most part and EPA's recommended logic model to the greatest extent possible. In this effort, we have conformed to EPA's terminology defined as follows:

- Activities: NEP work plan projects;
- Partnerships: involvement of local community partner agencies, organizations and/or individuals;
- Outputs: products and services resulting from the work plan (i.e., deliverables);
- Short-term outcomes: changes in knowledge, learning, attitude, and skills; raising awareness amongst targeted NEP partners and stakeholder groups;
- Intermediate outcomes: changes in behavior, practice, decisions and involvement among targeted NEP partners and stakeholder groups;
- Pressures: changes, positive and/or negative, related to specific quantitative targets (e.g., percent of nitrogen reduction); and
- Long-term outcomes: changes in condition of the state, when possible.

FY18 Workplan Task 1 - Wetland Restoration and Open Space Protection and Restoration

CCMP/Work Plan Goal(s):

Wetlands and habitat protection and restoration in the wetland action plans and the land use management action plans principally. (Sub-element: Habitat, Water Quality, Living Resources, Healthy Communities. Program goal: Ecosystem Restoration & Protection)

Project/Activity Purpose and Description: (ongoing)

As we have done in the past, the Buzzards Bay NEP will continue to work and collaborate with the Buzzards Bay Coalition, area land trusts, and municipalities, in our ongoing effort to protect and restore valuable wetlands and upland wildlife habitat throughout the Buzzards Bay watershed. Through this effort, the Buzzards Bay NEP will continue to provide maps, help develop state and federal grant applications, conduct land use analyses, and through the municipal grant program, provide funds for land protection and restoration purposes. Work related to this task will be principally generated through the municipal grant program and in response to requests by area lands trusts, municipalities, and the Buzzards Bay Coalition.

Responsible Partners and Their Role(s):

The Buzzards Bay Coalition, municipalities, and area land trusts are key partners in our combined efforts. These land trust are vitally important in the development of grant applications, and in building local financial and political support for new initiatives. These non-profits also work with private landowners to become partners in these protection efforts.

NEP Staff:

Principal Staff involved in these tasks: Regional Planner will provide technical support to the Buzzards Bay Coalition, municipalities, and area land trusts. Additional support will be provided from other Buzzards Bay National Estuary Program staff, with guidance from the Executive Director, as well as with input from the Coalition Executive Director, municipalities, and area land trusts. The Executive Director, Regional Planner, and Administrative Assistant complete the GPRA report.

Outputs/Products:

1. Grant applications to state and federal grant programs.
2. Additional applications will be submitted to the Buzzards Bay NEP municipal grant program in support of these efforts.
3. The Buzzards Bay NEP may provide support to towns to complete outdated local open space plans (which expire every seven years).
4. The permanent protection of new open space with wetlands and other important habitat in the Buzzards Bay watershed through conservation restriction or purchase in fee.
5. Annual GPRA reports on wetland and habitat protected or restored will be submitted through the NEPORT website.

Milestones:

1. Report to EPA each September via GPRA report on the NEPORT website. Other projects and activities as financial or local interest opportunities arise. Projects undertaken through Buzzards Bay NEP municipal grant program must comply with schedules established by the grant awards. State land conservation grant eligibility (and other grant programs) varies with communities. Maps prepared for area land trusts as need and upon request.

Budget:

Staff costs and those funds in the municipal grant program that are competitively awarded under this category. Roughly \$2,000 in office supplies and paper, and printer ink are projected to be expended on the production of maps, brochures, and outreach information.

Outcomes:

Short-term: Increased number of habitat acres protected and restored, including geographic information systems location data.

Intermediate: Increased number of wetland and habitat related actions in the Buzzards Bay Comprehensive Conservation and Management Plan that have been completed. Increased leveraging of resources committed to Buzzards Bay NEP activities or towards implementation of CCMP goals and recommended actions. Increased number of acres of protected open land through purchase or easement.

Long-term: CCMP Goal: Long-term increase of high-quality wetlands and coastal habitat in the Buzzards Bay watershed.

Supports CWA core program: CWA and state wetland protection efforts.

FY18 Workplan Task 2 - Stormwater Remediation and Technical Assistance (includes a \$160,000 subaward to the Massachusetts Maritime Academy)

Stormwater continues to be a special focus area for the Buzzards Bay NEP. Stormwater is contributing to nutrient and pathogen impairments in Buzzards Bay. There are roughly 5,500 acres of shell-

fish growing areas closed year-round. These closures are the result of bacterial contamination related to stormwater discharges. Because of the lack of internal funds to prepare municipal designs, the Buzzards Bay NEP will seek external grant funds to provide engineering services to Buzzards Bay municipalities.

In this workplan, we also include \$100,000 to hire an engineering firm to develop stormwater designs for five priority projects among the high priority discharges identified through the mapping and monitoring efforts of the stormwater collaborative. To stretch the cost effectiveness of this allocation, the Buzzards Bay Stormwater and GIS specialist will evaluate preliminary design options, characterize catchment areas, and work with municipal officials to identify the best candidate sites among the Stormwater Collaborative municipalities. An additional \$4,000 is set aside in the category for any needed professional survey work for stormwater designs and other projects.

The Buzzards Bay NEP staff will provide other routine stormwater management technical support ranging from MS4 NOI development and SWMP guidance, to project review of designs in complex local permit applications upon request.

CCMP/Work Plan Goal(s): Ecosystem Restoration and Protection:

Principally Stormwater Management, Shellfish Management, and Wetlands and Habitat action plans, secondarily Land Use, On-Site Septic System management plans.

Project/Activity Purpose and Description: (ongoing)

Presently, the Buzzards Bay National Estuary Program provides assistance to towns on stormwater issues in a number of ways. First, we review stormwater designs proposed by towns for remediation projects, or at the request of a town board as part of local permitting or site plan review. Second, we help towns prepare grant applications for federal monies to help fund remediation of priority sites. Third, we assist towns to develop and implement stormwater management plans, like the Phase II MS4 NPDES municipal plans. Finally, we work with town boards to adopt local stormwater regulations and LID strategies.

Under this task we will also continue to manage and guide the efforts of the Stormwater Collaborative, and to also guide towns in their efforts to comply with MS4 permit requirements. Funding will be provided to the Massachusetts Maritime Academy (MMA) in the form of a subaward grant to provide staff and interns to work with municipalities and the Buzzards Bay NEP to collect stormwater samples, inspect stormwater facilities, and map stormwater networks under the guidance of the Buzzards Bay NEP staff.

To manage this complex regional initiative, two Buzzards Bay staff will be detailed to collaborate with MMA and municipalities to implement the program. The Buzzards Bay NEP will procure laboratory services and acquire supplies necessary to support the effort.

The Buzzards Bay NEP's stormwater technical assistance program has clear measurable benefits including identification of potential illicit stormwater discharges, the creation of catchment and drainage system maps, and a water quality data management system to assist in municipal storm drain maintenance and tracking of stormwater problems. This information will be used for the creation of a report that will establish priorities for the treatment of stormwater discharges conveying non-point sources of pollution. The report will assist funding agencies and towns to target limited available dollars to treat stormwater discharges to improve water quality and open shellfish beds.

Another measure of the pilot program's success will be the participation of additional municipalities in future years.

Responsible Partners and Their Role(s):

On the Stormwater Collaborative Initiative, our principal partners on these projects are the watershed municipalities and their public works departments and the Massachusetts Maritime Academy. The Buzzards Bay Coalition provides ancillary outreach support about the initiative.

On site-specific projects, partners will involve various municipal boards, districts, and environmental groups. Other partners may arise in the course of project revisions, collaborations related to MEPA permit submissions, or projects commencing that are of regional significance.

NEP Staff:

As described above, about 80% of the full-time and part-time Stormwater Specialists' time will be dedicated to tasks associated with the Stormwater Collaborative, with the balance of time related to broader stormwater management goals and services to municipalities not yet participating in the Stormwater Collaborative.

The part-time Stormwater Specialist will conduct the stormwater design reviews and will assist in the implementation of stormwater regulations. The Stormwater Specialist and Executive Director will develop federal grant applications and attend meetings as needed or as opportunities arise.

The NEP Director not only oversees all elements of the program, but is also the architect of the stormwater water quality database and the stormwater GIS database and website management elements of the program.

Outputs/Products:

1. Oversee and guide the stormwater monitoring program.
2. Maintenance of the stormwater collaborative water quality database.
3. Maintenance of the stormwater collaborative GIS database.
4. Coordination of stormwater collaborative activities.
5. General local stormwater initiative products include: stormwater plan updates, review and analysis of stormwater calculations.
6. General local stormwater grants and technical assistance will result in proposals to fund stormwater designs developed by municipalities, minimize impacts of new development, and work with towns to adopt improved stormwater regulations and policies.
7. Assistance in the completion of past projects including facilitation of permitting, as well as past projects where the Buzzards Bay NEP prepared preliminary stormwater treatment designs, or where the Buzzards Bay NEP completed stormwater designs.

Milestones:

This year's workplan goal is to finalize the program's reports and document lessons learned and present the findings to municipalities. The Buzzards Bay NEP will then work with municipalities to tackle action with the highest priority discharges, ensure that any illicit connections have been eliminated, and work with them to identify the most viable sites to develop designs for the treatment of stormwater. Timelines will be defined by meetings with the towns and diagnosis of potential illicit connections.

For the general stormwater technical and financial assistance program, most products and activities in this technical assistance program are developed and are completed as needed on an ad hoc basis, and as permit applications are submitted, or as towns express interest and have match available to apply for federal and state grants. Some activities are defined by stormwater grants in the Buzzards Bay municipal grant program. Other specific milestones arise from projects already initiated.

Budget:

The costs are Buzzards Bay NEP staff time is \$165,000 (salary + fringe + indirect). \$100,000 will be needed for an engineering services contractor for stormwater treatment designs for five pilot projects. \$160,000 would be provided to our partner organization, the Mass Maritime Academy for the needed personnel and interns to work with the municipalities. In the budget, \$10,000 is set aside for lab testing contracts, and \$16,418 for supplies, materials, data loggers, survey equipment, GPS units, in support of the program, including printing of educational materials. \$4,000 is set aside for any needed survey work needed for this project or the salt marsh monitoring project.

Outcomes:

Short-term:

Stormwater Collaborative Initiative: maintain database structures to meet needs, collect samples, implement management oversight, and program control measures.

General Stormwater technical and financial assistance program: Increased citizen and government actions to protect and restore water quality and living resources in Buzzards Bay and its surrounding watershed through the implementation of the Buzzards Bay Comprehensive Conservation and Management Plan.

Intermediate:

Stormwater Collaborative Initiative: With the continued funding of the program, we hope to add additional towns as participants and work to include more municipal staff in the program, to make them more self-sufficient in implementing monitoring and mapping programs. This outcome will require local training to expand municipal self-reliance. Continue to transfer more management of the program responsibilities to municipalities. .

General stormwater technical and financial assistance program: Increased leveraging of resources committed to Buzzards Bay NEP activities or towards implementation of CCMP goals and recommended actions.

Long-term:

Stormwater Collaborative Initiative: Eventual independence of Buzzards Bay municipalities from Buzzards Bay NEP management and oversight or stormwater monitoring and mapping obligations.

General stormwater technical and financial assistance program: Actions taken to protect and restore water quality and living resources in Buzzards Bay and its surrounding watershed through the implementation of the Buzzards Bay Comprehensive Conservation and Management Plan.

Pressures affecting outcomes:

Stormwater Collaborative Initiative: It remains essential for the Stormwater Collaborative to receive adequate funding support and technical support from the Buzzards Bay NEP. Moreover, it remains critically important for the Buzzards Bay NEP to illustrate how to diagnose and take action to reduce or treat stormwater discharges that contain tens of thousands or hundreds of thousands of bacteria per 100 ml. We must work diligently to prove the value of this regional collaboration and attempt to develop increased participation by municipalities, and commitment of municipal resources. The expected reissuance of the MS4 permit will help prompt continued municipal collaboration. During this period, it will be essential to build local leadership to manage the program, and

develop financial self-sustaining mechanisms so that it eventually becomes an independent, and self-sustaining regional program.

General stormwater technical and financial assistance program: Interest and local match availability. The Buzzards Bay NEP can handle requests for technical assistance depending upon workload and ongoing projects.

Supports CWA core program: 1) improving water quality monitoring, 2) developing strategies to meet Buzzards Bay total maximum daily loads (for bacteria), 3) controlling non-point source pollution on a watershed basis, 4) strengthening National Pollutant Discharge Elimination System permits, and 5) supporting sustainable wastewater infrastructure.

FY18 Workplan Task 3 - Buzzards Bay NEP Technical Assistance and Municipal Grants

CCMP/Work Plan Goal(s):

Technical Assistance and Capacity Building, Buzzards Bay NEP technical assistance and municipal grant program. May address Stormwater, Nitrogen, Shellfish, Wetlands and Habitat, Land Use, On-Site Septic Systems, and other action plans.

Project/Activity Purpose and Description: (ongoing)

The SNEP program has provided \$100,000 in support of the municipal grant program. Portions of the time of the Regional Planner, Administrative Assistant, and Executive Director help manage this program.

Responsible Partners and Their Role(s):

Buzzards Bay municipalities and watershed NGOs are key partners in this effort. The Buzzards Bay Action Committee (BBAC) is a key partner in ensuring continued interest and participation in the program. Moreover the BBAC helps the Buzzards Bay NEP target grant funding areas in the program. The Buzzards Bay Coalition sometimes collaborates with Buzzards Bay municipalities in developing state and federal grant applications.

NEP Staff:

Principal Staff involved in these tasks includes the Regional Planner who is the principal municipal grant program manager, the Administrative Assistant, Executive Director, and CZM and other staff as needed.

Outputs/Products:

Scopes developed, contracts awarded, press releases prepared, website updated with projects, projects overseen, projects completed, match documents received, and contracts closed.

Milestones:

1. Minigrant RFR issued in July 2018.
2. Proposals due September 2018.
3. Grants awarded by December 2018.
4. Contracts close June 30, 2020.

Budget:

\$100,000 in federal (SNEP) funds, plus a fraction of time from three NEP staff are dedicated to this effort.

Outcomes:

Short-term: Increased citizen and government actions to protect and restore water quality and living resources in Buzzards Bay and its surrounding watershed through the implementation of the Buzzards Bay Comprehensive Conservation and Management Plan.

Intermediate: Increased leveraging of resources committed to Buzzards Bay NEP activities or towards implementation of CCMP goals and recommended actions.

Long-term: Actions taken to protect and restore water quality and living resources in Buzzards Bay and its surrounding watershed through the implementation of the Buzzards Bay Comprehensive Conservation and Management Plan.

Pressures affecting outcomes:

There are two principal issues that can delay this effort. First, the state may delay the award or release of funds for various reasons. Second, municipalities may have problems meeting grant schedules for various reasons and request extensions in their grant agreements.

This task may support many of the CWA core program including: 1) strengthening water quality standards, 2) improving water quality monitoring, 3) developing total maximum daily loads, 4) controlling non-point source pollution on a watershed basis, 5) strengthening National Pollutant Discharge Elimination System permits, 6) supporting sustainable wastewater infrastructure and CWA and state wetland protection efforts.

FY18 Workplan Task 4 - Program Oversight and Administration

CCMP/Work Plan Goal(s):

Supports all program activities.

Project/Activity Purpose and Description: (ongoing)

The Buzzards Bay National Estuary Program Executive Director and Administrative Assistant and MCZM Fiscal Officer ensure administration of the EPA and other grants and ISAs awarded to the Buzzards Bay NEP.

The Buzzards Bay National Estuary Program will submit complete Government Performance Results Act (GPRA) report information to EPA as specified in the EPA Funding Guidance. The GPRA report for NEPs includes annual estimates of habitat and wetlands protected or restored, and annual estimates of funds leveraged in some way by the NEP. As a requirement of this agreement, the Buzzards Bay NEP will provide information on the GPRA performance measures to EPA by their required date.

Responsible Partners and Their Role(s):

The Buzzards Bay NEP parent agencies of MCZM and EEA are responsible for the fiduciary and financial reporting requirements of the Buzzards Bay NEP.

NEP Staff:

Principal Staff involved in these tasks: Buzzards Bay NEP Executive Director and Administrative Assistant, with additional support from the MCZM financial management assistant.

Outputs/Products:

1. Financial reports to EPA.
2. Preparation of work plans, cooperative agreements, grant amendments.
3. Steering Committee meetings needed to review the work plan.
4. Performance reports to EPA.

Milestones:

1. Account draw downs and reports as needed and required.
2. GPRAs and leveraging reports due to EPA annually in September.
3. Draft 2018 work plan sent to Steering Committee in April/May 2018.
4. Approved Cooperative Agreement sent to EPA in June 2018.
5. EPA finalize award by 30 July 2018.

Budget:

The only costs are Buzzards Bay NEP staff time.

Outcomes:

Short-term: Increased leveraging of resources committed to Buzzards Bay NEP activities or towards implementation of CCMP goals and recommended actions.

Intermediate: Increase and improve upon the information that the Buzzards Bay community leaders, environmental managers, scientific and education community, Commonwealth of Massachusetts, federal officials, and the general public has for making management actions related to the restoration, protection, and sustainable use and enjoyment of Buzzards Bay and its watershed.

Long-term: Increased citizen and government actions to protect and restore water quality and living resources in Buzzards Bay and its surrounding watershed through the implementation of the Buzzards Bay Comprehensive Conservation and Management Plan.

Pressures affecting outcomes: Various administrative delays are possible at levels in the hierarchy.

This task does not directly support any CWA core programs.

FY18 Workplan Task 5 - Buzzards Bay Citizens' Water Quality Monitoring**CCMP/Work Plan Goal(s):**

Principally Nitrogen Management, but also some assistance toward goals in Stormwater, Shellfish, Wetlands and Habitat, Land Use, On-Site Septic Systems, Sewage Treatment Facilities action plans.

Project/Activity Purpose and Description: (ongoing)

With its support from the Buzzards Bay NEP, the Commonwealth of Massachusetts, citizens, Coalition dues, and other sources, the Buzzards Bay Coalition will continue its nationally recognized water quality monitoring program which costs roughly \$250,000 annually. The Buzzards Bay National Estuary Program provides technical support and funding to the program (\$30,000 this year). The Buzzards Bay National Estuary Program and the Coalition use data collected by the Coalition's program to advocate for nitrogen management in Buzzards Bay Watershed communities. The data is also used by DEP's Massachusetts Estuaries Project in the development of TMDLs. The Commonwealth of Massachusetts for a number of years provided between \$100,000 and \$150,000 annually towards this program that was used as match to our program. This funding has become sporadic

with lesser amounts. Currently there is a bill in the state house for \$125,000 awaiting legislative and gubernatorial approval.

The Buzzards Bay NEP director will continue to participate in the Buzzards Bay Coalition Science Advisory Committee workgroup which continues to work on a number of tasks, including a recommended monitoring and modeling requirements for any potential new wastewater outfalls that would be allowed under a changed state law that would enable such new outfalls.

Responsible Partners and Their Role(s):

The Buzzards Bay Coalition is the lead for the water quality program and is responsible for meeting state and federal QAPP requirements. They are also the lead on the Science Advisory Committee, but the Buzzards Bay NEP Director is also a member of that committee, and can provide technical and material support for some of their activities. The Buzzards Bay NEP Regional Planner provides GIS products in support of the water quality monitoring program. The Buzzards Bay NEP Executive Director coordinates with the Coalition Executive Director, and the Coalition's newly established Science Advisory Committee, on needed program support, and provides technical assistance and guidance on biannual water quality and related state of the bay products.

NEP Staff:

Principal Staff involved will be the Buzzards Bay NEP Executive Director, Administrative Assistant, Regional Planner, and other NEP staff as required.

Outputs/Products:

1. Annual data disks provided to the Buzzards Bay NEP.
2. Updates posted to Coalition and Buzzards Bay NEP website.
3. Electronic rainfall database maintained for evaluating impacts to water quality.

Milestones:

1. Coalition submits data for summer 2017 monitoring by September 2018.

Budget:

The only costs of Section 320 funds under this Cooperative Agreement with EPA is the separate \$30,000 award provided by the Buzzards Bay NEP, and some Buzzards Bay NEP staff time, and some supplies for map products. The Coalition's budget for the monitoring program is approximately \$250,000, much of which is used as match.

Outcomes:

Short-term: Increased information availability for use by Buzzards Bay community leaders, environmental managers, scientific and education community, Commonwealth of Massachusetts, federal officials, and the general public to make better management decisions and actions related to the restoration, protection, and sustainable use and enjoyment of Buzzards Bay and its watershed. Increase involvement of citizens to protect the natural resources of Buzzards Bay by actively empowering people to get involved and make a difference in the sound management and restoration of the Bay's resources.

Intermediate: Improved public and governmental understanding of Buzzards Bay environmental issues, increased productivity of partners needing information or Buzzards Bay documents, and increased public and financial support for action to protect and restore Buzzards Bay. The advancement in knowledge on the effects of nitrogen pollution and documentation of the condition of local-

ized water quality throughout Buzzards Bay harbors in relation to nutrient loads from the watersheds. Provide external water quality data for the Massachusetts Department of Environmental Protection to assess water body health and develop cleanup plans for impaired waters.

Long-term: Maintain, and ideally increase, the number of acres of eelgrass habitat in Buzzards Bay through reduced nitrogen loading. Meet nitrogen action plan goals: 1. Ensure that beneficial water uses will not be lost, nor will ecosystems adversely affected by excessive contributions of nitrogen to any embayment within Buzzards Bay. 2. Restore any beneficial water uses and ecosystems lost or impacted by the excessive contribution of nitrogen to any embayment within Buzzards Bay.

Pressures affecting outcomes: Turnaround time in receiving data and data analysis from the Coalition's analytical laboratory.

This task supports these core programs: 1) strengthening water quality standards, 2) improving water quality monitoring, 3) developing total maximum daily loads, 4) controlling non-point source pollution on a watershed basis, and CWA and state wetland protection efforts.

FY18 Workplan Task 6 - Environmental Indicators and Outcomes Tracking

CCMP/Work Plan Goal(s):

All Action Plans.

Project/Activity Purpose and Description: (ongoing)

The U.S. EPA requires an assessment of environmental “outputs” and “outcomes”, and a method to measure achievement of outputs and outcomes in our efforts to implement the CCMP, and to meet our overarching goal to protect and restore water quality, wetlands, and habitat in Buzzards Bay and its surrounding watershed. The Buzzards Bay National Estuary Program defines environmental outcomes and preliminary indicators through its annual Government Performance Reporting Act submissions.

The Buzzards Bay National Estuary Program submitted its first report to EPA in October 2003, and continues to submit this information annually. To a large degree, the Buzzards Bay National Estuary Program will measure this work plan's outputs and outcomes based on annual reporting of work plan tasks completed, CCMP recommendations implemented, remediation projects completed, and our GPR/ environmental indicators reporting. Each work plan will contain a summary of tasks and measurable outcomes accomplished over the previous year, and tasks ongoing through program extensions.

The Buzzards Bay NEP will continue its work with the Buzzards Bay Coalition to analyze and publish results from the Citizens Water Quality Monitoring program database, including assessing climate change impacts.

Specifically the Buzzards Bay National Estuary Program continues to track and monitor key environmental indicators to document the success of the CCMP. Besides the ongoing water quality monitoring program of the Coalition, DEP eelgrass data, together with new historical eelgrass information collated by the Buzzards Bay NEP, are quantified for Buzzards Bay and reported every three years in the Coalition's State of the Bay reports. Other data tracked by the Buzzards Bay National Estuary Program are shellfish bed permanent closures (also quantified for the Coalition's State of the Bay reports), percentage of stormwater discharges with some form of stormwater remediation implemented, tracking of CCMP accomplishments, ongoing monitoring of two key Buz-

zards Bay herring runs, and the ongoing tracking of protected open space and new land acquisitions (GPRA data).

To more readily transmit information collected through the citizen water quality monitoring program (see Task 5), the Buzzards Bay Coalition plans to continue to enhance its website to include annual updates of its water quality testing program to show individual trends for Buzzards Bay embayments. The Buzzards Bay NEP believes this important endeavor enables citizens and managers to see clearly trends in embayments of interest.

Responsible Partners and Their Role(s): (ongoing)

The Buzzards Bay Coalition is a key partner in this effort and is the lead in the collection and tracking of several data sets. The Massachusetts Division of Marine Fisheries is the lead agency in collecting and assessing shellfish closures, and provides this data to the Buzzards Bay NEP. The Buzzards Bay NEP coordinates closely with DMF in creating Buzzards Bay GIS shellfish bed closures.

NEP Staff:

Executive Director and Administrative Assistant.

Outputs/Products:

1. Annually updated shellfish bed closure maps for Buzzards Bay posted at the program's annual summary shellfish closure web page.

Milestones:

1. Shellfish bed closure map for the summer of 2018: To be initiated August 2018, and completed September 2018.

Budget:

The only section 320 funds are Buzzards Bay NEP staff time, with some supplies for map products. The Coalition's budget includes staff and outreach and publication costs.

Outcomes:

Short-term: Increased information availability for use by Buzzards Bay community leaders, environmental managers, scientific and education community, Commonwealth of Massachusetts, federal officials, and the general public to make better management decisions and actions related to the restoration, protection, and sustainable use and enjoyment of Buzzards Bay and its watershed.

Intermediate: Improved public and governmental understanding of Buzzards Bay environmental issues, increased productivity of partners needing information or Buzzards Bay documents, and increased public and financial support for action to protect and restore Buzzards Bay. The advancement in knowledge on the effects of nitrogen pollution and documentation of the condition of localized water quality throughout Buzzards Bay harbors in relation to nutrient loads from the watersheds.

Long-term: Increased citizen and government actions to protect and restore water quality and living resources in Buzzards Bay and its surrounding watershed through the implementation of the Buzzards Bay Comprehensive Conservation and Management Plan.

Pressures affecting outcomes: Unanticipated demands on staff time.

This task may indirectly support any of these CWA core program: 1) strengthening water quality standards, 2) improving water quality monitoring, 3) developing total maximum daily loads, 4) con-

trolling non-point source pollution on a watershed basis, 5) strengthening National Pollutant Discharge Elimination System permits, 6) supporting sustainable wastewater infrastructure and CWA and state wetland protection efforts.

FY18 Workplan Task 7 - Outreach and Education

CCMP/Work Plan Goal(s):

CCMP Actions: Will address Stormwater, Nitrogen, Shellfish, Wetlands and Habitat, Land Use, On-Site Septic Systems, Sewage Treatment Facilities.

Project/Activity Purpose and Description (ongoing):

The Buzzards Bay NEP's outreach and education efforts principally focus on the general public thorough the program's website, and to more directed efforts in support of municipalities through training workshops, participation in public meetings, and preparation of brochures and handouts as requested by towns. Some of these specific actions are included in other tasks of this workplan.

The NEP will continue its support for the two annual Wetlands Delineation Workshops and special request workshops (as needed) conducted by the Massachusetts Association of Conservation Commissions ([MACC](#)).

In order to avoid redundancy of public outreach efforts in the face of diminishing funds and staff resources, the Buzzards Bay NEP relies on the general public outreach of the Buzzards Bay Coalition¹. The Coalition will continue to undertake outreach and education activities highlighting the condition and state of Buzzards Bay, progress toward restoration and protection goals, and collaboration with the Buzzards Bay National Estuary Program in their activities. These activities include the July 2018 Swim Buzzards Bay, October 2018 Buzzards Bay Watershed Ride, their annual meeting, press events, and various publications, including the annual report to their members. The annual swim consists of a 1.2-mile open water swim across outer New Bedford Harbor. It highlights the role a clean and healthy Buzzards Bay plays in the lives of watershed residents.

The Coalition will continue to maintain their website. The Coalition will also continue its advocacy efforts through their various programs.

Additionally, the Buzzards Bay Action Committee has expanded its efforts to include environmental education in local schools. They also provide relevant speakers to the members for their monthly meetings and host workshops for Mass CZM and the Buzzards Bay NEP. They have also expanded their website to include recent actions and accomplishments such as their Earth Day activities.

Responsible Partners and Their Role(s):

The Buzzards Bay Coalition and the Buzzards Bay Action Committee are our principal partners, but we may partner with other organizations such as the Massachusetts Association of Conservation Commissions. The Buzzards Bay NEP may also periodically prepare newsletter articles for MCZM's Coastlines magazine. The BBAC promotes increased awareness in their municipalities' intra town networking, and they are also attempting to create a school education program.

¹ This strategy was agreed to as part of a 2005 Memorandum of Understanding between the Buzzards Bay NEP, Buzzards Bay Coalition, and the Buzzards Bay Action Committee.

NEP Staff:

Principal Staff involved will be the Buzzards Bay NEP Executive Director, Administrative Assistant, and other NEP staff as required.

Outputs/Products:

Coalition and Buzzards Bay NEP websites. Coalition newsletter, flyers, posters, press releases, and reports to their members and residents about actions to protect and restore Buzzards Bay.

Improve Buzzards Bay NEP website information, brochures, and flyers. Help update the Buzzards Bay Action Committee website. Wetlands delineation materials and [web page](#).

Milestones:

Both the Coalition and Buzzards Bay Action Committee have established schedules to meet their own goals and guidelines and are not included in this work plan.

Budget:

The only section 320 fund costs are the Buzzards Bay NEP staff time, and occasional costs for light refreshments and/or meals served at meetings, conferences, training workshops and outreach activities (events), consistent with 41 CFR 301-74.7, and as approved by the Director.

Outcomes:

Short-term: Increased information availability for use by Buzzards Bay community leaders, environmental managers, scientific and education community, Commonwealth of Massachusetts, federal officials, and the general public to make better management decisions and actions related to the restoration, protection, and sustainable use and enjoyment of Buzzards Bay and its watershed.

Intermediate: Improved public and governmental understanding of Buzzards Bay environmental issues, increased productivity of partners needing information or Buzzards Bay documents, and increased public and financial support for action to protect and restore Buzzards Bay.

Long-term: Increased citizen and government actions to protect and restore water quality and living resources in Buzzards Bay and its surrounding watershed through the implementation of the Buzzards Bay Comprehensive Conservation and Management Plan.

Pressures affecting outcomes: Many of the Coalition outreach efforts evolve around specific projects that may occur in the future. Unanticipated demands on staff time.

This task will principally support this CWA core program: 4) controlling non-point source pollution on a watershed basis, but may also indirectly support 1) strengthening water quality standards, 2) improving water quality monitoring, 3) developing total maximum daily loads, 5) strengthening National Pollutant Discharge Elimination System permits, 6) supporting sustainable wastewater infrastructure and CWA and state wetland protection efforts.

FY18 Workplan Task 8 - Other Specialized Technical Assistance

CCMP/Work Plan Goals:

Various action plans including nitrogen management, stormwater management, land use planning, and open space protection.

Purpose and Description: (ongoing)

The Buzzards Bay Comprehensive Conservation and Management Plan (CCMP) is largely a non-regulatory document, with most recommendations directed toward municipalities because they have the greatest authority and capacity to address the growth-related and non-point source pollution problems facing the bay and watershed. As a result, since completion of the CCMP, the focus of the Buzzards Bay National Estuary Program has been to provide technical assistance, and where feasible, financial assistance to towns in their efforts to implement the CCMP.

Because municipalities often lack adequate technical staff to develop or implement many of the recommendations contained in the CCMP, since 1992, the Buzzards Bay National Estuary Program has been providing essential and much needed specialized technical assistance to municipal boards. This technical assistance not only focuses on specific initiatives funded with NEP, state and federal funds, but a wide range of CCMP issues as well. This task includes items not included in the above tasks, and also includes special requests from our non-governmental organization partners.

Responsible Partners and Their Role(s):

The Buzzards Bay Coalition, the BBAC, Buzzards Bay municipalities, other state and federal agencies.

NEP Staff:

All NEP staff work on these projects as needed or required.

Outputs/Products:

1. Provide specialized technical assistance to municipalities to promote low impact development, remediate stormwater discharges and adopt stormwater management strategies, promote better management of on-site septic systems and innovative wastewater systems; improve local wetlands and habitat protection, manage nitrogen loadings, prepare and adopt open space plans.
2. Identify new local actions needed to support the development of the updated Buzzards Bay CCMP.
3. Encourage towns to take actions that support the updated Buzzards Bay CCMP.
4. Promote Low Impact Development and Smart Growth strategies and stormwater management in Buzzards Bay communities.
5. Help towns develop concepts, remediation strategies and help prepare grant applications to implement programs and projects to implement CCMP recommendations.
6. Promote better management of on-site wastewater systems and use of innovative technologies.
7. Help municipalities improve local wetlands and habitat protection through regulatory and non-regulatory approaches.

Milestones:

Depends on future projects that cannot be anticipated at this time.

Budget:

The only costs are Buzzards Bay NEP staff time.

Outcomes:

Short-term: Increased information availability for use by Buzzards Bay community leaders, environmental managers, scientific and education community, Commonwealth of Massachusetts, feder-

al officials, and the general public to make better management decisions and actions related to the restoration, protection, and sustainable use and enjoyment of Buzzards Bay and its watershed.

Intermediate: The advancement in knowledge on the effects of nitrogen pollution and documentation of the condition of localized water quality throughout Buzzards Bay harbors in relation to nutrient loads from the watersheds.

Long-term: Increased citizen and government actions to protect and restore water quality and living resources in Buzzards Bay and its surrounding watershed through the implementation of the Buzzards Bay Comprehensive Conservation and Management Plan.

Pressures affecting outcomes: We provide technical assistance on a first come first serve basis and as allowed by available staff time.

This task may directly or indirectly support any of these CWA core program: 1) strengthening water quality standards, 2) improving water quality monitoring, 3) developing total maximum daily loads, 4) controlling non-point source pollution on a watershed basis, 5) strengthening National Pollutant Discharge Elimination System permits, 6) supporting sustainable wastewater infrastructure and CWA and state wetland protection efforts.

FY18 Workplan Task 9 - Technology Transfer to Other Estuaries

CCMP/Work Plan Goal(s):

All CCMP actions to some degree.

Project/Activity Purpose and Description: (ongoing)

The Buzzards Bay NEP Director anticipates attending both the spring and fall NEP national meeting. The U.S. EPA requires NEP attendance at out-of-state conferences, particularly the spring and fall National Estuary Program meetings. Because of financial limitations, only the NEP Director will attend these meetings. The Buzzards Bay NEP Director also participates in the Buzzards Bay Coalition Science Advisory Committee. Additionally the NEP Director participates in the SNEP. The Buzzards Bay NEP Director will also from time to time provide technical assistance to other NEP directors and programs in efforts to communicate the benefits of protecting and restoring national estuaries.

Responsible Partners and Their Role(s):

The Buzzards Bay Coalition and the Buzzards Bay NEP send the appropriate staff to these meetings, or participate in collaborative NEP conference calls, webinars, training events, and meetings.

NEP Staff:

The Buzzards Bay NEP Executive Director or his designee will attend spring and fall NEP meetings and participant in conference calls, web meetings, and communication efforts. Other NEP staff may attend meetings as required by the Executive Director.

Outputs/Products:

1. Attendance at NEP meetings.
2. Presentations at out of state meetings.
3. Information transfer to Buzzards Bay communities.
4. Informational materials to area legislators.

Milestones:

Attendance of fall 2018 and spring 2019 EPA-NEP meetings at a minimum. Staff may also attend other national conventions (on planning, wetlands, and stormwater as budget, availability, and staff time allows.)

Budget:

The travel budget (\$4,400) covers all out of state meeting expenses, as well as all in-state travel of staff.

Outcomes:

Short-term: Information and lessons from Buzzards Bay transferred to other entities.

Intermediate: Increased involvement of citizens to protect the natural resources of Buzzards Bay by actively empowering people to get involved and make a difference in the sound management and restoration of the Bay's resources.

Long-term: Increased citizen and government actions to protect and restore water quality and living resources in Buzzards Bay and its surrounding watershed through the implementation of the Buzzards Bay Comprehensive Conservation and Management Plan.

Pressures affecting outcomes: Unanticipated budget shortfalls can require elimination of out-of-state travel.

This task does not directly support any CWA core programs.

FY18 Workplan Task 10 - Website Maintenance and Innovation**CCMP/Work Plan Goal(s):**

Supports all activities, in particular outreach and education components.

Project/Activity Purpose and Description:

The Buzzards Bay National Estuary Program shall continue to maintain an independent website (Buzzardsbay.org) to assist the Buzzards Bay NEP to promote new approaches, receive feedback, communicate successes, track trends in water quality, performance of government in implementing the CCMP, express the views and concerns of the NEP Steering Committee, create a forum for new initiatives and ideas of our partners, and support other obligations and tasks identified in this work plan. The website is also used to post results of the bay indicators and documents relating to the oil spill, data in support of the Coalition's State of the Bay reports, and post procurement notices and grant announcements. The Buzzards Bay NEP has also been systematically scanning all old Buzzards Bay NEP reports and gray literature related to Buzzards Bay and posting it on our website. In the past few years, the Buzzards Bay NEP has created new subdomains for several initiatives, including a SNEP site restore.buzzardsbay.org, climate.buzzardsbay.org, and sea-plan.buzzardsbay.org. With the launch of the Stormwater Collaborative, we launched the new subdomain stormwater.buzzardsbay.org.

In addition to our own website, The Buzzards Bay NEP designed and continues to maintain the Buzzards Bay Action Committee's website, buzzardsbayaction.org. Their page is updated with stories, photos, videos, and presentations at the request of the BBAC.

Principal Staff involved in these tasks:

Executive Director, Administrative Assistant.

Responsible Partners and Their Role(s):

The Buzzards Bay NEP coordinates with the Buzzards Bay Coalition to ensure that each of our indicator and tracking pages are consistent where we provide overlapping information.

NEP Staff:

The Buzzards Bay NEP Executive Director is the web master and principal author of the website. Administrative Assistant does much of the updating of data. Other NEP staff contribute to the site with specific documents and materials, and review.

Outputs/Products:

1. Posting of new web pages and documents.
2. Update of existing web pages.

Modify all pages and documents to meet state and federal requirements for Accessibility of the site for those with disabilities including W3C, WAI, and Section 508 compliance.

Milestones:

Updates and postings as need or required.

Budget:

The only costs are Buzzards Bay NEP staff time.

Outcomes:

Short-term: Improved public and governmental understanding of Buzzards Bay environmental issues, increased productivity of partners needing information or Buzzards Bay documents, and increased public and financial support for action to protect and restore Buzzards Bay.

Intermediate: Increased citizen and government actions to protect and restore water quality and living resources in Buzzards Bay and its surrounding watershed through the implementation of the Buzzards Bay Comprehensive Conservation and Management Plan.

Long-term: Assists in advancing all CCMP goals

Pressures affecting outcomes: creation of new pages limited by time availability of the Executive Director (webmaster) to add new information and links.

This task does not directly support any CWA core programs but may indirectly support 2) improving water quality monitoring, 4) controlling non-point source pollution on a watershed basis, 6) supporting sustainable wastewater infrastructure and CWA and state wetland protection efforts.

FY18 Workplan Task 11 - Scientific collaboration on nitrogen TMDLs, climate impacts, and water quality impacts on natural resources

The Buzzards Bay NEP will continue to work with the Buzzards Bay Coalition and area scientists to complete and publish findings related to the Buzzards Bay Coalition's water quality data set and land use changes in Buzzards Bay. This will include any requested support to the Valiela study (SNEP 2016 proposal: Assessing climate effects on watershed and stormwater nitrogen loads and vulnerabilities in meeting TMDLs), and other collaborations involving areas scientists.

Conduct GIS analyses of watershed land use, including number of onsite systems, occupancy rates, land use types, estimates of impervious area, lawn area, extent of sewerage, and agriculture.

- Conduct a similar analysis for the catchment area of each stormwater discharge monitored in the study.
- Provide assistance evaluating the Buzzards Bay Coalition's water quality data set.
- Provide guidance on the preparation QAPPs in support of these studies, and if appropriate, amend the Stormwater Collaborative QAPP to include analyses by a laboratory.
- Define sewer history in Buzzards Bay embayments, including the enumeration of septic systems over time based on municipal assessors records of the year of construction of each property in the assessed watersheds.
- The Buzzards Bay NEP will work with the Massachusetts Maritime Academy to ensure the collection of stormwater samples and sample splits to be analyzed by a laboratory.

Principal Staff involved in these tasks:

Executive Director, Administrative Assistant.

Responsible Partners and Their Role(s):

The Buzzards Bay NEP coordinates with the Buzzards Bay Coalition, and the Science Advisory Committee to ensure that the findings derived from the water quality datasets and precipitation and climate records are sound.

NEP Staff:

The Buzzards Bay NEP Executive Director is the lead on this effort. Other NEP staff contributes to the effort with specific documents, data entry, and review.

Outputs/Products:

1. Posting of new web pages and documents in support of the effort.
2. Production of data set that meets EPA, NEP, and Coalition and collaborating researcher goals and needs.
3. Issuance of a report on the history of wastewater loading to Buzzards Bay.

Milestones:

Updates and postings as need or required.

Budget:

The only costs are Buzzards Bay NEP staff time.

Outcomes:

Short-term: Improved Coalition water quality data set that can be imported into other applications, and incorporates necessary QA records, information, and metadata.

Intermediate: Increased utility of the data set for more expedited development of water quality health index scores, and facilitated joining to GIS data.

Long-term: Increased utility and use of the dataset by independent researchers.

Pressures affecting outcomes: work on the data set limited by time availability of the Executive Director.

This task supports several CWA core programs indirectly including elements: 2) improving water quality monitoring, 4) controlling non-point source pollution on a watershed basis, 6) supporting

sustainable wastewater infrastructure and CWA and state wetland protection efforts, and climate adaptation related priorities.

FY18 Workplan Task 12 - Salt Marsh Loss Assessment (\$30,000 subaward to Buzzards Bay Coalition)

The Buzzards Bay National Estuary Program and our non-profit partner organization, the Buzzards Bay Coalition, have each received reports of rapid salt marsh die-off in Buzzards Bay. In 2016, reports of disappearing salt marsh in the Westport River led to the collaboration between the Buzzards Bay NEP, Buzzards Bay Coalition, and the Marine Biological laboratory to document historical salt marshes losses in that estuary, and to identify potential causes. This successful collaboration led to the recognition that rapid salt marsh die off may be the result of several synergistic factors, but also that we lacked an effective monitoring program to document marsh vegetation loss because so much of the available aerial imagery is captured during leaf off periods, so it is impossible to discern between peat of dead low marsh and living marsh.

To address this problem, the Buzzards Bay Coalition has sought and received \$30,000 from a private foundation to undertake an early fall 2018 aerial (4-band sensor) survey of salt marshes in Buzzards Bay. This period was selected because aboveground biomass is at peak levels, and because with cooler weather, there are subtle changes in the color of vegetation types that we hope to discern with the survey. With \$25,000 from the EPA Headquarters, plus \$5,000 through SNEP, the Buzzards Bay Coalition will dedicate 1/2 the costs of a staffer to undertake this study. This individual will collect field data at 10 priority sites to verify the remote sensing data, and collect additional water quality data and document specific damage associated with crab grazing, storm damage and several other marsh indicators. The Buzzards Bay NEP will be the lead on the GIS analysis. This effort will follow and refine draft marsh monitoring protocols developed by a MA DEP and MA CZM under an EPA Wetlands Program Development grant awarded last year. We will include, as one of our priority monitoring sites, the single Buzzards Bay pilot site used by UMass Amherst under that grant. The NEP will support the effort through LiDAR analysis². To support these activities, the Buzzards Bay NEP to procure scanned historical aerial imagery at the priority sites. The BBC will provide training to any citizen volunteers participating in the program.

A previous approved QAPP developed for the FY12 task of the expansion of salt marshes with sea level rise study will be used as the starting point of a new QAPP that will developed for this project.

The Buzzards Bay NEP has sought headquarters funding for monitoring program support. If this funding is received, the SNEP funding for this task will be directed toward one of the unfunded tasks (Task 14 and \$15).

Principal Staff involved in these tasks:

Executive Director, Administrative Assistant, Buzzards Bay Coalition Staff, Buzzards Bay Coalition Science Advisory Committee subgroup (Giblin, Neill, Deegan will be among the principals).

² See <http://climate.buzzardsbay.org/marsh-migration-methods.html>

Responsible Partners and Their Role(s):

The Buzzards Bay NEP coordinates with the Buzzards Bay Coalition, and the Science Advisory Committee to ensure that the findings derived from analysis are sound.

NEP Staff:

The Buzzards Bay NEP Executive Director is the lead on this GIS component of the effort. Other NEP staff may contribute to the effort with specific documents, data entry, and review.

Outputs/Products:

1. Posting of new web pages and documents in support of the effort.
2. Production of GIS data sets that meets EPA, NEP, Coalition, and collaborating researcher goals and needs.
3. Issuance of a report on the history of salt marsh boundary changes at the selected sites and like causes prepared by the Buzzards Bay Coalition and Science Advisory principals.
4. QAPPs for monitoring and GIS mapping.
5. Aerial survey imagery and supporting field data at 10 priority sites, summarized in a final report by the Buzzards Bay Coalition.
6. Incorporation of marsh loss into the Buzzards Bay State of the Bay reports (as a narrative element). The Buzzards Bay Coalition prepares these reports with NEP support, and changes in salt marsh area or condition are not currently reported. In future reports the Coalition will report findings from periodic aerial surveys of marsh condition (narrative element).

Milestones:

Work on this project would begin as soon as our existing Cooperative Agreements is amended, and a grant contract issued to the Buzzards Bay Coalition (presumably August 2018). Buzzards Bay Coalition aerial survey work is planned for September 2018, with data and image processing undertaken through the spring of 2019. Updates and postings as need or required.

Budget:

\$30,000 subaward and Buzzards Bay NEP staff time.

Outcomes:

Short-term: Improved GIS data set of existing and historical marsh boundaries. Data set that can be imported into other applications, and incorporates necessary QA records, information, and metadata.

Intermediate: Increased utility of the data set for more expedited analysis of saltmarsh loss. A report on the potential or likely cause of marsh loss in each of the 10 sites.

Long-term: Increased utility salt marsh change dataset that can be used by independent researchers.

Pressures affecting outcomes: For the Buzzards Bay NEP task, limited by time availability of the Executive Director. At the Buzzards Bay Coalition, the efficacy and efficiency of the salt marsh field monitoring and sampling protocols.

This task supports several CWA core programs indirectly including elements: 2) improving water quality monitoring, 4) controlling non-point source pollution on a watershed basis, 6) supporting sustainable wastewater infrastructure and CWA and state wetland protection efforts, and climate adaptation related priorities.

FY18 Workplan Task 13 - Technical assistance to support Coastal Resiliency and Municipal Vulnerability Preparedness

The Commonwealth of Massachusetts announced more than \$6 million to the Coastal Resiliency and Municipal Vulnerability Preparedness grant programs in June 2018, and similar levels of funding are expected to be available again in May 2019. The Buzzards Bay NEP has been providing technical support to Buzzards Bay municipalities and CZM on priority needs in the Buzzards Bay watershed based on past sea level rise studies and technical analyses conducted previously by Buzzards Bay NEP or other entities. This technical assistance included developing maps, analyses, and information that can be used to support Buzzards Bay municipal applications.

Principal Staff involved in these tasks:

Executive Director, Administrative Assistant, Buzzards Bay Coalition Staff, Buzzards Bay Coalition Science Advisory Committee subgroup (Anne Giblin, Christopher Neill, Linda Deegan will be among the principals).

Responsible Partners and Their Role(s):

As has been done in the past, the Buzzards Bay NEP director will coordinate with the CZM South Coast Regional Coordinator to provide technical support for the development of proposal concepts for future state grant reports. Technical support will include LiDAR data, watershed, and landuse GIS analysis in support of applications, guidance on the development of tasks and project budgets, and other activities that would support Buzzards Bay municipality participation in these grant programs.

NEP Staff:

The Buzzards Bay NEP Executive Director is the lead on this task.

Outputs/Products:

Production of maps, data, and information that will support municipal applications to the Coastal Resiliency grant program.

Milestones:

Work on this project would be performed upon request on an ad hoc basis. At the start of the Cooperative Agreement, an announcement would be sent from the NEP to all applicable boards about the availability of NEP technical support for municipal applications to the Coastal Resiliency program. The announcement will include back links to the Buzzards Bay NEP website with existing interactive maps and datasets relevant to municipalities that support this task.

Budget:

Buzzards Bay NEP staff time. An estimated \$500,000 in grants to Buzzards Bay municipalities for Coastal Resiliency and Municipal Vulnerability Preparedness projects to be used as cash match to this Cooperative Agreement.

Outcomes:

Short-term: Increased number of municipal applications to the Coastal Resiliency Program and Municipal Vulnerability Preparedness grant programs.

Intermediate: Increased number of awards from the Coastal Resiliency Program and Municipal Vulnerability Preparedness grant programs from Buzzards Bay municipalities.

Long-term: Increased coastal resiliency and municipal vulnerability preparedness within the Buzzards Bay watershed.

Pressures affecting outcomes: For the Buzzards Bay NEP, limited by time availability of the Executive Director, and programmatically, local commitment of staff to support and application, and the level of competition for state grant funds.

This task supports several CWA core programs indirectly, including supporting sustainable wastewater infrastructure and CWA and state wetland protection efforts, and climate adaptation related priorities.

FY18 Workplan Task 14 - Collaboration with the Ecosystem Center to evaluate PRB Technology for remediation of residual nitrate in treated wastewater (\$60,531 subaward to the Marine Biological Laboratory Ecosystem Center).

The Buzzards Bay NEP collaborated with the Ecosystem Center at the Marine Biological Laboratory in the development of a grant application to the SNEP program to evaluate the feasibility of applying permeable reactive barrier (PRB) technology, using wood chips as a carbon source, to reduce nitrogen inputs from an advanced wastewater effluent under different controlled flow conditions. PRBs are a proven technology that have been demonstrated to passively reduce groundwater nitrate concentrations from several mg/L to less than 0.1 mg/L. The proposed work, which will be conducted also in partnership with the Wareham Water Pollution Control Facility, will evaluate how flows through the PRB media can be scaled, controlled, and optimized to further reduce nitrogen concentrations in the Wareham facility's discharge. The facility discharge currently averages less than 3 mg/L total nitrogen, mostly as nitrate. Evaluation of this approach and technology has applicability to the pumping of groundwater plumes contaminated with ammonia and nitrates, and the use of the technology to polish the effluent of advanced nitrogen reduction facilities like Wareham's.

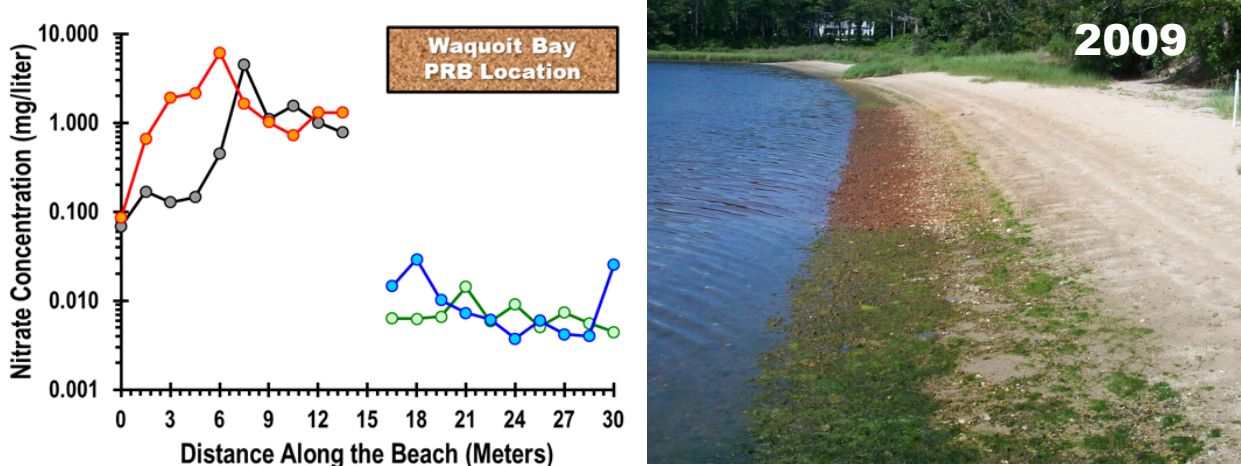


Figure 1. Nitrate concentration collected along a 30 m transect running parallel to the beach at the seepage face (intertidal region where groundwater emerges) down gradient from both control (0-14 m, grey and orange lines) and PRB (16-30 m, blue and green lines) at depths of 0.7 m and 1.4 m below grade. Photo shows exposed seepage face with algal growth along control site which abruptly stops downgradient from the PRB. Rust colored deposits are oxidized iron that precipitates from reduced iron mobilized by the PRB.

Although a larger comprehensive and more costly proposal failed to secure funding through SNEP, the Buzzards Bay NEP has included a scaled back pilot version of the proposed application in this work plan because it compliments past NEP funding and work at the Wareham Wastewater facility to reduce nitrogen from its discharge.

The pilot project as defined here would focus on evaluating the relationship between flow rates through the media. The Ecosystem Center scientists will construct six replicate small-scale test reactors (6" diameter pipe x 8 ft long) and manipulate conditions within these to maximize denitrification and removal of the residual nitrate. Reactors will be filled with either fresh wood or wood excavated from our existing 13 yr old barrier (to evaluate longevity of the media). The investigators will pump treated effluent from the WPCF through these systems at varying flow rates to control residence time. They will collect inflow, outflow, and interstitial water within the reactor to measure total N, NH₃, NO₃, PO₄, dissolved oxygen, DOC, and dissolved inorganic carbon at different points along the flow path. They will also measure denitrification (nitrate conversion to N₂ gas) directly using our membrane inlet mass spectrometry system. They will evaluate ways to enhance rates of denitrification within reactors to reduce the required residence time. Strategies include the addition of amendments with dissolved carbon sources such as methanol or glucose drawn from a separate reservoir, as well as the addition of a layer of iron or sulfur in series with the wood chips might foster auto-trophic denitrification so that contaminated waters would be subject to both heterotrophic and autotrophic nitrate removal in sequence. This pilot project will be an evaluation of a proof of concept, and if successful, provide a springboard for securing additional funding from other sources to scale up the treatment system and to better understand the biological processes involved.

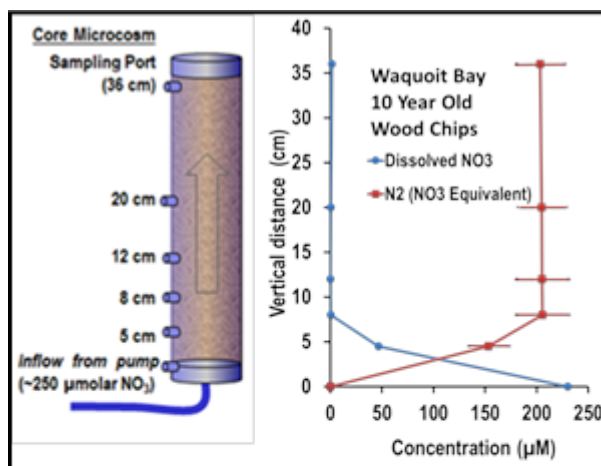


Figure 2. Complete conversion of nitrate to the equivalent amount of N₂ as groundwater is pumped upward through a reactor column filled with wood chips excavated from the Waquoit Bay PRB 10 years after installation in the field.

They will evaluate ways to enhance rates of denitrification within reactors to reduce the required residence time. Strategies include the addition of amendments with dissolved carbon sources such as methanol or glucose drawn from a separate reservoir, as well as the addition of a layer of iron or sulfur in series with the wood chips might foster auto-trophic denitrification so that contaminated waters would be subject to both heterotrophic and autotrophic nitrate removal in sequence. This pilot project will be an evaluation of a proof of concept, and if successful, provide a springboard for securing additional funding from other sources to scale up the treatment system and to better understand the biological processes involved.

The Buzzards Bay NEP will seek NEP Headquarters competitive grant funding to implement this task. Funding may be reallocated from other tasks in this workplan should they become available.

Principal Staff involved in these tasks:

The Buzzards Bay NEP Executive Director will facilitate coordination between the wastewater facility and the principal investigator, and communicate activities and findings of the project on the NEP website. The work will be undertaken by MBL staff and interns.

Responsible Partners and Their Role(s):

Dr. Ken Foreman, SES Director, is the project leader for MBL, and will oversee and manage the pilot study. Other associated Ecosystem Center staff include Vallino, Cardon, and Giblin.

NEP Staff:

The Buzzards Bay NEP Executive Director and Regional Planner will help oversee the grant to MBL.

Outputs/Products:

Production of draft and final report on the outcomes of the pilot study.

Milestones:

Work on this project would begin as soon as funding is secured and a grant written to the MBL.

Budget:

The requested \$60,531 covers materials, salary for a senior research technician (2.5 months) and two weeks of time for the principal investigator as well as for a student intern. All processing of samples and chemical analyses are done in-house by the ecosystem center.

Outcomes:

Short-term: Data defining the relationship between flow and nitrogen reduction under different control conditions.

Intermediate: A report summarizing the outcomes of the pilot study with recommended next steps and opportunities.

Long-term: If the technological approach is viable, application of the technology for larger scale volumes or field deployment for pump and treat of groundwater plumes. Further studies of bacterial process successful.

Pressures affecting outcomes: Funding is required to implement the pilot project. Pressures for the Buzzards Bay NEP are defined limited by time availability of the Executive Director. There may be unanticipated costs when implementing the program.

This task supports several CWA core programs indirectly, including supporting sustainable wastewater infrastructure and CWA and state wetland protection efforts.

FY18 Workplan Task 15 - Benthic monitoring for nutrient impacts. (\$15,000-\$60,000 needed)

The Town of Wareham has been working with the Buzzards Bay Coalition on conducting water quality and habitat monitoring in support of a potential relocation of the Wareham Wastewater Facility discharge from the Agawam/Wareham River to the Cape Cod Canal. The Wareham River is nitrogen impaired and a draft watershed nitrogen TMDL is pending. A water quality monitoring proposal from the Town of Wareham is pending before SNEP.

Recently, Massachusetts DEP, through a contractor, drafted a benthic infaunal monitoring guidance document in support of TMDL development and habitat condition assessments. This guidance document that closely follows EPA's NCCA protocols for benthic sampling. These protocols can be used to determine whether achieved TMDL targets are meeting living resource and habitat goals, and can be used for assessments related to permit applications to site new wastewater outfalls.

The Buzzards Bay NEP will work with the Town of Wareham, Buzzards Bay Coalition, and the Massachusetts Maritime Academy to seek NEP Headquarters' competitive grant funding to apply these protocols to establish baseline conditions in upper Buzzards Bay in the proposed outfall site. Mass Maritime is already working with the town and the Buzzards Bay Coalition to conduct underwater photographic surveys to document eelgrass distribution. Low level funding (\$15,000) can be used to fund two student interns for a summer COOP session to assist in the benthic sampling according to the protocols (quadrat surveys, underwater surveys, sediment grabs and sample pro-

cessing if additional funds become available for professional infaunal analysis.) Additional funding would be needed to cover the analysis of sediment samples for infauna (at a cost of \$45,000 for several sites.)

Funding may be reallocated from other tasks in this workplan should they become available. The BB NEP Executive Director will work with DEP to ascertain potential state funding or participation in the project.

Principal Staff involved in these tasks:

The Buzzards Bay NEP Executive Director will facilitate coordination between the partners and the principal investigators. Work by the MMA would be accomplished through an ISA.

Responsible Partners and Their Role(s):

Bill Hubbard, MMA, will oversee and manage the student participants and the field survey operations. A contractor will perform the infaunal analysis.

NEP Staff:

The Buzzards Bay NEP Executive Director and Regional Planner will help oversee the ISA to MMA.

Outputs/Products:

Production of draft and final report on the outcomes of the survey work.

Milestones:

Work on this project would begin as soon as funding was secured and an ISA is enacted with the MMA.

Budget:

An estimated \$15,000 to \$60,000 will be sought from the EPA NEP competitive grant program.

Outcomes:

Short-term: Data for use in the existing conditions assessment to help state and federal agencies evaluate a planned permit application.

Intermediate: A report summarizing the outcomes of the study; validation of the new DEP guidance protocols.

Long-term: Support for agency decision making for outfall relocation.

Pressures affecting outcomes: For the Buzzards Bay NEP, limited by time availability of the Executive Director, and programmatically, obtaining funds to implement this scope.

This task supports several CWA core programs indirectly, including supporting sustainable wastewater infrastructure and meeting water quality standards.

The Buzzards Bay NEP will seek NEP Headquarters competitive grant funding to implement this task. Funding may be reallocated from other tasks in this workplan should they become available.

Section 4: Budget Summary and Explanation

This workplan is a new Cooperative Agreement. The new budget is summarized according to these EPA grant categories. The FY18 budget is summarized in Table 2 and the pie chart in Fig. 13.

Table 2. Summary of Expenditures by EPA Grant Category	
EPA Category Summary	FY2018
PERSONNEL	\$372,269
FRINGE	\$138,261
OTHER: Rent, operations	\$41,101
OTHER: Municipal Grants	\$100,000
OTHER: Subawards	\$250,531
CONTRACTUAL	\$114,000
SUPPLIES	\$19,880
EQUIPMENT	\$0
TRAVEL	\$4,400
INDIRECT	\$54,558
TOTAL	\$1,095,000

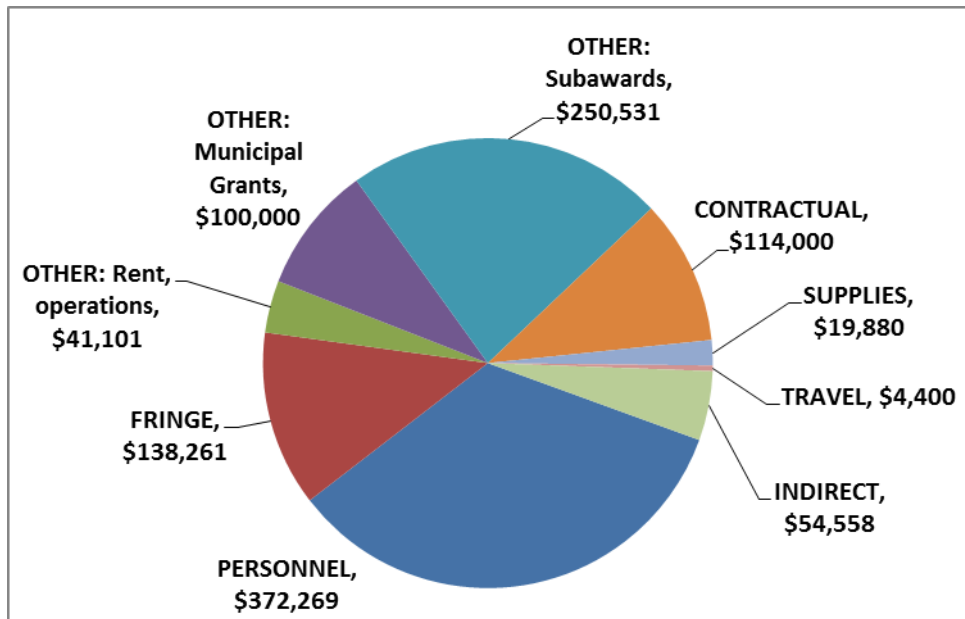


Fig. 13 Pie chart of FY18 federal budget summarized by EPA and other functional category

Federal FY18 BUDGET DETAIL

Award: \$1,095,000 (note: an additional \$30,000 is provided by the Buzzards Bay NEP to the Buzzards Bay Coalition for water quality monitoring under a separate Cooperative Agreement)

Personnel: \$372,269 (Personnel costs are based on the following staffing levels)

PERSONNEL	FTE	Salary based on FTE%
Executive Director	100%	\$106,597
Administrative Assistant 4/5 time	87%	\$59,850
Regional Planner 3/4 time	75%	\$67,392
Stormwater Specialist	100%	\$98,192
Stormwater Specialist 1/2 time	53%	\$40,238

Travel: \$4,400

Travel estimate is based on the actual expenditure from other years and new projections. The majority of travel is done within the Buzzards Bay watershed (site visits or partner meetings), with additional agency partner meetings in Massachusetts, and tech transfer meetings in New England. It is estimated that Buzzards Bay NEP staff will participate in the following:

Executive Director: 2 National meetings, 3 NE tech transfer meetings, 23 in-state and watershed partner meetings, 15 in-state site visits.

Regional Planner: 5 state and watershed partner meetings, 5 site visits.

Stormwater Specialist (FTE): 1 NE tech transfer meeting, 10 state and watershed partner meetings, 26 site visits.

Stormwater Specialist (HTE): 7 state and watershed partner meetings, 26 site visits.

Fringe: \$138,261

35.41% + 1.73% Medicaid, etc. charge on all personnel

Contractual: \$114,000

Stormwater Design Contracts* (Task 2, assume 5 projects)	\$100,000
Survey work*	\$4,000
Laboratory contracts for analyses* (Task 2)	\$10,000

Supplies: \$19,880

Postage, printing, paper, office supplies, field testing supplies, test meters, etc.

Other: \$391,632

Municipal Grants (Task 3)	\$100,000
Salt marsh monitoring program (Buzzards Bay Coalition) (Task 12)	\$30,000
Stormwater Collaborative Support (Task 2)	\$160,000
PRB optimization at wastewater facility (Marine Biological Laboratory) (Task 14)	\$60,531
Program Operations	\$41,101
12 months rent and utilities, cleaning, disposal, state audit, computer leases, repairs, telephone and internet charges, other chargebacks. It should be noted that cleaning, disposal, and repairs and maintenance (copy machine, printers, etc.), are not contractual purchases by the NEP. The vendors for these items are selected from state blanket contracts.	

Indirect costs: \$54,446

A 11.15% charge on "Personnel," plus selected expenditures in "Contractual" and "Other" categories (signified by an asterisk on detailed budget breakdown).

Table 3. FFY18 Budget for Workplan Total Award Proposed to Commence July 1, 2018

EXPENSES:	subtotal	Category
Technical Assistance and Program Costs		
PERSONEL*		\$372,269
Joe Costa, Executive Director	\$106,597	
Tracy Warncke, Admin. Assistant 4/5 time	\$59,850	
Sarah Williams, Regional Planner 3/4 time	\$67,392	
Kevin Bartsch, Stormwater Specialist	\$98,192	
Bernadette, Taber Stormwater Specialist 1/2 time	\$40,238	
CONTRACTUAL		\$114,000
Stormwater Designs* (assume 5 projects)	\$100,000	
Survey work*	\$4,000	
Laboratory contracts for stormwater analyses*	\$10,000	
OTHER (includes sub-awards)		\$391,632
Municipal Grants	\$100,000	
Salt marsh monitoring program (Buzzards Bay Coalition)	\$30,000	
Stormwater Collaborative Support (Mass Maritime Academy)	\$160,000	
WQ monitoring Support (\$30k holdback)	\$0	
PRB optimization at wastewater facility (Marine Biological Laboratory)	\$60,531	
Benthic Monitoring for Nutrient Impacts	\$0	
Program Operations	\$41,101	
FRINGE (37.14% combined)		\$138,261
TRAVEL (in state + out of state)		\$4,400
SUPPLIES		\$19,880
TOTAL DIRECT		\$1,040,442
INDIRECT (Comm. of MA= 0.1115, only * items)	11.15%	\$54,558
	TOTAL	\$1,095,000
"OTHER Program Operations detail		
rent + utilities	\$28,902	
cleaning*	\$2,496	
Frades disposal*	\$540	
repairs, maintenance (copy machine, printers, etc.)	\$500	
Phone, internet	\$1,895	
Data Center, Single Audit, etc.	\$5,968	
computer lease	\$800	
SUPPLIES Detail		
water	\$87	
subscriptions	\$300	
janitorial supplies	\$225	
Office supplies (paper, toner, printer, plotter, other)	\$2000	
WQ testing supplies, data loggers, theodolite, GSP units	\$16,418	
Historical aerial photographs	\$550	
postage	\$300	
total	\$19880	

Section 5: Match to the Cooperative Agreement

Below is a summary of the \$1,095,000 match that is being provided to meet the match requirement under this Cooperative Agreement to the Commonwealth. The largest portion of the match is provided by the Buzzards Bay Coalition programs followed by the municipal grant program. The Buzzards Bay Coalition, which last year had an operational budget of over \$3.5 million, works in a close partnership with the Buzzards Bay NEP on a number of tasks, including application of the water quality testing program, and work in support of wetland and habitat protection and restoration. The Buzzards Bay Coalition also provides a vital role in assisting communities to develop applications to the Buzzards Bay municipal grant program. Another important contributor to the match total are the cash and in kind contributions from the member communities of the Buzzards Bay Action Committee. These collaborations have led to a very high rate of leveraging in our municipal grant program and continue to represent one of the cores of the match to our cooperative agreement.

1) Buzzards Bay Coalition Water Quality Monitoring Program (\$278,209).

For the past decade, the Coalition secured nonfederal funds through grants, members' dues, state earmarks, and donations to support its water quality monitoring program and related outreach.

The cost of the core elements of this program (staff, publications, contractual laboratory testing services, and supplies) approaches \$180,000 per year. The core program elements plus the volunteer time increases the value of the program to more than \$250,000. We have estimated this volunteer time at \$124,804.68 based on \$31.17/hr. x 143 volunteers x 28 hours per season which is an underestimate since most volunteers contribute 40 hours per year.

Our match under this agreement for this task (\$278,209) includes these specific expenditures of the program: a portion (\$42,000) of the Director of Monitoring salary not used as match elsewhere, contractual laboratory analyses and volunteer time estimate (\$140,616), other miscellaneous expenditures (\$1,880), supplies (\$9,052), and travel (\$4,354).

2) Municipal support to BBAC (\$10,400).

The municipalities of Buzzards Bay pay \$10,400 per year to the Buzzards Bay Action Committee to support projects to implement the Buzzards Bay CCMP. These funds pay the costs of a part-time Executive Director, defray organization costs, helped fund a school education pilot program, and pay for meeting and workshop expenses.

3) BBAC and workshop meetings (\$14,300).

The BBAC is composed of high level municipal officials, generally Selectmen, Town Administrators, or Department heads that meet monthly (12 municipalities, about 10 officials typically attend, at 8 meetings per year for 2 hours per meeting. The average hourly rate assigned to these municipal officials is estimated to be \$78 per hour.

4) Municipal Match to the Stormwater Collaborative (\$25,000).

This includes 100 hours of DPW staff each year, collaborating with Buzzards Bay NEP and Massachusetts Maritime Academy staff to provide crews to remove manhole covers and other access to support water quality testing.

5) Other Coalition support: education and land conservation programs (\$172,091).

The Buzzards Bay Coalition's annual operational budget exceeds \$1.4 million and includes a wide

range of activities that compliment this work plan. These activities include public education and outreach initiatives and publications, water quality data management updates for their website, in-stream monitoring program, oil spill area contingency plan updates with municipal officials, newsletters and events that include the cost of Director, outreach staff, and communication costs. The applicable matching amounts support and coincide with the Buzzards Bay NEP tasks identified in this work plan.

The Coalition also has a vigorous land protection program to encourage Bay-focused watershed land protection, empower local land trusts, and educate private landowners about land conservation options. These efforts are supported by foundation and donor-supported programs, include several staff members, and has outreach costs. Expenditures under this program by the Coalition, especially land acquisition, continue to represent a large portion of this non-profit's expenditures. The activities support a key goal of the Buzzards Bay CCMP, the protection of wetlands, habitat, and open space to protect water quality, and living resources. Publicly accessible open space also helps build support for other environmental initiatives of both our programs.

The Buzzards Bay National Estuary Program is a key partner with the Coalition, preparing hundreds of maps and conducting GIS land use evaluations for targeted acquisitions. Our support is integral in the Coalition's outreach for their program, and has helped the passage of municipal town meeting legislative articles in support of conservation land acquisitions.

6) CZM Coastal Resiliency Grant program (\$495,000)

Grants awarded by CZM for projects in the Buzzards Bay watershed.

7) Municipal match to Buzzard Bay NEP grants (\$100,000)

The Buzzards Bay municipal grant program requires a 25% match of total project cost (=33% of award) but we are projecting overmatch of the amount shown based on historical averages.

Table 4. Summary of proposed match.

Proposed MATCH (non-state)	Total	Personnel	Fringe	Contractual	Other	Supplies	Travel	Indirect	TOTAL
1. Coalition WQ Monitoring Program (1)	\$278,209			\$278,209					\$278,209
2. BBAC dues	\$10,400			\$9,400		\$1,000			\$10,400
3. BBAC, other municipal meetings, workshops	\$14,300	\$14,300							\$14,300
4. Municipal match to Stormwater Collaborative (not used elsewhere)	\$25,000	\$25,000							\$25,000
5. Other Coalition Support(2)	\$172,091	\$170,391					\$1,700		\$172,091
6. CZM Coastal Resiliency Grant program	\$470,000				\$495,000				\$470,000
7. Municipal match to Buzzard Bay NEP grants	\$100,000				\$100,000				\$100,000
Summary	\$1,070,000	\$209,691	\$0	\$287,609	\$595,000	\$1,000	\$1,700	\$0	\$1,095,000

Footnote 1: In this category, we are including the value of the time volunteers contribute to the Buzzards Bay Coalition's Water Quality Monitoring Program. This contribution is based on 143 volunteers x \$31.17 (see www.independentsector.org/programs/research/volunteer_time.html) x 28 hours per season (= \$124,804.68, also added to the contractual category), plus additional cash provided by the state legislature to the program. The volunteer time contribution represents an underestimate of BBC volunteer time. We estimate actual average time per volunteer as more than 40 hours per year with retraining and samplings times for participants in the regular monitoring program (22 oxygen samplings and 4 nutrient samplings), but as little as 6 hours per year for a minority of volunteers who sample only the four nutrient dates. Travel includes both in-state and out-of-state estimated reimbursements. Supplies includes chemicals, replacement and new test kits, sampling devices and repairs, handheld monitoring devices, and a wide range of support materials related to the operation of the program. Other includes postage, printing, and program insurance.

Footnote 2: Portions of Buzzards Bay Coalition Staff in these positions: VP Education & Public Engagement (\$55,000) VP Watershed Protection (\$50,000), Director of Land Protection (\$40,000), Communications Specialist (\$40,000), Director of Land Protection (\$49,000), and Restoration Specialist (\$45,000).

Section 6: Reprogramming of FY17 Funds

No reprogramming is required.

Section 7: Buzzards Bay NEP Staff

Dr. Joe Costa is Executive Director of the Buzzards Bay NEP. Besides overseeing and administering the Program, he provides technical assistance on nitrogen loading assessment and management, water quality analysis, watershed planning, build-out analysis, data analysis, and software support. His research in marine ecology, particularly nitrogen loading effects on eelgrass beds and coastal ecosystems has been put to use in the Coalition's citizen monitoring program and the NEP's nitrogen management approach. The director is also the program's webmaster.

Kevin Bartsch is one of the Buzzards Bay National Estuary Program's Stormwater Specialists (full-time). He has a Master's Degree in Watershed Science and over 20 years' experience in GIS data development and modeling. Kevin has a wealth of knowledge in utility (water, wastewater, electric) infrastructure, asset management, soil erosion, natural resource management, and open space protection. At the Buzzards Bay NEP, Kevin works with municipalities and the Massachusetts Maritime Academy to create a comprehensive stormwater GIS and management program. Kevin also volunteers as a board member and as former Director and President of the Wareham Land Trust.

Bernadette Taber is one of the Buzzards Bay National Estuary Program's Stormwater Specialists (part-time). A long-time former employee of the USDA Natural Resource Conservation Service detailed to the Buzzards Bay NEP office since 1991, Bernie re-joined the Buzzards Bay NEP after leaving federal service in 2015. Bernie evaluates and develops engineering solutions for stormwater remediation in both agricultural and urban environments. Bernie has reviewed many engineering plans at the request of Buzzards Bay municipalities, and has also developed the preliminary stormwater and habitat restoration designs identified in collaboration with Buzzards Bay municipalities and their contractors.

Tracy Warncke is the Buzzards Bay NEP's Administrative Assistant (4/5 time). She not only handles administrative duties including federal grant administration at the Buzzards Bay National Estuary Program office and updates data for the website, but also has designed many reports, brochures, and fact sheets for the NEP and municipalities alike. Tracy spent four years with the Bourne Board of Health testing water for fecal coliform bacteria, experience she has put to work at the Buzzards Bay NEP.

Sarah Williams is the NEP's Regional Planner (3/4 time). She provides assistance to municipalities on land use and watershed planning, land conservation, buildout analysis, habitat restoration, and mapping. She is a coordinator between the towns and the Buzzards Bay National Estuary Program on our Municipal Grant Program, and prepared the NEP's regional open space plan. Sarah was also a former member of the Fairhaven-Acushnet Land Preservation Trust and Fairhaven Conservation Commission, and brings this valuable experience to bear on her activities.

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Appendix 1. Index of Tasks

Section 2 (FY2015 Workplan Tasks) represents status of last year's tasks, Section 3 (FY2016 Workplan Tasks) represents this year's tasks.

FY17 Workplan Task 1 - Wetland Restoration and Open Space Protection and Restoration.....	4
FY17 Workplan Task 2 - Stormwater Remediation and Technical Assistance	6
FY17 Workplan Task 3 - NEP Technical Assistance and Municipal Grant Program.....	9
FY17 Workplan Task 4 - Program Oversight and Administration.....	11
FY17 Workplan Task 5 - Buzzards Bay Citizens' Water Quality Monitoring	12
FY17 Workplan Task 6 - Environmental Indicators and Outcomes Tracking.....	12
FY17 Workplan Task 7 - Outreach and Education	14
FY17 Workplan Task 8 - Other Specialized Technical Assistance.....	18
FY17 Workplan Task 9 - Technology Transfer to Other Estuaries.....	20
FY17 Workplan Task 10 - Website Maintenance and Innovation	20
FY17 Workplan Task 11 - Analysis of Climate Change Vulnerability of Nitrogen TMDLs	22
FY18 Workplan Task 1 - Wetland Restoration and Open Space Protection and Restoration.....	23
FY18 Workplan Task 2 - Stormwater Remediation and Technical Assistance (includes a \$160,000 subaward to the Massachusetts Maritime Academy)	24
FY18 Workplan Task 3 - Buzzards Bay NEP Technical Assistance and Municipal Grants	28
FY18 Workplan Task 4 - Program Oversight and Administration.....	29
FY18 Workplan Task 5 - Buzzards Bay Citizens' Water Quality Monitoring	30
FY18 Workplan Task 6 - Environmental Indicators and Outcomes Tracking.....	32
FY18 Workplan Task 7 - Outreach and Education	34
FY18 Workplan Task 8 - Other Specialized Technical Assistance.....	35
FY18 Workplan Task 9 - Technology Transfer to Other Estuaries.....	37
FY18 Workplan Task 10 - Website Maintenance and Innovation	38
FY18 Workplan Task 11 - Scientific collaboration on nitrogen TMDLs, climate impacts, and water quality impacts on natural resources.....	39
FY18 Workplan Task 12 - Salt Marsh Loss Assessment (\$30,000 subaward to Buzzards Bay Coalition)	41
FY18 Workplan Task 13 - Technical assistance to support Coastal Resiliency and Municipal Vulnerability Preparedness.....	43
FY18 Workplan Task 14 - Collaboration with the Ecosystem Center to evaluate PRB Technology for remediation of residual nitrate in treated wastewater (\$60,531 subaward to the Marine Biological Laboratory Ecosystem Center).....	44
FY18 Workplan Task 15 - Benthic monitoring for nutrient impacts. (\$15,000-\$60,000 needed).....	46