

Buzzards Bay National Estuary Program

Implementation Activities

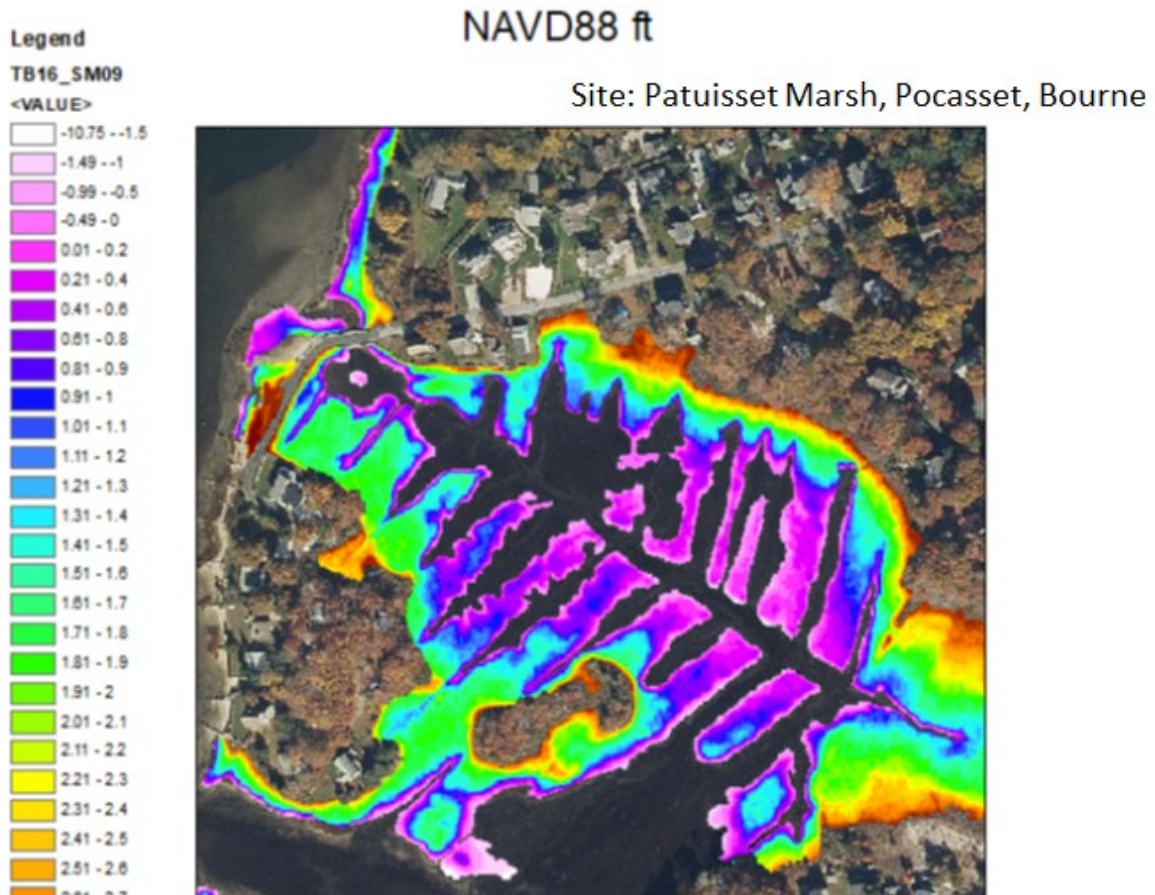
Federal FFY21 Funds Work Plan and Budget

Pursuant to Section 320 funding under

A Cooperative Agreement with the U.S. EPA

For work beginning July 1, 2021, to June 30, 2023

May 24, 2021, Amended May 20, 2022



Lidar elevations of a disappearing salt marsh (NEP, January 2021).

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May 12, 2022 updates to this FFY21 workplan and budget

This two-year workplan was submitted by the Buzzards Bay National Estuary Program (NEP) in May 2021 and approved by EPA in June 2021. After the workplan commenced, several tasks needed revision. Funding for contractual engineering services (funding in the "Contractual" grant category, \$75,000) was redirected to municipal grants and the Sea Lab subaward described below.

Because of this decision, funding for the first task for the UMass Dartmouth subaward, which was dependent upon the development of new stormwater designs (the focus of the first task), was reconfigured to wholly fund the second task in the UMass Dartmouth subaward, that of innovative monitoring approaches using Unmanned Aerial Systems to document salt marsh loss from climate change and other factors. The budget also increased from \$43,719 to \$49,411, utilizing funds created by reductions of indirect from moving funds from Contractual to Other.

The NEP will also initiate a new subaward with the New Bedford Public School System to strengthen our work with Environmental Justice communities. A portion of these funds (\$27,496) will fund a new initiative. The New Bedford Sea Lab Buzzards Bay NEP Partnership for Marine Education Support to Environmental Justice Communities that will constitute Appendix B. Sub-award Proposal 4. This project will help lay a foundation for future NEP Justice40 initiatives with the City of New Bedford.

Use of Federal FY21 funds

Category	2021 Award	Reprogram Amounts	Change	Non- Federal	Total
PERSONNEL	\$359,079	\$359,079	\$0	\$253,538	\$612,617
FRINGE	\$141,836	\$141,836	\$0	\$0	\$141,836
TRAVEL	\$3,600	\$3,600	\$0	\$272,704	\$276,304
SUPPLIES	\$4,258	\$4,258	\$0	\$422,058	\$426,316
CONTRACTUAL	\$104,000	\$29,000	-\$75,000	\$0	\$29,000
OTHER	\$270,395	\$355,925	\$85,530	\$1,700	\$357,625
TOTAL DIRECT	\$883,168	\$893,698		\$0	\$1,843,698
INDIRECT	\$66,832	\$56,302	-\$10,530	\$0	\$56,302
TOTAL	\$950,000	\$950,000	\$0	\$950,000	\$1,900,000

Section 1: Introduction and Overview

Since the completion of the *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 the CCMP. This mission was affirmed when the NEP Steering Committee approved the *CCMP 2013 Update* on November 26, 2013.

The U.S. EPA has made available to the NEP \$700,000 in 2021 federal fiscal year (FFY21) Clean Water Act Section 320 funds. In addition, Region I has made available, through the Southeast New England Program for Coastal Watershed Restoration (SNEP), \$250,000 for NEP grants and targeted sub-awards that support the goals and objectives of SNEP. Thus, this year's work plan budget outlines \$950,000 in spending. Sections 3 (FFY21 Tasks) of this work plan describes the tasks and activities planned with the use of federal FFY21 funds to meet NEP goals, and how the SNEP funds will be spent. Section 4 provides a detailed budget, and Section 5 summarizes the match to the grant.

A summary of NEP funding since 2011 is shown in Fig. 1. In the FFY14 and FFY15 funding cycles, the NEP administered \$728,000 and \$1,000,000 in EPA add-on funds (principally SNEP funds that were awarded as SNEP grants at the request of the U.S. EPA). SNEP provided 250,000 in both the FFY20 and FFY21 funding cycles for targeted grants and municipal grants.

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 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 NEP in achieving specific goals contained in the CCMP. For example, under the FFY21 work plan, CZM is providing \$5,000 toward the NEP’s rental agreement in support of the South Coast Regional Coordinator housed in the NEP office.

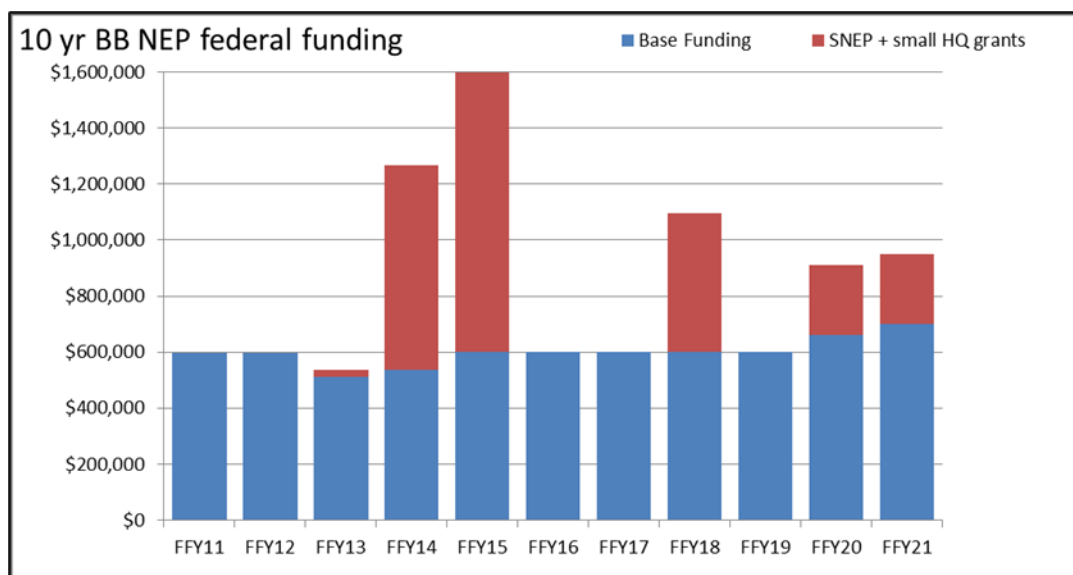


Fig. 1 NEP federal funding during the past decade.

Section 2: FFY20 Outcomes: Highlights and Accomplishments July 1, 2020 to June 30, 2021

Status of FFY20 Work Plan, July 1, 2020 to present

This work plan began during the height of the COVID-19 Pandemic. Despite the constraints imposed by the health crisis, the NEP successfully pursued its mission, including the award of municipal grants, issuance of sub-awards, continuance of our support of the Stormwater Collaborative, and several research and monitoring projects on which the NEP is a partner.

This section summarizes the status of tasks in last year's work plan activities and describes key accomplishments by the NEP and our partners. The FFY20 work plan Cooperative Agreement is ongoing because the grants and sub-awards under that work plan have not yet been completed. In particular, the onset of many projects was delayed due to the COVID-19 crisis that began in March 2020. While this section summarizes many of the specific actions achieved, it is important to stress that our support of the Stormwater Collaborative and participating municipalities represented the single largest commitment of staff resources.

FFY20 Work Plan Task 1 - Wetland Restoration and Open Space Protection and Restoration

As we have done in the past, the NEP continued to work and collaborate with the Buzzards Bay Coalition (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 NEP provided maps, helped develop state and federal grant applications, wrote letters of partnership and

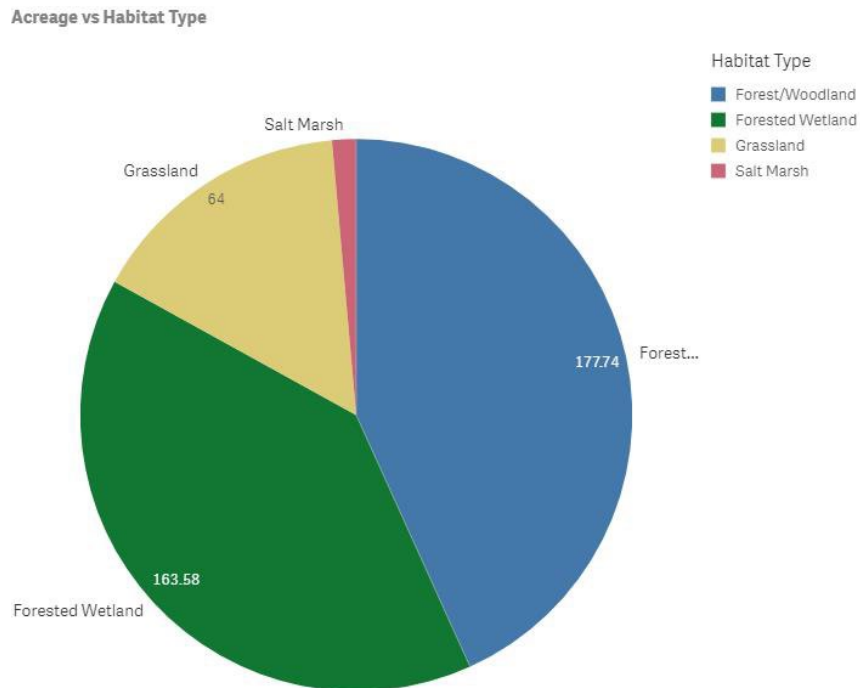


Fig. 2 Types of habitat protected or restored as reported in the 2020 GPRA report to EPA. The total 411 acres shown represent only those projects in the watershed in which the NEP provided some supporting role, mostly in the form of technical or financial assistance.

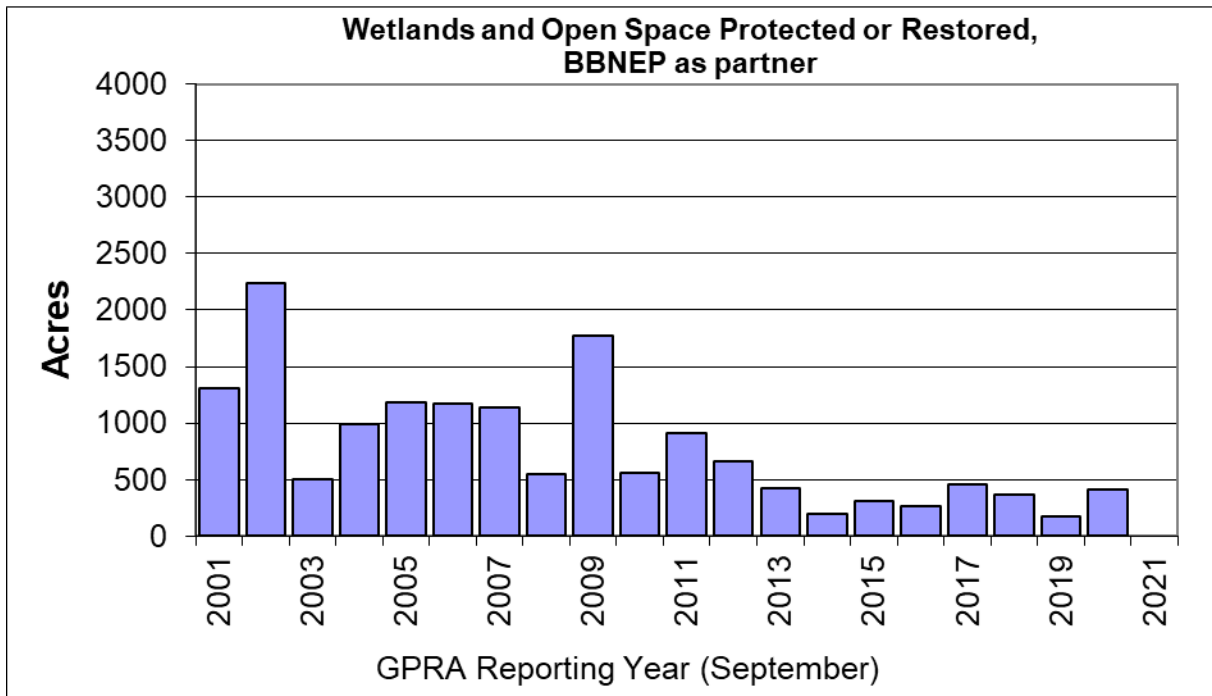


Fig. 3 Total wetlands and open space protected or restored.

support to granting agencies, conducted land use analyses, and through the municipal grant program, provided mini-grant funds that help meet match requirements for leveraging grants from other programs. As required by U.S. EPA headquarters, the NEP reports on wetland and habitat protected or restored with support of the NEP in our annual Government Performance Results Act (GPRA) report submitted through the National Estuary Program Online Reporting Tool (NEPORT) each September.

The success of Buzzards Bay municipalities, the Coalition, and the area land trusts can be seen in the acres of open space and habitat protected or restored in which the NEP was appreciably involved through funding or technical assistance. Fig. 2 sums the acreage of the primary characteristic of the parcels protected, and Fig. 3 shows the amount of land protected with NEP technical or financial support since 1999.

The 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 NEP in the last or previous fiscal years. The NEP directly funded six projects (four of which the Coalition was a partner), totaling \$125,606, and these are described in the summary of our municipal grants (Fig. 4 shows Apponagansett Bay Farm).

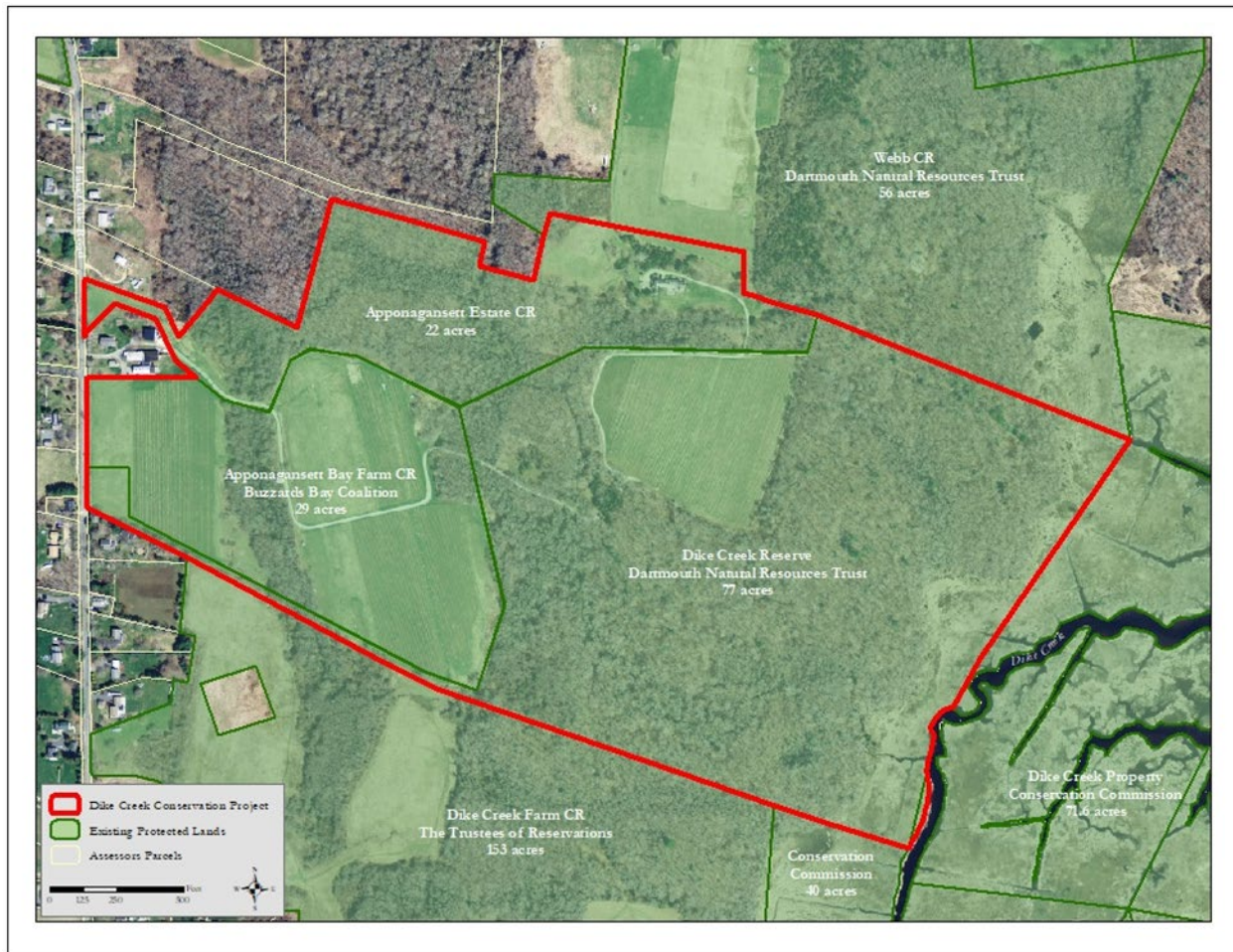


Fig. 5 Dike Creek Conservation Project

The Coalition is a responsible steward of the lands they protect, and they encourage the public's use and enjoyment of their properties. They have a strong record of restoring impaired properties by removing trash, derelict buildings, abandoned vehicles, and restoring wetlands and habitat. Most recently, the Coalition coordinated multiple funding sources in an effort to protect the Stuart Bog Cedar Swamp in Rochester. This 240-acre property includes historic wetlands that are now part of an active cranberry farm. Once protected, approximately 60 acres of retired farmland will be restored to historic wetland conditions and integrated into the broader landscape. While the NEP provided funding through its municipal mini-grant program to be used towards the acquisition of the property, the Coalition was able to secure additional funding through the Massachusetts Division of Ecological Restoration to support restoration design, permitting, and implementation. The property is expected to be acquired and protected by the end of 2021, with the restoration efforts ongoing.

Land protection efforts often take years to come to fruition and involve many partners. In 2018,



Fig. 4 Apponagansett Bay Farm, Dartmouth.

the NEP awarded the Town of Dartmouth and its partners, the Coalition and Dartmouth Natural Resources Trust, grant funds to acquire and protect nearly 77 acres of a larger 128-acre property (Fig. 5). The project, referred to as the Dike Creek Conservation Project, was to acquire and protect the most sensitive saltmarsh, wetlands, and forest along Dike Creek. After the most critical habitat was protected (now called Dike Creek Reserve), the Coalition acquired the remaining acreage of the property. This property was divided into two estate lots, one of which includes a vineyard. The Coalition placed conservation restrictions on both properties, to restrict future development, and the properties were sold to private landowners. The final conservation restriction was completed in March 2021, three years after the initial project began. More about the multi-year project can be located at: savebuzzardsbay.org/news/coalition-completes-protection-of-the-apponagansett-bay-farm/.



Fig. 6 NEP and MMA staff trained Marion DPW on the use of the newly outfitted IDDE trailers.

FFY20 Work Plan Task 2 - Stormwater Remediation and Technical Assistance

In 2020, with the ongoing support of a SNEP grant and a Department of Environmental Protection (DEP) MS4 grant to Massachusetts Maritime Academy (MMA), the NEP was able to support the expansion of the Buzzards Bay Stormwater Collaborative (Stormwater Collaborative) to eight Buzzards Bay watershed municipalities and conduct Illicit Discharge Detection and Elimination (IDDE) training. The NEP was a lead author and co-applicant on all these grant applications, and the NEP also provided funds for laboratory testing of stormwater samples.

MMA remains the lead in completing Stormwater Collaborative tasks with guidance from the NEP. In December 2020, MMA received its second DEP MS4 grant on behalf of the Stormwater Collaborative to use the newly outfitted IDDE trailer to conduct further training and investigations. The trailer is housed at MMA and is now available to any of the Stormwater Collaborative municipalities. The NEP was a partner on the first grant that began in January 2020 and directed the construction and equipment specifications. Hands-on training for town officials on how to use the trailer and its equipment has not been possible due to COVID-19. The NEP and MMA, with permission from DEP, developed a series of YouTube videos for training purposes. These videos were posted in June 2021, and provide information

on some stormwater basics, considerations for MS4 permitting, GIS mapping techniques, and sampling protocols currently used in the continuing monitoring program. For the video series, see the [Buzzards Bay Stormwater Collaborative YouTube channel](#). The [Buzzards Bay Stormwater Collaborative page](#) has additional information about the Stormwater Collaborative, and these and other useful stormwater monitoring training videos are on the Stormwater Collaborative's [Monitoring Discharges page](#).

This initiative remains a major time commitment of NEP staff during the past year. The NEP was not only one of the leads in founding the Stormwater Collaborative, but we were also responsible for many tasks, such as: Quality Assurance Project Plan (QAPP) update, training, GIS support, and data management. During the past year, the NEP continued to update monitoring guidance documents, and train students and staff in the program. The NEP director worked with the MMA Marine Science, Safety, and Environmental Protection (MSSEP) Professor William Hubbard to coordinate MMA and NEP efforts. In addition, one NEP stormwater specialist maintains a Geographic Information System (GIS) database incorporating the field investigations and transferring of plan data into the GIS database. The other NEP stormwater specialist oversees the collection of water quality data and conducts quality assurance checks of the data and prepares MS4 permit materials for Stormwater Collaborative participants.

In June, the NEP staff assisted MMA in the preparation of a second MS4 municipal assistance grant application. In December 2020, the Governor announced a \$47,000 award to continue MMA IDDE training with the new trailer and expansion of stormwater testing. This work is scheduled for completion by June 30, 2021.

In 2020, the NEP reviewed four years of Stormwater Collaborative data and identified fifteen priority discharges around Buzzards Bay where potential stormwater treatment might be warranted. Treatment sites were selected based on several criteria including pollutant concentrations, availability of space for treatment practices, size of catchment, and expected soils and water table elevation (based on Natural Resource Conservation Service's Soil Surveys). In May 2020, the NEP then hired Horsley Witten Group (HWG) to review the site data and develop stormwater treatment designs for those sites with the best potential. During the summer of 2020, from the original 15 potential project sites, five sites in the towns of Wareham, Mattapoisett, Acushnet, Dartmouth, and Mattapoisett were selected by the NEP and HWG for the development of conceptual plans. Each town's Public Works departments participated in that effort; including digging soils test pits, providing utility and stormwater facility plans, and providing guidance on feasible approaches for the town. In the fall, three sites were selected for the development of final plans (discharges from Acushnet's Riverview Park, Wareham's Besse Park, and Fairhaven's Jerusalem Road). In consultation and review by both the town and the NEP, HWG finalized the design in December 2020, and the town Conservation Commissions permitted each of the projects. In early April 2021, the NEP helped each of the towns prepare model grant proposals that will assist the towns in applying for state and federal funds to help construct the stormwater treatment facilities, which include green infrastructure like biofilter, sand filters, and swales.

In December 2020, a fourth site was selected for the development of stormwater treatment plans by civil engineering students in the University of Massachusetts Dartmouth (UMass Dartmouth) Civil and Environmental Engineering Department. This work, funded through a SNEP-funded collaboration between UMass Dartmouth and the NEP, will be completed in May 2021.

A second task incorporated in the interagency service agreement between UMass Dartmouth and the NEP was an evaluation of 5 years of water quality data collected by the Stormwater Collaborative, and an illicit discharge investigation in the Tub

Mill Brook drainage basin in the Town of Mattapoisett. These latter projects are being undertaken by a master's student in the Civil and Environmental Engineering Department of UMass Dartmouth. The project began because of concerns raised by the town about discharges from the state road, Route 6, to Tub Mill Brook. In March 2021, we notified the town that we were undertaking the investigation, but that we would need support from the town's highway department to remove grates and manhole covers, and supply police details. The town must also obtain a permit from Mass Department of Transportation. This work is planned for the spring and summer of 2021. The Route 6 discharge is one of perhaps 10 discharges (pipes or road cuts) to Tub Mill Brook. The effort will further the town's compliance with its MS4 stormwater permit with EPA.

Besides the Stormwater Collaborative support, the NEP aids towns on stormwater issues in several 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 and state monies to help fund remediation of priority sites. Third, we assist towns to develop and implement stormwater management plans, like the Phase II MS4 National Pollutant Discharge Elimination System (NPDES) municipal plans. Finally, we work with town boards to adopt local stormwater regulations and Low Impact Development (LID) strategies.

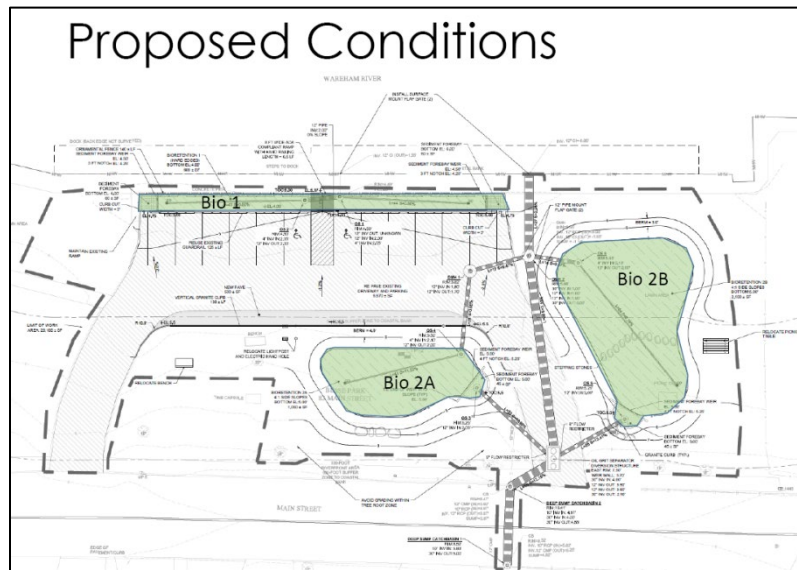


Fig. 7 HWG presentation, with the NEP, for biofilter construction at Besse Park.

FFY20 Work Plan Task 3 - NEP
Technical Assistance and Municipal
Grant Program

Through our grant and technical assistance programs, the NEP helps municipalities, and our other partners achieve the goals and objectives of the CCMP. In December 2020, EEA announced \$125,606 in federal grants for land protection, septic system tracking, and town bylaw amendments that will protect water quality and habitat in the Buzzards Bay watershed. The Municipal Mini-grants were awarded by the NEP through CZM with funding from SNEP. The six grants are being matched by over \$203,000 in private and municipal contributions and in-kind services. The following grants were awarded:

- Acushnet – \$15,000 to purchase and permanently protect several parcels of undeveloped forest land, for a total of 99 acres. This land is located in the headwaters region of Tripps Mill Brook—an important tributary to the Mattapoissett River, which is the primary source of drinking water for Acushnet and four surrounding towns.
- Carver – \$8,500 to revise its existing Transfer of Development Rights (TDR) bylaw to better position the town to preserve land and encourage appropriate and balanced development.
- Carver – \$20,946 to purchase and permanently protect two parcels of forested land totaling 32 acres. The properties are located over medium and high yield drinking water aquifers, lie along a tributary of Indian Brook in the Upper Weweantic River watershed, and abut existing conservation lands.
- Marion – \$50,000 to protect more than 36 acres of land in the Aucoot Cove watershed through a combination of land acquisitions and conservation restrictions. Protection of these lands, which contain designated habitat for rare species, will build on a larger block of existing conservation land.
- Rochester – \$20,946 to purchase and permanently protect 232 acres of land located within a large contiguous undeveloped forest area at the headwaters of the west branch of the Sippican River. The property includes Atlantic White Cedar Swamp, important state-designated habitat, and 65 acres of cranberry bogs.
- Westport – \$10,214 to join the Barnstable County Department of Health and the Environment’s Innovative and Alternative Septic System Tracking Program. These innovative septic systems are designed to release significantly less nitrogen than conventional Title 5 septic systems but are also more complex and require regular monitoring to ensure they are meeting established nitrogen standards.

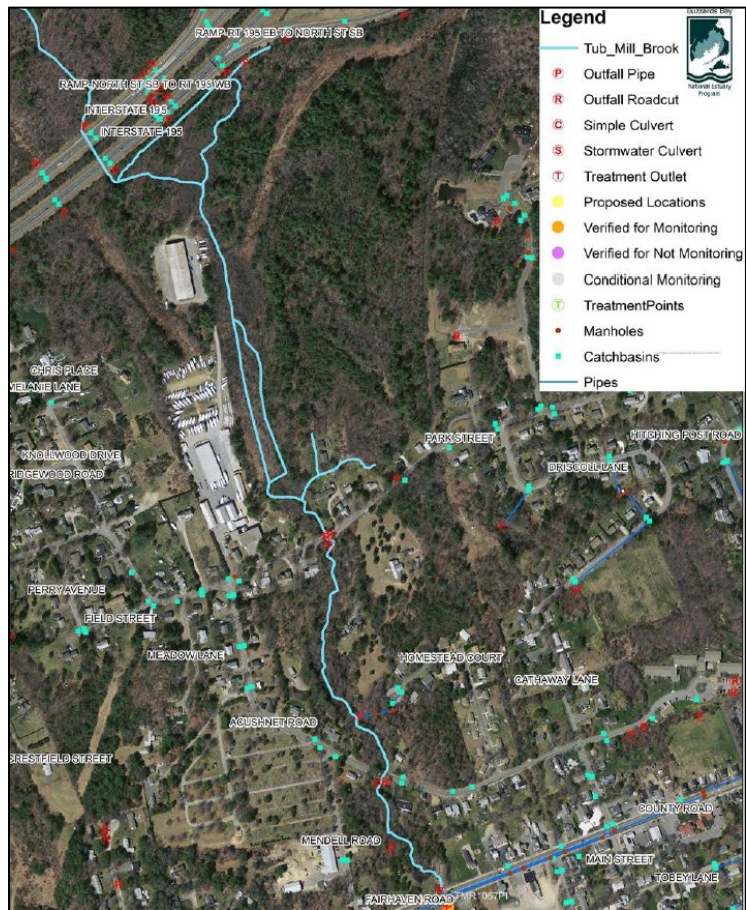


Fig. 8 Mattapoissett stormwater discharges to Tub Mill Brook.

The NEP continued to assist municipalities and other partners with GIS analysis, proposal development, review of local projects, and training and support for municipal MS4 compliance. The NEP's Regional Planner also produced over 675 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 Coalition, area land trusts, and municipalities. Examples include municipal open space maps, 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 NEP continues to work with the Coalition's SAC and a team of scientists in Woods Hole to identify pressing issues related to climate change, nitrogen and toxic pollution, and the loss of wetlands habitat and living resources in Buzzards Bay.

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

FFY20 Work Plan Task 4 - Program Oversight and Administration

The NEP Executive Director and CZM Fiscal Officer ensured the proper administration of the EPA grant, other grants, and Interagency Service Agreements (ISA) awarded to the NEP. The NEP Regional Planner, who manages the municipal grant program, assists in grant tracking and some reporting requirements.

During the spring and summer of 2020, after moving into new office space, the NEP director and staff worked to transition to a work-at-home office environment with great success. In March 2021, the EEA provided NEP staff with new laptops, docking stations, and monitors, facilitating staff productivity, and the planned transition to a hybrid work environment to be implemented in the summer and fall of 2021.

During the summer of 2020, the NEP and Boston finance staff worked together to close two outstanding cooperative agreements and submit all needed outstanding paperwork to EPA for Cooperative Agreement CE-00A00456 (\$1,095,000.00 and included \$500,000 in SNEP funds). This Cooperative Agreement ended March 31, 2021, and the NEP and CZM are now preparing the close-out paperwork. Cooperative Agreement FC00A00515 (\$600,000; 7/1/2019 start), ends June 1, 2021, and the NEP is preparing to drawdown remaining funds on that work plan.

In September 2020, the NEP submitted the 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 NEP provides information on the GPRA performance measures to EPA by their required date.

FFY20 Work Plan Task 5 - Buzzards Bay Citizens' Water Quality Monitoring

The Coalition continued its nationally recognized Baywatchers water quality monitoring program, which began in 1992. The Baywatchers program is supported by the Commonwealth of Massachusetts, the NEP, citizens, Coalition dues, and other sources. The NEP continued to support the Coalition's Baywatchers program with a \$40,000 grant, and this award will end in the fall of 2021. The Coalition's Baywatchers program, which began in 1992 under the direction of the NEP, remains 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 DEP's Massachusetts Estuaries Project. This work, together

with efforts to help towns identify problem stormwater discharges and to support efforts for treatment through technical assistance and grants, directly supports EPA goals to better control non-point source pollution on a watershed basis.

During the 2020 season, the 29th consecutive season water quality data was measured weekly from May to September with more intensive nutrient sampling occurring every two weeks, in July and August. More than 165 individuals volunteered their time and energy for the 2020 water monitoring program. This totaled more than 4,524 volunteer hours to collect 4,034 points of basic water quality parameter data. During the 2020 water-sampling season, data was gathered for the basic parameters of weather conditions, water temperature, salinity, clarity, and dissolved oxygen level (May-Sept). In addition, 804 coastal nutrient water samples and 114 samples for total phosphorous from freshwater inputs were collected for Health Index nutrient level analysis. Successful monitoring by this program provides another year of trend analysis data for regional assessments for the Bay (29 consecutive years) from more than 275 different sampling locations.

In March 2021, the Coalition published 27 years of Baywatchers water quality data in the international scientific journal, *Scientific Data* (part of the Nature Publishing Group). The publication will improve access to Buzzards Bay water quality data for researchers around the world investigating coastal eutrophication. Coalition Science Director Rachel Jakuba was the lead author of a team that included NEP Executive Director Joe Costa¹.



Fig. 9 Baywatcher volunteers monitor 200 sites.

¹ Jakuba, R.W., Williams, T., Neill, C. et al. Water quality measurements in Buzzards Bay by the Buzzards Bay Coalition Baywatchers Program from 1992 to 2018. *Sci Data* 8, 76 (2021). <https://doi.org/10.1038/s41597-021-00856-4>.

FFY20 Work Plan Task 6 - Environmental Indicators and Outcomes Tracking

The NEP continued to track various environmental indicators on its website including shellfish bed closures ([BB Closures website](#), Fig. 10 and Fig. 11) 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 quadrennial State of the Bay reports (the next report is scheduled for January 2022).

The NEP has been a member of the Coalition's SAC since its creation in 2014, and the NEP director attends the group's quarterly meetings and provides data and information at the request of the group. The SAC's focus is to identify research and monitoring program priorities, assist in Coalition grant application development, and review results of environmental indicator studies in Buzzards Bay. The group has also been working to define water quality and habitat monitoring needs to support a permit application by the Town of Wareham to relocate the municipal wastewater facility outfall to the Cape Cod Canal. This work has been ongoing since 2018, a continuation of an earlier SNEP grant awarded by the NEP and supported by some water quality monitoring funding by the NEP in 2018.

FFY20 Work Plan Task 7 - Outreach and Education

As a partner to the NEP on our work plan, the Coalition is the principal organization that targets outreach and education to the public. The Coalition undertakes outreach and education activities highlighting the condition and state of Buzzards Bay, progress toward restoration and protection goals, and its collaboration with the NEP in their activities. Because of the COVID-19 pandemic, many Coalition activities were suspended, including the June 2020 Swim Buzzards Bay event, their annual meeting, and press events.

Despite the challenges presented by the global pandemic, the Coalition's Onset Bay Center hosted 182 children in a rotating series of weekly programs during the summer of 2020 and then launched a new set of after-school offerings, ranging from kayaking and stand-up paddle boarding to fishing and coastal

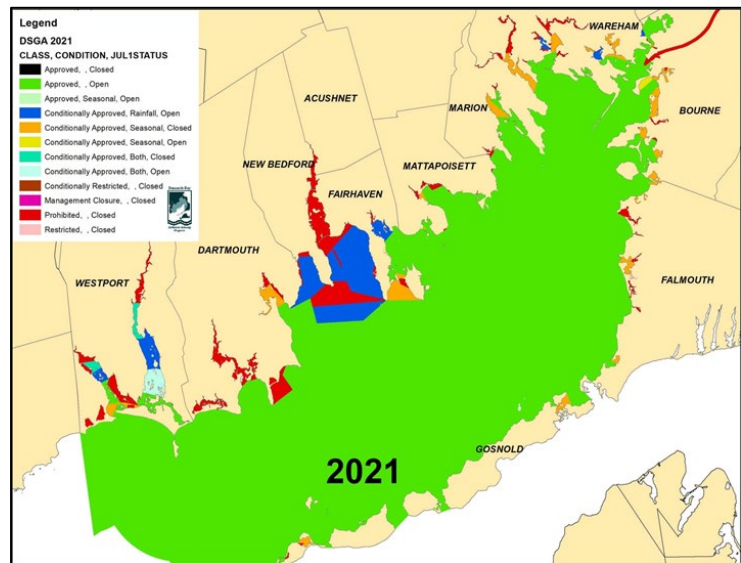


Fig. 10 Shellfish bed closure areas projected for July 1, 2021.

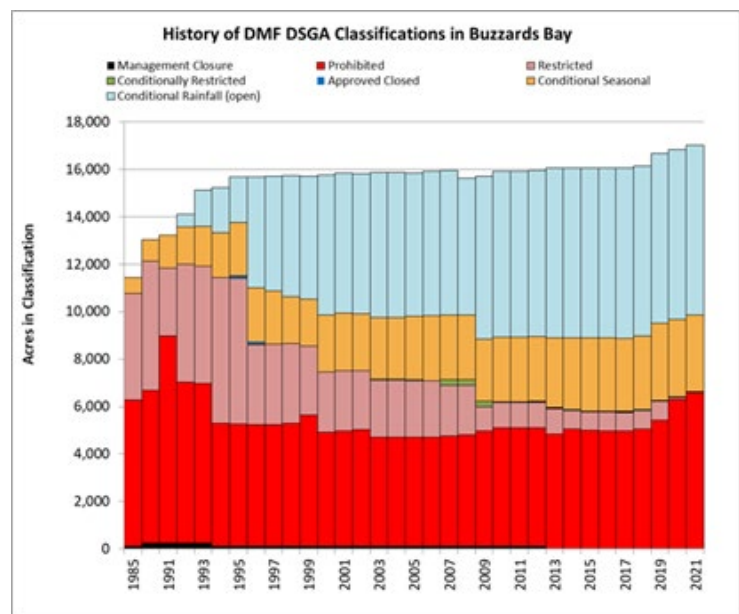


Fig. 11 Long-term shellfish bed closure trends for Buzzards Bay through 2021.

explorations of the beaches and marshes that border the bay. Most of the children who participated came to the center through its community partnerships. Of course, the Coalition did need to adjust its programs because of the pandemic. The number of students able to participate was reduced to 10 or less, depending upon the activity; mask-wearing was required; and an intensive disinfection procedure was implemented, among other things.

The Coalition was also able to hold its 14th Annual Watershed Ride on October 4, 2020. Three hundred cyclists participated by pedaling a 66-mile route to show their support for clean water (<https://www.savebuzzardsbay.org/news/nearly-300-cyclists-cycled-for-clean-water-at-the-14th-annual-buzzards-bay-watershed-ride/>). The event was supported by 58 volunteers and raised more than \$215,000 to support the Coalition's education, conservation, research and advocacy work.

While many activities were suspended in the summer of 2020 because of the COVID-19 pandemic, all programs were renewed, and reactivated in the spring of 2021. Examples of events planned include:

- Onset Beach "Fish on the Move" StoryWalk - May 15, 2021
- Onset Bay Paint Night for Adults – May 17, 2021
- Explore Buzzards Bay Volunteer Training – May 19, 2021
- Onset Bay Painting for Kids – June 12, 2021
- Onset Beach "Crab Moon" StoryWalk - June 12, 2021
- Buzzards Bay Swim – June 26, 2021

The Coalition also produces brochures, fact sheets, press releases, and other events about citizen action to protect and restore Buzzards Bay. Some information on upcoming events is at <http://www.savebuzzardsbay.org/events/>. Information on past events may be found at <https://www.savebuzzardsbay.org/news/>.

During 2020, the NEP continued to update and streamline the navigation of its website buzzardsbay.org and subdomains, climate.buzzardsbay.org and Stormwater.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. The stormwater website was updated to include results of the Buzzards Bay stormwater Collaborative Program. Most notably, the [Interactive Map](#) page was updated so that the monitoring program data for each site is displayed when monitoring sites are clicked upon (sites with data appear as red dots on the map).

The BBAC continues to be a strong partner with the NEP in guiding the Buzzards Bay municipal grant program and in holding monthly meetings on special topics. Information about meetings can be found on the BBAC's website buzzardsbayaction.org, which is managed and maintained by the NEP.

Since 1989, the NEP has been training Conservation Commission members on how to delineate wetlands in cooperation with the Massachusetts Association of Conservation Commissions ([MACC](#)). Retired NEP Wetlands Specialist John Rockwell has continued to provide these training sessions with support of the NEP. The support consists of printing and distributing various wetland training guides and brochures developed by Rockwell during his tenure at the NEP (go to our [wetland delineation training](#) web page to view them; Rockwell continues to volunteer to maintain and update the documents on this page). Unfortunately, due to the COVID-19 pandemic all the workshops had to be canceled in 2020.

FFY20 Work Plan Task 8 - Other Specialized Technical Assistance

The NEP continued to provide technical guidance on nitrogen management issues to the towns and Coalition. Of note was the fact that the NEP continues to work with the Coalition on water quality monitoring database issues and the salt marsh runnel practice study.

The NEP continues to distribute various specialized GIS datasets through its website to the municipalities and engineering firms, such as the sewer history coverage of Buzzards Bay

FFY20 Work Plan Task 9 - Technology Transfer to Other Estuaries

Between the spring of 2020, and the summer of 2021, national meetings were all held online because of the COVID-19 pandemic. The Executive Director attended the fall NEP, Restore America's Estuaries (RAE) meeting, and spring headquarters EPA meetings. The NEP Director continued to work with EPA and RAE to guide the Southeast New England Program for Coastal Watershed Restoration (SNEP). The NEP Director is a member of the SNEP Steering Committee and Policy Committee, and on the Steering Committee of the newly formed SNEP technical assistance group. The NEP Executive Director continued to guide partners to participate and secure funds from SNEP.

The NEP Executive Director and Regional Planner help maintain grant award information on the [Massachusetts Coastal Zone Management Grant Viewer](#). The CZM Grant Viewer is an interactive map of grants awarded by CZM, the NEP, and the Massachusetts Bays National Estuary Program (MassBays). It includes grants awarded throughout the CZM Coastal Watershed, representing a strong investment in clean estuaries, resilient coasts, and healthy habitats.

FFY20 Work Plan Task 10 - Website Maintenance and Innovation

The NEP continued to maintain an independent website 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 NEP has also been systematically scanning all old NEP reports and gray literature related to Buzzards Bay and posting it on our website.

The NEP Director continued to maintain and update the program's WordPress website (buzzardsbay.org). In addition, as noted in the outreach and education task in more detail, the NEP continues to maintain two 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, <http://stormwater.buzzardsbay.org/>, is the subdomain for the Stormwater Collaborative that was launched in 2016. In 2021, the NEP updated the stormwater interactive map database, where information about pipes, catch basins, and stormwater discharges, including water quality data can be downloaded by town officials and the public. In April 2021, the NEP posted a similar GIS online map to serve municipalities undergoing MS4 audits conducted by EPA.

Besides the NEP websites, the NEP continues to maintain the BBAC's website, buzzardsbayaction.org. Their page is updated with stories, photos, videos, and presentations to meet the needs of that organization as requested by the BBAC Executive Director.

FFY20 Work Plan Task 11 – Scientific collaboration on nitrogen TMDLs, climate impacts, and water quality impacts on natural resources.

The NEP collaborated with area scientists to publish results from the previous year's climate tasks and long-term trends including assessing impacts of climate change on water quality. As part of this task, the NEP conducted GIS analyses of watershed land use, including several onsite systems, occupancy rates, land use types, estimates of impervious area, lawn area, extent of sewerage, and agriculture. Specific accomplishments included:

- Provided assistance evaluating the Coalition's water quality data set;
- Updated the stormwater monitoring guide in support of the Stormwater Collaborative;
- Refined the shellfish bed closure history in Buzzards Bay embayments, including calculation of acre days closed based on the duration of seasonal closures;
- The NEP continued support to the Stormwater Collaborative and MMA to continue the stormwater network mapping and discharge monitoring program with Buzzards Bay municipalities.

In the Fall of 2020, the Coalition developed a 604(b)(3) grant application for the Town of Bourne to undertake a TMDL analysis. The NEP is a partner on the application and work plan and has agreed to conduct the land use loading analysis and develop targets for water quality goals. The work commenced in March 2021 and will continue through the end of the year. The NEP helped with the development of the TMDL QAPP in the spring of 2021.

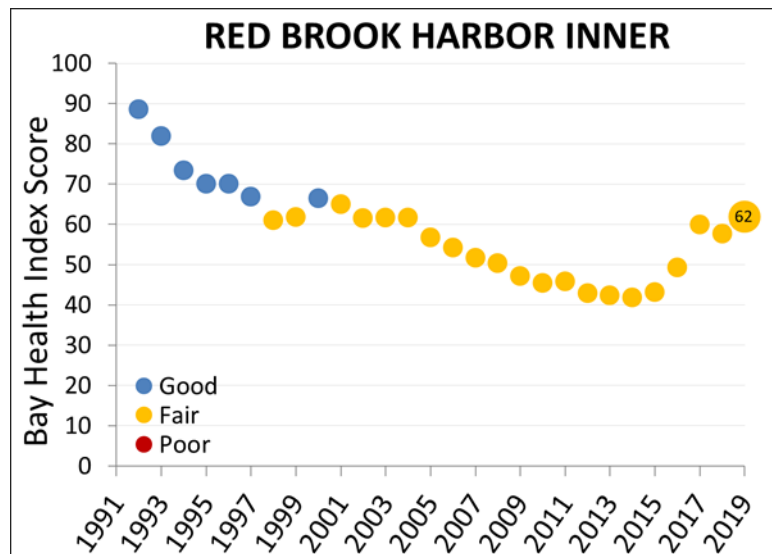


Fig. 12 Red Brook Harbor water quality from Baywatchers reports.

FFY20 Work Plan Task 12 – Salt Marsh Loss Assessment Collaboration with Coalition and Runnel Study with Coalition and Woodwell Climate Center

The NEP and our non-profit partner organization, the Coalition, continued to study salt marsh die-off in Buzzards Bay. During the summer and fall of 2020, the NEP director oversaw the installation of elevation benchmarks at the Oceanview Farm site in Dartmouth, and the Sippewisset Marsh site in Falmouth. The NEP Director helped train Coalition interns and staff on the use of a Leica Laser Leveler for the precise measurement of elevations within the salt marsh and converted GPS data to generate marsh vegetation-elevation profiles. Throughout the fall of 2020 to 2021, the NEP Director and Regional Planner helped develop a detailed 2009 base map of salt marsh cover in Buzzards Bay.

During this period, the NEP director helped the Coalition and a post-doc scientist with the Woodwell Climate Center complete tasks associated with a 2019 \$400,000 SNEP grant to study the use of runnels (shallow channels to drain standing water) as a sea level rise management tool. The NEP director also worked with this research team to develop another research grant application related to salt marsh loss. The NEP provided GIS and other support for all these efforts. The NEP maintained and updated an [interactive map website](#) of marsh sites, and created datasets that meet EPA, NEP, Coalition, and collaborating researcher goals. The preparation of a report on the history of salt marsh boundary changes at the selected sites is an ongoing task. Planned training and use of volunteers to assist in the high tide line monitoring effort was canceled during the summer of 2020 because of the COVID Pandemic. The NEP participated in a workshop and online meetings for the Runnel study.



Buying time – Salt marsh adaptive management to sea level rise using runnels

Alice Besterman
NE CASC Postdoctoral Fellow, Buzzards Bay
Coalition & Woodwell Climate Research Center, MA

Join us for the live stream or view later:
youtu.be/a1Lyc2p5u6Q

Water, Wetlands, and Watersheds Seminar
Wednesday
March 31, 2021, 11:45am EST



Fig. 13 Buzzards Bay Runnell study.

This task supported several Clean Water Act (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.

FFY20 Work Plan Task 13 – Technical assistance to support Coastal Resiliency and Municipal Vulnerability Preparedness.

The NEP provided maps of guidance to Buzzards Bay municipalities seeking Coastal Resiliency and Municipal Vulnerability Preparedness grants. In the summer of 2020, the State of Massachusetts announced these grants to Buzzards Bay municipalities:

Marion (\$225,000) Design of Creek Road Pump Station Resiliency Improvements,

The Town of Marion will design a new pump station at the existing Creek Road Pump Station site to reduce short- and long-term risks to storm surge and sea level rise. The pump station handles nearly half of the wastewater flow in the town and the project is a critical step in advancing the town's comprehensive approach to a more resilient sewer system. This pump station was identified as a concern by the NEP in this [2013 Sea Level Rise Vulnerability Report](#).

Mattapoisett (\$74,981) Mattapoisett Neck Road Flood Resilience Project

The Town of Mattapoisett will assess future flood risks from sea level rise and coastal storms and develop alternatives to improve the resilience of the Mattapoisett Neck Road causeway and a culvert crossing through a salt marsh under the southern portion of the road. This project was another outcome of the [Weather Ready Mattapoisett](#) project undertaken by the U.S. EPA in which the NEP participated.

New Bedford (\$77,755) West Rodney French Boulevard Beach Nourishment Design Plans and Contract Document Preparation

The City of New Bedford will prepare final design plans and contract documents for future construction of the West Rodney French Boulevard beach nourishment project. The project will help address long-term erosion of the shoreline, which threatens West Rodney French Boulevard and sewer infrastructure. The CZM SouthCoast Regional Coordinator in the NEP office provided considerable guidance to the city in the development and implementation of this project.

New Bedford Port Authority (\$154,178) Comprehensive Assessment of Municipal Infrastructure and Land/Sea Connections

The New Bedford Port Authority, in partnership with the City of New Bedford's Department of Environmental Stewardship and the Town of Fairhaven, will assess the current conditions of municipally owned and managed piers in the New Bedford/Fairhaven Harbor and New Bedford's South Terminal, evaluate adjacent utility and roadway connections, and develop recommendations for adapting the infrastructure to projected sea level rise and increased storm events. Threats to the inner harbor were identified and described in this 2012 [NEP SeaPlan study](#).

Wareham (\$233,720) Installation of a Bypass Connection at the Narrows Pump Station

The Town of Wareham will install an emergency sewer bypass at the Narrows Pump Station to allow the station to continue to serve critical infrastructure upstream of the station in the event of major equipment damage and debris impacts during storm events. This pump station was identified as a concern by the NEP in this [2013 Sea Level Rise Vulnerability Report](#).

FFY20 Work Plan Task 14 – Subawards

1. Collaboration with the Ecosystem Center to evaluate Permeable Reactive Barriers (PRB) Technology for remediation of in treated wastewater (\$27,375 sub-award to the Marine Biological Laboratory Ecosystem Center).

In 2019, the NEP collaborated with the Ecosystem Center at the Marine Biological Laboratory to conduct a study with SNEP funding to evaluate the feasibility of applying PRB technology at the Wareham Wastewater Treatment Facility. Using wood chips as a carbon source, the goal was 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. This project was renewed for a second year with reduced funding so that springtime conditions could be evaluated. This work began in 2021 because of difficulties in performing the work in 2020 during the pandemic and will be completed December 31, 2021.



Fig. 14 PRB test Columns at the Wareham Wastewater Treatment Facility.

2. Determining Nitrogen Inputs to Buzzards Bay from Coastal Rivers (Woods Hole Research Center, \$56,746)

In this project, the Woods Hole Research Center (WHRC) will initiate discharge and concentration sampling on six additional Buzzards Bay rivers: East Branch Westport River, Slocums River (Paskamansett River), Acushnet River, Mattapoissett River, Sippican River, and Wankinco River. In addition, the investigators will quantify discharge in Red Brook and the Pocasset River to combine with concentrations measured by the deployed monitoring equipment. The investigators will sample for one water year (1 October to 30 September) starting October 1, 2020. Together with the sampling of the Weweantic and Agawam Rivers by United States Department of Agriculture (USDA), these data will provide nitrogen load estimates for ten total rivers. The investigators will develop a database of river discharge and concentrations to be made available by the WHRC.

The specific activities conducted under this project will include: (1) establishing staff gages and recording staff level loggers at selected river gaging points; (2) periodic measurements of river discharge across a range of river flows to create a rating curve to translate staff measurements into river discharge; (3) regular biweekly sampling of river water; (4) analysis of ammonium, nitrate, dissolved organic nitrogen, particulate organic nitrogen, phosphate and total phosphorus in river water; and (5) calculation of annual watershed nitrogen loads from discharge and concentrations.

Due to COVID related delays, the project did not commence until late in 2020, and will continue until December 31. All monitoring staff gauges were established, and water samples are being collected.



Fig. 15 Sampling the East Westport River at the Mill Pond Conservation Area.

3) CCMP Climate Vulnerability Assessment Support (Coalition, \$10,000)

The NEP set aside \$10,000 for this task, made available by EPA headquarters Climate Ready Estuaries program, to support Coalition staff to host meetings and workshops with key stakeholders, synthesize responses, and prepare graphics associated with climate and pollutant trends in Buzzards Bay. Because of COVID-19, the NEP deferred this project until the summer of 2021, and will end December 2021.

While the NEP will be the lead in developing the CCMP climate vulnerability assessment in partnership with and technical support of U.S. EPA Region 1, the Coalition will facilitate the communication and consultation phases associated with the development of the CCMP climate vulnerability assessment. Specifically, the Coalition will use the forums to assess needs of each stakeholder group to gauge their particular interests or concerns about climate change risks and the adaptation planning process. The Coalition will hold a minimum of five workshops (webinars or in person meetings depending on the COVID-19 health emergency conditions) and develop a schedule for stakeholder involvement. The stakeholders consulted in this assessment included municipal, state, and federal government, a county government agency, a regional planning agency, the Buzzards Bay Steering Committee, environmental non-profits and lands trusts within the watershed, and area scientists, including those participating on the Coalition's SAC. Included in this task are the development of graphics to communicate environmental trends ranging from toxic contaminants to the mussel watch program to habitat change related to climate drivers.

2020 Leveraged Funding (Federal FFY20 Work Plan funds)

Each September, the NEP 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 NEP or leveraged by our partners with technical support by the NEP, in support of the implementation of the 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, 2019, to September 30, 2020, the NEP's leveraged funds in the primary, significant, or support category totaled \$7,074,699, \$7,145,899, and \$0 respectively.

Table 1. Summary of NEP role in leveraged funds, GPRA September 2020

NEP Role	Total
Primary	\$7,074,699
Significant	\$7,145,899
Support	\$0
Grand Total	\$14,220,598

We will report our FFY20 2020-2021 leveraged estimates to EPA in the fall of 2021.

Section 3: FFY21 Funds: Proposed Work Plan Activities July 1, 2020, to June 30, 2022.

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 support for the Stormwater Collaborative, 3) technical assistance to municipalities on MS4 and other issues, and 4) continued collaboration with area scientists, the Coalition, and other partners on land use and water quality data sets to guide management action. This year's funding utilizes \$750,000 in NEP base funding, and \$250,000 in a Region I SNEP add-on for targeted projects, for a total of \$950,000. Expenditures utilizing SNEP funds are summarized in Table 2

Table 2. Use of SNEP funds

Task	Amount
Municipal Grant Program (Task 3)	\$162,982
Stormwater Collaborative Staff Support (Task 2)	\$25,000
Sea Lab Environmental Justice Partnership	\$27,496
UMass Dartmouth salt marsh loss UAS surveys	\$49,411
Total (excess on S320 funds)	\$264,879

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.

FFY21 Work Plan 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 NEP will continue to work and collaborate with the 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 NEP will continue to provide maps, help develop state and federal grant applications, and conduct land use analyses. Work related to this task will be principally generated through meeting requests for technical assistance by area lands trusts, municipalities, and the Coalition in their efforts to receive grant funds from other sources.

Responsible Partners and Their Role(s):

The Coalition, municipalities, and area land trusts are key partners in our combined efforts. These land trusts 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 Coalition, municipalities, and area land trusts. Additional support will be provided from other NEP 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 and Regional Planner complete the GPRA report.

Outputs/Products:

1. Grant applications to state and federal grant programs by us or our partners with our support.
2. The NEP may provide support to towns to complete outdated local open space plans (which expire every seven years).
3. 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.
4. 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 with technical support from the NEP. Maps or analyses prepared for area land trusts or other partners as needed and upon request.

Budget:

Staff time to meet requests for technical assistance. Roughly, \$900 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 CCMP that have been completed. Increased leveraging of resources committed to 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.

FFY21 Work Plan Task 2 - Stormwater Remediation and Technical Assistance

Stormwater continues to be a special focus area for the NEP. Stormwater is contributing to nutrient and pathogen impairments in Buzzards Bay. There are roughly 5,500 acres of shellfish growing areas closed year-round. These closures are the result of bacterial contamination related to stormwater discharges. Because of these concerns, a large portion of the NEP's focus will remain on continuing the efforts of the Stormwater Collaborative. Previous SNEP funding terminates September 2021. The NEP will provide some support to the MMA to perform certain Stormwater Collaborative tasks during the winter months. During last year's work plan cycle the NEP helped MMA secure a \$46,000 DEP MS4 grant to purchase and outfit an IDDE investigation trailer which will terminate June 30, 2021. The Stormwater Collaborative will seek a third year of DEP MS4 funding, but continued funding is uncertain. The NEP staff will continue to support and train municipal officials and MMA staff on effective use of the IDDE trailer in both 2021 and 2022, irrespective of DEP funding. An additional \$4,000 is set aside in the category of laboratory testing, and some of the supplies budget includes expendable supplies for field monitoring. Overseeing these tasks will be a major focus of the two NEP stormwater specialists in the coming year.

During the upcoming work plan period, the NEP staff will provide other routine stormwater management technical support ranging from MS4 Notice of Intent development, MS4 reporting products, including the stormwater mapping through ArcGIS Online (MMA is providing the license) and Stormwater Management Plan guidance, and 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)

Besides the Stormwater Collaborative program support, the NEP aids towns on stormwater issues in several 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 state and 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 guide towns in their efforts to comply with MS4 permit requirements. The NEP stormwater specialists will continue to manage this complex regional initiative, collect stormwater samples, inspect stormwater facilities, and map stormwater networks, and provide guidance to MMA and the towns to implement these tasks.

In the coming fiscal year, the NEP is providing \$4,000 for laboratory testing services to test stormwater samples collected by the Stormwater Collaborative.

The 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 online data reports (see the [stormwater interactive map](#)) for each discharge that will establish priorities for the treatment of stormwater discharges conveying non-point sources of pollution. NEP reports and data will assist funding agencies and towns to target limited available dollars to treat stormwater discharges to improve water quality and open shellfish beds. This prioritization will aid municipalities in securing grants for remediation, such as CZM's Coastal Pollution Remediation fund. Another measure of the 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 Buzzards Bay watershed municipalities and their public works departments and the MMA. For on-site specific projects, DPWs will be the principal collaborator in developing the site-specific stormwater designs, as will municipal boards, districts, and environmental groups. Other partners may arise during project revisions, collaborations related to Massachusetts Environmental Policy Act (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 Specialists and Executive Director will develop state and federal grant applications and attend meetings as needed. The NEP Director also oversees staff in implementing the program.

Outputs/Products:

1. Oversee and guide the Stormwater Collaborative stormwater network mapping and discharge 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. Develop engineering designs for three or four priority sites in the Buzzards Bay watershed.
7. Provide stormwater grants or provide technical assistance to municipalities in their efforts to secure funding for stormwater designs.
8. Work with towns to adopt improved stormwater regulations and policies, and compliance with MS4 permits.

Milestones:

This year's work plan goal is to finalize engineering designs by the end of 2020 and assist MMA to complete reports and data submission requirements under their grant. The NEP will assist municipalities upon request to prepare documents and information to help them meet MS4 submission requirements and program deadlines. Project-specific timelines will be defined by meetings with the towns relating to best treatment strategies, the diagnosis of potential illicit connections, or MS4-specific submission deadlines.

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 for these tasks in terms of NEP staff time are estimated at more than \$300,000 (salary + fringe + indirect), or 60% of personnel costs. The MMA work will continue principally using municipal contracts. Other expenditures in this task include about \$1,500 of the program's Supplies budget, \$4,000 for the laboratory testing in the contractual category, and \$25,000 subaward to MMA through an ISA.

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 CCMP.

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 NEP activities or towards implementation of CCMP goals and recommended actions.

Long-term:

Stormwater Collaborative Initiative: Eventual independence of Buzzards Bay municipalities from 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 CCMP.

Pressures affecting outcomes:

Stormwater Collaborative Initiative: Sufficient funding from municipalities remains the greatest obstacle for completing tasks and meeting deadlines.

Stormwater Design Development: The NEP can handle requests for technical assistance depending upon workload and ongoing projects.

General stormwater technical and financial assistance: These efforts are also dependent on local interest and local match availability on site specific projects. The 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 NPDES permits, and 5) supporting sustainable wastewater infrastructure.

FFY21 Work Plan Task 3 - Municipal Grant Program

CCMP/Work Plan Goal(s):

Implementation and capacity building needs of the CCMP including potential action in the Stormwater, Nitrogen, Shellfish, Wetlands and Habitat, Land Use, On-Site Septic Systems, and other action plans.

Project/Activity Purpose and Description: (ongoing)

The NEP has set aside \$162,982 of the \$250,000 add-on SNEP funds to support the Buzzards Bay Municipal Mini-grant Program.

Responsible Partners and Their Role(s):

BBC, BBAC, and the Stormwater Collaborative are key partner in ensuring continued interest and participation in both the municipal grant program, and in participation and support of the Stormwater Collaborative.

NEP Staff:

Principal Staff involved in these tasks includes the Regional Planner who oversees grants and contracts, Executive Director, CZM, and the stormwater specialists.

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. Announce and award grants in the Fall of 20221, with any remaining funds awarded in subsequent grant rounds.

Budget:

The municipal grant program has been allotted \$162,982.

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 CCMP.

Intermediate: Increased leveraging of resources committed to 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 CCMP.

Pressures affecting outcomes:

There are two additional 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 programs 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 NPDES permits, 6) supporting sustainable wastewater infrastructure and CWA and state wetland protection efforts.

FFY21 Work Plan Task 4 - Program Oversight and Administration

CCMP/Work Plan Goal(s):

Supports all program activities.

Project/Activity Purpose and Description: (ongoing)

The NEP Executive Director and CZM Fiscal Officer ensure administration of the EPA and other grants and ISAs awarded to the NEP.

The NEP will submit complete 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 NEP will provide information on the GPRA performance measures to EPA by their required date.

Responsible Partners and Their Role(s):

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

NEP Staff:

Principal Staff involved in these tasks: NEP Executive Director with additional support from the CZM 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. GPRA and leveraging reports due to EPA annually in September.
3. Draft 2021 work plan sent to Steering Committee in April/May 2021.
4. Approved Cooperative Agreement sent to EPA in June 2021.
5. EPA finalize award by 30 July 2021.

Budget:

The only costs are NEP staff time.

Outcomes:

Short-term: Increased leveraging of resources committed to 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 CCMP.

Pressures affecting outcomes: Few pressures will affect this task.

This task does not directly support any CWA core programs, except implementation of section 320, the National Estuary Program.

FFY21 Work Plan 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 NEP, the Commonwealth of Massachusetts, citizens, Coalition dues, and other sources, the Coalition will continue its nationally recognized water quality monitoring program which costs roughly \$250,000 annually. The NEP is providing \$40,000 in this year's budget for that task. The NEP will continue to provide technical support to Coalition staff in implementing the Monitoring Program. The NEP and the Coalition will continue to use data to advocate for nitrogen management in Buzzards Bay Watershed communities and to evaluate trends in Buzzards Bay. The data is also used by DEP's Massachusetts Estuaries Project in the development of TMDLs. The Commonwealth of Massachusetts for several years provided between \$50,000 and \$150,000 annually towards this program that was used as match to our program.

The NEP director will continue to participate in the Coalition SAC workgroup, which continues to work on several 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 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 SAC, but the NEP Director is also a member of that committee and can provide technical and material support for some of their activities. The NEP Regional Planner provides GIS products in support of the water quality monitoring program. The NEP Executive Director coordinates with the Coalition Executive Director, and the Coalition's newly established SAC, 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 NEP Executive Director, Regional Planner, and other NEP staff as required.

Outputs/Products:

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

Milestones:

1. Though not required under a grant, the Coalition will share the water quality data for the summer of 2021 monitoring in September of 2022.

Budget:

The only costs of Section 320 funds under this Cooperative Agreement with EPA are the NEP staff time (principally the NEP Director) working with Coalition staff. The Coalition's budget for the monitoring program is approximately \$250,000, much of which is used as match. The NEP will also work with Coalition staff to secure additional sources of funding, including through EPA targeted grants to the NEPs

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 localized water quality throughout Buzzards Bay harbors in relation to nutrient loads from the watersheds. Provide external water quality data for the DEP 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 be 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: The Coalition is considering implementing a program to freeze certain samples for certain analyses as allowed for under the existing QAPP, if social distancing procedures or other policies cannot be implemented during the July-August sampling period. This may affect 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, and 4) controlling non-point source pollution on a watershed basis and CWA and state wetland protection efforts.

FFY21 Work Plan 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 NEP defines environmental outcomes and preliminary indicators through its annual GPRA submissions.

The NEP submitted its first GPRA report to EPA in October 2003 and continues to submit this information annually. To a large degree, the NEP 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 GPRA/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 NEP will continue its work with the Coalition to analyze and publish results from the Citizens Water Quality Monitoring program database, including assessing climate change impacts. Specifically, the NEP 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 NEP, are quantified for Buzzards Bay and reported every three years in the Coalition's *State of the Bay* reports.

Because a new Coalition *State of the Bay* report is expected in January 2022, the NEP will prepare shellfish closure statistics and eelgrass cover summaries under this work plan. Other data tracked by the NEP 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 Buzzards 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 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 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 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 NEP. The NEP coordinates closely with DMF in creating Buzzards Bay GIS shellfish bed closures.

NEP Staff:

Executive Director.

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 needed by January 2022: To be initiated August 2021 and completed November 2021.
2. Eelgrass cover map needed by January 2022: To be initiated August 2021 and completed November 2021.

Budget:

The only section 320 funds are 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 CCMP.

Pressures affecting outcomes: Unanticipated demands on staff time, particularly those of the NEP director, will have the greatest impact on this task.

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) controlling non-point source pollution on a watershed basis, 5) strengthening NPDES permits, 6) supporting sustainable wastewater infrastructure and CWA and state wetland protection efforts.

The NEP continues to track various environmental indicators on its website including shellfish bed closures ([shellfish closure web page](#) and Fig. 10 and Fig. 11) and eelgrass abundance. The Buzzards Bay eelgrass estimates are based on DEP databases, and our own interpretation of aerial photographs in areas not covered by DEP's analysis. These data are also used during the Coalition's quadrennial *State of the Bay* report, delayed this year, but now planned for a January 2022 release (the last report was released in 2017 and cover water quality through 2016).

FFY21 Work Plan 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):

Most of the activities under this task are met by the Coalition. With respect to the NEP, our outreach and education efforts principally focus on reaching out to the public thorough the program's website, or through more directed efforts in support of municipalities through training workshops, participation in public meetings, and preparation of brochures, meeting with residents on site specific projects, and handouts as requested by towns. Some of these specific actions are included in other tasks of this work plan. While many activities were suspended last year because of the COVID-19 pandemic, all programs will be renewed, and reactivated in the summer of 2021 and beyond.

The NEP will resume its support for the two annual Wetlands Delineation Workshops and special request workshops (as needed) conducted by the Massachusetts Association of Conservation Commissions ([MACC](#)). The workshops were suspended in 2020 because of the COVID Pandemic. These workshops are conducted by retired NEP wetlands specialist, John Rockwell, who does the workshops on a pro bono basis.

Since the 1990s, in order to avoid redundancy of public outreach efforts in the face of diminishing funds and staff resources, the NEP relies on the general public outreach of the Coalition². 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 NEP in their activities. These activities include the July Swim Buzzards Bay event, the October Buzzards Bay Watershed Ride, their annual meeting, press events, and various publications, including the annual report to their members.

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

The BBAC continues to hold monthly meetings inviting relevant speakers and hosting workshops for MCZM and the NEP as needed. 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 Coalition and the BBAC are our principal partners, but we may collaborate with other organizations such as the Massachusetts Association of Conservation Commissions. The NEP may also periodically prepare articles and notes for CZMail, an e-newsletter hosted by Massachusetts Coastal Zone Management. The BBAC promotes increased awareness in their municipalities' intra-town networking.

NEP Staff:

Principal Staff involved will be the NEP Executive Director and other NEP staff as required.

Outputs/Products:

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

Improve NEP website information, brochures, and flyers. Help update the BBAC website. Provide wetlands delineation materials and [web page](#).

Milestones:

Both the Coalition and BBAC 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 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.

² This strategy was formalized in a 2005 Memorandum of Understanding between the NEP, Buzzards Bay Coalition, and the Buzzards Bay Action Committee.

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 CCMP.

Pressures affecting outcomes: However, many of the Coalition outreach efforts around specific projects may be canceled, such as the Buzzards Bay Swim. Like all other tasks, unanticipated demands on staff time can also affect which outcomes are met.

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 NPDES permits, 6) supporting sustainable wastewater infrastructure and CWA and state wetland protection efforts.

FFY21 Work Plan Task 8 - 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)

This task includes technical assistance of NEP staff to municipalities, non-profits, other agencies, and the public to meet the goals of the CCMP. Because the CCMP is a non-regulatory document, most recommendations are directed toward municipalities because they have the greatest authority. Whether certain activities are initiated depends upon our partners' capacity to address specific growth-related and non-point source pollution problems facing the bay and watershed. Consequently, the NEP provides this assistance on an ad hoc. This technical assistance primarily focuses on specific initiatives funded or managed by the NEP but can include a wide range of CCMP issues and management topics. Work under this task is provided based on the availability of staff, and at the direction of the NEP director to ensure that technical assistance efforts continue to meet the needs and goals of the NEP.

Responsible Partners and Their Role(s):

Key partners in this effort include the Coalition, the BBAC, Buzzards Bay municipalities, CZM, and 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 CCMP.
3. Encourage towns to take actions that support the updated CCMP.
4. Promote LID 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 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, 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: 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 CCMP.

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 NPDES permits, 6) supporting sustainable wastewater infrastructure and CWA and state wetland protection efforts.

FFY21 Work Plan 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 NEP Director anticipates attending both the spring and fall NEP national meetings. 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 NEP Director also participates in the Coalition's SAC. Additionally, the NEP Director participates in the SNEP. The NEP Director will also, from time to time, provide technical assistance to other NEP directors, the Association of National Estuary Programs, and other national programs in efforts to communicate the benefits of protecting and restoring national estuaries.

Responsible Partners and Their Role(s):

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

NEP Staff:

The NEP Executive Director or his designee will attend the fall 2021 (remotely) and spring 2022 NEP meetings and participate 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 2021 (remotely) and spring 2022 EPA-NEP meeting (in Washington DC) at a minimum. Staff may also attend other national conventions (on planning, wetlands, and stormwater as budget, availability, and staff time allows, and as allowed by state policy.)

Budget:

The travel budget (\$3,600) covers the expenses of one out-of-state meeting, as well as all in-state travel of staff. This increases from last year because of expected relaxing of travel restrictions due to the subsidence of the COVID-19 health emergency and includes travel by the NEP director to the Spring NEP meeting in Washington DC in 2022.

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 CCMP.

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

This task does not directly support any CWA core programs, except promotes the success of Section 320 of the CWA.

FFY21 Work Plan 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 NEP shall continue to maintain an independent website (Buzzardsbay.org) to assist the 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 NEP has also been systematically scanning all old NEP reports and gray literature related to Buzzards Bay and posting it on our website main website buzzardsbay.org and the subdomains climate.buzzardsbay.org, and stormwater.buzzardsbay.org.

In addition to our own website, the NEP designed and continues to maintain the BBAC'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.

Responsible Partners and Their Role(s):

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

NEP Staff:

The NEP Executive Director is the web master and principal author of the website. 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.
3. 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 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 CCMP.

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.

FFY21 Work Plan Task 11 - Scientific collaboration on nitrogen TMDLs, climate impacts, and water quality impacts on natural resources

The NEP will continue to work with the Coalition and area scientists to complete and publish findings related to the Coalition's water quality data set and land use changes in Buzzards Bay and other collaborations involving area scientists. In 2021, the NEP partnered with the Coalition and the town of Bourne to receive 604(b) funding from MassDEP to conduct a TMDL assessment for Red Brook Harbor Phinneys Harbor Complex in the town of Bourne. The NEP has agreed to complete a number of tasks for this assessment (at no cost), including conducting GIS analyses of watershed land use, including the number of onsite systems, determining occupancy rates for census data, determining land use types including estimates of impervious area, lawn area, extent of sewerage, and agriculture.

Under this task, the NEP may undertake these additional tasks to support partners, including:

- Conduct a similar analysis for the catchment area of each stormwater discharge monitored in the study.
- Aid in evaluating the Coalition's water quality data set.
- Provide guidance on the preparation of 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 NEP will work with the MMA to ensure the collection of stormwater samples and sample splits to be analyzed by a laboratory.

Principal Staff involved in these tasks:

Executive Director.

Responsible Partners and Their Role(s):

The NEP coordinates with the Coalition, and the SAC to ensure that the findings derived from the water quality datasets and precipitation and climate records are sound.

NEP Staff:

The 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 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.

FFY21 Work Plan Task 12 - Salt Marsh Loss Assessment and Runnel Study Collaboration with Coalition

The NEP and our non-profit partner organization, the Coalition will continue to study salt marsh die-off in Buzzards Bay. The NEP has installed the needed elevation benchmarks and will continue to document transect elevations and tidal elevations and interpret changes in marsh boundaries in historical photographs during 2021 and 2022. The data will be used 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 NEP continues to be the lead on the GIS analysis. This effort will follow and refine draft marsh monitoring protocols developed by DEP and CZM under an EPA Wetlands Program Development grant awarded last year. The NEP will support the studies also through Light Detection and Ranging (LiDAR) analysis³

To support this task, the NEP has set aside \$25,000 for a contract to secure orthoimagery and digital elevation models for all the long-term study sites. The imagery will be processed to provide both ortho rectified imagery and photogrammetric processing to generate a digital elevation model to be used in ArcGIS. Pixel size for both products will be less than 0.1 meters.

Principal Staff involved in these tasks:

Executive Director, Coalition Staff, Coalition SAC subgroup (Anne Giblin, Chris Neill, Linda Deegan are among the principals).

Responsible Partners and Their Role(s):

The NEP coordinates with the Coalition, and the SAC to ensure that the findings derived from analysis are sound.

NEP Staff:

The 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.

³ See <http://climate.buzzardsbay.org/marsh-migration-methods.html>

2. Contract unmanned aerial vehicle surveys in the Fall of 2021 or summer of 2022.
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 Coalition and Science Advisory principals.
6. Incorporation of marsh loss into future Buzzards Bay *State of the Bay* reports (as a narrative element). The 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:

The summer monitoring season is expected to be complete by October 1, 2021. GIS coverage of key historical aerial surveys will be completed by December 30, 2022. Other updates and web postings as need or required.

Budget:

NEP staff time, principally the Director.

Outcomes:

Short-term: Baseline vegetation and elevation data at a minimum of 10 reference sites. 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 of salt marsh change dataset that can be used by independent researchers.

Pressures affecting outcomes: For the NEP task, limited by time availability of the Executive Director. At the 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.

FFY21 Work Plan Task 13 - Technical Assistance to Support Coastal Resiliency and Municipal Vulnerability Preparedness

In September 2021, the Commonwealth of Massachusetts announced the availability of \$3.0 million in Coastal Resiliency Program (CRP) grant funds, and in March 2022, the availability of \$11.1 million in Municipal Vulnerability Preparedness (MVP) grant funds were announced. The 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 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:

NEP Executive Director and Regional Planner; and collaboration with the CZM South Coast regional coordinator.

Responsible Partners and Their Role(s):

As has been done in the past, the 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 land use 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 NEP Executive Director is the lead on this task.

Outputs/Products:

Production of maps, data, and information that will support municipal applications to the CRP and MVP grant programs.

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 CRP and MVP grant programs. The announcement will include back links to the NEP website with existing interactive maps and datasets relevant to municipalities that support this task.

Budget:

NEP staff time. A minimum of \$110,640 in grants are estimated to be awarded to Buzzards Bay municipalities from the CRP and MVP programs during this work plan period, and they are expected to be used as cash match to this Cooperative Agreement. Both programs are state funded.

Outcomes:

Short-term: Increased number of municipal applications to the CRP and MVP grant programs.

Intermediate: Increased number of awards from the CRP and MVP 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 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.

FFY21 Work Plan Task 14 - Targeted Grant Sub-awards

This workplan has four targeted subawards including the Municipal Grant program in Task 3, and Coalition water quality monitoring, which is described in Task 5 and Appendix 2. The other two subawards are described here:

1) Innovative Environmental Monitoring and Assessment Approaches for salt marsh monitoring (\$49,411)

Under this initiative, the NEP will enter into a partnership with UMass Dartmouth to fund both a senior studies project and a graduate student research project. The University of Massachusetts Dartmouth (UMD) is working with the NEP to conduct salt marsh surveys in Buzzards Bay for the evaluation of vegetation, edge loss and elevation. UMD will perform the surveys utilizing Unmanned Aircraft Systems (UAS) having had experience with the operation and video footage processing of DJI Phantom 4 Pro quad-copters. They will process raw footage using 3D photogrammetry software to generate Digital Surface Models (DSM) and georectified true color imagery. UMD will use existing NGS rod benchmarks on each side along with BBNEP owned surveying equipment to set control points prior to each UAS survey. BBNEP will provide training on the use of their surveying equipment for setting control points.

3) MMA-NEP Partnership to Support the Stormwater Collaborative (\$25,000)

During the winter of 2021-2022, the MMA will continue to support the work of the Stormwater Collaborative. Funds will be used for the salary, overhead and indirect cost for the Stormwater Coordinator to enter data, update GIS mapping, prepare equipment for field season, prepare stormwater outreach materials, write grants, and coordinate with town representatives for additional town contracts. This task is budgeted at \$25,000, and additional details about the task are contained in Appendix 2.

4. New Bedford Sea Lab Buzzards Bay NEP Partnership Marine Education Support to Environmental Justice Communities (\$27,496)

The Commonwealth of Massachusetts, through the Executive Office of Energy and Environmental Affairs, maintains a policy of Environmental Justice to better serve the environmental needs of the Commonwealth's most vulnerable residents. Similarly, as noted by the U.S. EPA's Environmental Justice Office, EPA's goal is to provide an environment where all people enjoy the same degree of protection from environmental and health hazards and equal access to the decision-making process to maintain a healthy environment in which to live, learn, and work. An important pathway toward both these state and federal goals is the participation and education of vulnerable youth populations. These individuals will become tomorrow's stewards of the environment, and a strong foundation in science and natural ecosystems is essential for them to make informed decisions about the environment as adults, and to be the caretakers of our future.

While the New Bedford School Department has made great strides in bringing in minority, language isolated, and financially disadvantaged students into the program, the greatest single need identified by Sea Lab Facilitator Simone Bourgeois is the need to provide tuition waivers to families who cannot pay for the tuition. Beyond this dire need are specific unmet program expenses and initiatives that will broaden the programs. This New Bedford Sea Lab Buzzards Bay NEP Partnership is designed to meet these needs. The intent of this proposed work plan is three-fold. 1) to match privately funded school tuition waivers to Sea Lab (and thereby leverage future private donations), 2) fund a student proposal to reduce plastic waste at the school, and 3) fund specific equipment and program needs.

Section 4: Budget Summary and Explanation

This work plan is a new Cooperative Agreement. The new budget is summarized in Table 3 and the pie chart in Fig. 16, according to EPA grant categories. Supplemental details of the budget are contained in Table 4. Beginning with this work plan, EEA has assumed the costs of phone and data/internet services to the NEP.

Table 3. Federal FFY21 budget detail (Award= \$700,000 base funding + \$250,000 SNEP add-on)

Personnel*: **\$359,079**

(Personnel costs are based on the following staffing levels)

Joe Costa, Executive Director	\$112,825
Sarah Williams, Regional Planner	\$95,532
Kevin Bartsch, Stormwater Specialist	\$104,483
Bernadette, Taber Stormwater Specialist 20/h week	\$46,239

Contractual*: **\$29,000**

Laboratory contracts for stormwater analyses	\$4,000
UAV imagery, salt marshes	\$25,000

Travel: **\$3,600**

Travel estimate is based on the actual in-state and out-of-state expenditure from other years and new projections, and uncertainties in allowance to attend the fall NEP meeting cancellation, but inclusion of the Spring 2022 meeting in Washington DC. Most of the travel is done within the Buzzards Bay watershed (site visits or partner meetings), with additional agency partner meetings in Massachusetts, Rhode Island (mostly for SNEP meetings), and tech transfer meetings in New England. It is estimated that NEP staff will participate in the following:

- Executive Director: 1 national meeting, 2 NE tech transfer meetings, 7 in-state and watershed partner meetings, 30 in-state site visits.
- Regional Planner: 2 state and watershed partner meetings, 2 site visits.
- Stormwater Specialist (Full-Time Employee): 1 NE tech transfer meeting, 5 state and watershed partner meetings, 40 site visits.
- Stormwater Specialist (Half-Time Employee): 2 state and watershed partner meetings, 15 site visits.
-

Fringe: **\$141,836**

37.53% + 1.97% Medicaid, etc. charge on all personnel

Supplies: **\$4,258**

Postage, printing, paper, office and field supplies

Other: **\$355,925**

Program Operations	\$51,036
Municipal Grants	\$162,982
Buzzards Bay Coalition Monitoring	\$40,000
MMA Stormwater Collaborative Support	\$25,000
UMass Student Investigations and Stormwater Designs	\$49,411
Sea Lab Environmental Justice Partnership	\$27,496

Program Operations includes 12 months' rent (\$30,940 after \$5,000 offset from CZM for space for the South Coast Regional Coordinator), and utilities, cleaning, disposal, state audit, computer leases, repairs, telephone and internet charges, other chargebacks. State Audit, MMARS, and IT services total \$12,793. 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: **\$56,302**

There is an 14.04% charge on "Personnel," "Contractual," plus selected expenditures in the "Other" category (detail in 0).

Table 4. Supplemental budget details

"OTHER Program Operations detail	
rent (includes \$5,000 offset from CZM)	\$30,940
cleaning 6mos.	\$2,496
utility electric	\$960
utility gas	\$600
water/sewer	\$630
alarm system	\$360
repairs, maintenance (copy/printer, etc.)	\$365
Phone, internet	\$0
Core technology, single audit, etc. chargebacks	\$12,793
Printer/Copier/Scanner lease	\$1,892
Other Total	\$51,036
SUPPLIES Detail	
Field monitoring supplies, equipment	\$2,168
janitorial supplies	\$225
office supplies (paper, printer, plotter, copier)	\$1,565
postage	\$300
Supplies Total	\$4,258

Table 5. Indirect Costs Table

PERSONEL	\$359,079
CONTRACTUAL	\$29,000
OTHER Program Operations sub elements	
cleaning 6mos.	\$2,496
alarm system	\$360
Selected chargebacks (MMARS IT & Core Tech)	\$10,073
Indirect Base total	\$401,008
Indirect rate 14.04% (0.1404)	
Federal Indirect share	\$56,302

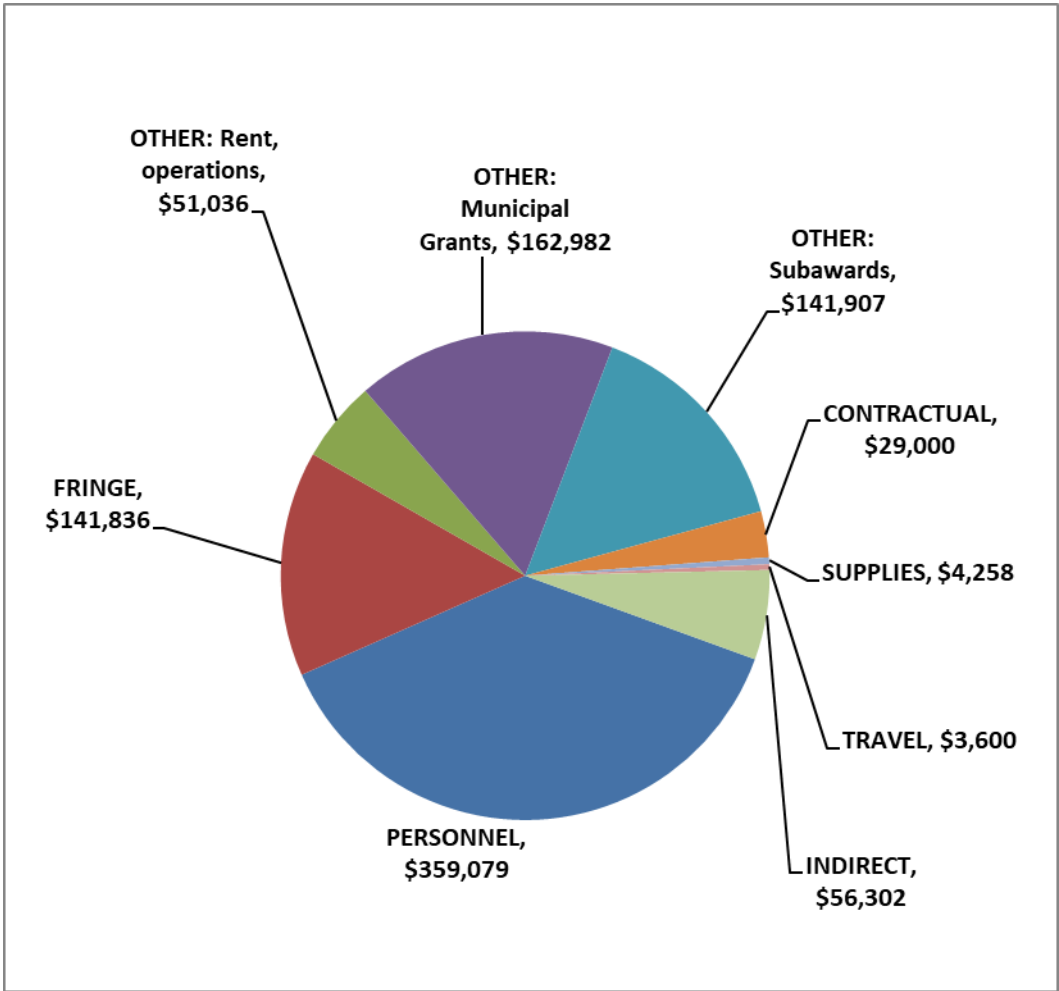


Fig. 16 FFY21budget.

Section 5: Match to the Cooperative Agreement

Below is a summary of the \$950,000 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 Coalition programs followed by the municipal grant program. The Coalition, which last year had an operational budget of over \$3.5 million, works in a close partnership with the NEP on several tasks, including application of the water quality testing program, and work in support of wetland and habitat protection and restoration. The 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 is the cash and in-kind contributions from the member communities of the BBAC. 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) Coalition Water Quality Monitoring Program (\$198,204)

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 monitoring program, excluding citizen volunteer time, exceeds \$250,000 per year, and includes staff time, contractual laboratory testing services, publications, web services, and supplies. We have limited the match to this Cooperative Agreement to just the estimated volunteer time of \$162,901 based on 2020 participation of 165 volunteers contributing 4524 volunteer hours x \$34.97 (BBC correspondence for volunteer time hours, value of volunteer time for Massachusetts rates at independentsector.org/value-volunteer-time-methodology/ for the 2020). In this category, we are including the value of the time volunteers contribute to the Coalition's Water Quality Monitoring Program. Added to this total (\$158,204) is the \$40,000 match to the monitoring subaward, which is derived from private foundations and donations that is used to purchase test kits, supplies, and monitoring equipment to support the monitoring effort, and related costs.

2) Municipal support to BBAC (\$25,000)

The municipalities of Buzzards Bay pay \$25,000 per year in dues assessments to the BBAC to support projects to implement the 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) In kind participation of BBAC meetings and workshops (\$21,038)

Municipal official participation in BBAC and NEP meetings (assume 11 meetings; average 15 people per meeting, 1.5 hours meeting time, and an \$85/h loaded rate. Some of these meetings are expected to remain as webinars until all COVID-19 health emergency restrictions are eliminated.

4) Other Coalition support: education and land conservation programs (\$234,200).

The 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 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 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 applicable matching amounts support and coincide with the NEP tasks identified in this work plan and represents portions of Coalition staff salaries working on these tasks.

The NEP is a key partner with the Coalition in these efforts, and each year, we prepare hundreds of maps and other products, 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.

5) CZM Coastal Resiliency and Municipal Vulnerability Grant programs (\$112,058)

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

6) Match to the municipal grant program (\$310,000)

Based on past multipliers, the NEP expects to receive \$310,000 in match toward the \$110,640 in municipal grants awarded.

7) Municipal funds provided to the Stormwater Collaborative (\$49,500)

Based on last year's support, MMA will receive \$49,500 from Buzzards Bay municipalities to fund Co-op Students participating in the effort to map stormwater networks and monitor stormwater discharges.

Table 6. Summary of proposed non-federal match.

Proposed MATCH (non-state)	Total	Personnel	Fringe	Contractual	Other	Supplies	Travel	Indirect	TOTAL
1. Coalition WQ Monitoring Program (1)	\$198,204			\$198,204					\$198,204
2. BBAC dues	\$25,000			\$25,000					\$25,000
3. BBAC, other municipal meetings, workshops (5)	\$21,038	\$21,038							\$21,038
4. Other Coalition Support (2)	\$234,200	\$232,500					\$1,700		\$234,200
5. CZM Coastal Resiliency Grant program (4)	\$112,058				\$112,058				\$112,058
6. Municipal match to NEP grants (3)	\$310,000				\$310,000				\$310,000
7. Municipal cash to stormwater collaborative contracts, MS4 grants	\$49,500			\$49,500					\$49,500
Summary	\$950,000	\$253,538	\$0	\$272,704	\$422,058	\$0	\$1,700	\$0	\$950,000

(1): In this category, we are including the value of the time volunteers contribute to the Coalition's Water Quality Monitoring Program. This contribution is based on 165 volunteers contributing 4524 volunteer hours x \$34.97 (BBC correspondence for volunteer time hours, value of volunteer time from Massachusetts data at www.independentsector.org/programs/research/volunteer_time.html). Added to this total (\$158,204) is the \$40,000 match to monitoring subaward, which is derived from private foundations and donations that is used to purchase test kits, supplies, and monitoring equipment to support the monitoring effort, and related costs.

(2): Portions of 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). Travel includes both in-state and out-of-state estimated reimbursements.

(3): Based on typical overmatch match typical for land acquisition grants.

(4): The actual amount of match in this category will depend on how much overmatch match is provided by the grant recipients.

(5): BBAC municipal official time is 11 meetings, avg 15 people per meeting, 1.5 hours, \$85/h fringe+indirect loaded rate.

Table 7. Summary of Non-Federal Match by Source

	State	Other (non-profit)	Local (munis)	Total Non-federal
PERSONNEL	0	\$232,500	\$21,038	\$253,538
FRINGE	0	\$0	\$0	\$0
TRAVEL	0	\$1,700		\$1,700
SUPPLIES	0	\$0		\$0
CONTRACTUAL	0	\$198,204	\$74,500	\$272,704
OTHER	\$112,058		\$310,000	\$422,058
INDIRECT	0	\$0	\$0	\$0
TOTAL	\$112,058	\$432,404	\$405,538	\$950,000

Section 6: Reprogramming of FFY20 Funds

Because of COVID-19, the part time stormwater specialist was not moved from a schedule of 20 hours per week to 24 hours per week. (the cost savings were used to increase stormwater engineering designs service from \$4,000 to \$13,693 and to purchase a new plotter (\$4,951), and to cover any unanticipated fringe and indirect rate increases in July 2021 (11.26% to 14.04%) that carries over to a portion of FFY20 salaries until September 2021. The shift in funds in a \$922,500 budget did not trigger the need for a formal program amendment.

Section 7: NEP Staff

Dr. Joe Costa is Executive Director of the 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 NEP's Stormwater Specialists (full-time). He has a Master's Degree in Watershed Science and over 20 years of 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 NEP, Kevin works with municipalities and the MMA to create a comprehensive stormwater GIS and management program. Kevin also volunteers as a board member and is former Director and President of the Wareham Land Trust.

Bernadette Taber is one of the NEP's Stormwater Specialists (part-time, 0.64 FTE). A long-time former employee of the USDA Natural Resource Conservation Service detailed to the NEP office since 1991, Bernie re-joined the 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 developed the preliminary stormwater and habitat restoration designs identified in collaboration with Buzzards Bay municipalities and their contractors.

Sarah Williams is the NEP's Regional Planner (full time). She aids municipalities on land use and watershed planning, land conservation, buildout analysis, habitat restoration, and mapping as well as some of the administrative functions of the Project. She is a coordinator between the towns and the NEP 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.

BBNEPwork planFFY21.docx

Appendix B. Sub-award Proposals

1. Monitoring Program Support for Baywatchers (Coalition, \$40,000)
2. Continued Collaboration with UMass Dartmouth on the development of Stormwater Designs and Innovative Environmental Monitoring and Assessment Approaches for SNEP Priorities, \$43,719)
3. MMA-NEP Partnership to Support the Stormwater Collaborative (MMA, \$25,000)
4. New Bedford Sea Lab Buzzards Bay NEP Partnership Marine Education Support to Environmental Justice Communities (\$27,496)



Buzzards Bay Water Quality Monitoring
Rachel Wisniewski Jakuba, PhD, Science Director

114 Front Street, New Bedford, MA 02740

Tel – 508-999-6363 x229 – jakuba@savebuzzardsbay.org

Project Description

This proposal would fund continuation of the Baywatchers program in Buzzards Bay during a critical funding period. The Baywatchers program is largely funded by Coalition fundraising events, like the Buzzards Bay Swim, and in the past has received direct state funding. The funds requested will help ensure core elements of the Baywatchers program continue.

Description of Environmental Impairment/Project Need

Nitrogen pollution is a critical threat to Buzzard Bay's ecological health, as described in the CCMP. Nitrogen pollution causes increased algae growth that reduces water clarity and oxygen levels, reduces shellfish and other biodiversity, can degrade salt marsh habitat, and degrades the recreational value of the Bay. Because of nitrogen pollution, eelgrass coverage in Buzzards Bay has declined by about 50% since the 1970s, and iconic bay scallops are now extremely rare. According to the Massachusetts Year 2016 Integrated List of Waters, over 40 water body segments around Buzzards Bay are impaired because of excess nitrogen. Restoring and preserving water quality will require effective management based on accurate information. The Coalition's Baywatchers monitoring program was designed to assess nutrient-related Bay health, documenting the impact of nitrogen pollution on the Bay's harbors and coves.

For 29 years, Baywatchers has collected basic water quality, nutrient, and algal pigment information around Buzzards Bay during the summer months and educated the public on their local water quality. Since 1992, this effort has directly engaged over 1,000 citizen scientists and has resulted in an impressive dataset of long-term trends of the ecological health of over 200 locations around the Bay.

Proposed Activities

The \$40,000 requested for this task would be used to support Baywatchers long-term monitoring program. This amount will support a portion of salary for the Coalition's Director of Monitoring Programs who runs the program - training volunteers, handling equipment repair and calibration, coordinating with the analytical laboratory, performing quality assurance, etc. – or the BBC's Science Director acting in that role. The funding will enable the collection of water quality monitoring data principally during the 2022 calendar year to continue the existing Bay-wide long-term record. With the help of trained volunteers, basic water quality measurements of dissolved oxygen, temperature, salinity, and water clarity will be made about every five days beginning in late May through mid-September. Samples may also be collected on four dates in July and August for analysis of the full suite of nutrients as well as algal pigments. All samples will be collected and analyzed in accordance with a QAPP that has already been approved by DEP and EPA.

Expected Environmental Benefits of Proposed Work One of the first actions to be implemented from the original CCMP was the initiation of water quality monitoring. This underscores the importance of monitoring as the foundation for actions that improve environmental health. For 29 years, Baywatchers water quality data has been critical for preserving and restoring coastal waters around Buzzards Bay. The data has been used repeatedly since 2002 in the development of the MassDEP's Integrated List of Waters. A water body's inclusion on the Integrated List of Waters as an impaired water body is the first step to restoration because it compels DEP to develop a nutrient reduction plan known as a TMDL. Baywatchers data has been used in the development of all the nitrogen TMDLs for impaired embayments

around Buzzards Bay. DEP and EPA have used the data when setting nitrogen limits for municipal and private wastewater treatment plants through the NPDES and Massachusetts Groundwater Discharge permit processes. For example, Baywatchers data led to EPA establishing a total nitrogen permit limit for the Wareham Wastewater Treatment Facility, which resulted in an over 50% decrease in the annual total nitrogen concentrations in the Agawam River where the Wareham Wastewater Treatment Facility discharges. The data has been also used by municipal government to justify new regulations, bylaws, or reduction of nutrients loads.

Budget

Salaries	\$27,617
Fringe	6,076
Indirect (18.72%)	6,307
Total	\$40,000

Match

The Coalition will provide an in-kind match of \$40,000 from private foundations and donations that is used to purchase test kits, supplies, and monitoring equipment to support the monitoring effort.

Collaboration with UMass Dartmouth Use of Unmanned Aerial Systems to Monitor Salt Marsh Loss from Climate Change and Other Factors

Proposed Work

The University of Massachusetts Dartmouth (UMD) is working with the Buzzards Bay National Estuary Program (BBNEP) to conduct salt marsh surveys in Buzzards Bay for the evaluation of vegetation, edge loss and elevation. UMD will perform the surveys utilizing Unmanned Aircraft Systems (UAS) having had experience with the operation and video footage processing of DJI Phantom 4 Pro quadcopters. They will process raw footage using 3D photogrammetry software to generate Digital Surface Models (DSM) and georectified true color imagery. UMD will use existing NGS rod benchmarks on each side along with BBNEP owned surveying equipment to set control points prior to each UAS survey. BBNEP will provide training on the use of their surveying equipment for setting control points. The UAS survey will be overseen by a FAA licensed operator, and UMD will be responsible for obtaining any additional licenses when operating in the vicinity of any airport.

Under this agreement UMD will deliver DSM and georectified true color imagery for eleven salt marsh sites twice a year, totaling twenty (20) surveys. Timing of the surveys will be decided jointly by BBNEP and UMD. The eleven site names and locations are as follows:

1. Little Bay North/Little Bay South, Fairhaven
2. Mattapoissett Neck, Mattapoissett
3. Hammett Cove, Marion
4. Little Harbor Beach, Wareham
5. Wings Neck, Bourne
6. Patuisset Marsh, Bourne
7. Herring Brook, Falmouth
8. Sippewissett Marsh, Falmouth
9. Ocean View Farm, Dartmouth,
10. Westport Town Farm, Westport
11. Demarest Lloyd State Park Dartmouth

Budget

The total budget for this project is \$49,411 as per the table below. The University will waive a portion of its 59% overhead for this project, which will be used toward match.

A. SALARIES & WAGES (Senior Personnel)		9-month Salaries		months per year		Year 1	TOTAL
1. Dan MacDonald		147,880	152,316	156,886	0.12	\$1,955	\$1,955
Total Senior Personnel						\$1,955	\$1,955
B. SALARIES & WAGES (Other Personnel)		Salaries		U			
Base							
4. Graduate Student (Annual Rate - Units = Month)		22,000	22,660	23,340	9	\$16,500	\$16,500
3. Technician (Annual Rate - Units = Month)		57,000	58,710	60,471	1	\$4,750	\$4,750
5. Undergraduate Students (per student semester) 2360		2,360	2,360	2,360	2	\$4,720	\$4,720
Total Other Personnel						\$25,970	\$25,970
Total Salaries & Wages						\$27,925	\$27,925
FRINGE BENEFITS							
Payroll Taxes (Faculty Summer) 1.94%						\$38	\$38
Summer Payroll (Grad Students) 1.94% Summer						\$80	\$80
Total fringe						\$1,582	\$1,582
Total Salaries, Wages, & Fringe Benefits						\$29,507	\$29,507
D. PERMANENT EQUIPMENT						\$0	
Total Equipment						\$0	\$0
E. TRAVEL							
Field Work Travel				Trips per year (Faculty/Grad Student)			
Total Travel						\$720	\$720
G. Other Direct Costs							
1. Materials and Supplies							
Hardware						\$4,500	
Computational Resources						\$1,000	\$1,000
2. Publication Costs/Page Charges						\$0	\$0
5. Subawards (Summer)						\$0	\$0
a. Tuition (in-state) *		\$9,504	\$9,979	\$10,478		\$4,752	\$4,752
b. Other Fees						\$0	\$0
Total Other						\$4,752	\$4,752
Total Other Direct Costs						\$10,252	\$10,252
H. Total Direct Cost						\$40,479	\$40,479
INDIRECT EXEMPTIONS						\$4,752	\$4,752
SUBCONTRACT ALLOWANCE						\$0	
MODIFIED TOTAL DIRECT COST (MTDC)						\$35,727	\$35,727
I. Total Indirect Costs(59% MTDC)						\$21,079	\$21,079
Allowed Indirect Costs(25% MTDC)						\$8,932	\$8,932
Unmet Indirect Costs provided as match						\$12,147	
K. Total Amount of This request						\$49,411	\$49,411



MMA-NEP Partnership to Support the Stormwater Collaborative

Background

Within the Buzzards Bay watershed, stormwater pollutants are contributing to the impairment of water resources. There are approximately 6,000 acres of shellfish growing areas closed year-round to shell-fishing, another 6,000 acres close after 0.2 inches or more of rain, and roughly 3,000 acres are seasonally closed. These closures result from bacterial contamination and are often caused by stormwater runoff. Stormwater is also an important contributor of nutrient pollutants in Buzzards Bay embayments, many of which are listed as nutrient impaired with some already assigned a TMDL for nitrogen.

The Stormwater Collaborative was launched in 2016, as a partnership between the NEP, BBAC, and five municipal public works departments (Dartmouth, Acushnet, Fairhaven, Mattapoisett, and Wareham). The purpose of the Stormwater Collaborative was to map stormwater infrastructure and monitor both wet and dry weather discharges (if present). An essential task of the program was to identify and precisely locate all stormwater discharges along the coast (both in and out of MS4 areas) and define the stormwater network connections to those discharge pipes and structures. In 2018, the Stormwater Collaborative expanded through a new partnership with the MMA. This new initiative added three additional municipalities (Westport, Marion, and Bourne). Under this partnership, MMA provided staff support and co-op students to work with Buzzards Bay municipalities and the NEP to continue the monitoring and mapping tasks.

Project Benefit

The Stormwater Collaborative has transitioned to an MS4 support program for the municipalities and thus funded by municipal contracts. During the transition, it will be difficult to fully fund the MMA Stormwater Collaborative coordinator salary until all the participating municipalities fully commit to the program. This subaward will meet Stormwater Collaborative staff funding needs while producing products that will benefit municipalities in their efforts to map stormwater networks and monitor stormwater discharges.

Scope

During the winter of 2021-2022, the MMA will support the work of the Buzzards Bay Stormwater Collaborative. Funds will be used for the salary, overhead and indirect cost for the Stormwater Coordinator to enter data, update GIS mapping, prepare equipment for field season, prepare stormwater outreach materials, write grants, and coordinate with town representatives for additional town contracts.

Budget

Salary -Stormwater Coordinator	\$19,841
Indirect	\$5,159
Total	\$25,000



New Bedford Sea Lab Buzzards Bay NEP Partnership Marine Education Support to Environmental Justice Communities

Background

The Sea Lab Marine Science Education Center is New Bedford Public Schools' (NBPS) marine and aquatic educational summer- school program supported through tuition and the Local Education Agency. Sea Lab is located on the Fort Rodman Peninsula, New Bedford, MA, close to the City's public beaches. Since 1968, third grade students through sophomores in high school, who present with an interest in the ocean sciences, have attended Sea Lab's six-week program. The curricula are cumulative from Level One - through Level Seven. Science curricula developed covers oceanography, limnology, meteorology, geology, marine biology, and chemistry as they relate to the marine environment. Course work includes laboratory work and field studies along the Massachusetts and Rhode Island coastlines. As noted on the program's website⁴,teaching materials are developed to achieve a balance between the introduction of basic scientific concepts and the discussion of observable phenomena with a focus on high interest, hands-on, intensive study designed to appeal to the serious student. Simone Bourgeois, Sea Lab Facilitator, has noted the program's emphasis is on experiential learning, with science content classes complemented by field studies and hands-on activities, focusing on scientific inquiry and observation⁵. The Program has been nationally recognized with past support from National Oceanic and Atmospheric Administration and the Naval Research Center. The curricula include collaboration with area universities, and Sea Lab students have had the opportunity to participate in on-going scientific research.

One of the most fundamental elements of the Sea Lab program is its focus to provide educational equity for all NBPS students. Scholarship funding helps to introduce minorities and economically disadvantaged youth of New Bedford with environmental studies, looking at ecosystems from a scientific perspective, experiencing their first time visiting the ocean, and learning



Grade 4- level 2 students study the historical significance of land-based and water-based lighthouses or light stations. They also learn about the optics of the light beam. Student instruction is manifested by the construction of land based or water-based lighthouse models.

⁴ <https://sealab.newbedfordschools.org/>

⁵ <https://www.newbedfordguide.com/sea-lab-marine-science-program-new-bedford-students-sea/2021/10/26>



Sixth graders are exposed to sailing experiences. Additionally, they are exposed to the utilization of sextants, marlinspike seamanship, along with the historical significance of sailing vessels.

the historical significance of environmental stewardship of the city in which they live.

As noted in the Buzzards Bay Coalition's 2019 B-Wet initiative⁶, outdoor recreation has long suffered from an "adventure gap"⁷ that excludes minorities and the economically disadvantaged from these programs. As noted in the New Bedford Public School's 2021 budget, 66.1 percent of New Bedford students are economically disadvantaged, 40.4 percent do not have English as the first language, and 60.2 percent are minorities⁸.

In 2021, 325 students participated in the Sea Lab program. To participate in this voluntary summer program, the families of resident children must pay \$400 tuition plus certain field trip fees. This tuition covers the costs of teacher salaries, some supplies, and some field trip costs. Sea Lab is also supported by a parent/teacher organization, the Sea Lab Keel, which raises money to buy and repair equipment, defray the costs of field trips, provide snacks for the children, purchase trophies and awards, and award scholarships to Sea Lab alumni as they go off to college. Several other individuals and organizations provide support to keep the Sea Lab program viable.

Project Goals

The Commonwealth of Massachusetts, through the Executive Office of Energy and Environmental Affairs, maintains a policy of Environmental Justice to better serve the environmental needs of the Commonwealth's most vulnerable residents. Similarly, as noted by the U.S. EPA's Environmental Justice Office, EPA's goal is to provide an environment where all people enjoy the same degree of protection from environmental and health hazards and equal access to the decision-making process to maintain a

⁶ <https://www.savebuzzardsbay.org/news/three-year-b-wet-grant-will-fund-outdoor-exploration-for-new-bedford-students/>

⁷ https://www.earthisland.org/journal/index.php/articles/entry/closing_the_adventure_gap_by_getting_inner_city_kids_outdoors/

⁸ [FY21 Preliminary Budget Book 7.06.20.pdf \(sharpschool.com\)](#).

healthy environment in which to live, learn, and work. An important pathway toward both these state and federal goals is the participation and education of vulnerable youth populations. These individuals will become tomorrow's stewards of the environment, and a strong foundation in science and natural ecosystems is essential for them to make informed decisions about the environment as adults, and to be the caretakers of our future.

While the New Bedford School Department has made great strides in bringing in minority, language isolated, and financially disadvantaged students into the program⁹, the greatest single need identified

by Sea Lab Facilitator Simone Bourgeois is the need to provide tuition waivers to families who cannot pay for the tuition. Beyond this dire need are specific unmet program expenses and initiatives that will broaden the programs. This New Bedford Sea Lab Buzzards Bay NEP Partnership is designed to meet these needs. The intent of this proposed work plan is three-fold. 1) to match privately funded school tuition waivers to Sea Lab (and thereby leverage future private donations), 2) fund a student proposal to reduce plastic waste at the school, and 3) fund specific equipment and program needs.

Project Scope

The work described in this proposal will be funded as a Cooperative Agreement sub-award in the form of a reimbursement contract between the Commonwealth of Massachusetts and the City of New Bedford Public Schools with the following tasks.

Task 1. The NEP will match privately funded tuition to disadvantaged students from the previous year. The value of this task will equal forty \$400 tuition waivers.

Task 2. Fund "An Environmentally Friendly Proposal" by a Sea Lab student¹⁰ to reduce plastic bottle waste and make the school environmentally more sustainable. In this project, the school will replace two



Level 7 High School freshmen and sophomores are introduced to design engineering and technology. These students are creating a prototype of a FIRST TECH ROBOT, which will complete a program course engineered by each group. These unique robots follow a route, pick up certain manipulates, and return the "grabs" back to the opening line.

⁹ Application are available in Spanish and Portuguese.

¹⁰ Tatum Reis, Sea Lab eighth grade student: *Hi, Mrs. Bourgeois, it's Tatum Reis and I have a proposal for this summer at Sea Lab. In past years I have noticed that every so often, the keel sends out flyers asking parents to purchase cases of plastic water bottles for the kids. I totally understand this since the summer is very hot and the water bottles often compliment snack time. However, I believe that Sea Lab can distribute water to kids in a much more sustainable way. Plastic water bottles take almost 450 years to break down and they release 2.5 million tons of carbon dioxide into the air. Also, they make up 6% of the ocean's total plastic. Since Sea Lab has taught me all about the ocean, I have grown to care a lot about it and ways that*

conventional water fountains with combination bottle filler fountains serving reverse osmosis filtered water, and the students will be encouraged to use their own reusable bottles instead of throw-away water bottles. The budget includes two bottle stations and some bottles for students in need. The student-led project will also involve local fundraising for the initiative.

Task 3. Equipment acquisition and repair to expand and sustain the program. Sea Lab will purchase four canoes and life preservers to add canoeing to their summer program. This task will fund the repair of damage to an existing training sailboat. Besides supporting the boating program, this task will fund 15 underwater student cameras to be used by students participating in skin diving classes and for teaching underwater photography, and documentation of local sea life. A wireless weather station will be mounted outdoors with a wireless display mounted indoors. Two document scanners are needed for student projects.

Task 4. Address Sea Lab curriculum needs. The NEP will work with Sea Lab on two specific sub tasks. First, like Task 2 above, Sea Lab will solicit the students for new project ideas. The NEP will work with Sea Lab to develop the best of these into proposals to state and federal grant programs, like EPA's Healthy Communities and Environmental Education Grant programs, and for applications to the NEP. Second, the NEP will review the Sea Lab curriculum and suggest opportunities to address environmental concepts and issues prioritized in the Buzzards Bay Comprehensive Conservation and Management Plan.



Participation in Sea Lab has transformed many people's lives. Executive Director Joe Costa spoke at the 44th Annual Sea Lab Commencement in 2012 describing how he chose to become a marine biologist because of his attendance at Sea Lab 1969-1972.

I can personally limit my pollution. So, I came up with a very easy way to prevent the use of plastic water bottles this summer so that Sea Lab can reduce its environmental impact. I am proposing that Sea Lab purchases reusable water bottles that kids can buy at the beginning of the summer. These bottles can have the Sea Lab logo on them and I am more than willing to help with the designing process and finding the right ones since New Bedford High School has recently undergone this same project.... They could be placed in the cafeteria during snack time and kids could fill their new reusable water bottles instead of purchasing a new plastic bottle every day. This would limit trash and recycling which is a positive since recycling is an expensive and very slow process. If you are on board with this idea, I can definitely assist in figuring out prices and profits, but I do think that this would be highly beneficial to the environment, especially the ocean, which is what Sea Lab is all about. Also, I am happy to discuss this over a call or a zoom meeting. Thank you for taking the time to read this email and I hope you consider it!

Project Benefit

This project meets state and federal Environmental Justice goals and helps the NEP meet Justice40 goals, by directly expanding the pool of disadvantaged students that can participate in the program. The project also directly meets goals in the Buzzards Bay Comprehensive Conservation and Management Plan Action Plan 21: Enhancing Public Education and Participation¹¹. Specifically, this project meets Goal 21.1. To expand the public's knowledge of the natural resources and water quality of Buzzards Bay and surrounding watershed and the threats they face¹². As noted in this Action Plan, "contributing to the problem, people, first as children, then as adults, may not have been educated about concepts like groundwater flow, pollution pathways in local watersheds, how wastewater is treated and disposed, or the connection between ground and surface waters."

Budget

Task	Amount
Task 1: Waiver of tuition fees for disadvantaged students	\$16,000
Task 2: Student proposed bottle filling stations (2, includes installation and supplies)	\$3,800
Task 3: Equipment and Supplies, and Equipment Repair	
Training sailboat repair	\$3,000
Wireless weather station and installation	\$900
Canoes (4 @ \$499 each)	\$1,996
Document camera (2 @ \$150 each)	\$300
Student underwater cameras 15 @ 100.00	\$1,500
TOTAL	\$27,496

Task 4 is internally funded by the NEP and Sea Lab.

¹¹ <https://buzzardsbay.org/newccmp/newccmp-education.pdf>

¹² Objective 21.1. To better convey concepts of watersheds and the flow of water from precipitation along the land surface and in the ground. Objective 21.2. To better convey an understanding of pollution sources and pathways in the environment. Objective 21.3. To improve the public understanding of human and natural effects on plant and animal populations and ecosystems.