Massachusetts Department of ENVIRONMENTAL PROTECTION

INDICATIVE PROJECT SUMMARIES

SECTION 319 NONPOINT SOURCE COMPETITIVE GRANTS PROGRAM

FFY 2012 - 2016

Massachusetts Department of Environmental Protection
Bureau of Water Resources
Douglas E. Fine, Assistant Commissioner

2016

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NONPOINT SOURCE PROGRAM
INDICATIVE PROJECT SUMMARIES

FFY 2012 – 2016

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INTRODUCTION

This report presents indicative summaries of the projects partially financed by the Section 319 Massachusetts Nonpoint Source Competitive Grants Program during federal fiscal years (FFY) 2012 through 2016. Projects funded from the inception of the program in 1990 through 2011 are listed in the Appendix at the end of this report.

Congress annually appropriates funds under Section 319 (319) of the Clean Water Act of 1987 (33 U.S.C.A., Sc. 1251 et. seq.) to assist states in implementing their approved nonpoint source (NPS) programs. Section 319 is administered by the US Environmental Protection Agency (EPA), which oversees the awards to individual states. The Massachusetts Department of Environmental Protection (Department), Bureau of Water Resources, administers this award as part of the Massachusetts Nonpoint Source Program.

The 319 program focuses on the implementation of activities and projects for the control of nonpoint source pollution. EPA defines NPS pollution as that which is "caused by diffuse sources that are not regulated as point sources and are normally associated with precipitation and runoff from the land or percolation." The awards are intended to provide financial support for the state's programs for controlling the major statewide categories of NPS pollution or for protecting or improving NPS-impaired or threatened targeted water resources. The Massachusetts Nonpoint Source Management Program Plan (http://mass.gov/dep/water/resources/nonpoint.htm) was revised and updated for 2014-2019 to outline goals and objectives that support program activities to address nonpoint source pollution statewide.

Each year, a portion of the 319 funds awarded to the state is used for specific watershed implementation projects that improve or protect threatened or impaired priority freshwater and coastal waters. Projects funded under this program must implement measures that address the prevention, control, and abatement of NPS pollution, and must result in restoration of beneficial uses or achieving or maintaining state water quality standards. A nine-element Watershed-based Plan is required to support these implementation projects.

A Request for Responses for competitive projects is issued by the Massachusetts Department of Environmental Protection in the spring. Proposals may be submitted by any interested Massachusetts public or private organization. The Department encourages all types of eligible, competitive proposals from all watersheds.

Since FFY 2001, the Department has particularly encouraged proposals that will begin implementation of Massachusetts's Total Maximum Daily Load (TMDL) analyses, or that implement recommendations made in Diagnostic/Feasibility (D/F) or other studies for waters that do not meet Water Quality Standards. The Department also continues to encourage applicants to propose projects that support the Department's ongoing basin-wide water quality activities. In 2013, new EPA guidelines (April 2013, *Nonpoint Source Program and Grant Guidelines for States and Territories*) modified the program and expanded the eligibility of 319 funds to address the protection of unimpaired waters. The same revised Guidelines amended previous rules pertaining to the use of 319 funds for NPDES regulated areas. Since 2013, work that is required by Final NPDES Stormwater Permits is ineligible to receive 319 funds. However, development of stormwater utilities is 319-eligible in all watersheds, and MassDEP has particularly encouraged this type of project in recent years.

An intra- and inter-agency screening committee reviews all eligible 319 proposals. Recommended proposals are approved by the Department to be included in the Department's yearly program Workplan, which is submitted to EPA at the start of the federal fiscal year. Once the Workplan has been approved, the Department enters into a contractual agreement with each applicant to conduct the project.

A 40% non-federal match is required from the grantee. This match may be in cash or from in-kind services performed as part of the approved project activities. Unless specifically recommended in a TMDL, research, program development, assessment, planning, and water quality monitoring for assessment purposes are not considered implementation activities and are not eligible for 319 funding or match credit. The typical project timeline is for two years.

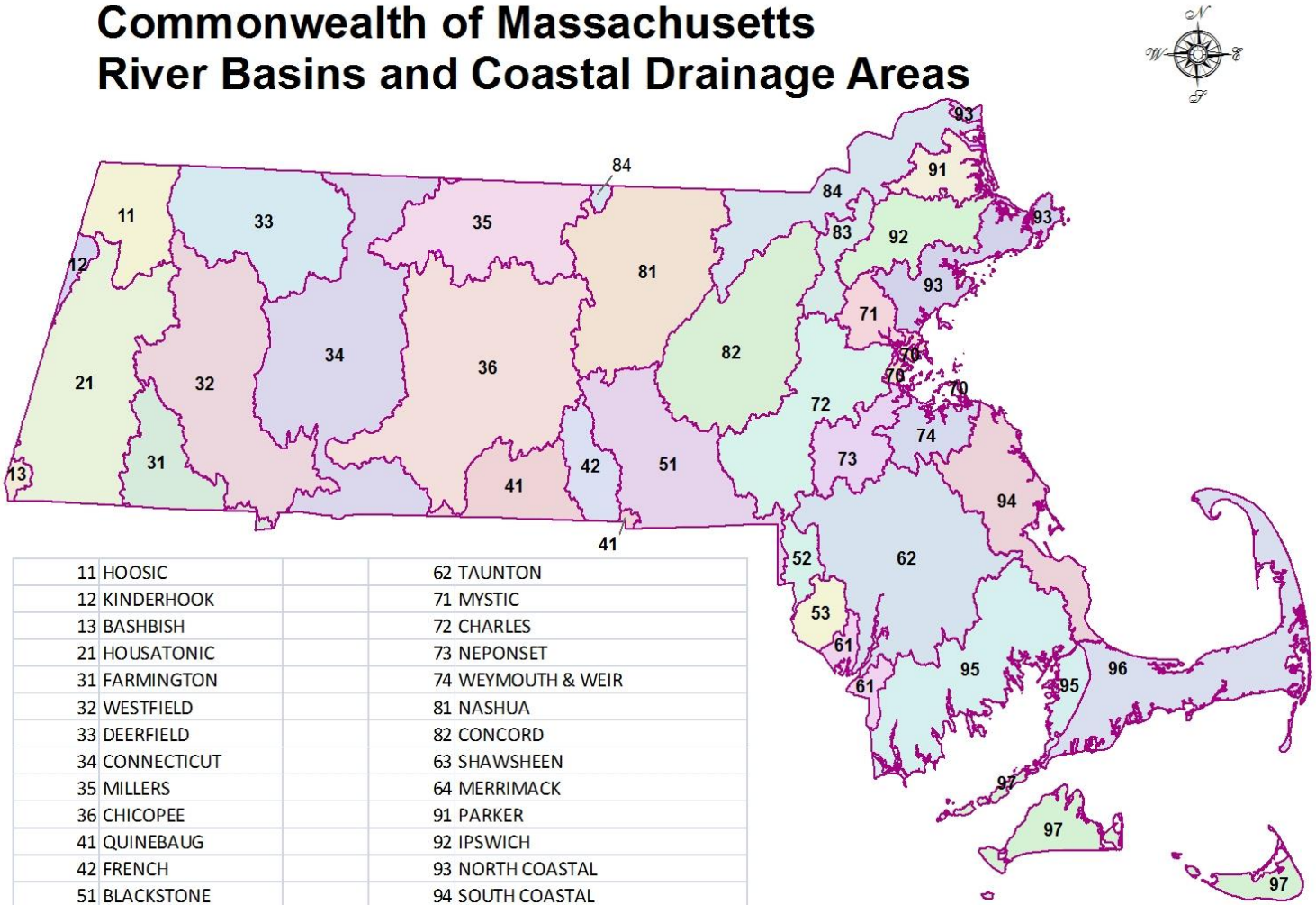
Activities funded by 319 are required to have a Quality Assurance Project Plan. MassDEP provides a Program Quality Assurance Project Plan that covers all 319-funded projects that do not have a sampling component. An Operation and Maintenance Plan is also required for each implementation project.

The Massachusetts river basins used in watershed planning are illustrated in Figure 1. Table 1 shows a comparison between the total number of projects funded through the 319 program in each basin, and the total project costs in each basin since the inception of the program in 1990.

These Indicative Summaries serve as examples of projects that have been competitively selected for funding, based on the priorities and guidelines that are in effect for the year that the project is selected. Program guidelines and priorities may change from year to year. Therefore, potential applicants are strongly encouraged to contact MassDEP program staff to discuss their ideas prior to proposal development, to ensure eligibility and competitiveness. Indicative summaries are presented in numerical order rather than by the fiscal year in which the project was selected.

Final reports for completed projects are available from the Division of Municipal Services, Massachusetts Department of Environmental Protection, 8 New Bond Street, Worcester, MA 01606, 508-767-2795.

Commonwealth of Massachusetts
River Basins and Coastal Drainage Areas



11	HOOSIC		62	TAUNTON
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21	HOUSATONIC		73	NEPONSET
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32	WESTFIELD		81	NASHUA
33	DEERFIELD		82	CONCORD
34	CONNECTICUT		63	SHAWSHEEN
35	MILLERS		64	MERRIMACK
36	CHICOPEE		91	PARKER
41	QUINEBAUG		92	IPSWICH
42	FRENCH		93	NORTH COASTAL
51	BLACKSTONE		94	SOUTH COASTAL
52	TEN MILE		95	BUZZARDS BAY
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MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
Number of 319 Projects and Allocation of Funds by Basin (1990-2016)

Table I

Basin Name	Number of Projects	Dollars Allocated (match plus 319 funds)
Hudson	0	0
Housatonic	17	$6,349,450
Deerfield	5	$1,361,570
Westfield	4	$998,170
Farmington	4	$173,200
Connecticut	16	$3,472,890
Millers	4	$908,910
Chicopee	8	$1,618,520
Quinebaug	2	$467,080
French	0	$0
Nashua	12	$3,350,230
Blackstone	10	$2,465,540
Merrimack	7	$1,125,690
Concord (SuAsCo)	9	$1,274,450
Shawsheen	3	$1,108,230
Parker	1	$88,300
Ipswich	5	$1,601,200
North Coastal	4	$453,600
Boston Harbor	15	$3,619,160
Charles	18	$5,153,280
South Coastal	22	$5,782,090
Cape Cod	18	$4,152,550
Islands	2	$218,600
Buzzards Bay	26	$4,909,250
Taunton	4	$283,090
Narr Bay & Mt Hope	0	$0
Ten Mile	1	$260,800
Statewide	61	$7,777,040
TOTAL	**278**	**$58,972,890**

Notes:
- Where projects encompass more than one basin, the grant allocation has been divided evenly among basins.
- Dollar amounts shown are total project costs and include 40% non-federal matching funds.
- All dollar amounts are rounded to the nearest $10.

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 12-01/319

PROJECT TITLE: Investigating Means Of Improving Onsite Septic Systems For Removal Of Contaminants Of Emerging Concern
NPS CATEGORY: Groundwater Disposal
INVESTIGATOR: Barnstable County Department of Health and the Environment
LOCATION: Statewide

DESCRIPTION:

The Massachusetts Septic System Test Center serves as a resource for quality third-party performance information regarding advanced onsite septic system technologies. In addition, the existence of the Test Center promotes the trial of new technologies to reduce nitrogen and phosphorus from wastewater.

This continuing project supports the state's TMDL program by providing environmental decision makers with the tools to achieve the goals of the TMDL and the Massachusetts Estuaries programs, especially where wastewater is a major source of pollutant loading. This project will continue the ongoing work of the MASSTC.

The project will investigate the effect of soil type in onsite septic system leach fields on the removal of pharmaceuticals, endocrine disrupting compounds and personal care products. The focus of the effort is to identify potential soil-layer placement and fill specification strategies that can be used to optimize the removal of selected contaminants of emerging concern (CEC). The information will be used to make recommendations for best management strategies to attenuate CEC inputs from septic systems. A second objective of the project is to facilitate the further development/testing of nutrient-removing onsite septic system technologies.

PROJECT COST: $ 99,964

FUNDING: $ 58,400 by the US EPA
$ 41,564 by Barnstable County and project participants

DURATION: 2012 – 2015

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 12-02/319

PROJECT TITLE: Decreasing Phosphorus in Cranberry Waters by Implementation of Best Management Practices
NPS CATEGORY: Agriculture
INVESTIGATOR: UMass Amherst
LOCATION: Buzzards Bay

DESCRIPTION:

Many inland water bodies in Southeastern Massachusetts watersheds are impaired due to enrichment of nutrients, and specifically phosphorus (P). Many ponds in the region are in categories 4 and 5, some have TMDLs and others are scheduled. An examination of aerial photographs of Southeastern Massachusetts illustrates the apparent hydrologic connection of many cranberry bogs to inland ponds. Cranberry production is a significant agricultural land use and economic driver in Southeastern Massachusetts; and when cranberry growing is associated with these ponds, BMPs that reduce P export become even more critical.

The focus of this project will be the reduction of P output from cranberry lands in order to meet current and anticipated TMDLs and generally improve water quality.

This project will have both *implementation* and *demonstration* tasks. Implementation activities with structural BMPs (a filtration system using aluminum oxide) and a sand filter bed will be evaluated. P levels will be evaluated in White Island Pond during each summer of the project to determine effects of these implementations on the Pond. Implementation of non-structural BMPs will be evaluated at 10-12 cranberry bog sites (fertilizer reduction evaluation and evaluation of changes in flood management including characterization of volumes). The utility of several other experimental approaches will be investigated/evaluated in the lab and demonstrated in the field. Outreach activities will educate growers about their utility and show them how to implement BMPs on their farms, thus multiplying the impact of the work.

PROJECT COST: $668,767

FUNDING: $346,716 by the US EPA
$322,051 by the University of Massachusetts

DURATION: 2012 – 2015

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 12-03/319

PROJECT TITLE: Minimizing Non-Point Source Pollution From Two Horse Facilities Through Installation And Demonstration Of Best Management Practices
NPS CATEGORY: Agriculture
INVESTIGATOR: UMass - Amherst
LOCATION: Statewide

DESCRIPTION:

The equine industry in Massachusetts, estimated to be over 50,000 animals, is of a size to make significant impact on non-point source pollution. An average horse generates about 45 lb. of manure per day, almost 10 tons per year as well as bedding. Thus, in Massachusetts approximately 500,000 tons of manure plus associated stall bedding are produced each year. Management of manure and mud on horse farms is a challenge for horse owners and equine facility managers. The growing number and size of unmanaged piles of manure seen on many properties is becoming an increasing concern due to greater public awareness and pressures in an increasingly urban society. Runoff from stables, manure piles and over grazed pastures has the potential to increase risks of non-point source pollution from nutrients, organic particles, fecal coliform bacteria, and other pathogens.

The goal of this project is to reduce the risk of nonpoint source pollution from equine facilities through installation and implementation of best management practices (BMPs) on two equine facilities. The project will also provide hands-on training to the Massachusetts equine community, including the general public, commercial equine stables, and riding facilities.

This project will focus on the equine industry with an emphasis on installing and implementing selected BMPs on the two pilot sites. BMPs include installation of three-bin composting systems, conversion of stable manure and bedding into biochar, improvement of exercise or sacrifice area footing using bark chips (hog's fuel) to prevent mud formation, use of various types of fencing to exclude horses from wetlands and water bodies, implementation of drainage swales, grass filter strips, gutters and downspouts for reducing mud formation and runoff, and creation of disposal areas for composting dead animals. The project will continue to support and reinforce USDA nutrient management programs and NRCS standards for nutrient management practices while reducing non-point source pollution.

PROJECT COST: $338,415

FUNDING: $198,500 by the US EPA
$139,915 by UMass Amherst

DURATION: 2012 – 2015

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 12-04/319

PROJECT TITLE: Massachusetts Stormwater Outreach and Education Program 2012
NPS CATEGORY: Urban Runoff
INVESTIGATOR: UMass - Amherst
LOCATION: Statewide

DESCRIPTION:

The goal of this project is to achieve a reduction in non-point source pollution by providing technology transfer on conventional and innovative stormwater BMPs and LID practices to a broad range of constituents, including Conservation Commissions, local and state officials, and other stormwater professionals. The project will build on an already developed source of validated technical information on BMPs; will provide end users with qualified information to make appropriate technology implementation decisions; and will assist municipalities to maximize the environmental benefits of grant programs by focusing efforts on technologies that have the most promising potential to reach specific water quality objectives. As municipalities comprise the primary intended audience for the web site, efforts to increase outreach to municipal officials directly will be a high priority for the upcoming project phase. In addition, MADEP requires a compatible source of information to support recommended performance rates that may be provided for innovative technologies in the revised stormwater guidance document of agency policy decisions.

This project provides technology evaluation, outreach and education via Web based materials providing validated performance information on a variety of stormwater BMPs. It will do so by maintaining, updating and expanding the existing MASTEP web site; and by promoting the site through a series of workshops and presentations offered to Conservation Commissions, local and state officials, and other stormwater professionals.

PROJECT COST: $ 92,956

FUNDING: $ 49,994 by the US EPA
$ 42,962 by UMass Amherst

DURATION: 2012 – 2015

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 13-01/319

PROJECT TITLE: Continued Investigation of Contaminants of Emerging Concern Discharged from Onsite Systems with Emphasis on Endocrine Disrupting Compounds
NPS CATEGORY: Groundwater Disposal
INVESTIGATOR: Barnstable County Department of Health and the Environment
LOCATION: Statewide

DESCRIPTION:
Investigations have indentified endocrine disrupting compounds as the priority contaminant class among Contaminants of Emerging Concern in areas such as Cape Cod where septic systems discharges are hydraulically connected with water supplies and sensitive wildlife aquatic habitats. This project will focus on two classes of endocrine disruptors, hormones and phenolic surfactants.

The goal of this aspect of the project is to further investigate the performance of soils-based low-technology onsite septic system designs for the removal of selected endocrine-disrupting compounds. This project will focus on seven natural and synthetic hormones and selected nonylphenol-containing surfactants know to have endocrine disrupting characteristics. The influence of hydraulic loading rate on removal efficiencies will also be investigated.

Project tasks include:

1. Sample and report on results for hormones and nonylphenol compounds.
2. Review all relevant literature relating to the use of Yeast Estrogen Screen (YES) tests and determine the feasibility of using this test to inform decisions on the extent and locations for the more expensive chemical analyses for estrogenic compounds. If the review indicates that the YES is a feasible option for determining estrogen influencing activity, conduct concurrent sampling of wastewater using YES and compare results with mass spectrometer findings.
3. Outreach

PROJECT COST: $68,574

FUNDING: $40,932 by the US EPA
$27,642 by the Barnstable County Department of Health and the Environment

DURATION: 2013 – 2016

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 13-02/319

PROJECT TITLE: Stormwater BMPs in the Provincetown Watershed
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Town of Provincetown
LOCATION: Cape Cod

DESCRIPTION:
Provincetown Harbor, currently listed on the 2010 Integrated List of Waters as a Category 4a water with a TMDL for pathogens, accommodates a multitude of recreational and commercial activities. The importance of the harbor to ecological systems, recreational uses, and the local economy demands appropriate planning and assessment of external impacts that may degrade this important resource. Dense development and large amounts of impervious areas immediately adjacent to the harbor result in significant stormwater runoff reaching the Harbor waters.

The project goal is to construct new permeable paving along a 3,200 foot long portion of Commercial Street, from Atlantic Avenue to the West End Parking Lot. Due to space limitations that are present along portions of Commercial Street and the amount of utilities within the road layout, porous pavement installation is a viable alternative to other drainage options. A preliminary BMP design for this area was completed as funded under a 2009 ARRA assisted 604(b) grant as part of an effort to address primary pollutants of concern in stormwater runoff to Provincetown Harbor, bacteria and sediments.

Project Tasks include:

1. Design and construct BMPs
2. BMP Operation and Maintenance plan
3: Public Education and Outreach

PROJECT COST: $1,000,000

FUNDING: $600,000 by the US EPA
$400,000 by the Town of Provincetown

DURATION: 2013 – 2016

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 13-03/319

PROJECT TITLE: Sediment Management BMPs for the South River in Conway
NPS CATEGORY: Resource Restoration
INVESTIGATOR: Franklin Regional Council of Governments
LOCATION: Deerfield River

DESCRIPTION:
This project is a priority restoration project on the South River in Conway, MA. The site is downstream of the Route 116 Bridge and combines bank stabilization measures to address 1,400 feet of eroding river bank and a floodplain lowering component to provide the river access to its floodplain to increase sediment storage and reduce flood flow velocities.

Approximately 13 miles of the South River from Emmett Road in Ashfield to the confluence with the Deerfield River, is listed on the 2010 Integrated List of Waters as a Category 5 Waters "Waters requiring a TMDL" for fecal coliform. This reach is also listed as having physical substrate habitat alterations.

The project goals are to stabilize 1,400 feet of eroding bank, and floodplain lowering to increase sediment storage, and reduce flood flow velocities and sediment loading to the South River and downstream receiving waters.

Project tasks include:

1. Design and construct BMPs
2. BMP Operation and Maintenance plan
3: Education and Outreach

PROJECT COST: $397,500

FUNDING: $238,500 by the US EPA
$159,000 by the Franklin Regional Council of Governments and participating communities.

DURATION: 2013 – 2016

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 13-04/319

PROJECT TITLE: Reducing Stormwater Pollution in the Western Millers River Watershed with Low Impact Development
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Franklin Regional County of Governments
LOCATION: Millers River

DESCRIPTION:
This project will implement a program in the western Millers River Watershed that is similar to the LID outreach and education project (11-06/319) undertaken by the Montachusett Regional Planning Commission (MRPC) in the eastern portion of the Millers River Watershed. Approximately 18.5 miles of the Millers River from South Royalston to Erving Center is listed as Category 5 Waters, waters requiring a TMDL for fecal coliform and total phosphorus, and most of the impervious surface area in the western portion of the Millers River Watershed in Franklin County is associated with Orange and Montague.

The project goal is to mitigate the impacts of stormwater runoff in Montague and Orange, and encourage development that incorporates LID to protect the sensitive areas in the more rural areas of the watershed. This project, combined with the work of MRPC in the eastern part of the watershed, will reduce the amount of nonpoint source pollution from stormwater and improve water quality for the impaired waterbodies in the Millers River Watershed.

Project tasks include:

1. Updating Local Bylaws with LID requirements
2. Regional LID Outreach and Training Workshops
3. Project Evaluation

PROJECT COST: $58,333

FUNDING: $35,000 by the US EPA
$23,333 by the participating communities

DURATION: 2013 – 2016

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 13-05/319

PROJECT TITLE: Manchaug Pond Water Quality Improvement - Phase 2
NPS CATEGORY: Resource Restoration
INVESTIGATOR: Manchaug Pond Foundation
LOCATION: Blackstone Basin

DESCRIPTION:

This project will implement Nonpoint Source Improvements in the form of structural stormwater BMPs in the Manchaug Pond Watershed to help improve the water quality of the pond (listed as Category 5 for low dissolved oxygen). The Manchaug Pond Foundation would lalso like to extend agricultural efforts beyond education and work directly with a large farm operation to provide technical services for the design and implementation of agricultural BMPs, and focus their educational efforts by providing NPS education and promoting watershed awareness to area children.

The project goals are: 1) sediment loading and associated pollutants are reduced, 2) invasive aquatic weed populations continue to decrease, 3) targeted outfalls are free of stormwater debris and erosion, and 4) watershed residents are knowledgeable about residential landscaping techniques and maintenance protocols for a healthy lake.

Project tasks include:

1. Design and construct BMPs
2. BMP Operation and Maintenance plan
3. Public education and outreach,
4. An aquatic weed management program

PROJECT COST: $208,525

FUNDING: $119,865 by the US EPA
$ 88,660 by the Manchaug Pond Foundation

DURATION: 2013 – 2016

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 13-06/319

PROJECT TITLE: Massachusetts Nonpoint Source Pollution Management Manual, Update, and Enhancement
NPS CATEGORY: Outreach and Education
INVESTIGATOR: Geosyntec Consultants Inc.
LOCATION: Statewide

DESCRIPTION:
This project will significantly improve the current (2006) version of the Massachusetts Nonpoint Source Pollution Management Manual (Manual), also known as the Clean Water Toolkit, with respect to content and accessibility by developing: 1) web format and feature upgrades that reflect current technology and usage of web-base educational materials: 2) content updates that reflect current regulations, BMP technologies and research; and, (3) additional interactive features that will provide more robust information, including linkage to past 319 grant project case studies.

The project goals are: 1) Improve functionality and content of the Manual through web format and feature upgrades that reflect current technology and usage of web-based educational materials, 2) Develop Manual content updates that reflect current regulations, BMP technologies, and research, 3) Develop new interactive features that will provide more robust information, including a collection of interactive site schematics and linkages to past 319 grant project case studies, and 4) Increase overall public education and outreach with regard to NPS pollution through improved NPS Manual accessibility and a better web user experience.

Project tasks include:

1. Plan and Develop Working Group
2. Update NPS Manual Content
3. Re-Design and Upgrade the BMP selector Tool
4. Develop interactive BMP Site Schematics
5. Searchable Case Studies/319 Grant Project Summaries
6. Convert NPS Manual to HTML format and Host on Website

PROJECT COST: $179,150

FUNDING: $107,490 by the US EPA
$ 71,660 by Geosyntec and project participants

DURATION: 2013 – 2016

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 13-07/319

PROJECT TITLE: City of Boston Porous Pavement Green Alley NPS Demonstration Project
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Charles River Watershed Association
LOCATION: Boston Harbor

DESCRIPTION:
This project will result in the design, construction, and monitoring of a permeable pavement retrofit in the City of Boston; outreach and education about the project; and a detailed analysis of the results of the project to enable replication of this technology, and to identify improvements or modifications that may be necessary. The permeable pavement will reduce stormwater volumes, reduce pollutant contributions to surface water bodies, increase the recharge of the City's groundwater, reduce existing flooding problems, and improve the aesthetics in the area. The result of this demonstration project will be to create design recommendations for the use of permeable pavements for retrofitting alleys in the City of Boston and the Region.

The project goals are: 1) Reduce nonpoint source pollutant (NPS) contributions to water bodies by decreasing the stormwater runoff volumes and treatment via permeable pavement and subgrade materials; 2) Increase the recharge of water in the City's Groundwater Conservation Overlay District; 3) Evaluate the potential for using permeable pavements in alleys as a standard practice for improving stormwater management in the City of Boston; 4) Quantify the benefits of the project with a monitoring program; 5) Develop design recommendations for the use of permeable pavements for retro-fitting alleys in the City of Boston; and 6) Identify areas for suggested additional research and investigation.

Project tasks include:

1. Design and construct BMPs
2. BMP Operation and Maintenance plan
3. Education and Outreach

PROJECT COST: $532,320

FUNDING: $297,776 by the US EPA
$234,544 by the City of Boston

DURATION: 2013 – 2016

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 13-08/319

PROJECT TITLE: ACPP Technical Providers for the Palmer River Watershed
NPS CATEGORY: Agriculture
INVESTIGATOR: Massachusetts Association of Conservation Districts (MACD)
LOCATION: Narragansett Basin/Palmer subwatershed

DESCRIPTION:
The Palmer River Watershed in the Narragansett Bay Basin has been selected by the USDA Natural Resources Conservation Service (NRCS) as the target of the National Water Quality Initiative (NWQI) in Massachusetts (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ma/programs/?cid=nrcs144p2_013949).

The Palmer River is impaired by pathogens and nutrients, some of which are related to agricultural activities. Pollutants from farms can effectively be mitigated through farm conservation practices and other nonpoint source BMPs. Under the NWQI, NRCS will dedicate additional technical and financial resources to address these impairments. MassDEP, through its 319 Nonpoint Source Program, can provide technical and financial resources. The Massachusetts Association of Conservation Districts (MACD), through its Accelerated Conservation Planning Program (ACPP), has field staff who can be engaged to work with Palmer River farmers to develop and implement conservation planning practices and nonpoint source BMPs to address NWQI goals.

The Grantee is the MACD. Under this agreement, MACD will provide two FTEs to serve as field staff dedicated to undertake the tasks and produce the deliverables as outlined herein. The goals of the project include 1) complete as many farm conservation plans as possible and 2) fully implement as many of the completed plans as possible.

The primary pollutants of concern are nutrients and pathogens.

Project tasks include:

1. Develop and implement farm conservation plans
2. Provide technical and regulatory support
3. Outreach and education
4. Help farmers identify and access financial and technical resources for enhanced water quality protection
5. Evaluate program successes and challenges Evaluate program successes and challenges to determine how the project outcomes can be used in furtherance of a Regulatory Certainty initiative.

PROJECT COST: $335,000

FUNDING: $200,000 by the US EPA
$ 25,000 by the Rehoboth Agricultural Commission
$ 35,000 by the Bristol County Conservation District
$75,000 by Participating Producers

DURATION: 2013 – 2016

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 13-09/319

PROJECT TITLE: Development of the 2014 Massachusetts Nonpoint Source Management Plan
NPS CATEGORY: Outreach and Education
INVESTIGATOR: Geosyntec Consultants Inc.
LOCATION: Statewide

DESCRIPTION:
The current version of the Massachusetts Nonpoint Source (NPS) Management Plan (http://www.mass.gov/eea/agencies/massdep/water/watersheds/nonpoint-source-pollution.html#4) was written in 1999. The plan outlined a strategy for addressing nonpoint source problems in accordance with EPA's then-current guidance. Over time, the 1999 plan was amended to reflect new initiatives and program changes. One amendment supports the use of SRF funds for green infrastructure and energy projects. Additional updates to the plan were also made to append the Nonpoint Source Action Strategies and the Massachusetts Watershed-based Plan. However, none of these amendments and appendixes has included a total revision of the 1999 plan.
MassDEP, in accordance with new EPA 319 Nonpoint Source guidelines ("Guidelines," April 2013, Nonpoint Source Program and Grants Guidelines for States and Territories, http://water.epa.gov/polwaste/nps/upload/319-guidelines-fy14.pdf), has selected Geosyntec Consultants, Inc. of Acton, MA to provide consulting services to revise and update the Massachusetts Nonpoint Source Management Plan to reflect current and future plans and priorities.

The 2014 Plan will cover a five-year timeline and will be organized to facilitate review and updating every five years. The 2014 Plan will revise and update the 1999 plan as needed, and will be consistent with April 2013 Guidelines. In particular, the 2014 NPS Management Plan should include activities that will:

- Instill, encourage, and nurture a passion for clean water and for the protection of water and related resources
- Increase awareness of NPS issues across agencies, stakeholders, and general public
- Establish and strengthen a watershed-based stakeholder network to support and carry out NPS monitoring, education and outreach, project development and implementation
- Support and promote local watershed planning and implementation of watershed-based plans
- Engage and strengthen local, state and federal partners to ensure coordinated and strategic program activities by all parties
- Based on the Recovery Potential Screening Tool, refine a strategy to prioritize watersheds for remediation
- Identify and prioritize high quality waters in need of protection
- Provide a basis for the allocation of resources to priority watersheds and activities
- Incorporate actions and strategies for adaptation to climate change
- Showcase and support program activities of all partners
- Identify and expand opportunities to accomplish and leverage NPS work through SRF, SWMI, CZM, NEP, EPA, and other state, federal, and non-governmental programs
- Encourage the use of green and sustainable technology for energy efficiency and associated mitigation of NPS air quality
- Emphasize coordination and strengthening of partnerships with agricultural community and agencies
- Identify needs and make recommendations for additional policies, regulations, and BMPs to enhance mitigation of NPS in the Commonwealth

PROJECT COST: $207,400
FUNDING: $203,348 by the US EPA
$ 4,052 by Geosyntec Consultants
DURATION: 2013 – 2014

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 14-01/319

PROJECT TITLE: Investigation of Passive Nitrogen Removal Strategies for Onsite Septic Systems at the Massachusetts Alternative Septic System Test Center
NPS CATEGORY: Groundwater Disposal
INVESTIGATOR: Barnstable County Department of Health and the Environment
LOCATION: Statewide

DESCRIPTION:

This project will take the findings from the publically-financed Florida Passive Nitrogen Removal Project and determine which elements from that study are successful, applicable, and transferable. This includes field testing of promising Florida designs at the Massachusetts Alternative Septic System Test Center (MASSTC). This investigation continues MASSTC's work to assure wastewater planners and managers that all decentralized options are properly evaluated and to provide tools for the management of wastewater nitrogen. This investigation will be conducted at MASSTC, which serves as a resource for quality third-party performance information regarding advanced onsite septic system technologies.

The project goals are to evaluate results from the Florida Passive Nitrogen Removal Project and determine whether elements from that study are successful, applicable, and transferable to the Massachusetts coastal area.

Project Tasks Include:

1. Determine whether the passive denitrification strategies investigated in Florida have relevance to the Massachusetts geographical area.
2. Conduct rigorous field testing of promising nitrogen removal technologies identified in the Florida study.
3. Determine what specific designs from that project hold the most promise for success in this geographical area, or what modifications may be required to compensate for differences in water chemistry, climate, or other factors.
4. If testing indicates promising results, then prepare a report describing design, expected nutrient removal, costs, life cycle, sustainability, etc.
5. Conduct this project concurrent to continued testing of additional proprietary technologies that purport to remove nitrogen.

PROJECT COST: $146,184

FUNDING: $ 85,725 by the US EPA
$ 60,459 by Barnstable County and project participants

DURATION: 2014-2017

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 14-02/319

PROJECT TITLE: White Island Pond Phosphorus Inactivation Project
NPS CATEGORY: Resource Restoration
INVESTIGATOR: Town of Plymouth
LOCATION: Buzzards Bay

DESCRIPTION:

White Island Pond, located in the towns of Plymouth and Wareham, is a shallow lake with a TMDL for phosphorus. Previous rounds of 319 and 604b funding have supported a strategy to control watershed phosphorus inputs, most notably from cranberry bogs. High anthropogenic inputs of phosphorus have settled into the sediments over many years. The internal sediment is the remaining major contributor of the total phosphorus budget, and an alum treatment or similar phosphorus control is recommended by the TMDL to control the phosphorus in the water column and lake sediment.

The goal of this project is to apply alum that will sequester the phosphorus in the water column and bottom sediments that cause impairments to the White Island Pond. Ultimately the goal is to move White Island Pond from the 303d list of impaired waters by addressing a major contributor of total phosphorus, internal sediment.

Project Tasks Include:

1. Conduct three phased treatments to remove phosphorus from the water column.
2. Collect water quality and analyze for total phosphorus, and take secchi disk measurements.
3. Public outreach conducted through educational newsletters and website updates.

PROJECT COST: $437,010.09

FUNDING: $260,231.50 by the US EPA
$176,778.59 by the Town of Plymouth and project participants

DURATION: 2014 – 2017

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 14-03/319

PROJECT TITLE: Monoosnoc Brook Renewal Project
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Massachusetts Watershed Coalition
LOCATION: Nashua Basin

DESCRIPTION:

Monoosnoc Brook flows out of the hills on the west side of Leominster. The brook connects six impoundments, the city's busy downtown area, and a variety of industrial facilities. Pollutants from urban runoff are transported downstream into the North Nashua River, which is listed in Category 5 on the 2006 *Integrated List of Waters* with a pathogen impairment. This project will design and install source reduction BMPs to reduce the amount of pollutants being discharged to the Brook. This project also will compile data on cost effective BMPs and LID techniques, and produce guidance, in the form of a BMP Cost Catalog to help local officials select practices that achieve the most pollutant removal for the least cost.

The project goals are to reduce sediment, phosphorus, and bacteria that impair Monoosnoc Brook and the North Nashua River through the installation of stormwater management BMPs, community outreach to assist source reduction, and the development and release of a BMP Cost Catalog.

Project Tasks Include:

1. Design and install BMPs, including three sediment vaults paired with infiltration trenches, seven bioswales, five treebox filters, four tandem leaching catch basins, porous paving, and rain gardens. All BMPs will be placed on municipal property.
2. Develop a BMP Cost Catalog to supply information for remediation projects and encourage more communities to revitalize streams impacted by urban runoff.
3. Provide community outreach and education through workshops, newspaper articles, cable TV programs, and working with the local conservation commission and planning board.

PROJECT COST: $515,000

FUNDING: $229,000 by the US EPA
$286,000 by the Massachusetts Watershed Coalition and project participants

DURATION: 2014 – 2017

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 14-04/319

PROJECT TITLE: Using Low Impact Development Techniques to Manage Stormwater Runoff in Greenfield
INVESTIGATOR: Franklin Regional Council of Governments
NPS CATEGORY: Urban Runoff
LOCATION: Deerfield Basin

DESCRIPTION:

The Green River is an important tributary to the Deerfield River. The segment of the Green River that flows through downtown Greenfield is listed as a Category 5 impaired waterbody requiring a TMDL for fecal coliform. This project will design and install BMPs to reduce urban stormwater runoff, a major contributor of nonpoint source pollution in the Green River.

The project goals are to reduce nutrients, pathogens, and sediment that impair the Green River through the installation of stormwater management BMPs, community outreach including an outdoor 'classroom' facility, and a public awareness campaign.

Project Tasks Include:

1. Retrofit a two-acre parking lot with the addition of bioretention areas to treat runoff that flows without treatment to the Green River.
2. Create an outdoor classroom at a site behind the Greenfield Public Library to demonstrate rain gardens and lawn care practices.
3. Implement a campaign to raise public awareness of stormwater pollution and to encourage residents and public officials to take action to reduce stormwater pollution.
4. Conduct two workshops for area residents to help reduce runoff from residential lawns.
5. Introduce local officials to low impact development (LID) regulations.
6. Conduct regional educational outreach efforts.

PROJECT COST: $595,600

FUNDING: $218,600 by the US EPA
$377,000 by the Town of Greenfield and project participants

DURATION: 2014 – 2017

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 14-05/319

PROJECT TITLE: Lake Gardner & Powow River Nonpoint Source Improvement Project
NPS CATEGORY: Resource Restoration
INVESTIGATOR: Town of Amesbury
LOCATION: Merrimack Basin

DESCRIPTION:

The Powow River is listed as a Category 5 impaired waterbody for pathogens (fecal coliform), total suspended solids, and turbidity. Lake Gardner is a 93-acre lake that lies between several reaches of the Powow River in the Merrimack River watershed.

This project will implement several prioritized BMPs to reduce pathogens, total suspended solids, and nutrients within the Lake Gardner and Powow River watersheds. The project goals are to reduce the amount of pollutants being discharged through the design and construction of stormwater BMPs at five prioritized locations within the watershed. This will help decrease the nonpoint source pollution impacts on water quality in Lake Gardner/Powow River and ultimately improve the water quality of the Merrimack River.

Project Tasks Include:

1. Design and install BMPs, including infiltration swales, deep sump catch basins with off-line leaching pipes/infiltration trench, and a subsurface interceptor trench to reduce erosion.
2. Install additional pet waste dispensers.
3. Provide community outreach and education through a new stormwater display for the DPW building and Lake Gardner Beach kiosk, an educational brochure, and material posted online.

PROJECT COST: $278,360

FUNDING: $166,960 by the US EPA
$111,400 by Town of Amesbury and project participants

DURATION: 2014 – 2017

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 14-06/319

PROJECT TITLE: Ipswich River Watershed BMP Implementation at Farley Brook
INVESTIGATOR: Town of Ipswich
NPS CATEGORY: Resource Restoration
LOCATION: Ipswich Basin

DESCRIPTION:

Farley Brook, located in the Town of Ipswich, is a major contributor of contaminated stormwater runoff to the Ipswich River. The segment of the river that receives the discharge from the Brook is listed as a Category 5 waterbody for pathogens, impacting important shellfish beds. Reducing the loading from Farley Brook to the Ipswich River is anticipated to be a major step in improving the condition of the river by addressing the existing TMDL for pathogens.

The project goals are to reduce pathogens, phosphorus, and sediment that impair the Ipswich River through the design and installation of a structural BMP, and implementation of an outreach and training program. This will help decrease the nonpoint source pollution impacts on water quality in Farley Brook and ultimately improve the water quality of the Ipswich River.

Project Tasks Include:

1. Design and install engineered wetlands along the open section of Farley Brook to serve as pretreatment steps for the removal of the target pollutants.
2. Design and install a structural BMP downstream from the wetlands along the culverted section of Farley Brook to provide final treatment of the stream flow prior to it entering the Ipswich River. This BMP will be subsurface treatment systems located beneath the Hammatt Street parking lot. After treatment, the flow will reconnect with the Farley Brook culvert before discharging to the Ipswich River.
3. Outreach and educational presentations to the Ipswich Board of Selectmen and project updates on the Town's website.

PROJECT COST: $438,782

FUNDING: $261,600 by the US EPA
$177,182 by the Town of Ipswich and project participants

DURATION: 2014 – 2017

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 14-07/319

PROJECT TITLE: Tree Canopy Stormwater Implementation & Outreach Program
NPS CATEGORY: Outreach and Education
INVESTIGATOR: Comprehensive Environmental, Inc.
LOCATION: Statewide

DESCRIPTION:

This project will develop and implement a program to preserve, replace, and enhance mature tree canopy, as an integrated component of stormwater management design in Massachusetts. The project will quantitatively characterize the potential role of canopy trees in achieving significant reductions in stormwater runoff; develop model regulatory language for use at both the municipal and state level for fostering the employment of tree canopy as a BMP; and compile guidelines for the use of trees for stormwater management in the urban landscape. These deliverables will be combined with a web-based technology clearinghouse to assist with distribution.

The project goal is to contribute to the suite of tools and resources available for remediation of stormwater impacts in urban and suburban areas. Trees are often overlooked as a natural BMP and it is hoped that these deliverables will advance the use of this natural and aesthetically pleasing option.

Project Tasks Include:

1. Develop a technical foundation upon which to base guidance materials and regulatory approaches for preserving and establishing tree canopy as an integral component of stormwater management practice. Develop and assess prototypical street and parking area tree planting scenarios, to quantitatively characterize the role tree canopies play in stormwater management.
2. Using this information, develop model regulatory language that can be adapted to municipal and state agency use.
3. Compile guidelines for the use of trees for stormwater management in the urban/suburban landscape. Guidelines will include resources for implementing public tree canopy programs as well as for private property owners.
4. Develop an online technology transfer clearinghouse to help in implementing the model regulation and guidelines.

PROJECT COST: $79,960

FUNDING: $47,976 by the US EPA
$31,984 by Comprehensive Environmental, Inc. and project participants

DURATION: 2014 – 2017

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 14-08/319

PROJECT TITLE: Assessing the Potential Effects of Climate Change on Stormwater Best Management Practices (BMPs) in Coastal Communities
NPS CATEGORY: Resource Restoration
INVESTIGATOR: EEA/CZM
LOCATION: Coastal

DESCRIPTION:

Climate change is predicted to bring about hydrologic changes including sea level rise, altered rainfall patterns, and groundwater fluctuations that will affect stormwater management in coastal communities. This project will provide an evaluation of stormwater BMPs in coastal communities to assess current and future performance through direct inspection and climate change scenario testing, including, but not limited to, the effects of salt water, flooding, expected design longevity of the treatment systems, and other factors.

Project outcomes will include recommendations for technologies or design elements to increase resiliency of stormwater Best Management Practices (BMPs). In addition, it will include recommendations for improvements to BMP design and operation and maintenance activities.

This project will lay the groundwork to assist state and municipal efforts to better protect coastal resources from potential impacts from climate change and will support the advancement of robust adaptation strategies and suitable policy change. Evaluations of currently employed BMPs and any potential new technologies will be conducted, as well as an evaluation of operation and maintenance activities and requirements. The analysis will include examination of BMP design life and continued effectiveness in the face of impacts from climate change.

The deliverable will be a report summarizing climate change impacts to stormwater management, design and operation recommendations, evaluation of current BMPs at risk, and recommendations to improve resiliency, as described above.

PROJECT COST: $75,000

FUNDING: $50,000 by the U.S. EPA
$25,000 by EEA/Coastal Zone Management (CZM)

DURATION: 2014 – 2015

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 14-09/319

PROJECT TITLE: Revision of Massachusetts Watershed-based Plans
NPS CATEGORY: Program
INVESTIGATOR: Geosyntec Consultants Inc.
LOCATION: Statewide

DESCRIPTION:

EPA's revised Nonpoint Source Program and Grants Guidelines for States and Territories (the "NPS Guidelines") issued on April 12, 2013, apply to all § 319-funded grant activities beginning in fiscal year 2014. These guidelines are requirements that apply to recipients of grants made with funds appropriated by Congress under § 319 of the Clean Water Act. These guidelines emphasize the use of § 319 funds for the implementation of WBPs to restore impaired waters and require states to set aside at least 50% of the § 319 funds for watershed projects that implement WBPs.

WBPs provide a watershed-specific roadmap to guide cost-effective, well-informed restoration and protection efforts. The EPA Guidance lists nine elements that are required to be included in WBPs. EPA continues to require that watershed projects funded under § 319 directly implement a WBP addressing the nine elements.

This project will develop a template-based tool to be used by agencies and stakeholders to develop the elements necessary to form the basis of good watershed-based projects.

Project Tasks Include:

1. Quality Assurance Program Plan ("QAPP") and Evaluation
2. Develop WBP Website
3. Prepare Information for Watersheds Statewide
4. Prepare WBP Guidance
5. WBP Technical Support
6. WBP Pilot Projects
7. Public Outreach
8. Reporting and Project Oversight

PROJECT COST: $399,411

FUNDING: $388,883 by the U.S. EPA
$ 10,528 by Geosyntec Consultants

DURATION: 2014 – 2017

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 15-01/319

PROJECT TITLE: Franklin Phase II of Stormwater BMP Retrofits
NPS CATEGORY: Resource Restoration
INVESTIGATOR: Town of Franklin
LOCATION: Charles River Watershed

DESCRIPTION:
Mine Brook, a major tributary to the Charles River within Franklin, is listed as impaired for thermal modifications and other habitat alterations in the Massachusetts Integrated Waters Reports MassDEP 2012 Integrated List of Waters. The Mine Brook subwatershed is the largest and most urbanized subwatershed within Franklin, encompassing the majority of the downtown area, and is a significant contributor to the Charles River. Reducing the pollutant loading to Mine Brook is anticipated to be an important step in improving the condition of the water quality.

PROJECT GOALS:
The project goals are to reduce the NPS that impairs Mine Brook and the Upper Charles River through the design and installation of BMPs and an outreach and training program. Decreasing the nonpoint source pollution impacts will ultimately improve the water quality in Mine Brook and the Upper Charles River. This project will retrofit three existing BMPs at the Jefferson Elementary and Remington Middle Schools, add bioretention areas and tree box filters along Cottage Street and Union Street, and install a bioretention area along Panther Way.

PROJECT TASKS INCLUDE:
1: Quality Assurance and Project Evaluation
2: Design and Construct Stormwater Management BMPs
3: Design and construct a bioretention area along Panther Way
4: Install vegetation in the bioretention area along Panther Way to enhance pollutant removal.
5: BMP Operation and Maintenance Plan
6: Public Education and Outreach
7: Reporting and Project Oversight

PROJECT COST: $234,500

FUNDING: $117,650 by the US EPA
$116,850 by the Town of Franklin

DURATION: 2015 – 2017

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 15-02/319

PROJECT TITLE: Dedham Mother Brook BMP Implementation Project
NPS CATEGORY: Resource Restoration
INVESTIGATOR: Town of Dedham
LOCATION: Neponset

DESCRIPTION:
Mother Brook, located in the Town of Dedham, is listed as "impaired for pathogens and nutrients in the MassDEP 2012 Integrated List of Waters". Mother Brook is a tributary to the Neponset River; both are listed as a Category 5 waterbody for pathogens. Reducing the loading to Mother Brook is anticipated to be a major step in improving water quality in both waterbodies.

PROJECT GOALS:
The project goals are to reduce pathogens, phosphorus, and sediment that impairs the Mother Brook and the Neponset River by constructing structural stormwater BMPs at the top three sites recommended through Dedham BMP Development 604b Project 2010-02/604, and by implementing an outreach and training program. Decreasing the nonpoint source pollution impacts will ultimately improve the water quality in Mother Brook and the Neponset River.

This project will construct a bioretention cell with a sediment forebay on Colburn Street, a subsurface infiltration system and water quality swale on Avery Street, and a bioretention cell on Sawmill Lane.

PROJECT TASKS:
1: Quality Assurance and Project Evaluation
2: Design and Construct Stormwater Management BMPs
3: BMP Operation and Maintenance Plan
4: Public Education and Outreach
5: Reporting and Project Oversight

PROJECT COST $148,124

FUNDING: $ 88,113 by the US EPA
$ 60,011 by the Town of Dedham

DURATION: 2015 – 2017

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 15-03/319

PROJECT TITLE: Upper Caroline Brook Restoration Project
NPS CATEGORY: Resource Restoration
INVESTIGATOR: Town of Wellesley
LOCATION: Charles River Watershed

DESCRIPTION:
The project will address water quality impairments in the Fuller Brook, listed as a Category 5 for impaired for physical substrate habitat, alterations, pathogens, nutrients, and sedimentation, by designing, installing, and maintaining BMPs to reduce pollutant loading from stormwater runoff and streambank erosion in the upper Caroline Brook, and BMPs improving habitat within the stream corridor. Reducing the loading to the headwaters of the upper Caroline Brook is anticipated to be a major step in improving the condition of the water quality in upper Caroline Brook and Fuller Brook.

PROJECT GOALS:
The project goals are to reduce pollutant loads from stormwater runoff currently entering the brook with no treatment and from eroding streambanks. Proposed BMPS include bioretention retrofits, disconnecting a discharge from an unpaved road, hard and soft steam stabilization practices (cross vanes, vegetative stabilization), and relocating the streambed below the Forest Street culvert to protect an undermined sewer main.

PROJECT TASKS INCLUDE:

1: Quality Assurance and Project Evaluation
2: Design and Construct Stormwater Management BMPs
3: BMP Operation and Maintenance Plan
4: Public Education and Outreach
5: Reporting and Project Oversight

PROJECT COST: $561,792

FUNDING: $337,048 by the US EPA
$224,744 by the Town of Wellesley

DURATION: 2015 – 2017

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 15-04/319

PROJECT TITLE: A Watershed-Based Plan to Maintain the Health and Improve the Resiliency of the Deerfield River Watershed
NPS CATEGORY: Healthy Watersheds
INVESTIGATOR: Franklin Regional Council of Governments
LOCATION: Deerfield River Watershed

DESCRIPTION:
The Deerfield River Watershed contains high quality water resources and large blocks of contiguous habitat. The development and implementation of a comprehensive watershed management plan will protect the high water quality of the Watershed, increase its resiliency to climate change, and restore the water quality and degraded fluvial geomorphic and habitat functions of impaired areas of the watershed.

PROJECT GOALS:
Develop a comprehensive Watershed-Based Plan for the Watershed that integrates the statewide Watershed-Based Plan strategy, the EPA's Healthy Watersheds Initiative, and climate change adaptation strategies. The plan will characterize the watershed conditions, identify, investigate, and address the current and emerging issues facing the watershed, and include specific, measurable actions to protect and improve water resource conditions and climate change resiliency. It will result in on-the-ground change within the watershed by recommending specific, measurable actions to protect and improve water resource conditions, and will proceed simultaneously with the development of the statewide strategy and may be amended accordingly.

PROJECT TASKS INCLUDE:
1: Quality Assurance and Project Evaluation
2: Build Partnerships
3: Compile Baseline Watershed Conditions Data [Element A of a Watershed-Based Plan]
4: Issue Request for Responses for Consultant Services for Tasks 5, 6, and 7
5: Estimate Pollutant Loads [Element A]
6: Comparative Subwatershed Analysis
7: Watershed Field Inventories [Elements A and C]
8: Land Use Regulatory Review [Element C]
9: Green Infrastructure Assessment and Climate Change Vulnerability Analysis [Element C]
10: Deerfield River Watershed Plan [Elements C, D, F, G, H, and I]
11: Issue Request for Responses for Consultant Services for Task 10.
12: Public Education and Outreach [Element E]
13: Climate Pilot Study for the Deerfield River Watershed

PROJECT COST: $305,971

FUNDING: $182,250 by the US EPA
$123,721 by the Franklin Regional Council of Governments

DURATION: 2015 – 2017

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 15-05/319

PROJECT TITLE: Small Farm BMP Guidance & Statewide NPS Outreach Project
NPS CATEGORY: Agriculture
INVESTIGATOR: Comprehensive Environmental Inc.
LOCATION: Statewide

DESCRIPTION:
This project will produce a statewide guidance document specifically geared towards the smaller farmer along with a series of quick read fact sheets to provide the needed information for them to manage their backyard hobby farms while reducing nonpoint source pollution entering nearby waterbodies. This project will also focus on outreach to organizations that can provide insight on what challenges small farmers face and who are in a position to distribute the resulting educational material to individual hobby farmers and remain a local source of support to them.

PROJECT GOALS:
Develop a set of easily understood educational materials to address the nonpoint source pollution challenges that small or hobby farmers face. Provide outreach to stakeholders, watershed associations, board of health offices, and other groups to obtain information on hobby farmer needs in their community to help define and distribute final content in the manual and fact sheets.

PROJECT TASKS:
1: Establish Advisory Committee
2: Integrating Small Farms into Watershed Management – Initial Outreach
3: Small Farm Guidance Manual
4: Small Farming Topic Specific Fact Sheets
5: Distribution of Small Farm Material & Survey
6: Reporting and Project Oversight

PROJECT COST: $166,186

FUNDING: $ 99,686 by the US EPA
$ 66,500 by Comprehensive Environmental Inc.

DURATION: 2015 – 2017

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 15-06/319

PROJECT TITLE: Stockbridge Bowl Management Project – Phase II
NPS CATEGORY: Resource Restoration
INVESTIGATOR: Town of Stockbridge
LOCATION: Housatonic River Watershed

DESCRIPTION:
Stockbridge Bowl is impaired by Eurasian water-milfoil which inhibits flow and facilitates sedimentation. A drawdown of 4' to inhibit growth had historically been achieved but accumulated sediments and aquatic plant growth have choked the outlet so that the maximum drawdown is not enough to control the non-native plant growth. A diversion pipe was installed underneath a gas pipeline set in a berm (with support of previous 319 Grant, project number 09-02/319). The diversion pipe has the potential to divert enough water past the berm to achieve the ideal drawdown. However, the effectiveness of the diversion pipe is severely limited due to widespread sediment deposition upstream of the pipe.

This project will create effective drawdown by digging a channel upstream of the diversion pipe, through accumulated sediments, to hydraulically connect the pipe to open waters of the lake. This connection will also reduce the amount of sediment and turbidity that will be transported downstream during drawdown activities.

PROJECT GOALS:
The goal is to achieve the desired drawdown to control non-native, invasive aquatic macrophyte growth. This project will create a channel that will hydraulically connect the diversion pipe to deeper waters of the lake, thus maximizing the functionality of the pipe needed to achieve the 5.5' drawdown target. The pipe channel will also minimize transport of sediment and turbidity downstream during autumn drawdown activities.

PROJECT TASKS:
1: Quality Assurance and Project Evaluation
2: Engineering and Permitting
3: Construct Trapezoidal Channel and Upland Disposal of Sediment
4: BMP Operation and Maintenance Plan
5: Aquatic Plant Harvesting
6: Education Program; technology transfer
7: Reporting and Project Oversight

PROJECT COST: $3,049,470

FUNDING: $ 672,920 by the US EPA
$2,376,550 by the Town of Stockbridge and project participants

DURATION: 2015 – 2017

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 15-07/319

PROJECT TITLE: Investigation of Passive Nitrogen Removal Strategies for Onsite Septic Systems at the Massachusetts Alternative Septic System Test Center
NPS CATEGORY: Groundwater protection
INVESTIGATOR: County of Barnstable
LOCATION: Statewide

DESCRIPTION:
This project continues the work of Project 14-01/319. It builds upon the findings from the publicly-financed Florida Passive Nitrogen Removal Project, the State of Washington Project, Waquoit Bay National Estuary Research Reserve (WBNERR) Project and other publicly-funded information sources and endeavors, to determine elements from those studies that are successful, applicable, and transferable to our area. This investigation is important to assuring wastewater planners and managers that all decentralized options are properly evaluated and to perhaps provide another tool for the management of wastewater nitrogen. Early results from Project 14-01/319 indicate high potential for nitrogen removal using these systems.

PROJECT GOALS:
- Determine whether the passive denitrification strategies investigated in various publically-funded efforts nationwide have relevance to our geographical area.
- Continue to allow the research, development and testing of commercially available products that remove contaminants from wastewater.

PROJECT TASKS:
1: Quality Assurance and Project Evaluation
2: Continue to monitor installed systems and evaluate for effectiveness
3: Education Program; technology transfer
4: Reporting and Project Oversight

PROJECT COST: $83,333

FUNDING: $50,000 by the US EPA
$33,333 by the County of Barnstable

DURATION: 2015 – 2017

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 16-01/319

PROJECT TITLE: Upper Charles River Regional Stormwater Finance Phase II Feasibility Study
NPS CATEGORY: Stormwater Utility
INVESTIGATOR: Town of Franklin
LOCATION: Charles River Watershed

DESCRIPTION:
Based on the 2014 draft MS4 permit and the new pollutant load reductions presented, the Town of Franklin expects that it may need to increase its stormwater management budget significantly. The effects of this increased investment in infrastructure, water quality, and public education will benefit local constituents and positively impact the Charles River Watershed, which is impaired in part from the impacts of discharge of stormwater from urban and suburban land use.

PROJECT GOALS:
The goals of this project are to compare stormwater programs implemented by a single municipality versus various regional structures. If comparison reveals that a regional stormwater utility offers substantial benefits then this project will document the compelling case that supports the development of a regional stormwater utility, outlines a road map towards specific elements of a regional stormwater utility that can be implemented by Franklin and its immediate neighbors, provides more efficient water quality services, and demonstrates how the road map for regional implementation of stormwater services could be applied to downstream communities in the watershed, and across the Commonwealth.

PROJECT TASKS INCLUDE:
1: Inventory of Stormwater Program Activities and Costs for Franklin, Medway, and Milford.
2: Analysis of Future Stormwater Program Activities and Costs for Franklin, Medway, Milford.
3: Assess Benefits, Challenges, and Funding Sources for Regional Stormwater Management.
4: Evaluate and Develop a Preliminary Legal Framework for Regional Stormwater Management.
5: Engage Select Representative Stakeholders to Participate on a Stakeholder Advisory Committee.
6: Engage the Public through a Public Education Plan Focused on Municipal Stormwater Responsibilities and Options for Stormwater Program Implementation.
7: Reporting and Project Oversight

PROJECT COST: $126,607

FUNDING: $76,000 by the US EPA
$50,607 by the Town of Franklin

DURATION: 2016 – 2018

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 16-02/319

PROJECT TITLE: Steep Hill Brook BMP Retrofit Project
NPS CATEGORY: Resource Restoration
INVESTIGATOR: Town of Stoughton
LOCATION: Boston Harbor Watershed

DESCRIPTION:
Steep Hill Brook is the primary tributary to the Neponset (Boston Harbor) in Stoughton. The Neponset River and Steep Hill Brook are all listed as impaired for pathogens, nutrients and/or a variety of other causes in the MassDEP 2012 Integrated List. Steep Hill Brook and its tributaries are subject to the Neponset River Watershed Bacteria TMDL. Also, the Sustainable Water Management Initiative identifies the Steep Hill Brook system as a groundwater and biological category five with net groundwater depletion of greater than 25%.

PROJECT GOALS:
This project reduce pollutant loading to Woods Pond and Steep Hill Brook, increase groundwater recharge and stream base flow, and increase public awareness of the need to reduce stormwater pollution and available methods to reduce pollutant loads. It will construct the recommended stormwater BMP retrofits at the top three sites identified through the earlier 604b grant (#2009-12/ARRA 604). The BMPs include an infiltration basin with sediment forebay that will treat runoff from the side and rear of the Gibbons School; a large bioretention cell with sediment forebay and underdrain that will treat runoff from the parking area in front of the School; and a smaller bioretention cell that will treat runoff from nearby Morton Street. The project will include a comprehensive outreach and education campaign, including press releases, web and social media content, signage at the BMPs, and a town-wide mailing on the project.

PROJECT TASKS:
1: Quality Assurance and Project Evaluation
2: Design and Construct Stormwater Management BMPs
3: BMP Operation and Maintenance Plan
4: Outreach and Technology Transfer
5: Reporting and Project Oversight

PROJECT COST: $236,486

FUNDING: $137,046 by the US EPA
$ 99,440 by the Town of Stoughton

DURATION: 2016 – 2018

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 16-03/319

PROJECT TITLE: Keeping Roadway Stormflow out of Arcadia Lake
NPS CATEGORY: Resource Restoration
INVESTIGATOR: Town of Belchertown
LOCATION: Connecticut River Watershed

DESCRIPTION:
Arcadia Lake, located in the Town of Belchertown, is shown on the Integrated List of Waters as impaired, Category 5, waters requiring a TMDL, for non-native aquatic plants and nutrient/eutrophication biological indicators. This project will design and construct BMPs to capture and infiltrate roadway stormflow that currently goes directly into Arcadia Lake. The project will also promote a lake-based Soak up the Rain campaign to draw attention to the new facilities and to promote residential practices around the lake for stormwater capture and infiltration. This works follows on a successful 604b grant.

PROJECT GOALS:
- Replace the two existing conventional catch basins on Federal and Metacomet streets with pre-cast deep sump catch basin with a hood, and connect to an infiltration catch basin
- Intercept direct run-off from the roadway to the lake with a bioswale

PROJECT TASKS:
1: Quality Assurance and Project Evaluation
2: Design and Construct Stormwater Management BMPs
3: BMP Operation and Maintenance Plan
4: Conduct Public Outreach and Education
5: Reporting and Project Oversight

PROJECT COST: $69,780

FUNDING: $41,868 by the US EPA
$27,912 by the Town of Belchertown

DURATION: 2016 – 2018

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 16-04/319

PROJECT TITLE: Lower Huckleberry Brook Stormwater Treatment and Wetland Park
NPS CATEGORY: Resource Restoration
INVESTIGATOR: Town of Milford
LOCATION: Charles River Watershed

DESCRIPTION:
The project is located in the Huckleberry Brook sub-watershed, which is in the headwaters of the Charles River watershed. Although Huckleberry Brook is not currently on the 303(d) list, this highly channelized stream is directly connected to and immediately upstream of Milford Pond on the Charles River, which is listed for multiple impairments. The Charles River is listed as impaired for pathogens and nutrients.

The project addresses water quality impairments in the Charles River Watershed by designing and installing a constructed stormwater wetland to reduce pollutant loading from stormwater runoff into Lower Huckleberry Brook and the adjacent Milford Pond/Charles River. The project site was identified as part of a Sustainable Water Management Initiative project.

PROJECT GOALS:
- Reduce pollutant loading from stormwater runoff currently entering Lower Huckleberry Brook and the adjacent Milford Pond/Upper Charles River without treatment.
- Educate the public about stormwater issues and how they can reduce the pollutant loading in the Lower Huckleberry Brook Sub-watershed and Charles River Watershed.

PROJECT TASKS INCLUDE:
1: Quality Assurance and Project Evaluation
2: Design and Construct Stormwater Management BMPs
3: BMP Operation and Maintenance Plan
4: Conduct Public Outreach and Education
5: Reporting and Project Oversight

PROJECT COST: $376,038

FUNDING: $225,290 by the US EPA
$150,748 by the Town of Milford

DURATION: 2016 – 2018

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 16-05/319

PROJECT TITLE: Edenfield Avenue Green Street Demonstration Project, Watertown
NPS CATEGORY: Resource Restoration
INVESTIGATOR: Charles River Watershed Association
LOCATION: Charles River Watershed

DESCRIPTION:
This project will improve stormwater management and reduce NPS to the Charles River which is listed for multiple impairments in the Integrated List of Waters. Evidence provided by river and outfall monitoring shows that stormwater flows from Watertown are contributing non-point source pollution loads to the river. Changing precipitation patterns driven by climate change will only compound runoff volumes, high peak flows and flood risks for the Town. Extensive private redevelopment and an aggressive plan for repair of the Town's roads both offer valuable opportunities for improvement. This project will implement structural and nonstructural BMPs to reduce NPS pollution impacts to the Charles River.

PROJECT GOALS:
- Reduce impervious surface as a source of non-point source pollution
- Develop a standard process for incorporating green infrastructure (GI) into road reconstruction and improvement projects that can be used by the Town and other municipalities in the greater Boston area
- Increase Watertown's capacity to make effective future investments in GI on its roadways and sidewalks in conjunction with a pending 604(b) project to identify GI opportunities in the Town
- Increase understanding of the sources and impacts of non-point source pollution and the potential benefits that GI can provide among Watertown residents
- Install BMPs on Edenfield Avenue

PROJECT TASKS:
1: Quality Assurance Project Plan (QAPP) Development and Project Monitoring
2: Design and Construct Stormwater Management BMPs
3: BMP Operation and Maintenance Plan
4: Outreach and Education
5: Project Evaluation
6: Reporting and Project Oversight

PROJECT COST: $1,011,548

FUNDING: $194,648 by the US EPA
$816,900 by the CRWA and Project Partners

DURATION: 2016 – 2018

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 16-06/319

PROJECT TITLE: Feasibility of a Stormwater Utility for Agawam
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Pioneer Valley Planning Commission
LOCATION: Connecticut and Westfield River Watersheds

DESCRIPTION:
This project will study the possibility of establishing a stormwater utility in Agawam. It will identify major needs and costs for a municipal stormwater program and evaluating billing, unit, rate, and other financial considerations. Goals for the project including a robust public engagement process to promote deep understanding of the challenges as well as full engagement in exploring a sustainable source of funding for the stormwater program.

PROJECT GOALS:
Engage a citizen's advisory group to learn about needs, costs, and options in establishing a sustainable funding source for Agawam's stormwater program. The other goals are:

- Identify stormwater program needs and costs in terms of compliance with the forthcoming permit and priority infrastructure repairs and improvements
- Evaluate fee models/rate methodologies and identify which would work best for Agawam
- Describe costs for implementation and define a strategy for moving forward.

PROJECT TASKS:

1: Hire consulting firms that are qualified to help with more technical aspects of project.
2: Identify major needs, priorities and costs for Agawam's municipal stormwater program.
3: Engage a citizen advisory task force that will learn about stormwater funding needs in Agawam, explore possible funding options, and make recommendations.
4: Conduct other public outreach and education to help promote understanding about stormwater funding needs.
5: Conduct parcel analysis and calculate equivalent residential unit
6: Define rate structure options, projected income growth, evaluate willingness/ability to pay, possible set up for credits program, and capacity of the Town to logistically support each option
7: Reporting and Project Oversight

PROJECT COST: $111,500

FUNDING: $ 66,900 by the US EPA
$ 44,600 by the Town of Agawam and other project participants

DURATION: 2016 – 2018

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 16-07/319

PROJECT TITLE: Protecting a Healthy and Resilient Taunton Watershed: Green Infrastructure Prioritization, Implementation, and Training
NPS CATEGORY: Healthy Watersheds
INVESTIGATOR: The Nature Conservancy
LOCATION: Taunton River Watershed

DESCRIPTION:
The region of the Taunton Watershed in and adjacent to the Three Mile River, Canoe River, and Hockomock Swamp Areas of Critical Environmental Concern (ACEC) includes healthy aquatic habitat that is being stressed by the impacts of climate change and development. A pathogen TMDL has been established for reaches within the Taunton River watershed, and portions of the watershed have waters requiring a TMDL for low dissolved oxygen, phosphorus, and turbidity. The Taunton River Watershed Management Plan describes the ecological implications of altered hydrology for wetlands and other aquatic resources, and calls for improved stormwater management and restoration of natural hydrology. The goal of this project is to enable municipalities and others to improve the resiliency of these aquatic systems through green infrastructure projects.

PROJECT GOALS:

- Implement two projects that result in important environmental benefits and demonstrate how municipalities can improve resiliency and climate change adaptation.
- Assess and prioritize green infrastructure project opportunities that will have the most impact on water quality and resiliency.
- Conduct outreach to municipalities and other stakeholders on how to incorporate green infrastructure options, resiliency, and water quality concerns into planning efforts.

PROJECT TASKS INCLUDE:

1: Quality Assurance and Project Evaluation
2: Design and Construct Stormwater Management BMPs
3: BMP Operation and Maintenance Plan
4: Green Infrastructure Prioritization
5: Municipality and Stakeholder Outreach and Education
6: Reporting and Project Oversight

PROJECT COST: $136,837

FUNDING: $82,102 by the US EPA
$54,735 by The Nature Conservancy and project partners

DURATION: 2016 – 2018

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 16-08/319

PROJECT TITLE: Water Street Stormwater Implementation to Improve Water Quality in Plymouth Harbor
NPS CATEGORY: Resource Restoration
INVESTIGATOR: Town of Plymouth
LOCATION: South Coastal Watershed

DESCRIPTION:
Plymouth Harbor is a Category 5 waterbody listed for fecal coliform, nutrient/eutrophication biological indicators. Based on the Nitrogen Loading in Plymouth Harbor Watershed Cumulative Nitrogen Loading Determination (SMAST 2013) 7% of the nitrogen loading to the embayment system is from impervious surface runoff. At the project site on Water Street, the untreated runoff currently enters Town Brook at the Water Street Bridge and continues to Plymouth Harbor.

The project will improve water quality in Town Brook, Plymouth Harbor (Category 5 Water) and adjacent Plymouth Bay by mitigating stormwater pollution through the implementation of BMPs on Water Street.

PROJECT GOALS:
The goal of this project is to control and treat untreated stormwater runoff by implementing BMPs on Water Street, and mitigating bacterial contamination toward de-listing Plymouth Harbor from the 303(d) list. The BMPs will treat bacteria and nutrients in the first flush 1" runoff thus reducing non-point source pollution impacts to Plymouth Harbor. This will improve the water quality of Plymouth Harbor and Plymouth Bay and help protect, enhance, and restore the natural resources that have previously been degraded due to poor water quality. The BMPs specifically selected for this project are a series of deep sump catch basins with eliminators, one hydrodynamic separator, and 360 linear feet of perforated pipe to induce infiltration.

PROJECT TASKS INCLUDE:
1: Quality Assurance and Project Evaluation
2: Design and Construct Stormwater Management BMPs
3: BMP Operation and Maintenance Plan
4: Reporting and Project Oversight

PROJECT COST: $390,195

FUNDING: $234,117 by the US EPA
$156,078 by the Town of Plymouth

DURATION: 2016 – 2018

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 16-09/319

PROJECT TITLE: Reducing Nonpoint Source Pollution from Two Livestock Facilities through Implementation, Remediation, and Education of Selected BMPs
NPS CATEGORY: Agriculture
INVESTIGATOR: UMass - Amherst
LOCATION: Connecticut River Watershed

DESCRIPTION:
Portions of the Mill and Fort Rivers in the Connecticut River watershed are impaired by pathogens, some of which are related to agricultural activities. This project will minimize NPS from two equine/livestock facilities located in critical watersheds and conduct on-site and off-site educational training for community livestock owners. This will be accomplished with farm conservation plans and the implementation of various BMPs. This project will provide hands on learning opportunities to various livestock communities throughout the state of Massachusetts, including the general public as well as commercial stables and riding facilities. Outreach will be provided through several complimentary hands-on workshops and field days throughout the year.

PROJECT GOALS:
- Generate conservation plans for at least two livestock facilities,
- Install BMPs
- Conduct hands-on workshops and demonstrations.
- Provide technical assistance to livestock owners wanting to install similar BMPs at their facilities through farm visits and educational materials. The BMPs can include manure storage, controlling runoff water from elevated areas to vegetated buffer strips, installing sacrifice lots to keep off animals from wet fields and pastures, installing low cost aerated composting systems, fencing off animals from wetlands and streams, and installing drainage swales, gutters and downspouts for reducing mud formation and runoff.

PROJECT TASKS:
1: Quality Assurance and Project Evaluation
2: Establish Expert Guidance Team
3: Develop and Implement Farm Conservation Plans
4: Assessment, Installation, and Implementation of BMPs on Two Farms
5: Provide Technical Support
6: Educational Workshops, Meetings, Tours for Industry and Community Livestock Owners
7: Reporting and Project Oversight

PROJECT COST: $315,300

FUNDING: $189,019 by the US EPA
$126,281 by UMass - Amherst

DURATION: 2016 – 2018

APPENDIX

319 NONPOINT SOURCE PROGRAM PROJECTS 1990-2011

90-01/319 **Avon Industrial Park Storm Water Management**
by Old Colony Planning Council
90-02/319 **Milkroom Wastewater Treatment Demonstration**
by Northwest Worcester Co. Conservation Dist.
90-03/319 **Pesticide Handling Demonstration**
by Franklin, Hampden & Hampshire Co. Conservation Districts
90-04/319 **Development of Pesticide Data and Support System for Risk Assessment**
by Worcester County Conservation District
90-05/319 **North and South Rivers Storm Water Mitigation**
by North & South Rivers Watershed Assoc.

91-01/319 **Soil Morphology as an Indicator for Maximum Groundwater Elevation Levels in MA**
by UMass, Amherst, Department of Plan and Soil Sciences
91-02/319 **Rehabilitation and Evaluation of the Sterling Filter Beds at Wachusett Reservoir**
by MDC, Division of Watershed Management
91-03/319 **Soil Bioengineering Streambank Protection Measures on the Blackstone and North Rivers**
by Franklin, Hampden & Hampshire Co. Conservation Districts
91-04/319 **Investigation of Low-Input Cranberry Production**
by UMass, Amherst, Entomology Dept.
91-05/319 **Hydrogeologic Evaluation of the Waquoit Bay Land Margin Ecosystem**
by Cape Cod Commission

92-01/319 **Spragues Cove Storm Water Remediation**
by Town of Marion
92-02/319 **Control of Urban Runoff in the Connecticut, Merrimack and Sudbury River Basins**
by Metropolitan Area Planning Council
92-03/319 **Ipswich River Nonpoint Source Prevention Program**
by MDFWELE, Riverways
92-04/319 **Technical Support for Developing and Implementing Urban Runoff Nonpoint Source Control Strategies in the Merrimack River Basin**
by MassDEP, Division of Water Supply

93-01/319 **Storm Water Remediation for the Broad Marsh River**
by Town of Wareham
93-02/319 **Sediment and Erosion Control in the Taunton River Basin Program**
by MDFWELE, Riverways
93-03/319 **Artificial Recharge Evaluation and Guidance to Municipalities**
by Pioneer Valley Planning Commission
93-04/319 **H_2Ome Check Pilot Project**
by Nashua River Watershed Association
93-05/319 **Commercial Underground Storage Tank Compliance**
by Barnstable County Department of Health and the Environment
93-10/319 **Cape Cod Coastal Nonpoint Source Management Plan**
by Cape Cod Commission
93-11/319 **Wachusett Septic System Management System**
by UMass Cooperative Extension, Amherst
93-12/319 **Nitrogen Loading Model Computer Program Development**
by Horsley & Witten, Inc.
93-13/319 **Development and Outreach of an Erosion and Sedimentation Control Guide for Massachusetts**

by Franklin, Hampden & Hampshire County Conservation Districts

94-01/319 **Best Management Practices to Control Nonpoint Source Pollution from Forestry Operations**
by Berkshire-Pioneer Resource Conservation and Development Area

94-03/319 **Green River Soil Bioengineering Demonstration Project**
by Berkshire Conservation District

94-05/319 **Alternative Onsite Septic Systems – Encouraging Their Use in Environmentally Sensitive Areas of Barnstable County**
by Barnstable County Dept. of Health and the Environment

94-06/319 **Orleans Storm Water Remediation Project**
by Cape Cod Conservation District

94-07/319 **Mill River Nonpoint Source Management Project**
by Mass Audubon Society, North Shore

94-08/319 **Lake Tashmoo Storm Water Remediation Project**
by Tisbury Waterways, Inc.

94-09/319 **Jones River/Billington Sea Nonpoint Source Pollution Control Project**
by Pilgrim Resource Conservation & Development Area Council, Inc.

95-01/319 **Lake Lorraine and Fivemile Pond Nonpoint Source Project**
by Pioneer Valley Planning Commission

95-02/319 **A Demonstration Program to Mitigate Storm Drain Pollution Impacting Shellfish Beds**
by MA Coastal Zone Management

95-03/319 **Buttermilk Bay Storm Water Remediation Project**
by Town of Bourne

95-04/319 **Demonstration of Urban Pollution Control in the Green River Watershed**
by Franklin, Hampden and Hampshire Conservation District

95-05/319 **Demonstration of an Alternative Onsite Wastewater Disposal System at Allen's Pond Wildlife Sanctuary** by Buzzards Bay Project

95-06/319 **Comprehensive Nonpoint Source Management in the Mill River Subwatershed, Hatfield, MA**
by Pioneer Valley Planning Commission

95-07/319 **Title 5 Training for Boards of Health in Five Towns in Barnstable County**
by Barnstable County Department of Health and the Environment

95-08/319 **Swan Pond River Storm Water Remediation Project**
by Town of Dennis

95-09/319 **Buzzards Bay Action Committee-Holmes Brook Restoration**
by Buzzards Bay Action Committee

95-10/319 **Developing and Conducting Training Workshops for the Revised Regulations for MGL C 132, Forest Cutting Practices Act**
by Berkshire-Pioneer Resource Conservation and Dev. Area Council

95-11/319 **Neponset River Fishway Project**
by MassDEP

96-01/319 **Septic System Management 2000 Project**
by Cooperative Extension System, UMass, Amherst

96-02/319 **Monitoring Strategies for Innovative Onsite Sewage Disposal Technologies**
by UMass, Amherst and Lowell

96-03/319 **Connecticut River Watershed Restoration Project**
by Franklin County Commission

96-04/319 **Demonstration of Urban Streambed Stabilization and Wetlands Function and Wildlife Habitat Improvement Using Soil Bioengineering Treatments at Hearthstone Quarry Brook, Chicopee**
by City of Chicopee

96-05/319 **Spicket River Watershed Revitalization**
by Merrimack River Watershed Council

96-08/319 **Statewide Outreach Course and Tool Kit and Central Massachusetts Partnership Pilot**

by Worcester County Conservation Districts

96-09/319 **Sub-Basin Assistance for the SuAsCo and Charles River Watersheds**
DFWELE, Riverways Program

96-10/319 **Watershed Display on NPS Information, Basin Team Newsletter and Resident Survey**
by Berkshire Conservation District

96-11/319 **Watershed Education Teaching (WET) Program**
by UMass Cooperative Extension System, Amherst

97-01/319 **Development of Stormwater Utilities in Two Demonstration Communities: Chicopee & South Hadley**
by Pioneer Valley Planning Commission

97-02/319 **Red Lily Pond Rejuvenation**
by Town of Barnstable

97-03/319 **Technical Outreach to Communities Regarding Alternative Onsite Septic Systems**
by Barnstable County Dept. of Health and the Environment

97-04/319 **Alternative Septic Systems Technologies Workshop Program**
by Berkshire Regional Planning Commission

97-05/319 **Leak Prevention for Heating Oil Storage Systems**
by Barnstable County Dept. of Health and the Environment

97-07/319 **Protecting Nitrogen Sensitive Coastal Embayments Through Land Conservation**
by Buzzards Bay Project

97-08/319 **Hall's Pond Wetlands Restoration Project**
by Town of Brookline

97-09/319 **Three Bay Area - Ropes Beach Subwatershed**
by Town of Barnstable

98-01/319 **Determining the Effectiveness of Onsite Septic Systems for the Removal of Viruses**
by Barnstable County Dept. of Health and the Environment

98-03/319 **Coastal Embayment/Title 5 Training Video**
by Cape Cod Commission

98-05/319 **Nashawannuck Pond Watershed Restoration Project, Easthampton, MA**
by Pioneer Valley Planning Commission

98-06/319 **NPS Pollution Correction in the Farmington River Watershed – Dirt Roads BMP Handbook**
by Berkshire Regional Planning Commission

98-07/319 **Reducing Stormwater in an Ultra-Urban Watershed**
by City of Somerville

98-08/319 **Protection of First Herring Brook**
by Town of Scituate

98-09/319 **Manual of Innovative/Alternative Onsite Wastewater Treatment Technologies**
by UMass Amherst

98-11/319 **Development and Demonstration of Protocols for Evaluating Greywater Disposal Systems**
by Massachusetts Department of Environmental Protection

98-12/319 **Demonstrating the Use of Eelgrass Monitoring to Assess Coastal Nonpoint Source Pollution**
by Massachusetts Department of Environmental Protection

99-01/319 **Alternative Septic System Test Center Project Monitoring**
by Buzzards Bay Project

99-03/319 **Pontoosuc Lake Watershed Resource Restoration Project**
by Berkshire Regional Planning Commission

99-04/319 **Winsegansett Salt Marsh Restoration Project**
by Town of Fairhaven

99-05/319 **Telecom City: Malden, Medford, Everett**
by Mystic Valley Development Commission

99-06/319 **Development of Recharging Stormwater Control Structures and Flow and Volume Design Criteria**
by UMass/Amherst

99-07/319 **Design and Guidance for Shallow Trench Low Pressure Pipe Distribution Systems for the Massachusetts Title 5 Innovative/Alternative Septic System Program**
by UMass/Amherst

99-08/319 **Mill River Watershed Restoration Project**
by Franklin Regional Council of Governments

99-09/319 **Demonstration of Best Management Practices to Control Agricultural NPS Pollution**
by Massachusetts Department of Food and Agriculture

99-11/319 **Coastal Zone Management Stormwater BMP Monitoring Project**
by Massachusetts Department of Environmental Protection and Office of Coastal Zone Management

00-01/319 **Implementing the Diagnostic/Feasibility Study Recommendations for Onota Lake**
by the Berkshire Regional Planning Commission

00-02/319 **Alternative Septic System Test Center Project Monitoring**
by the Barnstable County Department of Health and the Environment

00-03/319 **Development of a Rapid Field Test for the Quality of Stone Aggregate in Onsite Septic Systems**
by the Barnstable County Department of Health and the Environment

00-04/319 **Connecticut River Watershed Restoration Phase II**
by the Franklin Regional Council of Governments

00-05/319 **Atlas of Stormwater Discharges**
by the CZM Buzzards Bay Project

00-06/319 **Management Strategies for MA Dairy Farms to Reduce the Risk of Nonpoint Source Pollution**
by UMass Amherst

00-07/319 **Town of Acton Nonpoint Source Control Program**
by the Town of Acton

00-08/319 **Long Pond Restoration Project**
by the Town of Littleton

00-09/319 **Onset Bay, Wareham, MA, Nonpoint Source Pollution Remediation Project**
by the Town of Wareham

00-10/319 **Shaw's Plaza Drainage NPS Management**
by the Town of Sharon

00-12/319 **Salisbury Pond Resource Restoration**
by the City of Worcester

00-13/319 **Implementation of Nutrient Management Standards on Massachusetts Crop/Livestock Farms to Reduce the Risk of Nonpoint Source Pollution**
by UMass/Amherst

00-14/319 **Forestry Best Management Practices (BMP) Implementation and Monitoring Protocol Project**
by the Massachusetts Department of Conservation and Recreation

00-15/319 **Revision of the Massachusetts Nonpoint Source Management Manual**
by Geosyntec Consultants

00-16/319 **Lake Wyola TMDL Implementation**
by the Massachusetts Department of Conservation and Recreation

00-17/319 **Stormwater BMPs on Residential Property**
by EOEEA: DFWELE/Riverways

01-01/319 **Lake Cochituate, Snake Brook NPS Remediation, Phase I**
by the Department of Environmental Management

01-02/319 **Boat Waste Oil Recovery Program for New Bedford Harbor**
by the Massachusetts Coastal Zone Management Buzzards Bay Project

01-03/319 **Parker Pond Restoration, Gardner**
by the City of Gardner

01-04/319 **Massachusetts Buffer Manual and Demonstration Projects**
by the Berkshire Regional Planning Commission

01-05/319 **Evaluation of Phosphorus Removal in Onsite Septic Systems**
by the Barnstable County Department of Health and the Environment

01-06/319 **Memorial Pond Restoration, Phase I**
by the Town of Walpole

01-07/319 **Wareham NPS Remediation Program: East River, Broad Cove, Muddy Cove**
by the Town of Wareham

01-08/319 **Gray's Beach Park Restoration, Kingston**
by the Town of Kingston

01-09/319 **Nashawannuck Pond Restoration, Phase II**
by the City of Easthampton

01-10/319 **Development and Demonstration of a Lake Watershed Survey Program**
by the Massachusetts Department of Fisheries, Wildlife and Environmental Law Enforcement/Riverways Program

01-12/319 **Cranberry Bog Phosphorus Dynamics for TMDL Development**
by the University of Massachusetts Cranberry Experiment Station

01-13/319 **Lake Buel Implementation and Demonstration Project**
by the Berkshire Regional Planning Commission

01-14/319 **Pontoosuc Lake Watershed Resource Restoration Project**
by the Town of Lanesborough

01-15/319 **Implementing a Stormwater Remediation Strategy at Ashmere Lake**
by the Town of Hinsdale

01-16/319 **Plymouth Road Stormwater Treatment System**
by the Town of Bellingham

01-17/319 **North Green Stormwater Management Project**
by the Town of Ipswich

01-18/319 **Lagoon Pond Runoff Renovation Project**
by the Town of Oak Bluffs

01-19/319 **Oldham and Furnace Pond Stormwater Treatment**
by the Town of Pembroke

01-20/319 **Lake Attitash Stormwater Treatment Program**
by the Town of Amesbury

01-21/319 **Lake Quinsigamond and Lake Ripple Restoration Project**
by the Town of Brookfield

01-22/319 **Stormwater Management Plan at the Millyard Marketplace**
by the Town of Sturbridge

01-23/319 **Demonstration of Innovative Stormwater Management Retrofit Systems**
by the Center for Urban Watershed Restoration

01-24/319 **Storm Water System Maintenance and Residuals Waste Handling**
by the City of Quincy

01-25/319 **Operation and Maintenance of the Massachusetts Alternative Septic System Test Center**
by the Barnstable County Dept. of Health and the Environment

01-26/319 **Massachusetts Estuaries Project**
by UMass Dartmouth

01-27/319 **Beaver Brook Culvert Rehabilitation and Improvements to Beaver Brook Park**
by the City of Worcester

02-01/319 **Indian Lake Watershed Resource Restoration**
by the City of Worcester

02-02/319 **Wall Street Highway Yard Stormwater Improvements Project**
by the City of Attleboro

02-03/319 **Stormwater Management on the Middle Pond of the Congamond Lakes**
by the Pioneer Valley Planning Commission

02-04/319 **NPS BMPs at Richmond Pond**
by the Town of Richmond

02-05/319 **Neponset River Watershed Bacteria TMDL Implementation Project**
by the Neponset River Watershed Association

02-06/319 **Head of Westport Stormwater Project**
by the Town of Westport

02-07/319 **Lake Singletary Storm Drain Retrofit Program**
by the Town of Millbury

02-08/319 **Hammond Pond Stormwater Management Plan Implementation Phase I**
by the City of Newton

02-09/319 **Stormwater Remediation for Plymouth Harbor and Plymouth Bay**
by the Town of Plymouth

02-10/319 **Implementation of TMDL Recommendations at Lake Boon**
by the Town of Stow

02-11/319 **Wachusett Mountain NPS**
by Wachusett Mountain Associates (WMA)

02-12/319 **Martins Pond Shoreline Restoration and Sediment Reduction Project**
by the Town of North Reading

02-13/319 **Mill Creek Estuary Stormwater Mitigation**
by the Town of Sandwich

03-01/319 **Operation of the Massachusetts Alternative Septic System Test Center**
by the Barnstable County Department of Health and the Environment

03-02/319 **Comparison Of Virus Removal In Aggregate Free Chamber Leaching Systems vs. Aggregate Laden Trenches**
by the Barnstable County Department of Health and the Environment

03-03/319 **South Coastal Inter-Municipal Water Quality Improvement Project**
by the Town of Pembroke

03-04/319 **Dorothy Pond Perimeter and Local Watershed Stormwater Management/Remediation**
by the Town of Millbury

03-05/319 **Bare Hill Pond Noxious Aquatic Plant Reduction**
by the Town of Harvard

03-06/319 **Pittsfield Water Supply Stormwater Remediation Project**
by the City of Pittsfield

03-07/319 **Connecticut River Phase III**
by the Franklin Regional Council of Governments

03-08/319 **Powow River Stormwater Management**
by the City of Amesbury

03-09/319 **Clark and Cobb's Pond Stormwater Management**
by the Town of Walpole

03-10/319 **Spy Pond Stormwater Management**
by the Town of Arlington

03-11/319 **Billington Sea Stormwater Remediation**
by the Town of Plymouth

03-12/319 **Stormwater BMPs at Peppermint Brook and Lily Pond**
by the Cohasset Water Department

04-01/319 **Operation and Maintenance of MASSTC**
by the Barnstable County Dept. of Health and the Environment

04-02/319 **UMass/EOEEA Innovative Stormwater Technology Transfer and Evaluation**
by the University of Massachusetts/Amherst

04-03/319 **LID Training and Technical Assistance for Local Decision Makers**
by the North and South Rivers Watershed Association

04-04/319 **Upper Charles River Watershed Total Maximum Daily Load and Watershed-Based Plan**
by the Charles River Watershed Association

04-05/319 **Phosphorus and Sediment Load Reduction at Quaboag and Quacumquasit Ponds**
by the Town of Brookfield

04-06/319 **Enhancing Implementation of Nutrient Management on Massachusetts Crop/Livestock Farms**

to Reduce the Risk of Nonpoint Source Pollution
by the University of Massachusetts/Amherst

04-07/319 **Stormwater BMP Implementation for Route 28 to Bass River Subwatershed**
by the Town of Yarmouth

04-09/319 **Stormwater Management Retrofits for the Samoset Street Outfall to Plymouth Harbor**
by the Town of Plymouth

04-10/319 **Pontoosuc Lake Watershed Planning Program**
by the Berkshire Regional Planning Agency

04-11/319 **Cold Spring Brook Watershed Remediation**
by the Town of Wellesley

04-12/319 **Demonstration Boat Bottom Wash Water System**
by the Manchester Marina

04-14/319 **Development of Watershed-Based Plans**
by BETA Group, Inc.

04-15/319 **Dudley Pond Comprehensive Water Quality Improvement Project**
by the Town of Wayland

04-16/319 **Tree Box Filters as a Tool for Implementing the Neponset Bacteria TMDL**
by the Neponset River Watershed Association

04-17/319 **Erosion and Sediment Control and Stormwater Management at Construction Sites using Soils- and Compost-Based Best Management Practices**
by the Patriot RC&D

04-18/319 **Bare Hill Pond III**
by the Town of Harvard

05-01/319 **Operation and Maintenance of the Massachusetts Alternative Septic System Test Center**
by the Barnstable County Dept. of Health and the Environment

05-03/319 **Windsor Reservoir Restoration Project**
by the Dalton Fire District

05-04/319 **Operation and Maintenance of the Massachusetts Alternative Septic System Test Center and Investigation into Onsite Treatment of Endocrine-Disrupting Compounds**
by the Barnstable County Dept. of Health and the Environment

05-05/319 **Drumlin Farm Nonpoint Source Stormwater Management Project**
By Massachusetts Audubon

05-06/319 **Pembroke LID Retrofit Implementation Project**
by the North and South Rivers Watershed Association

05-07/319 **Kingston Elementary School LID Retrofit Implementation Project**
by the North and South Rivers Watershed Association

05-08/319 **Children's Wharf Project: Growing the Next Generation of Environmental Stewards**
by the Boston Children's Museum

05-09/319 **Old Oaken Bucket Pond Watershed NPS Improvements**
by the Town of Scituate

05-10/319 **Lake Shirley Low Impact Development Stormwater Improvement Project**
by the Town of Lunenburg

05-11/319 **Congamond Lakes FY 06**
by the Pioneer Valley Planning Commission

05-12/319 **Manchaug Pond NPS Improvement Project**
by the Manchaug Pond Association

06-01/319 **Orange Riverfront Park: Using Low Impact Development Techniques to Manage Stormwater Runoff**
by the Town of Orange

06-04/319 **Oak Hill Tributary Improvement Project**
by the City of Pittsfield

06-05/319 **First Herring Brook Low Impact Development Stormwater Enhancements**

by the Town of Scituate

06-06/319 **Herring River Coastal Low Impact Development Project**
by the Town of Scituate

06-07/319 **Reducing NPS from Equine Facilities**
by UMass Amherst

06-08/319 **Bedford NPS Project**
by the Town of Bedford

06-09/319 **River Street Best Management Practice Implementation**
by the Town of Ludlow

06-10/319 **Operation and Maintenance of the Massachusetts Alternative Septic System Test Center**
by the Barnstable County Dept. of Health and the Environment

06-11/319 **Operation and Maintenance of the Massachusetts Alternative Septic System Test Center**
by the Barnstable County Dept. of Health and the Environment

07-01/319 **Stormwater and Low Impact Development Technology Transfer**
by UMass Amherst

07-02/319 **Operation and Maintenance of the Massachusetts Alternative Septic System Test Center**
by the Barnstable County Department of Health and the Environment

07-03/319 **Rockwell Pond Source Reduction Pilot Project**
by the Massachusetts Watershed Coalition

07-04/319 **Improving Water Quality in the Hamilton Reservoir Watershed**
by the Pioneer Valley Planning Commission

07-05/319 **Franklin Stormwater Retrofit Improvement Project**
by the Town of Franklin

07-06/319 **Stormwater BMP Implementation for Little Harbor**
by the Town of Cohasset

07-07/319 **Jackson Square LID Program**
by the Jackson Square Partners LLC

07-08/319 **Onota Lake Preservation Project**
by the City of Pittsfield

07-09/319 **James Brook Urban Stormwater Improvements**
by the Town of Groton

08-01/319 **Eel River Headwaters Restoration**
by the Plymouth DPW

08-02/319 **Lake Waushakum LID BMP Implementation Project**
by the Town of Ashland

08-03/319 **Brewster Stony Brook Road Stormwater Improvements**
by the Town of Brewster

08-04/319 **Bare Hill Pond Noxious Aquatic Plant Reduction**
by the Town of Harvard

08-05/319 **Restoration of Lake Wickaboag at Wickaboag Valley Road**
by the Town of West Brookfield Storm Water Authority

08-06/319 **Stormwater BMPs: Implementation for Straits Pond at Richards Road and Pond Street**
by the Town of Hull

08-07/319 **Boston Architectural College Green Alley & Roof Project**
by the Boston Architectural College

08-08/319 **PCSWMM Evaluation**
by the UMass Amherst

08-09/319 **Onsite Septic System Investigations at the Massachusetts Alternative Septic System Test Center in Support of Comprehensive Wastewater Management Planning Efforts**
by the Barnstable County Department of Health and the Environment

09-01/319 **Congamond Lakes FFY 09**

by the Pioneer Valley Planning Commission

09-02/319 **Stockbridge Bowl Management Project Phase I**
by the Town of Stockbridge

09-03/319 **Stormwater BMPs in the Provincetown Harbor Watershed**
by the Town of Provincetown

09-04/319 **Northern Fairhaven New Bedford Inner Harbor Drainage Area LID Stormwater Enhancements**
by the Town of Fairhaven

09-05/319 **Phosphorus Mitigation Program for Cranberry Bogs on White Island Pond**
by the Cape Cod Cranberry Growers' Association

09-06/319 **Massachusetts Regional Stormwater Management Training Seminar Series**
by the Vanasse Hangen Brustlin Inc. (VHB)

10-01/319 **MaSTEP 2010**
by the UMass Amherst

10-02/319 **Investigation of Blackwater Disposal as a Means of Nutrient Management in Watersheds of Nitrogen Sensitive Marine Embayments**
by the Barnstable County Department of Health and the Environment

10-03/319 **Lower Monoosnoc Brook Remediation Project**
by the Massachusetts Watershed Coalition

10-04/319 **Stormwater Best Management Practices: Little Harbor, Cohasset Cove, and Cohasset Harbor**
by the Town of Cohasset

10-05/319 **North Reading Stormwater Infiltration Project: Reaching Out to Address Runoff (ROAR)**
by the Town of North Reading

10-06/319 **Northern Fairhaven New Bedford Inner Harbor Drainage Area Phase II LID Stormwater Enhancements**
by the Town of Fairhaven

10-07/319 **Stormwater Management BMPs for Unpaved Roads: Four Mile Brook Road in Northfield, MA**
by the Town of Northfield

10-08/319 **Sawmill River Implementation Project: An Ecosystem Approach to Restoration**
by the Franklin Conservation District

11-01/319 **Investigating Means Of Enhancing Onsite Septic System Attenuation For Emerging Contaminants**
by the Barnstable County Department of Health and the Environment

11-02/319 **Westport Middle School Stormwater BMP Implementation Project**
by the Town Of Westport

11-03/319 **Long Pond Watershed Non-Point Pollution Abatement, Phase 1 BMP Implementation**
by the Town of Tewksbury

11-04/319 **Farm Pond Stormwater BMP Implementation Project**
by the Town Of Sherborn

11-05/319 **Castle Hill Avenue Storm Drainage Improvements**
by the Town of Great Barrington

11-06/319 **Stormwater Pollution Reduction Project in the Montachusett Region's Millers River Watershed**
by the Montachusett Regional Planning Agency

11-07/319 **Lake Attitash Watershed Restoration**
by the Town of Amesbury

11-08/319 **Water Quality Improvements of Vine Brook and Old Reservoir Recreational Beach**
by the Town of Lexington

11-09/319 **Online Phosphorus Trading System**
by the Charles River Watershed Association

11-10/319 **Sunset Lake Watershed Stormwater BMPs**
by the Town of Braintree

11-11/319 **Improvement to Lake Wickaboag Sediment BMPs at Lakeview Avenue**
by the Town of West Brookfield

11-12/319 **Water Quality Analysis Support for Massachusetts Volunteer Monitors**

by the UMass Water Resources Research Center