Nonpoint Source Management Program:
Clean Water Act Section 319
2022 Annual Report

Commonwealth of Massachusetts
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Nonpoint Source Management Program:
Clean Water Act Section 319
2022 Annual Report

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Cover Photo
Merrimack River salt marsh (left), runoff management at a bedded pack facility in southeastern Massachusetts (top right), rain garden catching and infiltrating rainwater prior to release into Monoosnoc Brook in Leominster (bottom right); photos courtesy of Jennifer Hughes, Merrimack Valley Planning Commission, Michael Leff, Massachusetts Association of Conservation Districts, and Ed Himlan, Massachusetts Watershed Coalition, respectively.

Notice of Availability
This report is available on the Massachusetts Department of Environmental Protection website: https://www.mass.gov/info-details/grants-financial-assistance-watersheds-water-quality#section-319-nonpoint-source-competitive-grants-program-

Massachusetts Department of Environmental Protection

MassDEP's mission is to protect and enhance the Commonwealth's natural resources – air, water, and land – to provide for the health, safety, and welfare of all people, and to ensure a clean and safe environment for future generations. In carrying out this mission MassDEP commits to address and advance environmental justice and equity for all people of the Commonwealth; provide meaningful, inclusive opportunities for people to participate in agency decisions that affect their lives; and ensure a diverse workforce that reflects the communities we serve.

Watershed Planning Program

The Watershed Planning Program is a statewide program in the Division of Watershed Management, Bureau of Water Resources, at MassDEP. We are stewards of the water resources of Massachusetts. Together with other state environmental agencies, we share in the duty and responsibility to protect, enhance, and restore the quality and value of the waters of the Commonwealth. We are guided by the federal Clean Water Act and work to secure the environmental, recreational, and public health benefits of clean water for the residents of Massachusetts. The Watershed Planning Program is organized into five Sections that each have a different technical focus under the Clean Water Act: (1) Surface Water Quality Standards; (2) Surface Water Quality Monitoring; (3) Data Management and Water Quality Assessment; (4) Total Maximum Daily Load; and (5) Nonpoint Source Pollution.

Disclaimer

References to trade names, commercial products, manufacturers, or distributors in this report constituted neither endorsement nor recommendation by MassDEP.

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Executive Summary

The Watershed Planning Program in the Massachusetts Department of Environmental Protection (MassDEP) prepared this report to summarize the activities and accomplishments of the Massachusetts Nonpoint Source (NPS) Management Program ("NPS Program") in 2022. This report meets the annual reporting requirements of Section 319(h) of the federal Clean Water Act (CWA) and helps to notify the public as well as the U.S. Environmental Protection Agency (EPA) about the work being done in the Commonwealth to reduce and control NPS water pollution.

NPS pollution is a significant source of degraded water quality in Massachusetts. NPS water pollution involves the movement of water over and through the ground, which transports and deposits pollutants into waterbodies such as lakes and rivers. The NPS Program is funded in part by the EPA under sections 319(h) and 604(b) of the CWA to control NPS pollution. The Massachusetts 2020-2024 Nonpoint Source Management Program Plan ("NPS Program Plan") recognizes that MassDEP must continue to work with its many partners on a watershed-by-watershed basis to improve and protect the water resources of the Commonwealth.

Each year, MassDEP undertakes a competitive process seeking proposals for CWA §319-funded projects to restore and remediate impaired waters through the implementation of total maximum daily loads (TMDLs), Watershed-Based Plans (WBPs), and the Massachusetts NPS Program Plan. The awards provide financial support for local projects and programs that control NPS pollution or that protect or improve NPS-impaired or threatened water resources.

This report includes an overview of 2022 highlights, program activities, outreach, capacity building efforts, the development of Environmental Justice (EJ) policies, §319 grant information, and summaries of §319-funded projects conducted under the Massachusetts NPS Program Plan.

MassDEP recommended twelve new projects for funding from the federal fiscal year 2021 (FFY2021) §319 allocation. The selected projects will demonstrate structural and non-structural best management practices to improve the water quality of impaired waters. In 2022, the NPS Program also conducted a series of internal and external assessments to identify the strengths, weaknesses, opportunities, and threats associated with the §319 grant program. Based on these assessments, MassDEP is currently considering a multifaceted approach to enhance the equitable distribution of §319 funds among all communities of the Commonwealth. These capacity-building and EJ initiatives will help to meet federal Justice40 requirements in the upcoming years. Building capacity through active and inclusive engagement within communities is a central goal of MassDEP's NPS grant program.

Figure 1. Rain Garden in Canton, MA.

Table of Contents

Figure 2. Rain Garden in Franklin, MA.

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I. Introduction

Nonpoint source (NPS) pollution can occur anywhere and involves the movement of water over and through the ground. As runoff moves, it transports natural and human-made pollutants that are eventually deposited into waterbodies such as lakes and rivers. Examples of pollutants include fertilizers, oil, construction sediment, and bacteria and nutrients from animal wastes. The major categories of NPS pollution sources in Massachusetts consist of developed areas and associated impervious cover, transportation, agriculture, forestry, hydromodification, atmospheric deposition, landfills, waste management sites, and natural resource extraction.

Under Section 319 of the CWA, EPA awards federal grants to states, territories, and tribes for projects that will help prevent and control NPS pollution. Massachusetts' Nonpoint Source Management Program ("NPS Program") is guided by the Massachusetts 2020-2024 Nonpoint Source Management Program Plan ("NPS Program Plan") (https://www.mass.gov/doc/final-2020-2024-massachusetts-nonpoint-source-management-program-plan/download).

This report summarizes NPS Program activities and accomplishments in 2022. Every year, MassDEP prepares a report to describe the progress made in Massachusetts toward controlling NPS water pollution and meet the annual reporting requirements of Section 319(h) of the CWA.

Figure 3. Installing an Infiltration Trench in Winchester, MA.

II. 2022 Highlights – NPS Management Program

A. **Program Integration -** FFY2022 marked the third full year that the MassDEP §319 NPS Program has been incorporated into the Watershed Planning Program (WPP), Division of Watershed Management, Bureau of Water Resources. The organizational change has resulted in enhanced collaboration and coordination for the NPS Program within WPP. The Water Quality Management Planning grant program (CWA Section 604(b)) was also formally integrated into the NPS Program, which has strengthened collaboration between the two programs. The §604(b)-grant program has historically solicited projects that support the development of competitive §319 projects. Through the FFY2022 §604(b) grant solicitation, MassDEP focused on projects that will result in the development of Watershed-Based Plans (WBPs) in accordance with the nine-element template. Projects that support the identification and remediation of water quality pollution sources were also solicited.

B. **New Grant Projects in 2022 -** The FFY2022 §319 NPS Project Funds Target awarded by the EPA was set at $1,144,860. Two Requests for Responses (RFRs) were issued for the FFY2022 allocation. Nineteen proposals were received in response to the two FFY2022 RFRs (funded using the FFY2021 §319 allocation; MassDEP has used the FFY §319 allocation from a previous year to fund projects starting in the next FFY). After review and evaluation, an inter- and intra-agency committee selected 12 new projects to be recommended for funding from the FFY2021 §319 allocation. The combined grant amount provided by the EPA for the 12 projects was $2,019,037, and the combined match amount (in the form of cash or in-kind services) was $1,287,640. These projects are referred as FFY2022 projects in this document.

C. **Closing Grant Projects in 2022** – Six projects funded through the NPS §319 grant program in recent years were closed out in 2022. Three of four implementation projects and one of two non-implementation projects were successfully completed. One implementation project and one non-implementation project partially completed the proposed objectives. These projects were awarded a combined total of $1,213,165 in section §319 funds. Matching funds for these projects (in the form of cash or in-kind services) were valued at $984,265.

- Projects were completed in the towns of Amherst, Avon, and Westport and in the city of Chicopee. Target watersheds included the Cape Cod, Connecticut, Taunton, and Westport watersheds.

- Project outcomes included the implementation of best management practices (BMPs) and public outreach. As a result, there was a reduction of nutrients, pathogens, sediment, and other contaminants in waterbodies, and an increase in public knowledge of NPS pollution and BMPs, ultimately improving the quality of impaired waters in Massachusetts.

D. **National Water Quality Initiative** (NWQI) – MassDEP previously coordinated with the US Department of Agriculture National Resource Conservation Service (NRCS) and EPA to nominate two hydrologic unit code 12 (HUC12) watersheds as NWQI watersheds: the South River watershed in Franklin County, which discharges into the Deerfield River, and the Manhan River watershed, which includes portions of Huntington through South Hadley. MassDEP will continue to support the NWQI and NRCS through cooperative actions in these watersheds. NRCS solicited readiness reports for the South River and Manhan River. NRCS has chosen the Franklin Regional Council of Governments (FRCOG) to complete a readiness phase report for the South River. It is expected that NRCS will release a future solicitation for the Manhan River readiness phase report.

The NRCS and EPA (§319 and drinking water programs) initiated an NRCS-EPA NWQI in the James Brook watershed in 2020. James Brook is part of the Nashua and Merrimack River watersheds. In addition to restoring water quality in James Brook, the primary focus of this initiative is to protect drinking water in the Merrimack River Watershed. NRCS completed a draft *Unkety Brook- Nashua River Watershed Assessment* that provides a characterization and analysis of the Unkety Brook-Nashua River drainage area. NRCS will support efforts that focus on water quality concerns within the watershed, including nitrogen and pathogen pollution, and mitigation strategies. In 2021, MassDEP conducted sampling in James Brook and Unkety Brook as part of this NWQI, with laboratory analysis support from EPA.

In order to implement the *Westport River Estuarine System Total Maximum Daily Loads for Total Nitrogen* (MassDEP, 2017)[1] the Westport River watershed was also chosen as a NWQI watershed. Implementation of the *Final Pathogen TMDL for the Buzzards Bay Watershed* (MassDEP, 2009)[2] in the Westport River Watershed is also expected. The Westport River watershed was the focus of a recent Massachusetts Association of Conservation Districts (MACD) §319 grant project and MassDEP intends to replicate the overall success in the Palmer River Watershed, which has seen the implementation of numerous agricultural BMPs funded by both NRCS and the MassDEP §319 grant program. The Palmer River watershed is a good case study of a successful partnership between local farmers and state and federal agencies. NRCS has completed a draft of their readiness phase report entitled *Draft Final Westport River Watershed Assessment, NRCS National Water Quality Initiative* (NRCS, 2021).[3] The draft report, along with the current §319 grant, will support efforts to address pollutant sources in the watershed, principally targeting nitrogen and pathogen pollution.

E. **Nonpoint Source Coordinators** - One recent initiative, continued for 2022, is a contract with a planning agency to serve as regional NPS coordinator in the Merrimack River Watershed portion of Essex County. This contractor will be asked to develop WBPs, high-quality projects to be funded through the §319 program, and to conduct outreach and education work to enhance the NPS Program.

F. **Agricultural Regional NPS Coordinators** - Another newer initiative is a contract with regional conservation districts to serve as agricultural regional NPS coordinators for Franklin, Hampshire, and/or Hampden Counties. This contractor will be asked to conduct agricultural NPS-focused work to develop WBPs, high-quality projects to be funded through the §319 program, and outreach and education to enhance communication with agricultural communities by the NPS Program.

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[1] Massachusetts Department of Environmental Protection. 2017. *Westport River Estuarine System Total Maximum Daily Loads for Total Nitrogen*. Report Number CN 375.1. Watershed Planning Program, Bureau of Water Resources, Massachusetts Department of Environmental Protection, Worcester, MA.

[2] Massachusetts Department of Environmental Protection, U.S. Environmental Protection Agency, and ENSR International. 2009. *Final Pathogen TMDL for the Buzzards Bay Watershed.* Report Number 251.1. MassDEP, Division of Watershed Management, Worcester, MA.

[3] US Department of Agriculture Natural Resources Conservation Service and TetraTech, Inc. 2021. *Draft Final Westport River Watershed Assessment, NRCS National Water Quality Initiative.* USDA Natural Resources Conservation Service, Amherst, MA.

G. **Healthy Watersheds** - Program guidelines encourage projects to protect healthy watersheds and unimpaired/high quality waters. Accordingly, the FFY 2021 §319 solicitation included a category for implementation projects that address climate change adaptation and resiliency and projects that protect unimpaired and high-quality waters from the effects of NPS pollution. Two healthy watershed proposals were received from the Franklin Regional Council of Governments, and both were recommended for funding: the Dirt Roads Stormwater Management Toolkit and Watershed-Scale Zoning to Reduce NPS. Three climate resiliency proposals were also received and two, the Dirt Roads Stormwater Management Toolkit and Lake Waushakum BMPs in Framingham, MA, were recommended for funding in the this round.

H. **Updating the Watershed-Based Planning (WBP) Tool** - MassDEP developed its WBP Tool in 2017 to support §319 implementation projects. Section 319 funds were used to support the development of nine-element WBPs for implementation projects to protect lakes, streams, and estuaries, and for other watershed plans. Additional recent updates include the revision of training materials and the presentation of a training workshop for regional NPS coordinators. In 2022 several enhancements were made, including updating information on impaired waters to reflect the EPA-approved Massachusetts Year 2016 Integrated List of Waters, a BMP Hotspot Map, and formatting improvements to the WBP export document. The BMP Hotspot Map was developed as a cursory planning level tool to assist WBP Tool users with identifying priority parcels for future NPS BMP implementation within a selected watershed. A technical memorandum provides information on this and other recent updates. As resources allow, operation and maintenance cost estimates may be added to the BMP selector tool and additional functionality to estimate load reductions from nonstructural BMPs may be added.

   MassDEP required the development of WBPs as a component of each implementation project and encouraged development of WBPs through §604(b) funds. Proposals that used WBPs as a basis for watershed projects received priority for §319 funding.

III. Massachusetts NPS Management Program

A. Overview

The Massachusetts Nonpoint Source Management Program Plan ("NPS Program Plan") presents MassDEP's strategy for preventing, controlling, and reducing NPS pollution to protect and improve the quality of the Commonwealth's waters. The plan was originally developed in 1989 and approved by EPA, pursuant to Section 319 of the CWA. It has been revised in 1994, 1999, and 2014. In 2019, the NPS Program Plan was updated to reflect the current priorities of the Massachusetts NPS Program, current EPA program guidelines, funding levels, and staff resources for the five-year period of 2020-2024.

MassDEP, as the agency designated to administer CWA programs for the Commonwealth, has established an overall vision for the Massachusetts NPS Program that focuses on protecting and restoring water quality. The vision of the Massachusetts NPS Program is to bring the residents of the state together to restore surface and groundwater impaired by NPS pollution, to protect water quality in healthy watersheds, and to plan for and address human-induced and naturally occurring changes in the environment. The Plan identifies the five major goals below.

1. Identify and expand opportunities to accomplish and leverage work by private, state, local, and federal partners.

2. Restore impaired waters, reduce NPS pollutants, and mitigate the effects of climate change.
3. Protect healthy and threatened waters through planning, education, program coordination, and implementation of climate ready BMPs.
4. Monitor waters for NPS impairments and improvements to prioritize actions, measure success, and increase program efficacy.
5. Instill, encourage, and nurture a passion for restoring water quality through education, capacity building, and building new partnerships.

B. Outreach, Capacity Building, and Environmental Justice

In FFY 2022, the NPS Program added an NPS Outreach Coordinator and welcomed a new NPS Section Chief, who have both invigorated outreach and capacity building activities conducted by the NPS Program. Environmental Justice (EJ) has also become a central imperative. Activities associated with the identification of specific EJ goals for the §319 grant program include conducting an equity assessment, providing required technical support through the EJ coordinator program, and establishing innovative finance partnerships with state-funded grant programs to address the match requirement for the EJ communities. The NPS Outreach Coordinator conducts outreach among stakeholders to promote the §319 grant program, develops new relationships, and strengthens existing relationships with federal, state, regional, and community-based agencies and organizations, develops and delivers targeted outreach, and provides technical assistance to support capacity building, especially among community-based organizations in disadvantaged (DAC) and EJ communities.

C. Restoring Impaired Waters

The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. As one step toward meeting this goal, each state must administer a program to monitor and assess the quality of its surface and groundwater and provide periodic status reports to the EPA, the U.S. Congress, and the public. Section 305(b) of the CWA codifies the process whereby waters are evaluated with respect to their capacity to support designated uses as defined in surface water quality standards (SWQS) for each state. These uses include aquatic life support, fish and shellfish consumption, drinking water supply, and primary (e.g., swimming) and secondary (e.g., boating) contact recreation. The Section 305(b) process entails assessing each of these uses for rivers, lakes, and coastal waters. The causes and sources of impairments are identified wherever possible.

Section 303(d) of the CWA and the implementing regulations at 40 CFR 130.7 require states to identify those waterbodies that are not expected to meet SWQS after the implementation of technology-based controls and to prioritize the development of total maximum daily loads (TMDLs). A TMDL establishes the maximum amount of a pollutant that may be introduced into a waterbody and still ensure the attainment and maintenance of water quality standards. Furthermore, a TMDL must also allocate acceptable pollutant load among all potential sources. The formulation of the 303(d) List of Impaired Waters (303(d) List) includes a more rigorous public review and comment process than reporting under s. 305(b), and the final version of the list must be formally approved by the EPA. The most recent approved Integrated List can be found here: https://www.mass.gov/lists/integrated-lists-of-waters-related-reports.

Watershed-Based Plans (WBPs)

The Massachusetts WBP template was first developed in 2006 in response to EPA guidelines

requiring a nine-element WBP to support the award of §319 implementation project funds. The purpose of the WBP template is to organize information pertaining to Massachusetts' watersheds and present it in a format that supports the development of WBPs that can be used as the basis for NPS watershed projects to restore water quality in the Commonwealth.

The completed WBP Tool (http://prj.geosyntec.com/MassDEPWBP) allows users to select watersheds for lakes, rivers, streams, and estuaries. Following the nine-element format, the WBP tool provides existing information about the selected watershed, estimates pollutant loads, guides the user to BMP selection and remediation strategies, and assembles the WBP into an editable Word document.

In addition to supporting the WBP Tool, MassDEP also provides §604(b) and §319 grant funds to implement WBPs. In 2022 MassDEP accepted eight Watershed-Based Plans. At the end of 2022, there were thirty-five MassDEP-accepted nine-element WBPs (Table 1).

Table 1. Watershed-Based Plans completed in FY2022.

Watershed-Based Plan	Regional Watershed	Assessment Unit ID	Town(s)	Healthy/ Impaired
Lake Attitash	Merrimack	MA84002	Amesbury	Impaired
Lake Garfield	Housatonic	MA21040	Monterey	Impaired
Town of Milton	Weymouth & Weir, Neponset	MA73-02, MA73-03, MA73-04, MA73-26, MA73-29, MA73-30, MA73003, MA73059, MA74015	Milton	Impaired (MA73-02, MA73-03, MA73-04, MA73-26, MA73-29, MA73-30, MA73003) Healthy (MA73059, MA74015)
Malden River	Mystic	MA71-05	Malden	Impaired
Monatiquot River	Weymouth & Weir	MA74-08	Braintree	Impaired
Quaboag (North) Pond & Quacumquasit (South) Pond	Chicopee	MA36130 & MA36131	Brookfield, East Brookfield, Sturbridge	Impaired
Waushakum Pond	Concord (SuAsCo)	MA82112	Framingham, Ashland	Impaired
Westport River	Buzzards Bay	MA95-54	Westport	Impaired

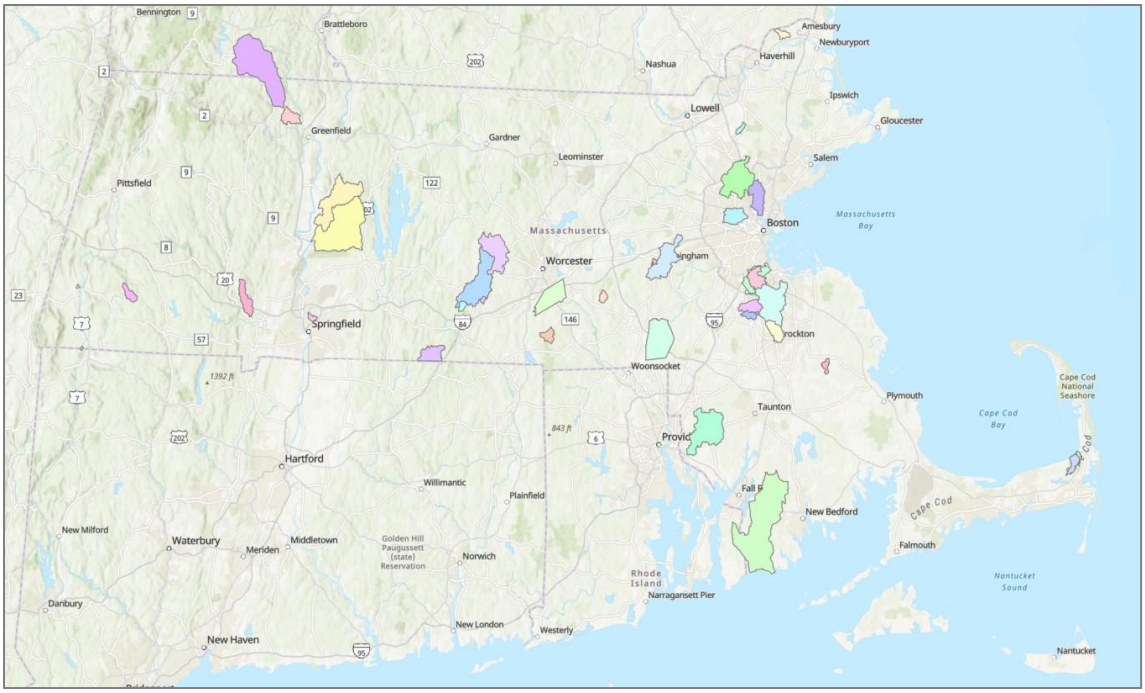

Figure 4. MassDEP-accepted nine-element Watershed-Based Plans in Massachusetts.

D. NPS Pollutant Load Reductions

The Grants Reporting and Tracking System (GRTS) is a comprehensive EPA database of NPS program information used to track §319 program activity and to enhance the understanding of NPS projects and programs. Pursuant to EPA guidelines, States are required to use GRTS to report all nationally mandated elements described in the most recent GRTS memorandum located on the GRTS website https://www.epa.gov/nps/319-grant-current-guidance. MassDEP enters all mandated elements for projects ending in a given federal fiscal year by February 15 of the following federal fiscal year as required. For all projects which ended in FFY2022, MassDEP has entered all mandated information including load reductions achieved by individual §319-funded projects.

E. Section 319 Grant Administration

Each year, MassDEP undertakes a competitive process seeking proposals for §319 funded projects to remediate and restore impaired waters through implementation of TMDLs and WBPs and implementation of the Massachusetts Nonpoint Source Management Program Plan. The awards are intended to provide financial support for local projects and programs for controlling the major statewide categories of NPS pollution or for protecting or improving NPS-impaired or threatened water resources. An intra- and inter-agency screening committee reviews all eligible §319 proposals. The proposals that are determined most likely to succeed in a cost-effective manner are selected for recommendation. Recommended proposals are approved by MassDEP and will be included in the annual program workplan, which is submitted to EPA at the start of the federal fiscal year. Once the workplan has been approved, MassDEP enters into a contractual agreement with each applicant to conduct the project. MassDEP negotiates a scope of work, milestone schedule, and a budget, which are all incorporated into a contract with the selected grantee.

The April 14, 2021, Request for Responses (RFR) for FFY 2022 projects encouraged applicants to propose high quality projects in six categories, with emphasis on projects that address water quality impairments. The "Final Massachusetts Year 2016 Integrated List of Waters (303d list)" served as the basis for impairment information for the FFY 2022 §319 RFR that solicited projects in the following categories:

A. **Implementation Projects in Impaired Waters**. The most competitive applicants will propose projects that pursue a watershed-based strategy to implement a combination of structural and non-structural BMPs addressing all impairments and leading to restoration of impaired waters. (Impaired waters are those listed in categories 4a, 4c, and 5 of the Massachusetts 2016 Integrated List of Waters: https://www.mass.gov/files/documents/2020/01/07/16ilwplist.pdf). BMPs should be selected for optimal pollutant load removal, emphasizing source reduction. Proposed BMPs must be developed at least to the conceptual design stage and submitted with the proposal. Proposals must contain site-specific information to demonstrate that the project is feasible and ready to be constructed within the project timeline. Additional information addressing the nine elements of the WBP supporting a project may be required for awarded projects, as outlined in the EPA Program Guidelines.

B. **Healthy Watersheds and Protection of High-Quality Waters**. Proposed implementation projects for climate change adaptation and resiliency, and projects that protect non-impaired and high-quality waters from the effects of NPS pollution, are eligible for §319 program funds. These proposals must be supported with documentation of the problem, conceptual or better plans to explain the strategy and approach, and all information necessary to demonstrate the feasibility and effectiveness of the project.

C. **Development of Municipal and Regional Stormwater Collaboratives and Funding Mechanisms**. A stormwater utility is a property assessment tool that provides a sustainable source of funding to construct, maintain, and repair stormwater infrastructure. Proposals may include initial research to evaluate whether a stormwater utility is appropriate for a town, quantifying the current and future cost of stormwater management programs, development and distribution of educational materials, and development of regional agreements and funding structures.

D. **Regional Implementation Project Development**. Eligible not-for-profit entities in Worcester and Plymouth counties will serve as Regional NPS Coordinators. These regional coordinators will develop WBPs and high-quality projects to be funded through the §319 program and will conduct outreach and education to enhance the NPS Program message.

E. **Agricultural NPS Regional Coordinator**. Eligible regional conservation districts will serve as agricultural NPS Regional Coordinators for Berkshire, Franklin, Hampshire and/or Hampden Counties and carry out agricultural related NPS-focused work to develop WBPs, high-quality projects to be funded through the §319 program, and outreach and education work to enhance the NPS Program message in agricultural communities.

F. **Zoning to Protect Water Resources Addressing NPS Pollution**. NPS Planning: Local controls can address a wide range of issues related to NPS pollution. Projects that include local planning related items such as bylaw review (open space community zoning, cluster/flexible zoning, etc.) and riparian corridor planning, which will result in adoption of local bylaws and reduce NPS pollution, are eligible for funding. Projects that can show concrete deliverables and quantify how proposed planning activities, if adopted, will result in less impervious area and NPS pollution will be the most competitive.

The October 13, 2021, Request for Responses (RFR) for FFY 2022 projects encouraged applicants to propose high quality projects in five categories, with emphasis on projects that address water quality impairments. The "Final Massachusetts Year 2016 Integrated List of Waters (CWA §303d list)" served as the basis for impairment information for the FFY 2022 §319 RFR that solicited projects in the following categories:

A. **Implementation Projects in Impaired Waters**. The most competitive applicants will propose projects that pursue a watershed-based strategy to implement a combination of structural and non-structural BMPs addressing all impairments and leading to restoration of impaired waters. (Impaired waters are those listed in categories 4a, 4c, and 5 of the Massachusetts 2016 Integrated List of Waters: https://www.mass.gov/files/documents/2020/01/07/16ilwplist.pdf). BMPs should be selected for optimal pollutant load removal, emphasizing source reduction. Proposed BMPs must be developed at least to the conceptual design stage and submitted with the proposal. Proposals must contain site-specific information to demonstrate that the project is feasible and ready to be constructed within the project timeline. Additional information addressing the nine elements of the WBP supporting a project may be required for awarded projects, as outlined in the EPA Program Guidelines.

B. **Healthy Watersheds and Protection of High-Quality Waters**. Proposed implementation projects for climate change adaptation and resiliency and projects that protect non-impaired and high-quality waters from the effects of NPS pollution are eligible for §319 program funds. These proposals must be supported with documentation of the problem, conceptual or better plans to explain the strategy and approach, and all information necessary to demonstrate the feasibility and effectiveness of the project.

C. **Development of Municipal and Regional Stormwater Collaboratives and Funding Mechanisms**. A stormwater utility is a property assessment tool that provides a sustainable source of funding to construct, maintain, and repair stormwater infrastructure. Proposals may include initial research to evaluate whether a stormwater utility is appropriate for a town, quantifying the current and future cost of stormwater management programs, development and distribution of educational materials, and development of regional agreements and funding structures.

D. **Regional Implementation Project Development**. Eligible not-for-profit entities in Worcester and Plymouth counties will serve as Regional NPS Coordinators. These regional coordinators will develop Watershed-Based Plans and high-quality projects to be funded through the §319 program and will conduct outreach and education to enhance the NPS Program message.

E. **Outreach and Education**. Outreach and education is often recommended as an effective nonstructural BMP. Successful projects in this category will propose specific outreach and education activities and products and will develop and implement an evaluation method to gauge the effectiveness of these activities. Projects should have regional or statewide relevance and should include a deliverable that can be made available in both print and electronic form, ensuring accessibility for disabled and non-English-speaking audiences if appropriate.

Responses to MassDEP's two §319 RFRs for FFY 2021 funding have been reviewed and evaluated, and a total of twelve project recommendations have been approved for funding as of May 19, 2022. The April 2022 Workplan for the FFY2022 program year also features these same recommendations. See Section IV, C below for more information.

F. Expenditure of Funds

In accordance with program guidelines, expenditures are reflected according to an even split of the §319 allocation between Watershed Project and Program funds. For the allocation between program and project funds and the amounts awarded to grantees as sub-awards, see Table 2. The watershed project funding allocation will be spent for implementation projects that address water quality impairments. Program funds support NPS staff and administrative functions as well as projects that are consistent with the 2020-2024 Nonpoint Source Management Program Plan.

The FFY2016 PPG (99187811) funded projects started on FFY2018 and FFY2019 and is currently closed out. Six projects funded through this PPG have closed and are reported here. Three Regional Coordinator (non-implementation) projects (started in 2020) used some rollover remaining program funds from the 2016 PPG but were primarily funded through the 2020 PPG (99187812). These three projects (20-01/319, 20-04/319, and 20-06/319) are active.

Table 2. Percentages of yearly-allocated funds used for subawards.

FFY Projects	Total §319 Allocation	Total Program award	Program Sub-awards	Program Sub-awards (%)	Watershed Implementation Projects (WIP) Award	WIP Sub-awards	WIP Sub-awards (%)	Total Sub-awarded (%)[1]
2018	$2,160,757	$1,080,379	$589,076	55%	$1,080,379	$1,080,379	100%	77%
2019	$2,138,319	$1,069,160	$283,507	27%	$1,069,160	$1,069,160	100%*	63%
2020	$2,228,120	$1,114,060	$217,436	20%	$1,114,060	$1,114,060	100%*	60%
2021	2,289,720	$1,144,860	$100,000	9%	$1,144,860	$719,419	63%**	36%
2022	2,288,720	$1,144,360	$395,435	35%	$1,144,360	$1,144,360	100%	67%
Total	**$11,105,636**	$5,552,819	$1,585,454	29%	$5,552,819	$5,127,378	92%	60%

[1] Remaining funds go to MassDEP §319 Program Administration
** Note: some implementation projects have been used to meet prior year commitments/awards.*
*** FY2022 implementation projects to be used to meet WIP award value.*

Match

Grantees receiving competitive sub-awards are required to provide a 40% non-federal match of the total project cost as part of the grant-funded project. The 40% match may be in cash or from in-kind services performed as part of the approved project activities. The match for the FFY 2021 allocation is shown in Table 3.

Table 3. FFY 2021 Match Required

FFY 2021	Sub-awards and Nonpoint Source Projects	MassDEP Program Expenses	Total
§319 funds	$2,019,037	$666,697	$2,685,734
Match	$1,287,640	$444,465	$1,732,105
Total Program Value	$3,306,677	$1,111,162	$4,417,839

This report summarizes activity on seventeen §319-funded projects. Six projects are closing with this report, and eleven projects remain ongoing. For a financial summary of these projects see Table 4. With the twelve proposed new FFY 2022 projects, 23 active projects are anticipated.

The total §319 funds for the twenty-three projects reported is $5,892,312.90 Total project value, including match, is $9,863,922.71. With six of these projects closing, the §319 funds committed to the twenty-three active and proposed projects will be $4,523,968.00 and current and proposed total project value will equal $7,572,063.00.

Table 4. Financial Status of Projects Reported on in Annual Report.

FFY	Project Number	Grantee	Project Title	Status	End Date	§319 Grant Award	Reimbursed	Balance
2018	18-02	Geosyntec Consultants Inc	Update of WBP	Closed	9/30/2022	$420,984	$420,984	$0
2019	19-01	City of Chicopee*	Lower Abbey Brook	Closed	9/30/2022	$322,000	$116,172	$205,828
2019	19-02	County of Barnstable*	MASSTC	Closed	9/30/2022	$346,603.54	$313,260.75	$33,342.79
2018	19-05	Town of Avon	Avon Town Hall	Closed	6/30/2022	$79,107	$68,832.53	$10,274.47
2018	19-06	Massachusetts Association of Conservation Districts	Westport River	Closed	9/30/2022	$196,200	$196,200	$0
2020	20-01	Franklin Regional Council of Governments	Regional Coordinator	Active	9/30/2022	$200,000	$100,000	$100,000
2020	20-02	Town of Amherst**	Amherst-Fearing Brook Restoration	Closed	6/30/2022	$276,549	$252,895.62	$23,653.38
2020	20-03	Town of Spencer	Spencer BMPs	Active	6/30/2022	$88,200	$51,629.75	$ 36,570.25
2020	20-04	Berkshire Regional Planning Comm	Regional Coordinator	Active	9/30/2022	$200,000	$ 78,211.84	$121,788.16
2020	20-05	Comprehensive Environmental Inc	Grantee Guidebook	Active	6/30/2022	$75,285	$69,829.49	$ 5,455.51
2020	20-06	Pioneer Valley Planning Comm	Regional Coordinator	Active	9/30/2022	$200,000	$ 56,825.77	$143,174.23
2020	20-07	UMass-Amherst	UMass-Equine Projects	Active	6/30/2022	$286,670	$81,058.57	$205,611.43
2021	21-01	Mystic River Watershed Association	Small-Scale Street Trenches	Active	6/30/2023	$498,715	$196,151.09	$302,563.91
2021	21-03	Manchaug Pond Foundation	Water Quality Improvements	Active	6/30/2023	$265,190	$95,527.89	$169,662.11

FFY	Project Number	Grantee	Project Title	Status	End Date	§319 Grant Award	Reimbursed	Balance
2021	21-04	Merrimack Valley Planning Commission	Essex County NPS Coordinator	Active	6/30/2023	$100,000	$24,672.27	$75,327.73
2021	21-05	Town of Holland	Hamilton Reservoir Improvement	Active	6/30/2024	$256,871	$0	$256,871
2021	21-06	Massachusetts Association of Conservation Districts	Western Mass Ag NPS Program	Active	6/30/2023	$259,000	$173,000	$432,000
2022	22-01	Franklin Regional Council of Governments	Watershed-Scale Zoning to Reduce Nonpoint Source Pollution and Protect Healthy Watersheds	Active	6/30/2024	$78,450	$52,300	$130,750
2022	22-02	Massachusetts Association of Conservation Districts	Agricultural NPS Regional Coordinators for Franklin, Hampshire, Hampden Counties	Active	6/30/2025	$241,848	$161,232	$403,080
2022	22-03	County of Barnstable	Encouraging the Use of Lignocellulose (Wood) Based Onsite Septic Systems for Nitrogen-Sensitive Environments by Demonstrating Concurrent Contaminant Removal That Justifies More Economical Means for Effluent Disposal	Active	9/30/2024	$72,385	$50,278	$122,663
2022	22-04	Town of Milton	Collicot/Cunningham Stormwater BMP	Pending		$158,500	$111,514	$270,014
2022	22-05	Franklin Regional Council of Governments	Developing a Dirt Roads Stormwater Management Toolkit to Reduce NPS and Improve Resiliency in Healthy Watersheds	Active	6/30/2024	$105,200	$68,853	$174,053
2022	22-06	Town of Braintree	Braintree Council on Elder Affairs Retrofit	Active	11/30/2024	$138,250	$95,514	$233,765

FFY	Project Number	Grantee	Project Title	Status	End Date	§319 Grant Award	Reimbursed	Balance
2022	22-07	Town of Monterey	Hupi Road Drainage Improvements to Reduce Sediment Inflow to Lake Garfield	Active	11/30/2024	$139,000	$97,000	$236,000
2022	22-08	Town of Sturbridge	Quacumquasit Pond Phosphorus Inactivation Project	Active	12/30/2024	$300,000	$200,000	$500,000
2022	22-09	Town of Braintree	Watson Park BMP Implementation	Pending		$375,000	$264,592	$639,592
2022	22-10	City of Framingham	Lake Waushakum BMPs	Pending		$249,980	$162,775	$412,755
2022	22-11	Geosyntec Consultants Inc	Massachusetts Watershed-Based Plans: Enhancement and Implementation	Pending		$139,400	$93,500	$232,900
2022	22-12	Housatonic Valley Association	Increasing the Pace of On-Farm Watershed Restoration in Berkshire County	Pending		$96,024	$69,982	$166,006
			Total			**$5,892,312.90**	**$4,278,597.43**	**$9,328,942.33**

***** These projects (19-01 and 19-02) were closed before completion due to expiration of the PPG; please see page 21 for details.

** This project (20-02) completed all tasks but had an unspent remaining balance, which will be allocated to new implementation projects on the same PPG.

IV. Massachusetts NPS Program Activities in 2022

A. Justice40 Prioritization

CWA §319 Program Equity Assessment

To achieve the goal of meeting communities where they are, the NPS program conducted assessments through a series of internal and external Strength, Weakness, Opportunity, and Threat (SWOT) analyses to identify short-term and long-term initiatives leading to improved accessibility of §319 funds. Figure 5 shows the results of MassDEP's §319 Equity Assessment through SWOT Analysis (internal and external), identified gaps and need, and nine new initiatives to enhance environmental justice in the §319 grant program. Five short-term initiatives will be incorporated in the upcoming RFR, and four long-term initiatives are currently being discussed with a long-term goal to be incorporated into future RFRs (Figure 5).

Identified Equity Barriers: The SWOT analysis identified two major barriers preventing communities with lesser capacity, including EJ communities, from applying:

1. **Accruing 40% match:** To overcome the match requirement barrier, the NPS program is currently establishing innovative financial partnerships with state-funded grant programs to accrue the match at the state level, which would waive/reduce the match for EJ communities and reduce the match for non-EJ communities.

2. **Comprehending the complexities of §319 eligibility:** To enhance the understanding of the scope and eligibility of the §319 program, the NPS program is considering adopting the following steps to streamline the RFR, especially for first-time applicants:

   - **A survey titled Eligibility Form as the first step to applying to the Section 319 grant program**: All information related to eligibility is gathered and organized in one section of the RFR and in the same order as the Eligibility Form so that it can serve as a guide for applicants to fill out the survey.
   - **Introducing Climate Resiliency** as a preferred element for implementation projects.
   - **Environmental Justice Capacity Building** as a new Non-Implementation project subcategory seeking Environmental Justice Coordinators (EJC) -modeled after the existing Regional Coordinators (RC) program. Proposals of this type will be prioritized among all Non-Implementation project proposals.
   - **Illustrations and Flow Path to explain complex materials in a more simplified manner.**
   - **Statewide Spread of the Regional Coordinator Program:** The RC program is currently limited to four counties, primarily in Western MA; this RFR will seek proposals from Regional Planning Agencies (RPA) statewide. Targeted outreach is currently ongoing with the RPAs who have not been involved in the RC program so far.

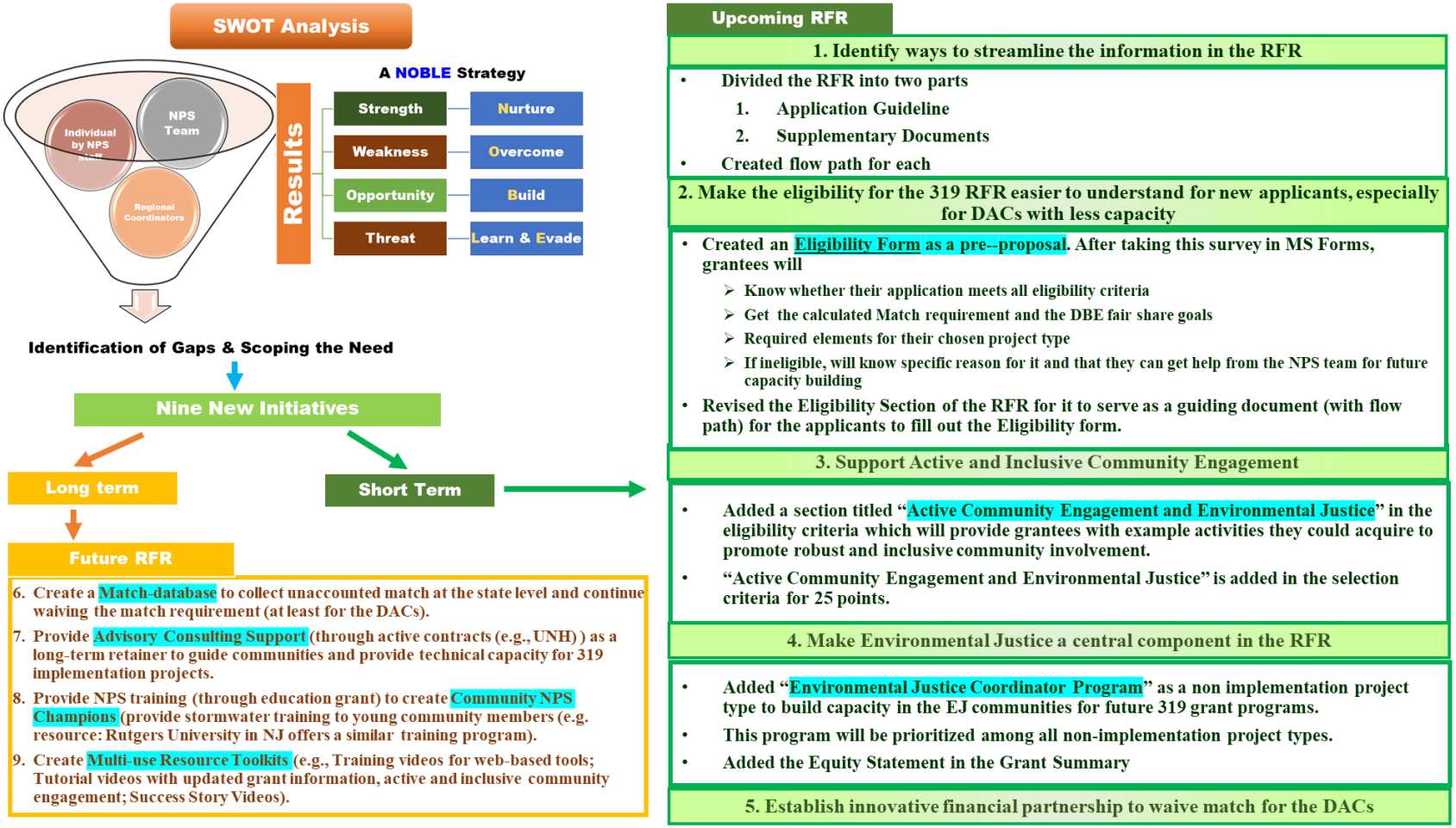

Figure 5. MassDEP's §319 Equity Assessment through SWOT Analysis (internal and external) identified gaps and needs, and nine new initiatives to enhance environmental justice in the §319 grant program. Five short-term initiatives will be incorporated in the upcoming RFR, and four long-term initiatives are currently being discussed with a long-term goal to be incorporated into the future RFR.

- **Streamlined Project Types into three broad categories to align with the §319 program goals:** Implementation, Non-Implementation – Capacity Building, and Non-Implementation - Healthy Watershed (Table 5).
- **Active Community Engagement and Environmental Justice as a new eligibility category.** The objectives of making these initiatives mandatory by including it in the selection criteria are:
    - Transformation of community engagement from passive, unidirectional information sharing (such as distributing flyers) to active and inclusive activities (through direct participation of ALL community members).
    - Enhancing equity in all §319 projects by facilitating the participation of disadvantaged community members in all communities (irrespective of its identification as an EJ community) through suggested inclusive practices.

Table 5. CWA §319 Grant Program Project Types

§319 Goals	Project Type	Subcategories	Deliverable
Restoration of Impaired Water	Implementation	Installation of structural and nonstructural BMPs	Pollutant Reduction Numbers
Building Capacity for Implementation Projects	Non-Implementation – Capacity Building	NPS Coordinators • Regional Coordinators • Agricultural Coordinators • Environmental Justice Coordinators Outreach, Education, and Technology Transfer	Project Proposals applying for §319 Restoration Funds (involving active and inclusive community engagement)
Prevention	Non-Implementation - Healthy Watershed	Installation of structural and nonstructural BMPs to protect Healthy Watersheds	

Other Accomplishments in 2022

- Using the Recovery Potential Screening Tool (RPST) developed in 2021, lists of priority waterbodies for §604(b) and §319 grant funding were included in the 2022 grant solicitations.
- Awarded funding for two locally led projects to address agricultural NPS pollution in western Massachusetts.
- Extended funding for NPS regional coordinators to continue developing locally led projects that address NPS.
- Conducted annual NPS Stakeholder Forum to inform and educate Massachusetts NPS partners and grantees.
- Conducted outreach to community-based organizations to promote §319 grant program and determine capacity to conduct NPS projects. Based on these discussions, the NPS Program began developing draft outreach and capacity building policies for EJ communities.
- Began the process of evaluating both federal and state criteria for environmental justice/

disadvantaged communities to develop combined criteria that will enhance equity in the §319 grant program. This process will continue in 2023.

B. Partnership

The NPS Plan recognizes that MassDEP must continue to work with its many partners on a watershed-by-watershed basis to improve and protect the water resources of the Commonwealth. Strengthening partnerships with state and federal agricultural programs is vital. The following is a summary of the coordination undertaken with other groups and agencies.

Coordination with NRCS and EPA

MassDEP staff worked with NRCS and EPA to nominate four HUC12 watersheds as NWQI watersheds. The four nominated watersheds include the James Brook/Nashua River, Westport River, Manhan River and South River. NRCS worked with their contractor to prepare readiness reports for the James Brook/Nashua River and Westport River watersheds, which were completed in August 2021. NRCS has contracted with the Franklin Regional Council of Governments (FRCOG) to complete a readiness report for the South River, and with the Massachusetts Association of Conservation Districts (MACD) to complete a readiness report for the Manhan River. Completion of both readiness reports are anticipated in 2023.

Joint reviews of grant application proposals

NPS staff regularly participate in the review and selection of project proposals for work funded through NPS partner programs, including the MassDEP §604(b) and Water Quality Monitoring grant programs, the Massachusetts Office of Coastal Zone Management (CZM) Coastal Pollution Remediation (CPR) grant program, the Sustainable Watershed Management Initiative (SWMI), and the Massachusetts Environmental Trust. This cross-program activity ensures that recommended projects are chosen within the context of sister agency activities and experiences and the NPS Management Program Plan, resulting in synergistic work and higher quality grantees and projects.

In the past year, MassDEP staff participated in CZM CPR grant review and MassDEP Water Quality Monitoring grant program review. Additionally, MassDEP staff participated in the EEA Municipal Vulnerability Program (MVP) grant program review and the NRCS readiness report solicitation review for the South River and Manhan River.

Accomplishments in 2022

- Participated in the EPA Region 1 Nonpoint Source Work Group, which is convened by NEIWPCC.
- Participated in the EPA *National Near-Term Actions to Support Environmental Justice in the Nonpoint Source Program* workshop and equity workgroups.
- Facilitated communication between partners through attendance at NRCS State Technical Committee meetings and interagency grant review.
- Conducted one-on-one outreach to community-based organizations to develop and/or enhance partnerships.
- Represented MassDEP on Southeast New England Program (SNEP) Steering Committee.

C. Healthy Watersheds

Progress has been made to improve water quality in Massachusetts, but more work remains to be done. EPA's 2013 guidelines for the CWA §319 grant program allow states flexibility to use program funds and a limited amount of watershed project funds for activities to protect unimpaired, high-quality waters where a state identifies protection as a priority and has described a process for identifying such waters. In addition to the high-priority work to revise and implement the statewide WBP, the need for coordinated program planning and project development assistance remains. Consistent with EPA's program guidelines, MassDEP recognizes that it is important to consider the protection of waters and watersheds that are not listed as impaired, as well as those that have been delisted due to restoration efforts.

The primary focus of the NPS Program remains the restoration of impaired waters, and the majority of §319 funds available for NPS watershed projects (which must implement WBPs) are directed at remediating water quality impairments. Protection of water quality in unimpaired or restored waters will be a secondary, but important, priority.

D. Grant Awards Issued in 2022

The restoration of NPS-impaired waters and the reduction of NPS pollutants are important goals. Targeted §319 grant projects are used to implement restoration activities. As part of the two FFY2022 §319 RFRs, nineteen proposals were received. The proposals were reviewed and evaluated by an inter- and intra-agency committee. As a result, twelve new projects were recommended to be funded from the FFY2021 §319 allocation (Table 6). The selected projects will demonstrate structural and non-structural BMPs to improve water quality in impaired waters. Three of the recommended projects are "shovel-in-the-ground" projects that either address Category 5 impairments or implement TMDL recommendations. Two projects will support healthy watersheds. The final project will support an agricultural regional NPS coordinator who will target impaired waterbodies and implement agricultural BMP projects. Grantees for the recommended sub-awards include municipalities, a watershed association, a lake association, a regional planning agency, and a conservation district association. The FFY 2022 §319 Project Funds Target is $1,144,860.

Table 6. CWA §319 NPS grants issued in 2022 using the FFY2021§319 allocation.

Project #	Project Title	Grantee	Grant $	Match $
22-01/319	Watershed-Scale Zoning to Reduce Nonpoint Source Pollution and Protect Healthy Watersheds	Franklin Regional Council of Governments	$78,450	$52,300
22-02/319	Agricultural NPS Regional Coordinators for Franklin, Hampshire, Hampden Counties	Massachusetts Association of Conservation Districts	$241,848	$161,232
22-03/319	Encouraging the Use of Lignocellulose (Wood) Based Onsite Septic Systems for Nitrogen-Sensitive Environments by Demonstrating Concurrent Contaminant Removal That Justifies More Economical Means for Effluent Disposal	County of Barnstable	$72,385	$50,278
22-04/319	Collicot/Cunningham Stormwater BMPs	Town of Milton	$158,500	$111,514
22-05/319	Developing a Dirt Roads Stormwater Management Toolkit to Reduce NPS and Improve Resiliency in Healthy Watersheds	Franklin Regional Council of Governments	$105,200	$68,853
22-06/319	Braintree Council on Elder Affairs Retrofit	Town of Braintree	$138,250	$95,514
22-07/319	Hupi Road Drainage Improvements to Reduce Sediment Inflow to Lake Garfield	Town of Monterey	$139,000	$97,000
22-08/319	Quacumquasit Pond Phosphorus Inactivation Project	Town of Sturbridge	$300,000	$200,000
22-09/319	Watson Park BMP Implementation	Town of Braintree	$375,000	$264,592
22-10/319	Lake Waushakum BMPs	City of Framingham	$249,980	$162,775
22-11/319	Massachusetts Watershed-Based Plans: Enhancement and Implementation	Geosyntec Consultants Inc	$139,400	$93,500
22-12/319	Increasing the Pace of On-Farm Watershed Restoration in Berkshire County	Housatonic Valley Association	$96,024	$69,982
Totals			$2,094,037.00	$1,427,540.00

V. Summaries of NPS Projects Closed in 2022

Four projects funded through the NPS §319 grant program in past years were successfully completed and two projects were partially completed; all six projects were closed out in 2022 (Table 7). Four of these projects were implementation projects and two were outreach and education projects. These six projects were granted a combined total of $1,368,345 in Federal §319 Funds. Matching funds for these projects, provided in the form of cash or in-kind services, was equal to $933,232 (40%). Funds from the grant award and match total $2,301,577.

- Projects took place across three towns including Amherst, Avon, and Westport, and in the city of Chicopee. Target watersheds included the Cape Cod, Connecticut, Taunton, and Westport watersheds.

- BMPs included the installation of two tree box filters, one Rain Garden, one gravel wetland with sediment forebay, one vegetated swale, and one flood plain creation.

- The two projects that were partially completed were 1) Stormwater Management and Stream Restoration for Water Quality in Lower Abbey Brook (19-01/319) and 2) Reducing Phosphorus Impacts from Septic Systems Near Freshwater Lakes and Ponds - Defining Best Management Practices (19-02/319).

    - For 19-01/319, the initial project included stormwater improvements to be designed, permitted, and implemented in association with removal of the Lower Bemis Pond Dam. As the project expanded far beyond the initial proposal, the added feasibility of removing the Upper Bemis Pond Dam, as part of this same project, could only occur with significant downstream upgrades. These elements expanded the scope of work for design and subsequently increased the permitting burden. State and federal agencies required permitting of the work in Lower Abbey Brook as a whole, rather than segmented parts. These changes extended both the scope of work overall and the timeline beyond the §319 grant period. It should also be noted that the COVID-19 pandemic impacted all levels of government, agency workflows, staffing levels, and workflows.

    - For 19-02/319, the project initially focused on the need to identify and validate onsite wastewater treatment system technologies capable of removing phosphorus. However, in 2020, the original scope was expanded to include an investigation of the adequacy of the present vertical separation to groundwater requirements of Title 5. This amendment required the construction and equipping of a laboratory for culture of bacteria phage virus and storage of human virus samples, and the construction of thirty-five test leach fields with highly controlled and segregated feed and sample collection systems. This was the largest single endeavor undertaken at the Massachusetts Alternative Septic System Test Center since its original construction in 1999. In addition, staff were required to procure a building, design, and equip a laboratory, hire and train laboratory staff and demonstrate proficiency in phage virus culture. The pandemic also limited the Boards of Health meetings and reviews for a period of the year.

- A total of twenty-two agricultural-specific BMPs were installed, and these included three waste storage facilities, two roofs and covers, three fences, one filter strip, one lined waterway, one pasture planting, one livestock pipeline, prescribed grazing, one roof run-off structure, three heavy use area protection, one watering facility, one underground outlet, one waste transfer, one

vegetated treatment area, and one water and sediment control basin. These BMPs were installed over six different farms.

- Additional project outcomes included an increased public knowledge and understanding of NPS pollution and BMPs, and a reduction of nutrients, pathogens, sediment, and other impairments in Massachusetts waterbodies.

Summaries of each project are on the following pages and include the project sponsor, grant amount, general problem or need, description of the project and goals, project outcomes and contact information.

Table 7. List of CWA §319 grant projects closed out in 2022.

Revision of Massachusetts Watershed-Based Plans #18-02/319

Location:	Statewide Application
Project Sponsor:	Geosyntec Consultants Inc.
Project Duration:	March 2018 - June 2022
§319 Grant Amount:	$420,984 by the US EPA
Local Match:	$103,957 by Geosyntec Consultants, Inc. and project partners

Figure 6. Watershed Based Plans web-based tool developed by Geosyntec on behalf of MassDEP.

PROBLEM:

Watershed-Based Plans (WBP), a requirement for §319 implementation projects, are an important planning tool to guide water quality restoration. This project built on the earlier success of the Massachusetts WBP web-based tool (http://prj.geosyntec.com/MassDEPWBP) by supporting MassDEP partners in completing technically robust, completed WBPs and provide technical and programmatic support to the MassDEP NPS Program for the WBP tool.

PROJECT DESCRIPTION

This project provided support to complete WBPs by working with MassDEP's partner organizations and provided targeted science and engineering support as needed to complete WBPs for identified §319 implementation projects. It focused on providing the technical assistance identified as most needed by partner organizations for completion of WBPs, including guiding the completion of Watershed-Based Plans and field assessment of BMP locations, selection, sizing, etc.

This project also provided NPS Program Support. The successful and increased use of the WBP tool was accomplished by: (1) ongoing website hosting and technical support and (2) development of a WBP Review Criteria and Scoresheet that NPS Program staff can use for evaluation of completed WBPs and to provide constructive feedback to project partners.

PROJECT OUTCOMES:

- Technical and programmatic support to the MassDEP NPS Program for the WBP tool through web hosting and development of a WBP Review Criteria and Scoresheet that staff used for evaluation of completed WBPs and constructive feedback to project partners.
- Supported MassDEP partners with the completion of technically robust completed WBPs.

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Stormwater Management and Stream Restoration for Water Quality in Lower Abbey Brook #19-01/319

Waterbody Name:	Abbey Brook (MA36-40)
Location:	Chicopee River Watershed
Waterbody Status:	Category 5
Project Sponsor:	City of Chicopee
Project Duration:	March 2019 - September 2022
§319 Grant Amount:	$116,172 by the US EPA
Local Match:	$213,095.59 by the City of Chicopee and project participants

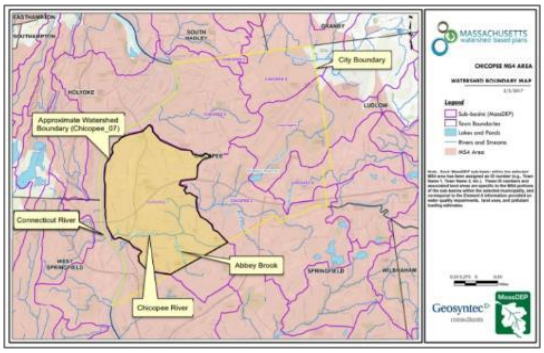

Figure 7. City of Chicopee Watershed boundary map.

PROBLEM:

Abbey Brook is impaired and listed under Category 5 for *E. coli* and total suspended solids. Abbey Brook drains a small, but highly urbanized watershed in Springfield and Chicopee and flows 1.5 miles to join the Chicopee River. Sampling done under a 2016 §604(b) grant found high *E. coli* levels in lower Abbey Brook attributable to the Canada geese that congregate at Lower and Upper Bemis Ponds in Szot Park.

This project sought to improve water quality in Abbey Brook and transform the landscape around the two ponds in Szot Park. Stormwater BMPs for the shoreline will discourage year-round geese from using the park and address the previously identified bacteria issues in a high priority stormwater management location. The stormwater work will coincide with plans to remove the lower dam and efforts to advance a feasibility study for removal of the upper dam. All recent activities aim to increase public understanding about water quality and knowledge of ongoing restoration activities in Abbey Brook.

PROJECT DESCRIPTION:

Stormwater runoff will be reduced to improve the water quality of the brook with the hope of removing the brook from the §303(d) list of impaired waters. This was accomplished primarily through: (1) installing BMPs to discourage congregation of geese, treat stormwater runoff impacts, reduce sediment loading from the nearby roadway, and slow flows along the slopes that drain to Bemis Pond/Abbey Brook; (2) reducing stormwater flow volumes with infiltration to make the areas around Abbey Brook more resilient to climate change; (3) advancing full restoration of Abbey Brook with an investigation at the upper dam, and; (4) supporting public understanding of water quality improvements and what Szot Park could look like with the restoration of Abbey Brook.

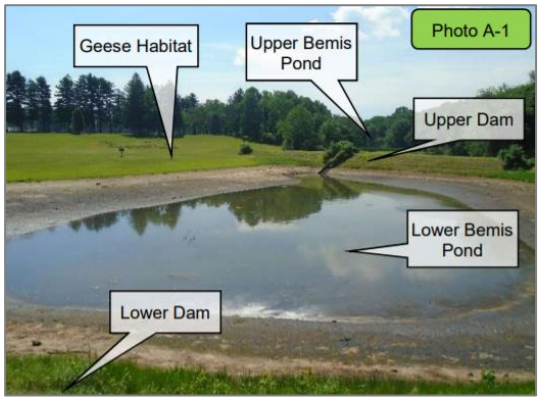

Figure 8. Site location at Szot Park.

The project entailed design for an ambitious initiative to improve water quality in Abbey Brook and provide

important climate change resilience benefits. The project's design included transformation of the Szot Park landscape with removal of the Lower Bemis Pond Dam and installation of shoreline stormwater BMPs designed to address the identified bacteria issues and discourage year-round geese that are habituated to using the slopes of the Lower Pond. The project included a feasibility study for removal of the Upper Bemis Pond Dam. That study revealed the need for a much more extensive downstream effort to accommodate flows that will result with removal of the Upper Dam, including upgrading the culvert at Front Street and daylighting Lower Abbey Brook between Front Street and its confluence with the Chicopee River. State and federal agencies required permitting of the work in Lower Abbey Brook as a whole, rather than segmented parts. This extended both the scope of work overall and the timeline beyond the §319 grant period such that construction has not yet occurred. Final permitting from MassDEP, the U.S. Army Corps of Engineers (USACE), and the Department of Conservation and Recreation (DCR) Office of Dam Safety (ODS) is expected soon. The project is scheduled to be bid for construction during winter 2023. The City of Chicopee has been encouraged to continue with this project going forward.

PROJECT OUTCOMES:

- At the end of PPG 99187811, September 30, 2022, the City of Chicopee had been unable to expend all the §319 funds allocated to it due to permitting and Covid-related delays. The remaining amount will be returned to the EPA.
- Survey and design of BMPs that will provide decentralized treatment of stormwater runoff impacts, reduction of sediment loading from nearby roadway, and slowing the stormwater flows with infiltration along the slopes that drain to Bemis Pond/Abbey Brook.
- An Operations and Maintenance Plan for the BMPs designed for the Lower Bemis Pond removal and Szot Park stormwater improvements.
- Feasibility study for the removal of the Upper Bemis Pond Dam and restoration of Lower Abbey Brook, and the removal of Lower Bemis Pond Dam.
- Increase public awareness and understanding in the Town of Chicopee of what Szot Park could look like with restoration of Abbey Brook. A three-part module was produced and delivered to 5th graders from the Bowe, Belcher, and Barry Elementary Schools to explore the story of Abbey Brook and aquatic species typical of healthy stream systems. The work resulted in a poster showcasing student drawings of dragonflies, a water filtering experiment by students, and a video summarizing the purpose of the project relative to stormwater and water quality.

Figure 9. Examples of Public Education and Outreach in the Abbey Brook Watershed.

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Reducing Phosphorus Impacts from Septic Systems Near Freshwater Lakes and Ponds - Defining Best Management Practices #19-02/319

Location:	Statewide Application
Project Sponsor:	County of Barnstable
Project Duration:	February 2019 - September 2022
§319 Grant Amount:	$313,260.75 by the US EPA
Local Match:	$237,972.09 by the County of Barnstable and project participants

PROBLEM:

For many areas of Massachusetts septic systems are a source of nutrients and pollution which impact both freshwater and estuarine waterbodies. This project validated cost-effective BMPs for protecting freshwater resources from phosphorus and pathogen inputs from onsite septic systems. Phosphorus inputs to our region's freshwater lakes and ponds are often responsible for harmful algae blooms, anoxic events that cause fish kills, and reduced biodiversity.

In addition to the dearth of available treatment technologies, phosphorus management from wastewater near ponds and lakes is hampered by the common practice of replacing native in-place soil in leaching fields with sand fill. This is unfortunate as native soils in the shallow A and B soil horizons are important in efforts to attenuate phosphorus. Accordingly, this project installed five phosphorus removing, systems in native shallow soil horizons and demonstrated the efficacy of a simpler and more-passive means of phosphorus attenuation. Educational efforts targeted boards of health and the engineering/design community to encourage this strategy for the protection of freshwater resources.

The Commonwealth of Massachusetts presently requires five feet of vertical separation between the infiltrative surface beneath a wastewater dispersal system and groundwater in highly transmissive soils (with percolation rates < 2 minutes per inch) and four feet in soils with lower percolation rates. This project evaluated pathogen removal rates at these depths and at the depths of 2 and 3 feet through a field study and literature review.

DESCRIPTION:

This project piloted five advanced-treatment technologies to address the issue of phosphorus from onsite septic systems. Additionally, the project demonstrated the efficacy of applying two shallow soils-based treatment technologies, which currently have General Use Approval, to attenuate phosphorus from onsite septic systems.

The goals were to install at least four advanced onsite systems that purport to remove phosphorus to study their phosphorous removal capacity, two to four shallow native-soil systems in watersheds of freshwater ponds in Barnstable County to demonstrate their efficacy in removing phosphorus, and to build thirty-five test cells to evaluate pathogen removal within soil treatment units. Finally, this project sought to educate and encourage the community of engineers and system designers to adopt technologies found to successfully remove phosphorus to protect and restore freshwater resources impacted by phosphorus loading.

PROJECT OUTCOMES:

- Installation of five advanced onsite systems that remove phosphorus and installation of three shallow native-soil systems in watersheds of freshwater ponds in Barnstable County. These systems were tested for their effectiveness in removing phosphorus.
- Evaluated pathogen removal at varying depths in the infiltrative surface beneath a wastewater dispersal unit.
- Outreach and education focusing on phosphorus treatment strategies and technologies. This included five presentations at regional seminars and training events for health officers, engineers, designers and installers. All information was posted on the Barnstable County website and various conference websites.

Figure 10. Construction of 35 test cells and doing mechanism for the project.

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Avon Town Hall Green Infrastructure Demonstration Project #19-05/319

Waterbody Name:	Trout Brook (MA62-07)
Location:	Taunton River Watershed
Waterbody Status:	Category 5
Project Sponsor:	Town of Avon
Project Duration:	January 2019 - June 2022
§319 Grant Amount:	$68,832.53 by the US EPA
Local Match:	$68,991.38 by the Town of Avon and project participants

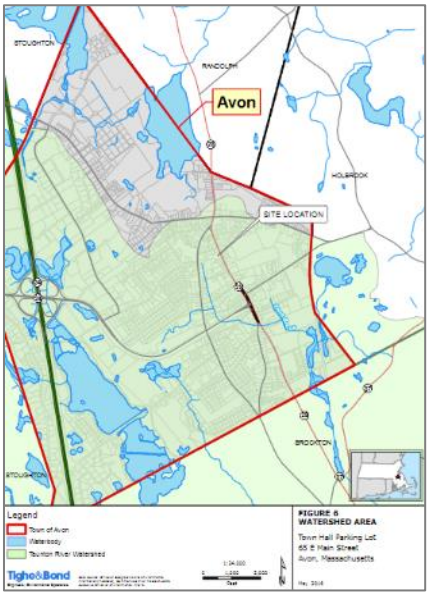

Figure 11. Town of Avon with site location within Taunton River Watershed.

PROBLEM:

Trout Brook is listed as a Category 5 waterbody on the 2016 Integrated List of Waters for bacteria and dissolved oxygen. There is also a final TMDL to address pathogens in this brook in the portion downstream from Avon. Impervious cover and discharge of untreated stormwater from Avon is strongly suspected to be the cause of the impairment in Trout Brook and the source of the total and fecal coliform detected in a public water supply well. In addition, more than 65% of the Town's water supply is drawn from the Trout Brook aquifer, through which the brook flows.

This project designed and constructed BMPs at Avon's Town Hall to reduce pollution from stormwater runoff discharging to Trout Brook. Runoff from the Town Hall parking lot entered Trout Brook without treatment via the storm drain network. It is a priority location identified through work completed under an Environmental Protection Agency's Southeast New England Program (SNEP) grant titled "*Identification and Assessment of Causes of Impairment: Trout Brook (MA62-07_2008(5))*" awarded in FFY2015. The implementation of stormwater treatment by installing a gravel wetland, tree box filters, and a rain garden at the Town Hall parking lot reduced the loading of pollutants.

PROJECT DESCRIPTION:

The goals of this project were to: (1) reduce the loading of sediment, pathogens, nutrients and other contaminants from entering Trout Brook through treatment of stormwater runoff, as a step towards attaining designated uses for this and downstream waterbodies; (2) provide outreach and education regarding stormwater pollution and treatment strategies, in a manner that spurs implementation of specific municipal and individual pollution reduction actions; and (3) continue to implement the town's pollution reduction plans while enhancing local knowledge and expertise within the Avon Public Works Department in the design, construction and maintenance of BMPs such as gravel wetlands, tree box filters, and rain gardens, and possibly porous asphalt/concrete and day-lighted drainage swales.

This project constructed two tree box filters and a gravel wetland with a sediment forebay and rain garden. The gravel wetland is located to the west of the Town Hall and receives sheet flow from the parking area, and piped flow from existing drainage on the site and on Bartlett Street. The gravel wetland is sized to treat runoff from the first inch of rain from a tributary area of approximately 1.22 acres with significant

impervious cover. The two tree box filters treat a small volume of runoff from a portion of the front parking lot (approximately 3,000 square feet total). A rain garden along Town Hall now captures runoff from approximately 8,000 square feet). In addition, an educational sign was installed near the gravel wetland to explain the purpose of the basin and how it is helping to improve water quality.

Figure 12. Example of a gravel wetland (UNHSC).

PROJECT OUTCOMES:

- Reduction of sediment loading, pathogens, oil, nutrients and other contaminants from entering Trout Brook through the construction of two tree box filters and a gravel wetland with a sediment forebay and rain garden pretreatments that collect and treat the first inch of stormwater runoff from the 1.22-acre drainage area.
- Annual estimates for pollutant removal include 281 lbs. total sediment, 10.9 lbs. total nitrogen, 0.9 lbs. phosphorus, and 6,012 billion colonies of fecal coliform per year.
- An educational sign installed near the BMPs to explain the purpose of the basin and how it is helping to improve the water quality.

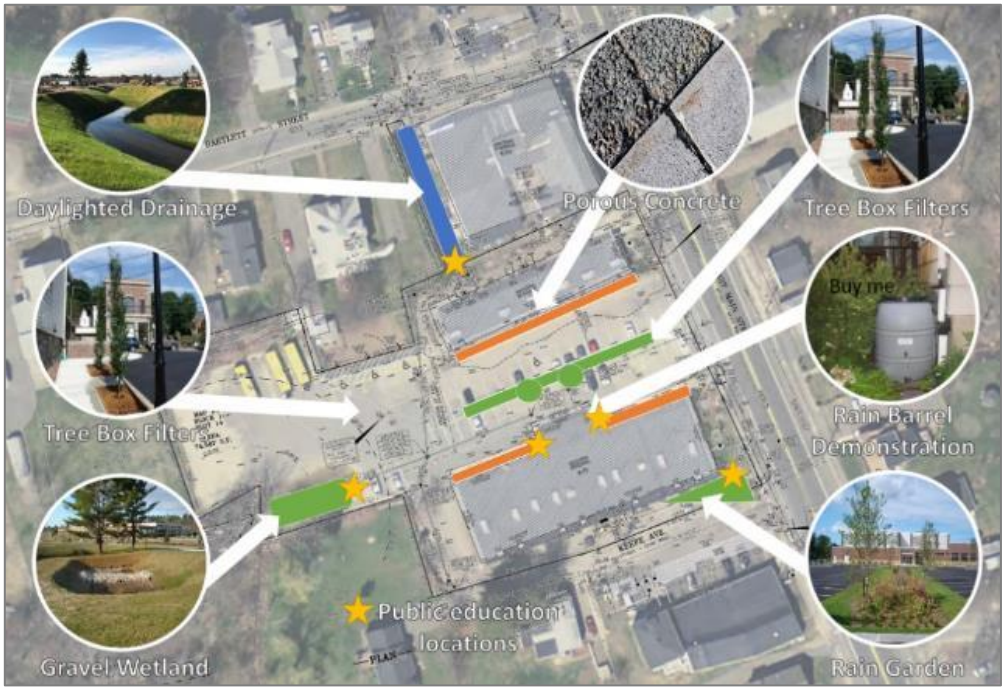

Figure 13. Green infrastructure BMPs and locations in the Town of Avon, MA.

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Westport River Agricultural Nonpoint Source Program #19-06/319

Waterbody Name:	Westport River
Location:	Westport River Watershed located within the Buzzards Bay Watershed
Waterbody Status:	Category 4a and 5
Project Sponsor:	Massachusetts Association of Conservation Districts (MACD)
Project Duration:	February 2019 - September 2022
§319 Grant Amount:	$196,200 by the US EPA
Local Match:	$130,800 by the MACD and project participants

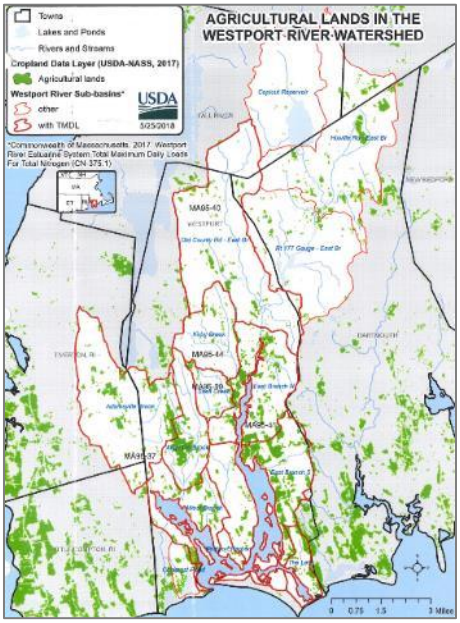

Figure 14. Agricultural lands in the Westport River watershed.

PROBLEM:

The Westport River is impaired by pathogens and nutrients, some of which are related to agricultural activities. Pollutants from farms can effectively be mitigated when farmers implement conservation practices. This project encouraged agricultural operations to take voluntary actions to minimize their impacts on water quality through the development and implementation of NRCS designed and engineered BMPs such as manure management. The grantee applied an adaptive management framework in nonpoint source pollution mitigation which includes assessing the problem, designing solutions, implementing BMPs, modeling results, and adjusting to help achieve proposed outcomes as part of a cooperative effort among governmental agencies, private organizations, and the public.

The project focused on the following Westport River segments: MA95-40, MA95-41, MA95-44, MA95-59, MA95-37, and MA95-54. These segments are classified as Category 4a and 5 impaired waters due to pathogens and nitrogen with a significant source of pollution coming from agricultural operations.

PROJECT DESCRIPTION:

This project involved the completion of farm conservation plans and the implementation of BMPs to reduce contaminant runoff and improve water quality in the Westport River watershed. The project also involved outreach and education with farmers to solicit interest in the program; develop NRCS approved conservation plans outlining BMPs to reduce pollutant runoff; assist landowners in obtaining access to financial resources; implement BMPs; and ensure farmers' preparation of operation and maintenance plans.

PROJECT OUTCOMES:

- Completion and implementation of approved farm conservation plans including installation of BMPs to reduce polluted runoff and improve water quality of Westport River watershed. A total of twenty-two agricultural-specific BMPs were installed, and these included three waste storage facilities, two roofs and covers, three fences, one filter strip, one lined waterway, one pasture planting, one livestock pipeline, prescribed grazing, one roof run-off structure, three heavy use area protection, one watering

facility, one underground outlet, one waste transfer, one vegetated treatment area, and one water and sediment control basin. These BMPs were installed over six different farms.

- It is estimated that these conservation practices will result in a removal of 46,080 lbs. of nitrogen per acre per year.

- Completion of outreach and education with farmers to solicit interest in the program and outreach to residents to share NRCS, MDAR and MACD activities to preserve and protect water quality.

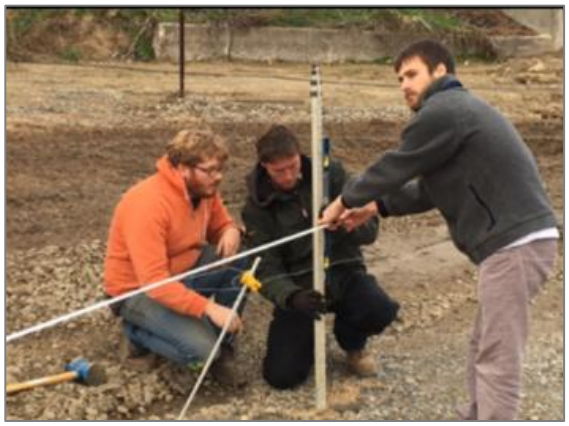

Figure 15. Project team installing BMPs on a farm.

Mixed Vegetables	**Dairy**	**Equine**	**Cattle**	**Mixed Livestock**
Grassed Waterway	Comprehensive Nutrient Management Plan	Gutters	Comprehensive Nutrient Management Plan	Fencing
Surface Drain	Surface Drain	Fencing	Stream Crossing	Stream Crossing
Irrigation Pump	Heavy Use Area Roofing	Subsurface Drains	Roof Bedded Pack	Roofed Bedded Pack
Reception Pit	Fencing		Subsurface Drains	Roof Runoff
	Leachate and Milk House Waste Filtering		Roof Runoff	
	Manure Storage			

Figure 16. Farm Conservation Measures

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Fearing Brook Floodplain Creation Project #20-02/319

Waterbody Name:	Fearing Brook and Fort River (MA34-27)
Location:	Connecticut River Watershed
Waterbody Status:	Varies
Project Sponsor:	Town of Amherst
Project Duration:	March 2020 - June 2022
§319 Grant Amount:	$252,895.62 by the US EPA
Local Match:	$168,698.75 by the Town of Amherst and project participants

Figure 17. Approximate Project Area.

PROBLEM:

Fearing Brook is a small, 1-mile long, urban stream originating beneath downtown Amherst. The modest watershed of 0.75 miles is approximately 90% impervious. Fearing Brook is a tributary to the Fort River, the longest free flowing tributary to the Connecticut River in the state. Recent studies have documented that Fearing Brook is a significant source of pollution to the Fort River which is listed in category 5 for *E. coli*. in the 2016 Integrated List of Waters.

In 2015, the Town of Amherst received a grant from the Massachusetts Environmental Trust (MET) to study the Fearing Brook including sampling for stormwater pollutants. Based on this work, the Town applied for support to DER's Priority Project program to investigate and remediate the Fearing Brook. DER recommended Fearing Brook as a Priority Project and in 2018, DER funded further investigation of Fearing Brook to catalog its existing condition, identify problems, and recommend and prioritize potential restoration projects. Floodplain restoration and reconnection at the lower Fearing Brook reach was selected as the top priority both for its feasibility and its water quality potential. The restoration area is immediately upstream of Fearing Brook's confluence with the Fort River and is on town-owned land.

This project improved water quality, river processes and habitat by restoring and reconnecting Fearing Brook to its historic floodplain as a first phase of a strategic restoration effort for this urban stream. The floodplain restoration increased nutrient and sediment retention which will reduce bacteria concentrations while also reducing erosive forces associated with the disrupted hydrologic regime associated with 'urban stream syndrome'.

PROJECT DESCRIPTION:

The project goal was to improve water quality in Fort River by remediating stormwater-related pollution in the Fearing Brook. Fearing Brook's channel was isolated from its natural floodplain- the result of over 150 years of manipulation. Much of the visible stream channel had been straightened and dredged with the dredged material cast next to the stream creating high, steep banks. This project removed a segment of the built-up bank, regraded the bank to recreate a functioning floodplain, conducted in-stream bioengineering to reduce erosion, created more complex habitat and removed invasive species along the river corridor.

PROJECT OUTCOMES:

- Reduction of sediment loading, pathogens, and nutrients from entering Fearing Brook through the lowering approximately 450 linear feet of the side-cast berms/banks and bank regrading to recreate a functioning floodplain. Access to a healthy, stable vegetated floodplain allows stream flow to disperse across and infiltrate into the floodplain creating a sink for sediment and phosphorus.
- Annual estimates for pollutant removal include 12.4 tons total sediment, 1,108 lbs. total nitrogen, and 64.2 lbs. phosphorus per year.
- Instream features with increased channel diversity and roughness reduced erosive forces against the stream banks and channel. The restoration area was stripped of invasive plants and replanted with native species.
- Completion of an education and outreach program consisting of educational signage, educational materials as well as tours and walks about the site following construction.

Figure 18. BMPs installed, waiting to complete the plantings.

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VI. Summaries of Active NPS Projects

A total of twenty-three currently active projects are summarized below. Summaries of each project are on the following pages and include the project sponsor, grant amount, general problem or need, description of the project and goals, anticipated project outcomes, and contact information.

Table 8. List of active CWA Section 319 NPS projects.

Regional Nonpoint Source Coordinator Initiative: A Proposal for Franklin County Project #20-01/319

Waterbody Name:	County-wide
Location:	Connecticut, Deerfield, and Millers Rivers Watersheds
Waterbody Status:	Varies
Project Sponsor:	Franklin Regional Council of Governments
Project Duration:	March 2020 - December 2024
§319 Grant Amount:	$200,000 by the US EPA
Local Match:	$133,333 by FRCOG and project participants

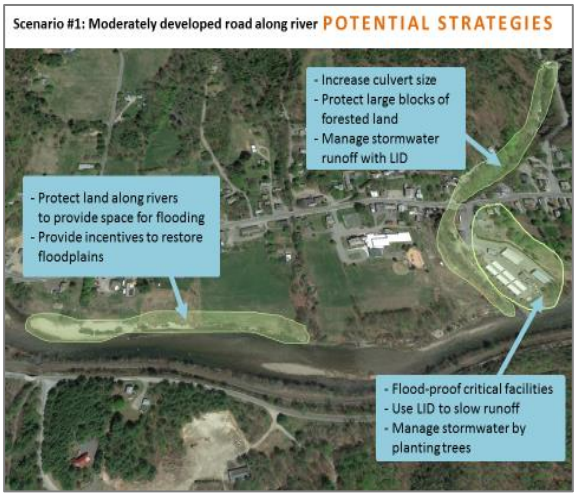

Figure 19. Moderately developed road along river in Western Massachusetts.

PROBLEM:

This project will support the Massachusetts Nonpoint Source (NPS) Program and carry out nonpoint source pollution mitigation focused work. The grantee will develop Watershed-Based Plans, facilitate high-quality §319 program project proposals and conduct outreach and education work to enhance the NPS Program message and support the NPS Program.

PROJECT DESCRIPTION:

The project goals are to provide services in support of the Nonpoint Source Program by assigning staff to serve as Regional Coordinators to conduct work that is focused on NPS. It will include a collaborative watershed-based planning approach across subwatersheds, identification and prioritization of regional NPS priorities, development of Watershed-Based Plans, development and submittal of high-quality proposals for funding under the §319 competitive grant program, outreach and education efforts, and any other activities that will further the goals of the Nonpoint Source Program especially objectives and milestones identified in the 2020-2024 Massachusetts Nonpoint Source Management Program Plan.

The Regional NPS coordinators may fulfill the following objectives identified in the 2020-2024 Massachusetts Nonpoint Source Management Program Plan:

- Fund locally led projects and increase program efficacy.
- Establish geographic focus areas (Support the USEPA Healthy Watershed Program).
- Address urban/rural sources of NPS pollution.
- Promote/assist development of complete Watershed-Based Plans (WBPs) to guide NPS watershed projects.
- Incorporate protection into watershed planning.
- Engage local partners on climate change adaptation, resiliency planning, and protection of healthy waters.
- Engage new partners to address NPS pollution (e.g., encourage land trusts to participate in protection of healthy watersheds/high-quality and unimpaired watershed protection).
- Educate the public and increase the capacity of NPS partners.

ANTICIPATED PROJECT OUTCOMES:

- Identified and expanded opportunities to accomplish and leverage work by private, state, local, and federal partners.
- Reduced nonpoint source pollutants and restored impaired waters and protected unimpaired/high quality and threatened waters through planning, education, program coordination, and implementation of climate-ready Best Management Practices (BMPs): Identified and prioritized solutions, prepared conceptual designs, provided guidance with regard to permitting requirements, and provided sound cost estimates for implementation. These services will focus on ensuring that projects selected for advancement include sufficient engineering evaluation of site conditions, optimal BMP selection based on anticipated pollutant removal and cost, BMP sizing considerations (including pre-treatment requirements), site characteristics and other potential design and permitting constraints.
- Instilled, encouraged, and nurtured a passion for restoring water quality through education, capacity building, and building new partnerships.

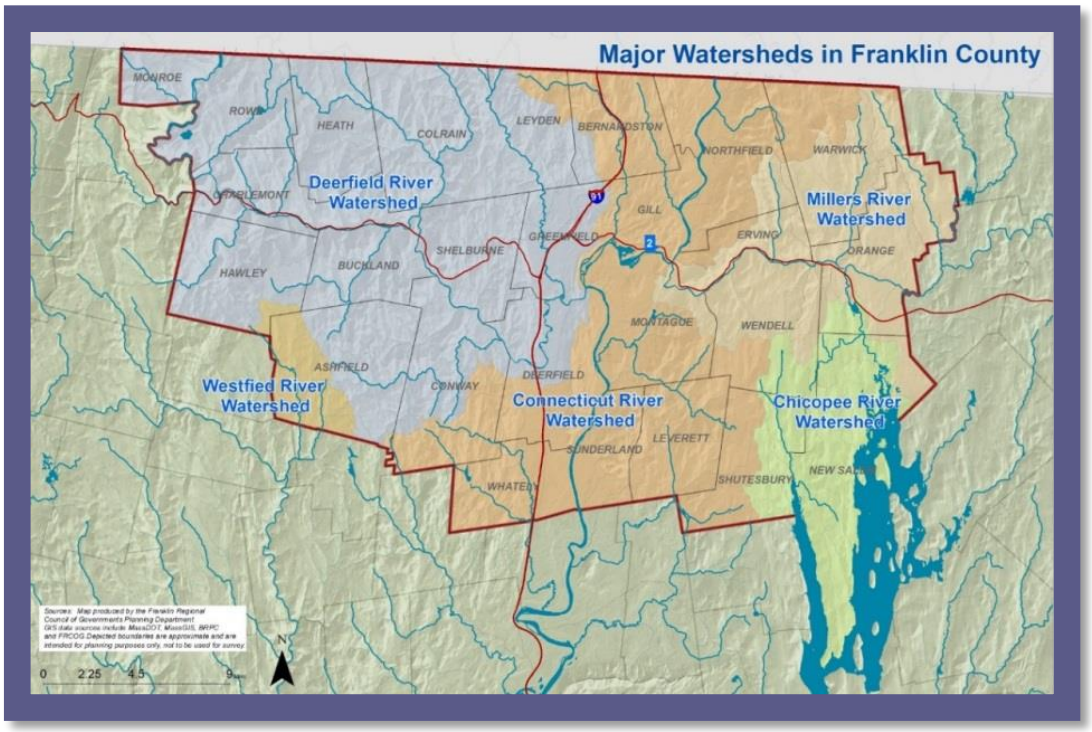

Figure 20. Major Watersheds in Franklin County

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Stormwater BMPs: Sevenmile River Watershed Project #20-03/319

Waterbody Name:	Sevenmile River (MA36-11)
Location:	Chicopee River Watershed
Waterbody Status:	Category 5
Project Sponsor:	Town of Spencer
Project Duration:	April 2020 - June 2023
§319 Grant Amount:	$88,200 by the US EPA
Local Match:	$60,300 by the Town of Spencer and project participants

Figure 21. Example of a gravel wetland (UNHSC)

PROBLEM:

The Sevenmile River (MA36-11, MA36-12) is listed as a Category 5 water on the 2016 List of Impaired Waters with an impairment of *E. coli*. Stormwater management in these tributary areas generally consists of piped drainage infrastructure that discharges to Sevenmile River without treatment. This project will protect the Sevenmile River (Chicopee River Watershed) in Spencer along with the Town's public water supply aquifer through the design and construction of stormwater BMPs for drainage areas predominantly along Meadow Road from Pleasant Street to Olde Main Street, and along North Spencer Road (Route 31) south of Alta Crest Road.

The Project will build upon work already completed under the 2017 §319 Grant (17-09/319), which included design of five BMPs and construction of three BMPs in the Meadow Road area. This project will allow the Town to construct the two remaining, already designed BMPs, including an infiltrating rain garden at 30 Meadow Road and hydrodynamic separators at Meadowbrook Lane. The project will also allow the Town to design and construct two new BMPs at 84 North Spencer Road and Hillsville Road at Meadow Road as well as continue public outreach and education activities.

PROJECT DESCRIPTION:

The goals of this project are to: (1) design and construct stormwater BMPs to protect the high-quality water resource such as bioretention/rain gardens, infiltration basins and constructed vegetated wetlands; and (2) a public outreach and education program that will inform residents of the stormwater BMPs and of project progress and educate and encourage them to participate in reducing nonpoint source pollution.

ANTICIPATED PROJECT OUTCOMES:

- Reduction of sediment loading, pathogens, and nutrients from entering Sevenmile River through the utilization of a mixture of structural and non-structural BMPs. The grantee anticipates promoted treatment, storage/detention and infiltration (where possible) prior to discharge into the river. BMPs may include bioretention/rain gardens and bioswales, and infiltration chambers that will capture first-flush stormwater runoff contaminants.
- Annual estimates for pollutant removal include 10 tons of sediment and 34 pounds of phosphorus per year.
- Completion of an education and outreach program consisting of educational materials addressing nonpoint source pollution in the Sevenmile River watershed and posted and/or available at Town

Hall and provided on local cable access television as appropriate.

Figure 22. A subsurface infiltration system.

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Berkshire County Regional Nonpoint Source Coordinator Project #20-04/319

Waterbody Name:	County-wide
Location:	Hudson/Hoosic River, Housatonic, Farmington, and Westfield River watersheds.
Waterbody Status:	Varies
Project Sponsor:	Berkshire Regional Planning Comm.
Project Duration:	April 2020 - December 2024
§319 Grant Amount:	$200,000 by the US EPA
Local Match:	$133,333 by BRPC and project participants

Figure 23. sUAS imagery of a stormwater basin

PROBLEM:

This project will support the Massachusetts Nonpoint Source (NPS) Program and carry out on-the-ground nonpoint source pollution mitigation focused work. The grantee will develop Watershed-Based Plans, facilitate high-quality project proposals to be funded through the §319 grant program and conduct outreach and education work to enhance the NPS Program message and support of the NPS Program.

PROJECT DESCRIPTION:

The project goals are to provide services in support of the Nonpoint Source Program by assigning Grantee's staff to serve as Regional Coordinators to conduct work that is focused on NPS. It will include a collaborative watershed-based planning approach across subwatersheds, identification and prioritization of regional NPS priorities, development of Watershed-Based Plans, development and submittal of high-quality proposals for funding under the §319 competitive grant program, outreach and education efforts, and any other activities that will further the goals of the Nonpoint Source Program especially objectives and milestones identified in the 2020-2024 Massachusetts Nonpoint Source Management Program Plan.

The Regional NPS coordinators may fulfill the following objectives identified in the 2020-2024 Massachusetts Nonpoint Source Management Program Plan:

- Fund locally led projects and increase program efficacy.
- Establish geographic focus areas (Support the USEPA Healthy Watershed Program).
- Address urban/rural sources of NPS pollution.
- Promote/assist development of complete Watershed-Based Plans (WBPs) to guide NPS watershed projects.
- Incorporate protection into watershed planning.
- Engage local partners on climate change adaptation, resiliency planning, and protection of healthy waters.
- Engage new partners to address NPS pollution (e.g., encourage land trusts to participate in protection of healthy watersheds/high-quality and unimpaired watershed protection).
- Educate the public and increase the capacity of NPS partners.

ANTICIPATED PROJECT OUTCOMES:

- Identified and expanded opportunities to accomplish and leverage work by private, state, local, and federal partners.
- Reduced nonpoint source pollutants and restored impaired waters and protected unimpaired/high quality and threatened waters through planning, education, program coordination, and implementation of climate-ready Best Management Practices (BMPs): Identified and prioritized solutions, prepared conceptual designs, provided guidance regarding permitting requirements, and provided sound cost estimates for implementation.
- Instilled, encouraged, and nurtured a passion for restoring water quality through education, capacity building, and building new partnerships.

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Massachusetts Nonpoint Source Grant Guidebook Project #20-05/319

Location:	Statewide Application
Waterbody Status:	Varies
Project Sponsor:	Comprehensive Environmental Inc.
Project Duration:	February 2020- June 2023
§319 Grant Amount:	$75,285 by the US EPA
Local Match:	$10,290 by CEI and project participants

PROBLEM:

Responding to the need to support Nonpoint Source Pollution (NPS) Program partners, this project will develop a suite of materials and support services to support and enhance the work of the NPS program staff and NPS Regional Coordinators. It will provide a wide range of NPS public education/outreach materials and resources that will strengthen the capacity for MassDEP project partners to develop competitive §319 grant projects. This project will develop a suite of NPS Program support materials organized around a primary document, the Nonpoint Source Pollution Grant Guidebook (Guidebook), that will comprehensively guide §319 applicants from "concept to implementation" in a way that builds upon MassDEP NPS Program efforts.

The Guidebook will be fully compatible with and complementary to existing MassDEP NPS public outreach resources such as the *Massachusetts Clean Water Toolkit, BMPs Cost Catalog,* and the *Massachusetts Watershed-Based Plans* (WBP) website. As such, the Guidebook will reference and link to these materials to guide potential §319 grantees from project concept to submittal of a highly competitive §319 grant application that includes a nine-element Watershed-Based Plan.

PROJECT DESCRIPTION:

The goals of this project are to:

1. Facilitate and enhance the education/outreach efforts of MassDEP NPS Program staff and NPS Regional Coordinators.
2. Provide comprehensive education and outreach materials and resources that will strengthen local capacity for MassDEP project partners to develop competitive §319 grant projects.
3. Develop the Nonpoint Source Pollution Grant Guidebook to comprehensively guide §319 applicants from "concept to implementation" supporting the MassDEP NPS Program.

Figure 24. Elements from the Grant Guidebook

ANTICIPATED PROJECT OUTCOMES:

- Improved educational materials providing robust guidance helpful to §319 grant applicants and grantees.
- Organized all existing and new information in a format that is specific to the needs of the §319 grant applicants and the MassDEP staff who assist them. The NPS Grant Guidebook and its supporting materials will guide applicants through all aspects of a §319 grant project from concept to post-project documentation.
- Increase public awareness of existing NPS Program resources wherever possible.

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A Regional Nonpoint Source Coordinator: Collective Action in the Pioneer Valley for Water Quality Improvement and Greater Community Resilience Project #20-06/319

Waterbody Name:	Watershed-wide Waterbodies
Location:	Chicopee River Watershed
Waterbody Status:	Varies
Project Sponsor:	Pioneer Valley Planning Commission
Project Duration:	April 2020- December 2024
§319 Grant Amount:	$200,000 by the US EPA
Local Match:	$133,333 by PVPC and project participants

PROBLEM:

This project will support the Massachusetts Nonpoint Source (NPS) Program and carry out nonpoint source pollution mitigation focused work. The grantee will develop Watershed-Based Plans, facilitate high-quality project proposals to be funded through the §319 grant program, conduct outreach and education work to enhance the NPS Program message and support of the NPS Program.

The project goals are to provide services in support of the Nonpoint Source Program by assigning staff to serve as Regional Coordinators to conduct work that is focused on NPS pollution. It will include a collaborative watershed-based planning approach across subwatersheds, outreach and education efforts, identification and prioritization of regional NPS priorities, development of Watershed-Based Plans, development and submittal of high-quality proposals for funding under the §319 competitive grant program, and any other activities that will further the goals of the Nonpoint Source Program especially objectives and milestones identified in the 2020-2024 Massachusetts Nonpoint Source Management Program Plan.

The Regional NPS coordinators may fulfill the following objectives identified in the 2020-2024 Massachusetts Nonpoint Source Management Program Plan:

- Fund locally led projects and increase program efficacy.
- Establish geographic focus areas (Support the USEPA Healthy Watershed Program).
- Address urban/rural sources of NPS pollution.
- Promote/assist development of complete Watershed-Based Plans (WBPs) to guide NPS watershed projects.
- Incorporate protection into watershed planning.
- Engage local partners on climate change adaptation, resiliency planning, and protection of healthy waters.
- Engage new partners to address NPS pollution (e.g., encourage land trusts to participate in protection of healthy watersheds/high-quality and unimpaired watershed protection).
- Educate the public and increase the capacity of NPS partners.

ANTICIPATED PROJECT OUTCOMES:

- Identified and expanded opportunities to accomplish and leverage work by private, state, local, and federal partners.
- Reduced nonpoint source pollutants and restored impaired waters and protected unimpaired/high quality and threatened waters through planning, education, program coordination, and implementation of climate-ready Best Management Practices (BMPs): Identified and prioritized solutions, prepared conceptual designs, provided guidance with regard to permitting requirements, and provided sound cost estimates for implementation. These services will focus on ensuring that projects selected for advancement include sufficient engineering evaluation of site conditions, optimal BMP selection based on anticipated pollutant removal and cost, BMP sizing considerations (including pre-treatment requirements), site characteristics and other potential design and permitting constraints.
- Instilled, encouraged, and nurtured a passion for restoring water quality through education, capacity building, and building new partnerships.

Figure 25. The Connecticut River

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Reducing Nonpoint Source Pollution from Two Equine Facilities through Implementation, Remediation, and Education of Selected BMPs Project #20-07/319

Waterbody Name:	Fort River (MA34-27), Mill River (MA34-25), Lake Warner (MA34098)
Location:	Connecticut River Watershed
Waterbody Status:	Categories 4a and 5
Project Sponsor:	University of Massachusetts-Amherst
Project Duration:	May 2020 - June 2023
§319 Grant Amount:	$286,670 by the US EPA
Local Match:	$191,394 by UMass-Amherst and project participants

PROBLEM:

Portions of the Mill and Fort Rivers in the Connecticut River watershed are impaired by pathogens, some of which are related to agricultural activities. Pollutants from farms can effectively be mitigated through farm conservation practices and other nonpoint source pollution BMPs. This project will minimize nonpoint source pollution from two equine facilities located in critical watersheds and conduct educational training targeted to community livestock owners. This will be accomplished with approved farm conservation plans and the implementation of various BMPs. This project will provide hands on learning opportunities to various livestock owning constituencies throughout the state of Massachusetts, including owners of commercial stables and riding facilities and the general public. Outreach will be provided through several hands-on workshops and field days throughout the year. The project will reinforce USDA nutrient management programs and NRCS standards for nutrient management practices while reducing non-point source pollution.

PROJECT DESCRIPTION:

This project will: 1) generate approved farm conservation plans (NRCS approval is subject to the availability of the NRCS) for at least two livestock facilities; 2) install BMPs;3) educate horse owners on good management practices utilizing the two pilot farms for several hands-on workshops and demonstrations; and 4) provide technical assistance to horse owners wanting to install similar BMPs at their facilities through farm visits and fact sheets, as well as other educational materials.

The BMPs may include installation of sacrifice lots and fencing to keep off horses from streams and wet fields, installation of low cost aerated composting systems as part of manure management, installing gutters, French drains and underground outlets to convey roof runoff to drainage swales thus reducing mud formation and runoff, and repairing walkways between paddock area and pasture areas to minimize carrying nutrients and sediments from the walkway land flow.

ANTICIPATED PROJECT OUTCOMES:

- Assessment of manure and mud management on pilot farms.
- Installation of appropriate best management practices to minimize nonpoint source pollution.

- Description of improvements post BMPs installation.
- Annual estimates for pollutant removal include 1,560 pounds of phosphorus 4,950 pounds of nitrogen, and 6.0 x 10^{12} organisms of fecal coliform per year.
- Hands-on educational workshops at the demonstration sites conducted for local horse community members and equine facility owners.
- Distribution of new and updated BMP factsheets and educational materials to help horse owners with manure management, composting, protecting wetlands, sacrifice lots, pasture management, mud management, and controlling runoff.

Figure 26. Potential BMPs at Full of Grace Farm, Hadley

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Distributed Small-Scale Street Trenches for Phosphorus Load Reduction Project #21-01/319

Waterbody Name:	Alewife Brook (MA71-04), Aberjona River (MA71-01), & Mystic River (MA71-02)
Location:	Mystic River Watershed
Waterbody Status:	Category 5
Project Sponsor:	Mystic River Watershed Association
Project Duration:	March 2021- June 2023
§319 Grant Amount:	$498,715 by the US EPA
Local Match:	$370,000 by the Mystic River Watershed Association and project participants

PROBLEM:

This project will reduce phosphorus loads to the Mystic River (MA71-02). The Mystic River watershed is a heavily urbanized watershed where MassDEP water quality assessment reports (1999, 2004-2008) indicate that the primary causes of impairment are nutrients and pathogens, and approximately 25 river miles and several ponds appear on the §303(d) List as impaired by those stressors.

This project will install 50 small-scale infiltration street trenches in three municipalities, replicating a design pioneered by the Town of Arlington. These trenches, which treat the first flush of stormwater by directing flow to a trench before water in the catch basin rises to reach the outlet, have multiple advantages compared to traditional alternatives: tested, pre-existing design; reduced footprint (simple road cut, as opposed to catch basin removal and reinstall, for ex.); design flexibility (if conditions demand, changes can be made to alter width and length of trench); construction efficiency (contractors have been able to install two per day) and ease of maintenance.

PROJECT DESCRIPTION:

This project will:

- Implement this modular trench design that can be replicated in large numbers and can reduce engineering and construction costs for the most cost-effective approach to reduce nutrient loads.
- Reduce phosphorus loads to Mystic River water bodies by implementing the recommendation in the Alternative TMDL report for distributed, cost-effective green infrastructure.
- Serve as a regional model for the benefits of distributed small-scale GI.
- Transfer knowledge and build capacity in municipalities to continue this work into the future, taking advantage of future road work to make street trenches at catch basins a routine occurrence.
- Educate residents and key stakeholders on the mechanisms and importance of nutrient pollution controls and describe these installations in the larger frame of need for investment in stormwater infrastructure.

ANTICIPATED PROJECT OUTCOMES:

- Initiated a forum for staff from three municipalities, to share Arlington's experience and designs.
- Assisted municipal staff and outside engineering contractor as necessary in narrowing the pool of candidate sites identified here for optimal feasibility.
- Researched utility, sewer, water and other conflicts.
- Prepared final design plans for each site: complete final design and engineering and prepare construction bid documents.
- Raise public awareness of the project through presentations to local residents, Mystic Committees, the EPA-convened Mystic Steering Committee, Conservation Commissions and messaging through social media channels. Present to the 12-municipalities of the Mystic Stormwater Education Collaborative.
- Created MassDEP-approved short videos or other communication vehicles.
- Report final recommendations and findings of planning and scoping, design, construction management, and public engagement.

Figure 27. A Small-Scale Infiltration Trench in the Mystic River Watershed

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Manchaug Pond Water Quality Improvements and Greater Agricultural Outreach Project #21-03/319

Waterbody Name:	Manchaug Pond (MA51091)
Location:	Blackstone River Watershed
Waterbody Status:	Category 5
Project Sponsor:	Manchaug Pond Foundation (MPOF)
Project Duration:	May 2021 - June 2023
§319 Grant Amount:	$265,190 by the US EPA
Local Match:	$177,656 by MPF and project participants

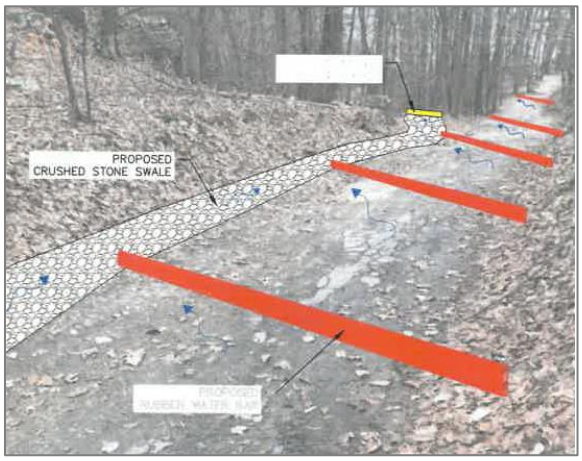

Figure 28. Steep Driveway Water Bars and Level Spreader.

PROBLEM:

Manchaug Pond (MA51091) is a 380-acre Great Pond located in Sutton and Douglas, MA and is the headwaters to the Mumford and Blackstone River systems. It is listed on MassDEP's 2016 Integrated List of Waters as Category 5 for low dissolved oxygen and non-native aquatic plants. Manchaug Pond flows to Stevens Pond, which is the start of the Mumford River, a major tributary to the Blackstone River-both are listed as Category 5 waters. Manchaug Pond water quality data has indicated moderate nutrient levels with increased bacteria levels.

PROJECT DESCRIPTION:

This project will improve water quality in the pond, employing BMPs that include structural and non-structural agricultural practices to address hobby farm and horse keeping activities throughout the watershed to control stormwater quantity and improve water quality. These BMPs will be constructed at five locations identified in the draft 2020 Watershed-Based Plan recommendations in addition to the local boat ramp and along a long steep driveway.

The goal of the current project is to improve the water quality of Manchaug Pond through the implementation of both structural and non-structural BMPs focused on nutrient, sediment, and bacteria reduction, and to change agricultural-related watershed behaviors. Combined, these actions will address the sources of pollution to the pond.

ANTICIPATED PROJECT OUTCOMES:

- Designed and constructed infiltration based Best Management Practices (BMPs) with a design focus on climate resiliency at several locations within the watershed including the boat ramp with multiple BMPs. These will decrease the input of sediment, nutrients (phosphorus/nitrogen) and bacteria/pathogens into Manchaug Pond.
- Installed water bar BMPs designed as a demonstration project for homeowners with steep slope unpaved driveways. This included a technology transfer component with a goal to reduce erosion and sediment with similar installations throughout the watershed.
- Implemented a comprehensive agricultural education and outreach program. Based on guidance

developed under a previous §319 grant completed by others (Small Farm BMP Guidance - *Hobby Farming with Water Quality in Mind: A Guide to Successful Backyard Farming While Protecting Our Water Resources, 2017*), the grantee will have published a series of newsletters and pre-recorded webinars. Educated watershed residents with backyard farms and farm animals and horses, include several days of one-on-one assistance from a nonpoint source expert with experience in agricultural BMP design and site assessment. Provided site-specific recommendations for nonpoint source pollution mitigation.

- Installed kiosk and educational material at the Overlook property. Implemented watershed wide events and cleanup/weed removal efforts along with outlined project survey to document task success.

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Essex County Nonpoint Source Coordinator Project #21-04/319

Waterbody Name:	Watershed-wide Waterbodies
Location:	Merrimack River Watershed
Waterbody Status:	Varies
Project Sponsor:	Merrimack Valley Planning Commission (MVPC)
Project Duration:	March 2021- June 2023
§319 Grant Amount:	$100,000 by the US EPA
Local Match:	$66,667 by MVPC and project participants

Figure 29. The Merrimack River.

PROBLEM:

This project will support the Massachusetts Nonpoint Source (NPS) Program by conducting work to mitigate nonpoint source pollution. The grantee will assemble a local NPS implementation committee, develop Watershed-Based Plans, identify priority areas impacted by NPS pollution and facilitate high-quality project proposals to be funded through the §319 grant program. Additionally, the grantee will conduct outreach and education work to enhance the NPS Program message and support of the NPS Program by targeting all eleven communities in Essex County.

PROJECT DESCRIPTION:

The project goals are to provide services in support of the Nonpoint Source Program by assigning Grantee's staff to serve as Regional Coordinators to conduct work that is focused on NPS. It will include a collaborative watershed-based planning approach across subwatersheds, outreach and education efforts, identification and prioritization of regional NPS priorities, development of Watershed-Based Plans, development and submittal of high-quality proposals for funding under the §319 NPS Competitive Grant Program, and any other activities that will further the goals of the Nonpoint Source Program especially objectives and milestones identified in the 2020-2024 Massachusetts Nonpoint Source Management Program Plan. Outreach efforts will include engagement with one or more environmental justice communities.

The Regional NPS coordinators may fulfill the following objectives identified in the 2020-2024 Massachusetts Nonpoint Source Management Program Plan:

- Fund locally led projects and increase program efficacy.
- Address urban/rural sources of NPS pollution.
- Establish geographic focus areas.
- Promote/assist development of complete Watershed-Based Plans (WBPs) to guide NPS watershed projects.
- Engage local partners on climate change adaptation, resiliency planning, and protection of healthy waters.
- Educate the public and increase the capacity of NPS partners.
- Investigate potential §319 implementation projects which enhance groundwater recharge and protection of critical surface and subsurface water supplies, potentially using Sustainable Water Management Initiative (SWMI) grants as match.

ANTICIPATED PROJECT OUTCOMES:

- Identified and expanded opportunities to accomplish and leverage work by private, state, local, and federal partners.
- Reduced nonpoint source pollutants and restored impaired waters and protected unimpaired/high quality and threatened waters through planning, education, program coordination, and implementation of climate-ready Best Management Practices (BMPs): Identified and prioritized solutions, prepared conceptual designs, provided guidance with regard to permitting requirements, and provided sound cost estimates for implementation. These services will focus on ensuring that projects selected for advancement include sufficient engineering evaluation of site conditions, optimal BMP selection based on anticipated pollutant removal and cost, BMP sizing considerations (including pre-treatment requirements), site characteristics and other potential design and permitting constraints.
- Instilled, encouraged, and nurtured a passion for restoring water quality through education, capacity building, and building new partnerships.

Figure 30. Merrimack River Salt Marsh

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Hamilton Reservoir Watershed Improvement Project #21-05/319

Waterbody Name:	Hamilton Reservoir
Location:	French and Quinebaug River Watershed
Waterbody Status:	Category 4c
Project Sponsor:	Town of Holland
Project Duration:	November 2021- June 2023
§319 Grant Amount:	$256,871 by the US EPA
Local Match:	$171,248 by the Town of Holland and project participants

Figure 31. Stormwater runoff emptying sediment into Hamilton Reservoir.

PROBLEM:

Hamilton Reservoir is in the Town of Holland, located in south, central Massachusetts bordering Union, Connecticut (encompassing a total of 413 acres, with 386 acres in Holland and 27 acres in Union). Hamilton Reservoir is an impaired water body listed under category 4c due to invasive non-native plants. Sediment loading and the addition of nutrients through nonpoint source pollution are accelerating the eutrophication of the lake; also leading to nuisance plants and algae, shallower areas and increased erosion along the shore, increased water temperatures, and low dissolved oxygen levels.

PROJECT DESCRIPTION:

This project will address the storm water drainage from the top of Mountain Road and the intersection of Old County Road then down Mountain Road. Runoff here flows unchecked, down the steep terrain carrying gravel, sediment, road debris, de-icing salts, and other chemicals or nutrients over the bottom of Sandy Beach Road, and into the Reservoir. Currently, there are no catch basins on any sections of these roads where this work will be completed, and sediment-laden storm water flows directly into the south basin of Hamilton Reservoir.

The primary goal of this project is to reduce runoff in order to improve the water quality of Hamilton Reservoir and remove the lake from the impairment list. It will accomplish this by treating the storm water by improving Mountain Road for 1,289 feet until it intersects with Sandy Beach Road, and then improving approximately 100 feet of Sandy Beach Road at the bottom of Mountain Road.

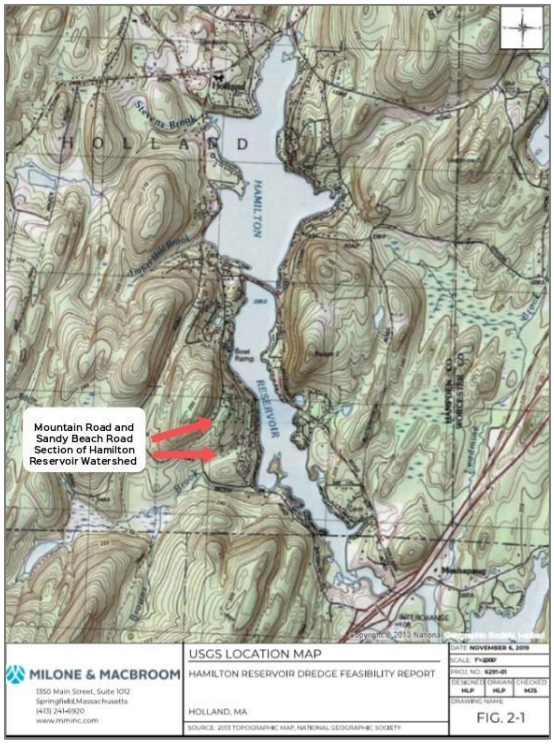

Figure 32. Hamilton Reservoir

ANTICIPATED PROJECT OUTCOMES:

- Installed ten deep sump catch basins with oil hoods along with six deep sump drop inlets with oil hoods will capture the storm water runoff and pollutants that contribute to the impairment of the Reservoir. A hydrodynamic separator was also installed to further remove suspended sediments and pollutants.
- Reduced nonpoint source pollutants and restored impaired waters through planning, education, and implementation of climate-ready Best Management Practices (BMPs).
- Instilled led, encouraged, and nurtured a passion for restoring water quality through education, capacity building, and building new partnerships.

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Western Massachusetts Agricultural Nonpoint Source Program Project #21-06/319

Waterbody Name:	Watersheds-wide Waterbodies
Location:	Connecticut, Deerfield, Westfield River Watersheds
Waterbody Status:	Varies
Project Sponsor:	Massachusetts Association of Conservation Districts
Project Duration:	March 2021- June 2023
§319 Grant Amount:	$259,000 by the US EPA
Local Match:	$173,000 by MACD and project participants

PROBLEM:

This project will work with farmers to develop conservation plans and implement Best Management Practices (BMPs) to reduce contaminant runoff to impaired water bodies. This project will address the issue of impaired water bodies related to agriculture in the western portion of the state. The grantee will focus on impaired water body segments in the Connecticut River, Westfield River and Deerfield River Watersheds. Targeted waterbodies are inclusive of, but not limited to, the following: Fort River (MA34-27), Mill River (MA34-25), Moose Meadow Brook (MA32-41), East Branch North River (MA33-19) and Hinsdale Brook (MA33-21).

PROJECT DESCRIPTION:

The project goals are to engage with farmers having previous contact with the Natural Resources Conservation Service (NRCS) and the Massachusetts Association of Conservation Districts (MACD) to develop and implement farm conservation plans with the ultimate goal of installing BMPs to reduce contaminant runoff from agricultural operations. The grantee will work with farmers to discuss options available to finance BMP implementation such as NRCS' Environmental Quality Incentives Program (EQIP), MDAR's Agricultural Environmental Enhancement Program (AEEP), and matching MassDEP's §319 grant program funds. The types of BMPs (NRCS designed and engineered BMPs) include but are not limited to manure management or construction of waste facilities, fencing, roof drains, or concrete pads.

ANTICIPATED PROJECT OUTCOMES:

- Identified and expanded opportunities to accomplish and leverage work by private, state, local, and federal partners.
- Reduced nonpoint source pollutants and restored impaired waters and protected unimpaired/high quality and threatened waters through planning, education, program coordination: conducted outreach and education with farmers to solicit interest in the program; developed conservation plans that outline BMPs to reduce pollutant runoff; assisted landowners obtain access to financial resources; finalized Watershed-Based Plans and implemented agricultural Best Management Practices (BMPs) to reduce significant amounts of sediment, pathogen, and nutrient-related pollution.

- Instilled, encouraged, and nurtured a passion for restoring water quality through education, capacity building, and building new partnerships.

Figure 33. Agricultural Best Management Practices in Southeast Massachusetts

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Watershed-Scale Zoning to Reduce Nonpoint Source Pollution and Protect Healthy Watersheds Project #22-01/319

Waterbody Name:	Watersheds-wide Waterbodies
Location:	Statewide
Waterbody Status:	Varies
Project Sponsor:	Franklin Regional Council of Governments
Project Duration:	July 2022 - June 2024
§319 Grant Amount:	$ 78,450 by the US EPA
Local Match:	$ 52,300 by FRCOG and project participants

PROBLEM:

The Deerfield River Watershed is one the healthiest watersheds in Massachusetts; however, nonpoint source pollution, including uncontrolled stormwater runoff and impaired fluvial geomorphic functions related to land use in the surrounding watershed, is a major threat to water quality. In an effort to protect water quality the grantee will implement recommendations in the *Watershed-Based Plan to Maintain the Health and Improve the Resiliency of the Deerfield Watershed* (§319 grant project number 15-04/319). The grantee will work with Greenfield, Bernardston, and Shelburne to update and align their land use regulations to protect healthy waterbodies and reduce pollutant loadings to impaired waters from new development and redevelopment projects.

PROJECT DESCRIPTION:

The project goals are to update and align the land use regulations of Greenfield, Bernardston, and Shelburne to protect shared healthy waterbodies and reduce pollutant loadings to impaired waters from new development and redevelopment projects. River corridors will be mapped for the Fall River and two tributaries in Bernardston. The project is consistent with priorities in the 2020-2024 Massachusetts NPS Management Program Plan and partially implements the following priority recommendation from the Deerfield watershed-based plan (15-04/319): update and align land use regulations across the 14 watershed towns, with a focus on mapping and managing the river corridor.

ANTICIPATED PROJECT OUTCOMES:

- Build support for inter-municipal land use regulation alignment among residents and private property owners via the development of outreach material, including the sharing of success stories, and identification of concerns that could represent barriers to the project goals.
- Utilize the River Extent Assessing Landforms (REAL) river corridor mapping methodology, developed as part of Project 17-06/319 *Using the Science of Fluvial Geomorphology to Develop River Corridor Management Tools*, to map the river corridor for the Fall River and two of its tributaries for the Town of Bernardston.
- Adapt the previously developed Model River Corridor Protection Zoning Overlay District (Project 17-06/319) to the needs of Greenfield and Bernardston.
- Utilize the Zoning and Subdivision Regulations Scorecard developed as part of A *Watershed-Based Plan to Maintain the Health and Improve the Resiliency of the Deerfield River Watershed (Project 15-04/319* to identify examples of good regulations to inform this project.

- Draft updates to the Zoning and Subdivision Regulations that focus on stormwater management for development in urbanized areas and appropriate uses, prohibited uses, stormwater management, land conservation and performance standards for development within river corridors and floodplains.

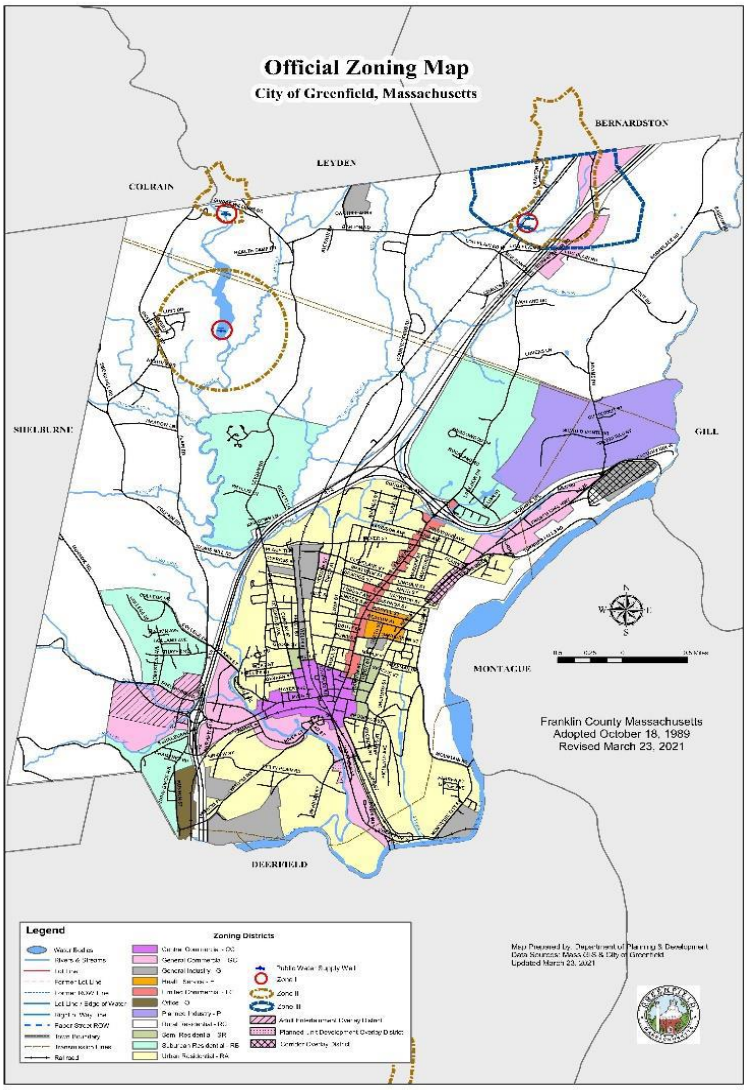

Figure 34. City of Greenfield in Franklin County

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Agricultural NPS Regional Coordinators for Franklin, Hampshire, Hampden Counties Project #22-02/319

Waterbody Name:	Watersheds-wide Waterbodies
Location:	Chicopee, Connecticut, Deerfield, Millers, Westfield Watersheds
Waterbody Status:	Varies
Project Sponsor:	Massachusetts Association of Conservation Districts
Project Duration:	March 2022- June 2025
§319 Grant Amount:	$241,848 by the US EPA
Local Match:	$161,232 by MACD and project participants

PROBLEM:

This project will support two Agricultural Nonpoint Source Regional Coordinators to bring water quality stakeholders together to develop a more comprehensive approach to prioritizing agricultural water quality improvement projects. This project will prioritize subbasins for both restoration and protection, complete Watershed-Based Plans, conduct outreach to agricultural producers, and design Best Management Practice (BMP) implementation projects to reduce contaminant runoff to impaired waterbodies leading to the development of a strategy to reduce agricultural NPS sources within high priority subbasins.

PROJECT DESCRIPTION:

This project aligns with the Nonpoint Source Management Program Plan (2020-2024) goal to "work to collaboratively address NPS pollution from agricultural sources through program coordination, increased communication, and technical support to producers," and will facilitate greater coordination between partners, prioritize subbasins for agricultural BMP implementations, and garner farmer support, resulting in:

1. Improved coordination between planning, regulatory, outreach, and agricultural entities,
2. Development of a comprehensive database of priority impaired subbasins or at-risk healthy subbasins for agricultural BMP implementation,
3. Successful outreach to the agricultural community resulting in the scoping and design of high-priority BMP projects,
4. Completion of funding applications for BMP implementations, and
5. Recovery of impaired waters (categories 4a, 4c, and 5) as well as protection of healthy watersheds at high risk of impairment.

ANTICIPATED PROJECT OUTCOMES:

- Hire Agricultural Nonpoint Source Regional Coordinators for Franklin, Hampshire, and Hampden Counties to develop and lead the partner collaborative.
- Leverage existing ties between Conservation Districts and the local agricultural communities to engage farmers in project planning and implementation.
- Convene stakeholders (including, but not limited to, municipalities, conservation commissions, boards of health, non-profit organizations, agricultural commissions, agriculture producers, conservation districts, regional planning agencies, and state and federal agencies) to:

a. Develop a comprehensive database of priority subbasins, and identify/target 3-5 priority subbasins for development of EPA Nine-Element Watershed-Based Plans,
b. Upon completion of the Watershed-Based Plans, identify projects in priority subbasins, develop implementation projects, and conduct outreach to agriculture producers in high-priority subbasins to garner project support, and
c. Develop a prioritization plan to guide future BMP implementation actions, well-vetted conceptual designs, and complete funding proposals for several high-priority agricultural BMP projects.

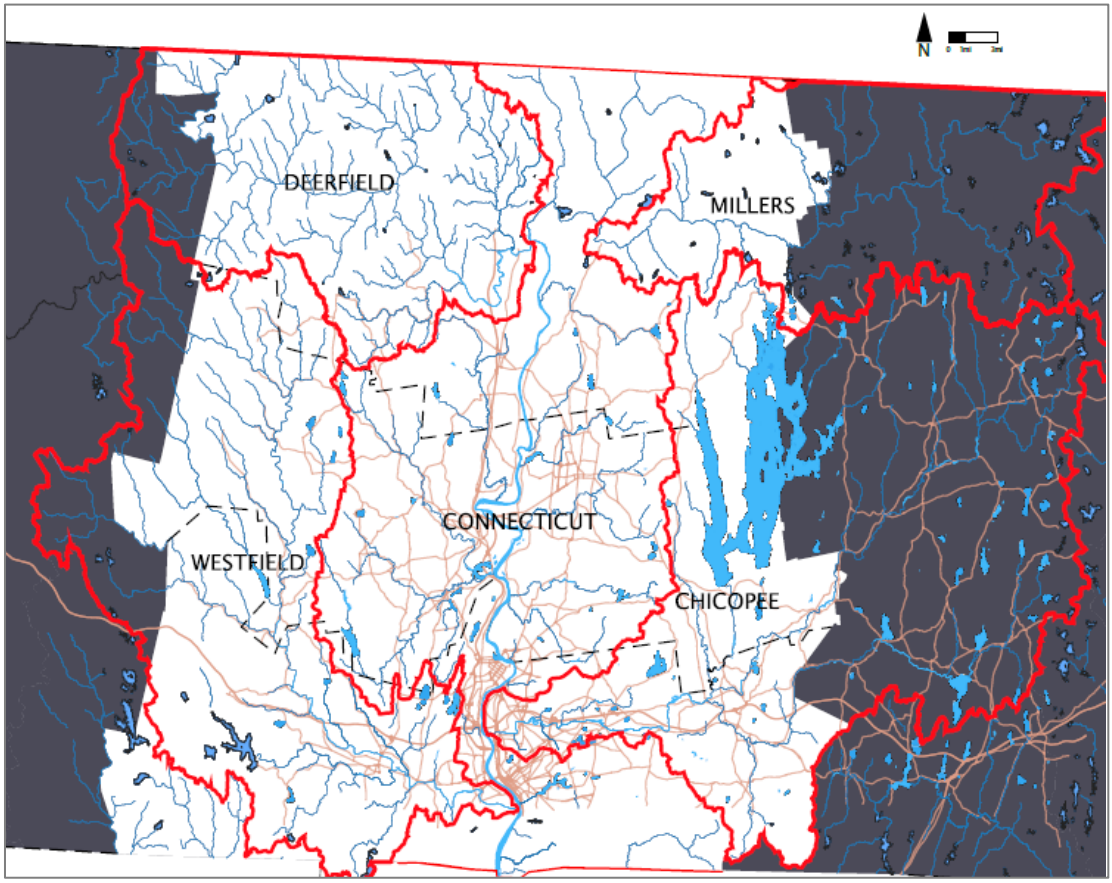

Figure 35. Project Focus Area Map

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Encouraging the Use of Lignocellulose (Wood) Based Onsite Septic Systems for Nitrogen-Sensitive Environments by Demonstrating Concurrent Contaminant Removal That Justifies More Economical Means for Effluent Disposal Project #22-03/319

Waterbody Name:	Watersheds-wide Waterbodies
Location:	All Watersheds in Southeast Massachusetts
Waterbody Status:	Varies
Project Sponsor:	County of Barnstable
Project Duration:	October 2022 - September 2024
§319 Grant Amount:	$ 72,385 by the US EPA
Local Match:	$ 50,278 by Barnstable County and project participants

PROBLEM:

The discharge of nitrogen and other pollutants such as pathogens and Contaminants of Emerging Concern (CEC) from decentralized wastewater management systems into groundwater in coastal areas represents a significant threat to both public health and the aquatic environment. Marine estuary studies conducted under the Massachusetts Estuaries Project (MEP) and similar efforts continue to confirm the role of wastewater-derived nitrogen in accelerating eutrophication in marine coastal embayments. In Barnstable County and many other coastal communities, it is likely that onsite wastewater treatment systems (or septic systems) will remain as part of the solution into the foreseeable future. The Barnstable County Department of Health and the Environment (grantee) will support the Massachusetts Nonpoint Source (NPS) Program by testing the efficacy of lignocellulose-based denitrification septic systems for the removal of wastewater-associated pollutants on small (<10,000 sq. ft.) lots.

PROJECT DESCRIPTION:

The project goals are to demonstrate the treatment efficacy of lignocellulosic (wood-based) denitrification systems for pathogens and selected Contaminants of Emerging Concern so that effluent disposal means that reduce costs and area requirements can be implemented with an overall benefit to public health and the environment.

ANTICIPATED PROJECT OUTCOMES:

- Address information gaps associated with lignocellulose-based systems by testing the effectiveness of a system to reduce or eliminate bacteria and viruses and CECs prior to the discharge of effluent to the soil treatment area.
- Demonstrate ability of leaching pits designed and constructed in accordance with the pre-1995 version of Massachusetts CMR 15.000 - Title 5 regulations to adequately dispose of wastewater, reducing the system cost and required soil treatment area.

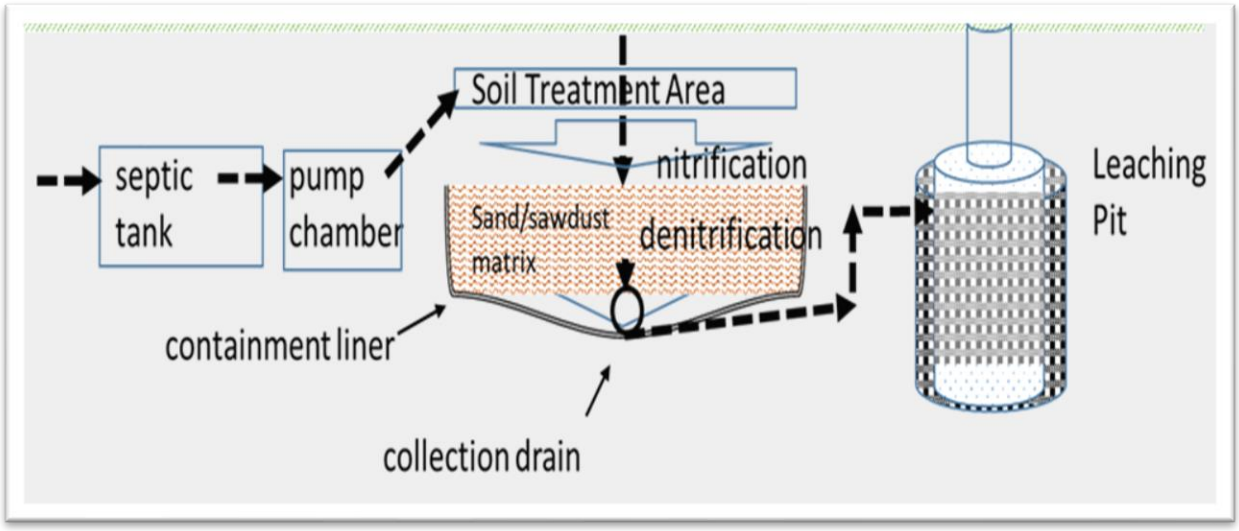

Figure 36. Schematic illustration of a lined woodchip/sand bioreactor configured with discharge to a leaching pit.

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Collicot/Cunningham Stormwater BMP Project #22-04/319

Waterbody Name:	Unquity Brook
Location:	Boston Harbor: Neponset River Watersheds
Waterbody Status:	Category 5
Project Sponsor:	Town of Milton
Project Duration:	March 2022- June 2025
§319 Grant Amount:	$158,500 by the US EPA
Local Match:	$111,514 by Milton and project participants

PROBLEM:

Unquity Brook (MA73-26) is the major freshwater tributary to Gulliver's Creek. Unquity Brook flows from Canton Avenue into Gulliver's Creek just over two miles away. The brook is culverted for part of its length and passes through dense residential areas where roads and driveways create large volumes of stormwater runoff.

The Town of Milton contains part of the Neponset River Estuary Area of Critical Environmental Concern (ACEC). Within the estuary and this ACEC is Gulliver's Creek, a brackish and sinuous body of water that provides habitat for diadromous fish, most prominently including spawning grounds for rainbow smelt.

Unquity Brook is listed on the 2016 Massachusetts Department of Environmental Protection Integrated Waters List (303d List) as impaired for several causes including *E. coli*, fecal coliform, dissolved Oxygen, low pH, total Phosphorus, and Sedimentation/Siltation. Gulliver's Creek and its tributaries, including Unquity Brook, are impaired by poor quality mostly caused by stormwater runoff and are subject to the Neponset River Watershed Total Maximum Daily Load (TMDL) for pathogens.

The Unquity Brook BMP Planning Project, funded by the Massachusetts Coastal Zone Management (CZM), led the town to prioritize BMP retrofits to help treat stormwater runoff before it reaches the brook. Reducing nonpoint source pollution will complement previous non-point source reduction in the brook and put it on a path to be removed from Massachusetts's list of impaired waters.

PROJECT DESCRIPTION:

The goal of this project is to improve the water quality of Unquity Brook through the implementation of structural infiltration basin focused on nutrient, sediment, and bacteria reduction, and address the sources of pollution in the subwatershed.

ANTICIPATED PROJECT OUTCOMES:

The town will install stormwater BMPs behind Collicot/Cunningham Elementary School to collect and treat runoff before it travels to the brook. Runoff will flow directly into a water quality structure where pretreatment will occur to remove sedimentation and trash before flowing into the infiltration basin for additional treatment. In a rainfall event greater than 1.0", water will overflow directly to Unquity Brook.

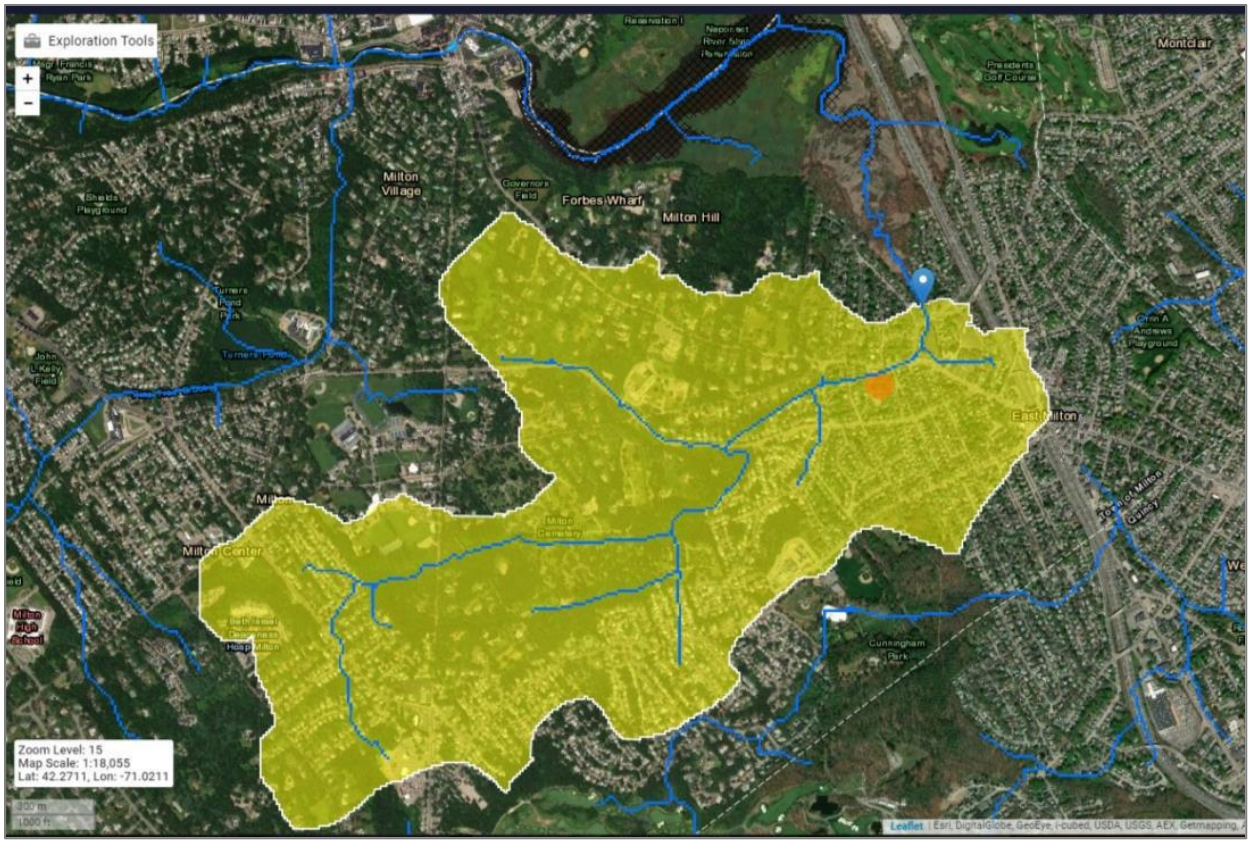

Figure 37. Unquity Brook watershed, shaded in yellow. Gulliver's Creek and the Neponset River are visible on the north edge of the watershed. The brook flows from its headwaters at Milton Police Station into Gulliver's Creek.

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Developing a Dirt Roads Stormwater Management Toolkit to Reduce NPS and Improve Resiliency in Healthy Watersheds Project #22-05/319

Waterbody Name:	Watersheds-wide Waterbodies
Location:	Connecticut, Deerfield, Westfield River Watersheds
Waterbody Status:	Varies
Project Sponsor:	Franklin Regional Council of Governments
Project Duration:	March 2022 - June 2024
§319 Grant Amount:	$105,200 by the US EPA
Local Match:	$68,853 by FRCOG and project participants

Figure 38. The Deerfield River.

PROBLEM:
Although the Deerfield River Watershed is one the healthiest watersheds in the Commonwealth, in Franklin County dirt and gravel roads near sensitive environmental resources such as rivers, streams, upland tributaries and wetlands are vulnerable to erosion, which causes high levels of runoff and sedimentation into wetlands, Cold Fish Resources (CFR), and other sensitive habitats, and may result in water quality impairments.

The grantee will develop a Dirt Roads Stormwater Management Toolkit to provide towns with a simple way to assess and classify unpaved roads and select sediment stormwater management Best Management Practices (BMPs) and appropriately size road drainage culverts for increasing stormwater flows due to climate change. These structures do not cross perennial streams and are not subject to the Massachusetts Stream Crossing standards. The Toolkit will be a comprehensive, easy-to-use resource for communities as they work to improve the resiliency of their roadways and protect Coldwater Fish Resources in the Deerfield River Watershed. This Toolkit will bring together many past projects in the Deerfield River Watershed and leverages multiple sources of funding at both the state and federal level to protect water quality and infrastructure in a rural region of the state. Additionally, utilizing other funding sources, the Toolkit will be piloted in two towns. Public outreach targeted to local municipal officials and interested parties will also be conducted.

Figure 39. Dirt road in Colrain experiencing erosion from stormwater.

PROJECT DESCRIPTION:
The goal of this project is to develop a Dirt Roads Stormwater Management Toolkit that will enable local communities to assess their unpaved roads for erosion and select appropriate stormwater BMPs and right-sized culvert drainage that match the classification of the vulnerability of the roadway, protect and improve the health and climate change resiliency of the Deerfield River Watershed, and be applicable for use across the Commonwealth.

ANTICIPATED PROJECT OUTCOMES:

- Develop an assessment methodology that will examine unpaved roadways in a simple, clear way that measures a roadway's vulnerability to erosion and then classifies the roadways into various typologies.
- Use roadway typology to provide the towns with guidance as to which stormwater management BMPs, maintenance techniques, and size of culvert drainage would be most effective to control nonpoint source pollution. Review BMP choices, pollutant load reduction potential, and their optimal application in order to develop a selection of appropriate stormwater BMPs.
- Apply a "right-sizing protocol" previously developed in the Deerfield Watershed under a Massachusetts MVP Action Grant to a larger town-wide scale to provide guidance to towns on selecting appropriately sized culvert drainage that will accommodate more frequent and intense storm flow events.

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Braintree Council on Elder Affairs Retrofit Project #22-06/319

Waterbody Name:	Monatiquot River
Location:	Boston Harbor/Weymouth-Weir Watershed
Waterbody Status:	Category 5
Project Sponsor:	Town of Braintree
Project Duration:	November 2022 - November 2024
§319 Grant Amount:	$138,250 by the US EPA
Local Match:	$95,515 by the Town of Braintree and project participants

PROBLEM:
This project will address the Final Pathogen TMDL for the Boston Harbor, Weymouth-Weir, and Mystic Watersheds to control bacteria pollution to the Monatiquot River through construction of stormwater management BMPs at the Braintree Council on Elder Affairs property. The Monatiquot River (MA74-08) is a 4.4-mile river in Braintree that empties into the Weymouth Fore River estuary. It is listed on MassDEP's 2016 Integrated List of Waters as Category 5 for E. coliform and low dissolved oxygen. The Final Pathogen TMDL for the Boston Harbor, Weymouth-Weir, and Mystic Watersheds (MassDEP & EPA, 2018) lists the Monatiquot as a Pathogen Impaired Segment due to bacterial contamination by fecal coliforms such as *E. coli* and Enterococcus.

The project is based on recommendations from the Braintree Sub-Watershed Assessment and Stormwater Retrofit Plan, which was funded by a §604(b) grant (2019-05/604). The project will also include targeted public outreach to Braintree residents and seniors who will be frequent visitors to the site of the BMPs. Under current conditions, runoff from Harrison Avenue and the upper Council on Elder Affairs property is captured by the storm sewer system and piped without treatment to the nearby Monatiquot river. Construction of the proposed retrofits will provide significant pollutant reduction to the Monatiquot River.

PROJECT DESCRIPTION:
The project will address the Final Pathogen TMDL for the Boston Harbor, Weymouth-Weir, and Mystic Watersheds to control bacteria pollution to the Monatiquot River through construction of stormwater management BMPs at the Braintree Council on Elder Affairs property. The project is based on recommendations from the Braintree Sub-Watershed Assessment and Stormwater Retrofit Plan, which was funded by a §604(b) grant (2019-05/604). The project will also include targeted public outreach to Braintree residents and seniors who will be frequent visitors to the site of the BMPs.

ANTICIPATED PROJECT OUTCOMES:

- The installation of structural BMPs at the parking lot of the Council on Elder Affairs in Braintree, which was one of the priority sites identified in the Braintree Sub-Watershed Assessment and Stormwater Retrofit Plan.
- Retrofitted paved parking lot with two landscaped strips and a grass swale that direct stormwater into an infiltration basin at the base of the parking lot. The landscaped strips and grass swale were chosen for their relative ease of maintenance, ability to infiltrate, and aesthetic value. The larger bioretention basin will treat the majority of stormwater, and a supplementary sediment forebay will slow runoff from the upper parking lot as it enters the basin. The Town plans to design the structures to treat at least the first inch of stormwater runoff.

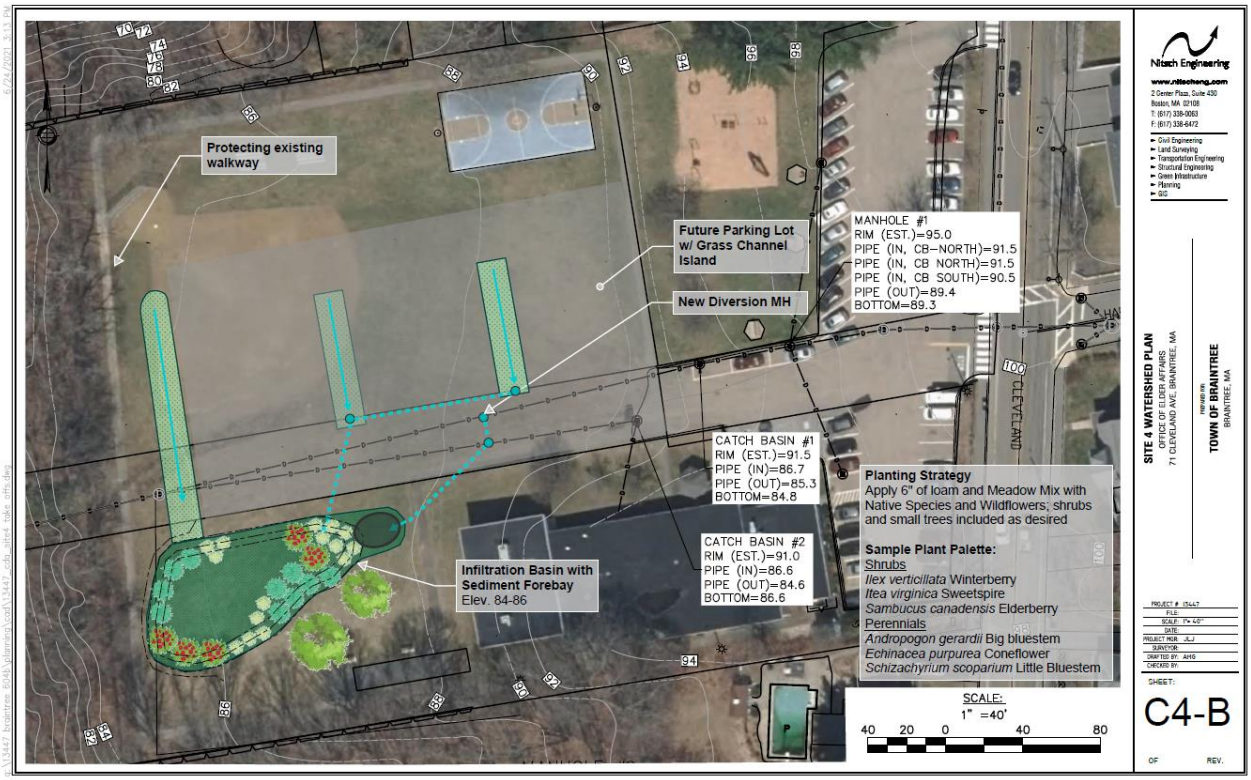

Figure 40. Council on Elder Affairs in Braintree

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Hupi Road Drainage Improvements to Reduce Sediment Inflow to Lake Garfield Project #22-07/319

Waterbody Name:	Lake Garfield
Location:	Housatonic Watershed
Waterbody Status:	Category 5
Project Sponsor:	Town of Monterey
Project Duration:	November 2022- November 2024
§319 Grant Amount:	$139,000 by the US EPA
Local Match:	$ 97,000 by Monterey and project participants

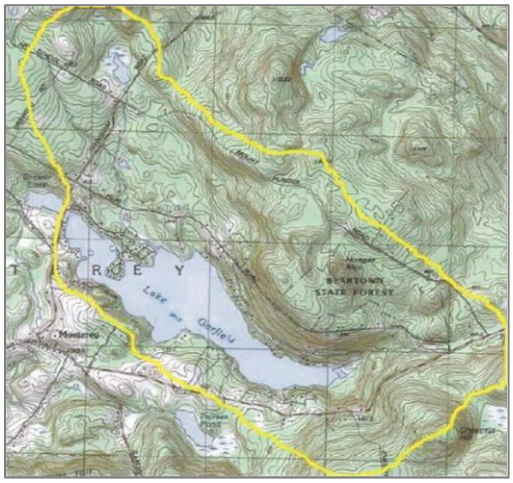

Figure 41. Lake Garfield watershed.

PROBLEM:
Lake Garfield (MA21040) is a 255-acre Great Pond located in Monterey. It is listed on MassDEP's 2016 Integrated List of Waters as Category 5 for phosphorus, low dissolved oxygen and non-native aquatic plants. The Phosphorus Loading Assessment for Lake Garfield (project number 2016-01/604) identified managing surface water runoff to best reduce phosphorus and sediment loading into the lake.

This project will improve water quality in the Lake, employing BMPs that include structural and non-structural BMPs in the watershed to control stormwater quantity and improve water quality. These BMPs will be constructed in drainage areas F and G as identified in the 2018 final report for the *Phosphorus Loading Assessment for Lake Garfield* §604(b) grant project. And as designed and planned with support from a second §604(b) grant, awarded in 2020. The project site was chosen on the basis of drainage area size, phosphorus loading, ease of access, location on public land, and minimal regulatory hurdles anticipated.

PROJECT DESCRIPTION:
The goal of the project is to reduce phosphorus and sediments in runoff through the implementation of both structural and non-structural BMPs focused on phosphorus and sediment reduction to improve the water quality of Lake Garfield and remove the lake for the Integrated List of Waters. Sediment and transported nutrients in stormwater runoff results in shallower near shore areas which provide enhance conditions for aquatic weed growth.

ANTICIPATED PROJECT OUTCOMES:
This goal will be accomplished primarily through the installation of a treatment train of structural Best Management Practices (BMPs), along 1,000 feet of Hupi Road, to control, capture and treat runoff and the implementation of non-structural BMPs including a watershed education program. The Grantee will also reach out to watershed-wide property owners to through a comprehensive educational toolkit that will include information on the efficacy and construction of rain gardens and vegetated swales, septic system maintenance and landscaping techniques to further reduce runoff.

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Quacumquasit Pond Phosphorus Inactivation Project #22-08/319

Waterbody Name:	Quacumquasit Pond
Location:	Chicopee River Watershed
Waterbody Status:	Category 4a
Project Sponsor:	Town of Sturbridge
Project Duration:	December 2022- September 2024
§319 Grant Amount:	$300,000 by the US EPA
Local Match:	$200,000 by the Town of Sturbridge and project participants

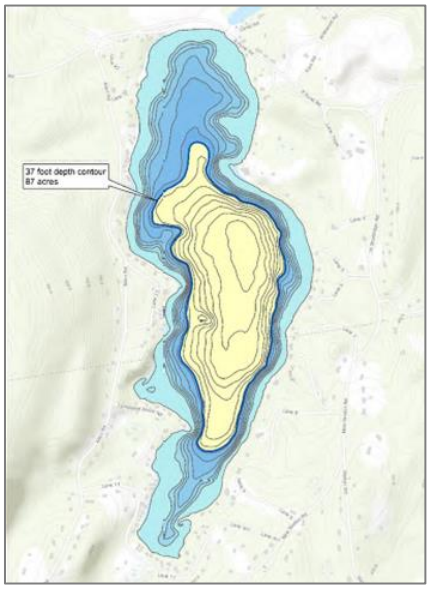

Figure 42. Quacumquasit Pond.

PROBLEM:

Quacumquasit Pond (MA36131) is a 223-acre pond located in Brookfield, East Brookfield, and Sturbridge. The pond, which feeds into Quaboag Pond is listed on MassDEP's 2018/2020 Integrated List of Waters as Category 4a for Eurasian Water Milfoil and non-native aquatic plants. Quaboag Pond is a §319 Priority Waterbody for 2021 and Quaboag Pond is listed on the state's §303d list of impaired waters as Category 5 and suffers from algal blooms and excessive plant growth. Both ponds are impaired by phosphorus loading as established by the MassDEP in the TMDL (MassDEP 2007). The source of continued high levels of phosphorus has been identified as the internal loading from sediments.

PROJECT DESCRIPTION:

The goal of this project is to reduce the impact of phosphorus on Quacumquasit Pond and to restore it through alum application and education of local residents. The project will significantly reduce internal phosphorus loading to achieve the TMDL goal for phosphorus and protect the pond from further water quality degradation due to internal recycling of nutrients. The project will also benefit Quaboag Pond and the downstream Chicopee River through the sequestration of phosphorus loading being generated from the sediments.

ANTICIPATED PROJECT OUTCOMES:

The town will conduct an alum treatment in Quacumquasit Pond to reduce internal phosphorus loading and allow the lake to meet the TMDL goals established by MassDEP (MassDEP 2006). This will also benefit Quaboag Pond and the Chicopee River downstream of the pond.

The objective is to reduce internal loading by at least 59 kg/year (29% of the annual load) which will lead to decreased phosphorus recycling, reduced cyanobacteria abundance, and increased water clarity and improved deep water oxygen levels. Aluminum compounds will be applied to an area of approximately 87 acres at a dose of approximately 100 g/m^2 to remove phosphorus from the water column and achieve the TMDL goals for phosphorus established for the pond. Treatments will be applied to the pond with application rates and timing to be determined following review by local and state government staff.

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Watson Park BMP Implementation Project #22-09/319

Waterbody Name:	Monatiquot River
Location:	Boston Harbor/Weymouth-Weir Watershed
Waterbody Status:	Category 5
Project Sponsor:	Town of Braintree
Project Duration:	January 2023- June 2024
§319 Grant Amount:	$375,000 by the US EPA
Local Match:	$264,592 by the Town of Braintree and project participants

PROBLEM:

The Monatiquot River (MA74-08) in Braintree is listed as a pathogen-impaired segment in the 2018 Final Pathogen TMDL for the Boston Harbor, Weymouth-Weir, and Mystic Watersheds. The 2016 Massachusetts Integrated List of Waters includes the Monatiquot River in Category 5 (i.e., impaired by one or more pollutants) due to *E. coli*, fecal coliform, dissolved oxygen, benthic macroinvertebrates, physical substrate habitat alterations, fish passage barrier and curly-leaf pondweed. Currently, stormwater from the upland neighborhood enters the drainage system just north of the park and is conveyed, untreated, through pipes to outfalls at the confluence of the Monatiquot River and the Weymouth Fore River.

This project will divert runoff from the existing street drainage into a bioretention basin and will complement the ongoing work funded by CZM to reduce potential stormwater impacts to the Fore River. Construction of the proposed retrofits will provide significant pollutant reduction to the receiving waters.

PROJECT DESCRIPTION:

The goals of this project are to implement the Boston Harbor Pathogen TMDL, address substrate habitat alterations in the Weymouth Fore River, and ultimately to achieve full attainment of designated uses in the Weymouth-Weir subwatershed. This project will include significant public outreach to Braintree families who use the Watson Park recreational area through targeted outreach and events.

The project supports ongoing work to promote coastal resilience and nature-based solutions to flooding. The park is currently the subject of a shoreline restoration project partially funded by a CZM Coastal Resilience grant, as well as a related redesign of the park partially funded by the town through a Community Preservation Grant. The restoration and redesign will preserve some of the recreational uses of the park while allowing for salt marsh migration in the long term.

ANTICIPATED PROJECT OUTCOMES:

Construction of structural BMPs within Watson Park-a priority site identified in the Braintree Sub-Watershed Assessment and Stormwater Retrofit Plan which was funded by a Section 604(b) grant (2019-05/604). These BMPs will divert runoff from the existing street drainage into a bioretention basin and subsurface installation chamber. The BMPs will meet the Massachusetts Stormwater Standards, including sizing to treat runoff from the 1-inch storm at a minimum, with additional treatment if feasible.

Figure 43. Watson Park in Braintree

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Lake Waushakum BMPs Project #22-10/319

Waterbody Name:	Lake Waushakum
Location:	Concord (SuAsCo)Watershed
Waterbody Status:	Category 5
Project Sponsor:	City of Framingham
Project Duration:	January 2023- December 2024
§319 Grant Amount:	$249,980 by the US EPA
Local Match:	$162,775 by the City of Framingham and project participants

PROBLEM:

Lake Waushakum (MA82112) is an 82-acre kettle pond located in Framingham and Ashland, with an approximately 145-acre catchment area in Framingham. It is currently listed on Massachusetts Integrated Lists of Waters as Category 5 for "Waters requiring a TMDL" for total phosphorus, turbidity, dissolved oxygen, and aquatic plants impairments. Framingham's public beach at Lake Waushakum is consistently closed due to high levels of *E. coli*, never even opening in the 2021 season due to poor water quality.

Lake Waushakum has significant historic connections to the community and currently accommodates multiple recreational uses, economic support, and ecological and climate resiliency benefits. Historic development in the area has resulted in densely developed, largely impervious areas. Stormwater runoff has been identified as the main contributor of pollutant loading and inability to meet water quality standards. The poor water quality has intensified with more extreme rain events and impacts from climate change.

PROJECT DESCRIPTION:

The primary project goal is to reduce phosphorus, sediment, and *E. coli* loading to Lake Waushakum. The secondary goal is to increase public awareness of water quality impairments and encourage behaviors and actions to address these concerns. The project will take a strategic, watershed-based approach utilizing a combination of structural and non-structural BMPs to improve water quality. It will retrofit the public beach with green infrastructure, enhance the riparian buffer at the City's property with vegetation, and expand public outreach and education programs. It will finalize design plans, support permitting, and construct green infrastructure at the public beach.

ANTICIPATED PROJECT OUTCOMES:

- Retrofit Lake Waushakum's public beach with BMPs designed for climate resiliency and changing precipitation.
- Enhance the riparian buffers.
- Expand public outreach and education programs, including improving outreach to Environmental Justice communities, with a focus on climate resiliency and improving access to open space.

Figure 44. Lake Waushakum

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Massachusetts Watershed-Based Plans: Enhancement and Implementation Project #22-11/319

Waterbody Name:	Statewide Application
Location:	Statewide Application
Waterbody Status:	Varies
Project Sponsor:	Geosyntec Consultants, Inc.
Project Duration:	December 2022- December 2024
§319 Grant Amount:	$139,400 by the US EPA
Local Match:	$93,500 by Geosyntec Consultants, Inc. and project participants

PROBLEM:

Watershed-Based Plans (WBP), a requirement for §319 implementation projects, are an important planning tool to guide water quality restoration. This project built on the earlier successes of the Massachusetts WBP web-based tool (http://prj.geosyntec.com/MassDEPWBP) by supporting MassDEP partners in completing technically robust, completed WBPs and provide technical and programmatic support to the MassDEP's Nonpoint Source Program for the WBP tool.

PROJECT DESCRIPTION:

This project will provide support to complete WBPs by working with MassDEP's partner organizations, and by providing targeted science and engineering support as needed to complete WBPs for identified §319 implementation projects. It will provide the technical assistance identified as most needed by partner organizations for completion of WBPs, including guiding the completion of Watershed-Based Plans. It will update the WBP tool to include technical and programmatic updates.

ANTICIPATED PROJECT OUTCOMES:

- Technical and programmatic support to the MassDEP NPS Program for the WBP tool.
- Incorporate the 2018/2022 Massachusetts Integrated List of Waters and hyperlinks into the WBP tool, update pollutant load export rates (PLERS) and BMP performance curves for total nitrogen, total phosphorus, and total suspended solids, and incorporate bacteria (*E. coli*) PLERS and BMP performance curves not currently available in the tool.
- Support MassDEP partners with the completion of technically robust completed WBPs.

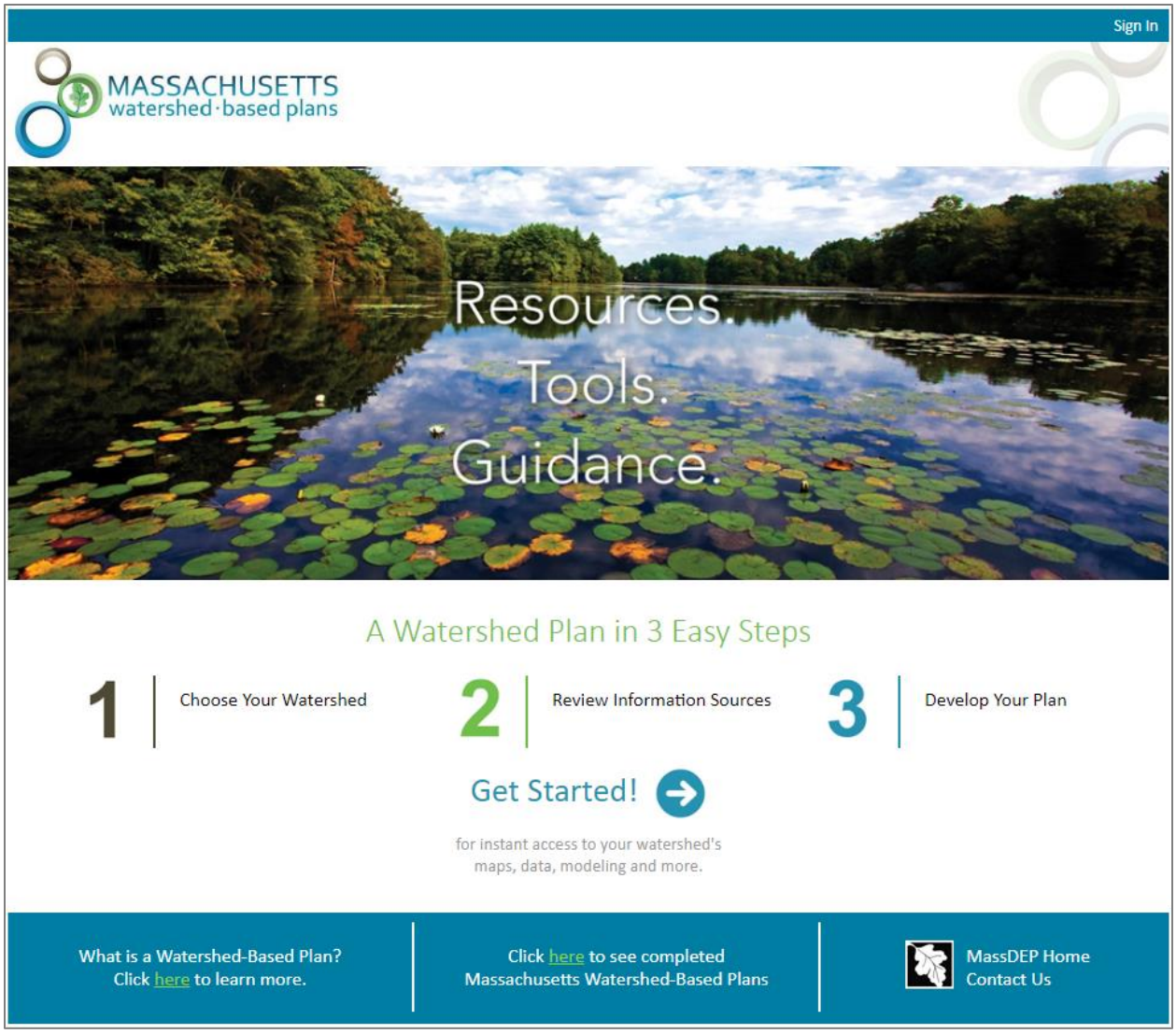

Figure 45. Elements from the online Watershed-Based Plan tool.

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Increasing the Pace of On-Farm Watershed Restoration in Berkshire County Project #22-12/319

Waterbody Name:	Berkshire County-wide
Location:	Housatonic and Hoosic Watersheds
Waterbody Status:	Varies
Project Sponsor:	Housatonic Valley Association
Project Duration:	January 2022-December 2024
§319 Grant Amount:	$96,024 by the US EPA
Local Match:	$69,982 by Housatonic Valley Association and project participants

PROBLEM:

Farm management of nutrients, bacteria, stream corridor modifications, and other elements of agricultural production can contribute to existing water quality impairments and threaten critical cold-water habitats. The grantee will work with farmers to develop conservation plans and implement Best Management Practices (BMPs) to reduce contaminant runoff to impaired water bodies. This project will address the issue of impaired water bodies related to agriculture in the Hoosic and Housatonic watersheds in Berkshire County.

PROJECT DESCRIPTION:

The project goal is to reduce agricultural nonpoint source pollution to remove existing water quality impairments. It will support an agricultural NPS coordinator to implement planning and outreach efforts in priority watersheds, build partnerships, develop Conservation Plans, identify NPS pollution reduction BMPs, and coordinate funding and technical support to further develop and implement projects and to remove existing water quality impairments. The project will provide outreach to agricultural producers to address agriculture-related impairments in the Hoosic and Housatonic watersheds in Berkshire County.

ANTICIPATED PROJECT OUTCOMES:

- Formation of a Berkshire County Agricultural Nonpoint Source Pollution (AgNPS) Advisory Committee which will include Core Partners as well as other key stakeholders, including but not limited to MassDEP, NRCS, Berkshire Regional PlanningCommission, Berkshire Grown and key producers.
- Hiring of an Agricultural NPS Coordinator and connect them with appropriate training to become a Certified Conservation Planner and attain Technical Service Provider (TSP) status facilitate on-farm Conservation Planning.
- Identified priority subwatersheds for AgNPS reduction in both the Housatonic and Hoosic watersheds.
- Development of a Producer Outreach Strategy and engaged farmers in priority subwatersheds.
- Development and implementation of farm-scale Conservation Plans for willing landowners.
- Development shovel-ready designs and implementation BMPs to help prevent and remediate agricultural nonpoint source pollution.

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Appendices

Appendix A. FFY 2022 Approved or Awarded CWA §319 Projects

Table 9. Projects included in the FFY2022 Workplan.

Project number	Project name	Grantee
22-01/319	Watershed-Scale Zoning to Reduce Nonpoint Source Pollution and Protect Healthy Watersheds	Franklin Regional Council of Governments
22-02/319	Agricultural NPS Regional Coordinators for Franklin, Hampshire, Hampden Counties	Massachusetts Association of Conservation Districts
22-03/319	Encouraging the Use of Lignocellulose (Wood) Based Onsite Septic Systems for Nitrogen-Sensitive Environments by Demonstrating Concurrent Contaminant Removal That Justifies More Economical Means for Effluent Disposal	County of Barnstable
22-04/319	Collicot/Cunningham Stormwater BMP	Town of Milton
22-05/319	Developing a Dirt Roads Stormwater Management Toolkit to Reduce NPS and Improve Resiliency in Healthy Watersheds	Franklin Regional Council of Governments
22-06/319	Braintree Council on Elder Affairs Retrofit	Town of Braintree
22-07/319	Hupi Road Drainage Improvements to Reduce Sediment Inflow to Lake Garfield	Town of Monterey
22-08/319	Quacumquasit Pond Phosphorus Inactivation Project	Town of Sturbridge
22-09/319	Watson Park BMP Implementation	Town of Braintree
22-10/319	Lake Waushakum BMPs	City of Framingham
22-11/319	Massachusetts Watershed-Based Plans: Enhancement and Implementation	Geosyntec Consultants Inc
22-12/319	Increasing the Pace of On-Farm Watershed Restoration in Berkshire County	Housatonic Valley Association

Appendix B. CWA §319 NPS Grant Projects Closed in 2022

Table 10. NPS grant projects that were closed in 2022.

Project Title	Project ID#	Grantee	Grant Amount	Non-Federal Match	Completion Date
Revision of Massachusetts Watershed-Based Plans	18-02/319	Geosyntec Consultants Inc	$420,984	$103,957	9/30/2022
Stormwater Management and Stream Restoration for Water Quality in Lower Abbey Brook	19-01/319	City of Chicopee	$116,172	$213,095.59	9/30/2022
Reducing Phosphorus Impacts from Septic Systems Near Freshwater Lakes and Ponds - Defining Best Management Practices	19-02/319	County of Barnstable	$313,261.07	$237,591.69	9/30/2022
Avon Town Hall Green Infrastructure Demonstration Project	19-05/319	Town of Avon	$68,832.53	$68,991.38	6/30/2022
Westport River Agricultural Nonpoint Source Program	19-06/319	Massachusetts Association of Conservation Districts	$196,200	$140,897.80	9/30/2022
Fearing Brook Floodplain Creation Project	20-03/319	Town of Amherst	$252,895.62	$168,698.75	6/30/2022

Appendix C. Active CWA §319 NPS Grant Projects

Table 11. Active CWA §319 Nonpoint Source Grant Projects

Project Title	Project Number	Grantee	Grant Amount ($)	Non-Federal Match ($)	Planned Completion Date
Regional Nonpoint Source Coordinator – Franklin County	20-01/319	Franklin Regional Council of Governments	$200,000	133,333.33	December 2024
Stormwater BMPs: Sevenmile River Watershed	20-03/319	Town of Spencer	$88,200	$60,300	June 2022
Berkshire County Regional Nonpoint Source Coordinator	20-04/319	Berkshire Regional Planning Commission	$200,000	$133,333.33	December 2024
Nonpoint Source Pollution Grant Guidebook	20-05/319	Comprehensive Environmental Inc. (CEI)	$75,285	$50,250	June 2022
A Regional Nonpoint Source Coordinator: Collective Action in the Pioneer Valley for Water Quality Improvement and Greater Community Resilience	20-06/319	Pioneer Valley Planning Commission	$200,000	$133,333.33	December 2024
Implementation Remediation, and Education of Selected Best Management Practices to Minimize the Environmental Impact of Two Equine Operations	20-07/319	UMass-Amherst	$286,670	$191,395	June 2022
Distributed Small-Scale Street Trenches for Phosphorus Load Reduction	21-01/319	Mystic River Watershed Association	$498,715	$370,000	June 2023
Manchaug Pond Water Quality Improvements and Agricultural Outreach	21-03/319	Manchaug Pond Foundation	$265,190	$177,656	June 2023
Essex County Nonpoint Source Coordinator	21-04/319	Merrimack Valley Planning Commission	$100,000	$66,667	June 2023
Hamilton Reservoir Watershed Improvement Project	21-05/319	Town of Holland	$256,871	$297,500	June 2023
Western Massachusetts Agriculture NPS Program	21-06/319	Massachusetts Association of Conservation Districts	$259,000	$175,000	June 2023
Watershed-Scale Zoning to Reduce Nonpoint Source Pollution and Protect Healthy Watersheds	22-01/319	Franklin Regional Council of Governments	$78,450	$52,300	June 2024
Agricultural NPS Regional Coordinators for Franklin, Hampshire, Hampden Counties	22-02/319	Massachusetts Association of Conservation Districts (MACD)	$241,848	$161,232	June 2025
Encouraging the Use of Lignocellulose (Wood) Based Onsite Septic Systems for Nitrogen-Sensitive Environments by Demonstrating Concurrent Contaminant Removal That Justifies More Economical Means for Effluent Disposal	22-03/319	Barnstable County	$72,385	$50,278	September 2024
Collicot/Cunningham Stormwater BMP	22-04/319	Town of Milton	$158,500	$111,514	June 2025
Developing a Dirt Roads Stormwater Management Toolkit to Reduce NPS and Improve Resiliency in Healthy Watersheds	22-05/319	Franklin Regional Council of Governments	$105,200	$68,853	June 2024
Braintree Council on Elder Affairs Retrofit	22-06/319	Town of Braintree	$138,250	$95,515	November 2024
Hupi Road Drainage Improvements to Reduce Sediment Inflow to Lake Garfield	22-07/319	Town of Monterey	$139,000	$97,000	June 2024
Quacumquasit Pond Phosphorus Inactivation Project	22-08/331	Town of Sturbridge	$300,000	$200,000	December 2024
Watson Park BMP Implementation	22-09/319	Town of Braintree	$375,000	$264,592	June 2025
Lake Waushakum BMPs	22-10/319	City of Framingham	$249,980	$162,775	June 2025
Massachusetts Watershed-Based Plans: Enhancement and Implementation	22-11/319	Geosyntec Inc.	$139,400	$93,500	December 2024
Increasing the Pace of On-Farm Watershed Restoration in Berkshire County	22-12/319	Housatonic Valley Association	$96,024	$69,982	June 2025