



Massachusetts
Department
of
ENVIRONMENTAL
PROTECTION

PROJECT SUMMARIES

SECTION 319 NONPOINT SOURCE COMPETITIVE GRANTS PROGRAM

FFY 2014 - 2018

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

2018

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

**SECTION 319 NONPOINT SOURCE PROGRAM
PROJECT SUMMARIES**

FFY 2014 – 2018

**Prepared by:
Malcolm M. Harper
319 Nonpoint Source Program**

**Massachusetts Executive Office of Energy and Environmental Affairs
Matthew A. Beaton, Secretary**

**Department of Environmental Protection
Martin Suuberg, Commissioner**

**Bureau of Water Resources
Douglas E. Fine, Assistant Commissioner**

**Division of Municipal Services
Steven J. McCurdy, Director**

2018

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**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
8 NEW BOND STREET
WORCESTER, MA 01606**

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INTRODUCTION

This report presents summaries of the projects partially financed by the Section 319 Massachusetts Nonpoint Source Competitive Grants Program during federal fiscal years (FFY) 2014 through 2018. Projects funded from the inception of the program in 1990 through 2013 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.

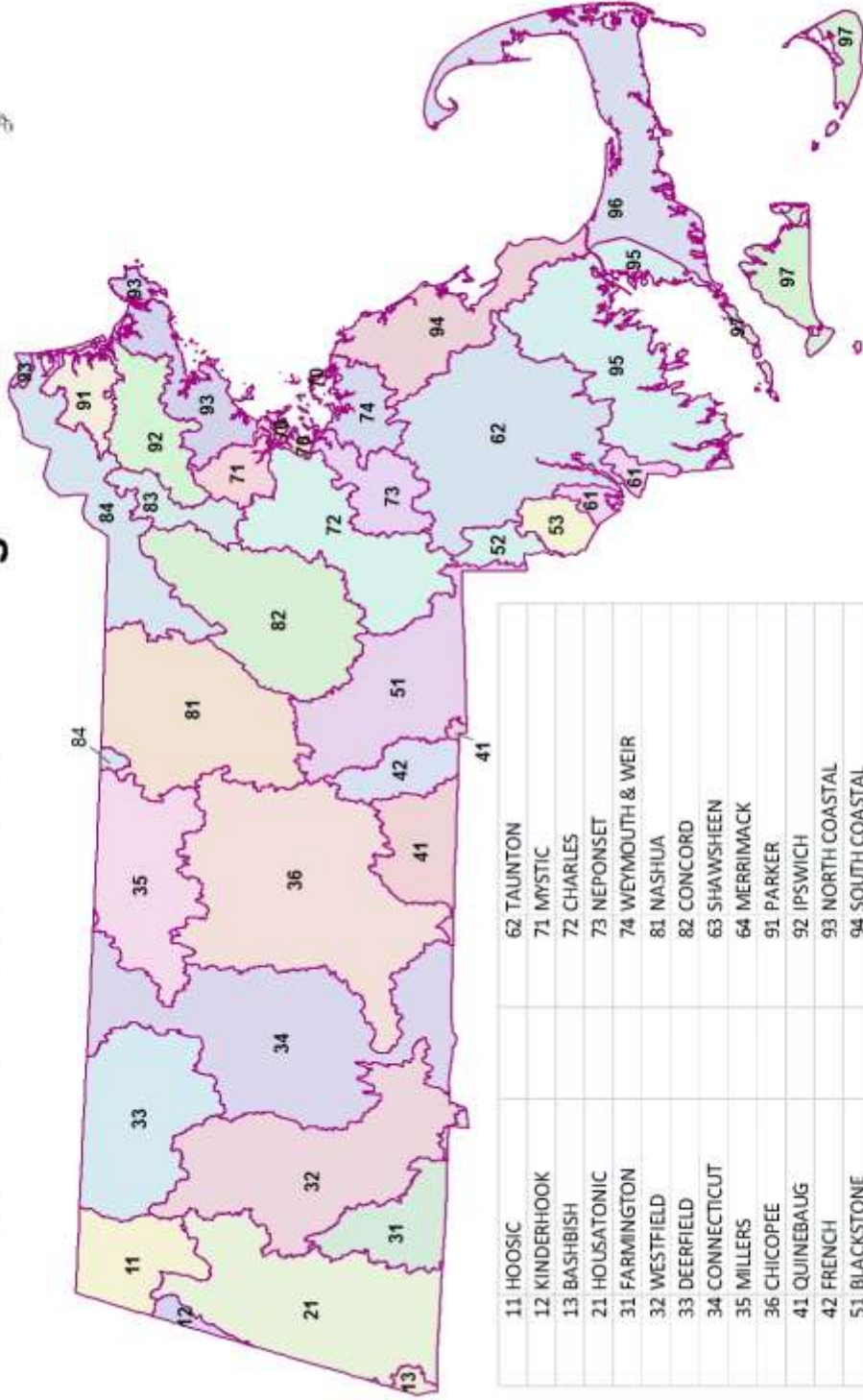
Activities funded by 319 are required to have a Quality Assurance Project Plan. MassDEP provides a Program Quality Assurance Project Plan that covers all 319-funded projects that do not have a sampling component. An Operation and Maintenance Plan is also required for each implementation project.

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 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. The 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	
12 KINDERHOOK	71 MYSTIC	
13 BASHBISH	72 CHARLES	
21 HOUSATONIC	73 NEPONSET	
31 FARMINGTON	74 WEYMOUTH & WEIR	
32 WESTFIELD	81 NASHUA	
33 DEERFIELD	82 CONCORD	
34 CONNECTICUT	63 SHAWSHEEN	
35 MILLERS	64 MERRIMACK	
36 CHICOPEE	91 PARKER	
41 QUINEBALUG	92 IPSWICH	
42 FRENCH	93 NORTH COASTAL	
51 BLACKSTONE	94 SOUTH COASTAL	
52 TEN MILE	95 BUZZARDS BAY	
53 NARRAGANSETT BAY	96 CAPE	
61 MT HOPE BAY	97 ISLANDS	

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
Number of 319 Projects and Allocation of Funds by Basin (FFY 1990-2017)**

Table I

<u>Basin Name</u>	<u>Number of Projects</u>	<u>Dollars Allocated (match plus 319 funds)</u>
Hudson	0	0
Housatonic	19	\$6,909,585
Deerfield	6	\$1,634,850
Westfield	4	\$998,170
Farmington	4	\$173,200
Connecticut	16	\$3,472,890
Millers	4	\$908,910
Chicopee	9	\$1,796,020
Quinebaug	2	\$467,080
French	0	\$0
Nashua	12	\$3,350,230
Blackstone	11	\$2,615,540
Merrimack	9	\$1,527,681
Concord (SuAsCo)	11	\$1,634,441
Shawsheen	3	\$1,108,230
Parker	1	\$88,300
Ipswich	5	\$1,601,200
North Coastal	4	\$453,600
Boston Harbor	18	\$4,005,034
Charles	20	\$5,376,175
South Coastal	22	\$5,782,090
Cape Cod	19	\$4,257,550
Islands	2	\$218,600
Buzzards Bay	26	\$4,909,250
Taunton	5	\$458,090
Narr. Bay & Mt Hope	2	\$549,400
Ten Mile	1	\$260,800
Statewide	63	\$8,276,475
TOTAL	296	\$63,833,391

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 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.

Project Goals:

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:

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.

Project Goals:

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:

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: \$260,232 by the US EPA
\$176,779 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.

Project Goals:

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:

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.

Project Goals:

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:

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: \$495,600

Funding: \$218,600 by the US EPA
\$277,000 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.

Project Goals:

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:

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.

Project Goals:

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:

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.

Project Goals:

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:

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/ Coastal Zone Management
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 Goals:

This project will develop recommendations for technologies or design elements to increase resiliency of stormwater Best Management Practices. In addition, it will include recommendations for improvements to BMP design and operation and maintenance activities.

Project Tasks:

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. Summarize 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.

Project Goals:

Development of 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:

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: \$496,411

Funding: \$485,883 by the U.S. EPA
\$ 10,528 by Geosyntec Consultants, Inc.

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:

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:

- 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: Boston Harbor Watershed

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 (Boston Harbor watershed); 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:

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:

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 stream stabilization practices (cross vanes, vegetative stabilization), and relocating the streambed below the Forest Street culvert to protect an undermined sewer main.

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: \$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:

- 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:

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:

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:

- 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:

- 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: Boston Harbor 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 (Boston Harbor 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:

- 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:

- 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

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 17-01/319

Project Title: Wendell Brook BMPs
NPS Category: Resource Restoration
Investigator: Town of Milton
Location: Boston Harbor Watershed

Description:

The specific target waterbody is Wendell Brook which drains into Pine Tree Brook which is listed for dissolved oxygen, turbidity, and aquatic plants, and pathogens. Under existing conditions, runoff is discharged directly to the brook with no treatment. Stormwater is the sole source of water pollution entering Wendell Brook and wet weather sampling conducted at outfalls along Wendell Brook found a geometric mean for E. coli of 10,181 MPN. Furthermore ammonia and surfactant levels were minimal indicating that illicit discharges are not an issue. These E. coli concentrations are 81 times the applicable load allocation established in the Neponset Bacteria TMDL and significantly higher than the values observed at other sites in the study.

Project Goals:

Implement selected recommendations from the “Milton Stormwater BMP Retrofit Development Project” which was funded through the 604b grant program (11-02/604). It will also complement and reinforce previous investments along Pine Tree Brook by the Town of Milton, MassDEP and EPA through two earlier 319 grants. The project will construct structural BMPs at a site recommended by the 604b study, specifically along Wendell Brook, a tributary of Pine Tree Brook in the Neponset River watershed (Boston Harbor).

The goals are to implement the Neponset Bacteria TMDL, address other sources of water quality impairments in Wendell Brook and areas downstream, and ultimately to achieve full attainment of designated uses in these waterbodies. The project also seeks to raise awareness throughout the Town about the need and opportunity to reduce stormwater pollution and to encourage adoption of behaviors such as proper pet waste and yard waste management that will support achievement of these objectives.

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: \$149,110

Funding: \$87,030 by the US EPA
\$62,080 by the Town of Milton

Duration: 2017 – 2019

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 17-02/319

Project Title: Farm Pond Green Infrastructure BMPs
NPS Category: Resource Restoration
Investigator: Town of Framingham.
Location: Farm Pond sub-basin in Concord (SuAsCo) watershed

Description:

Farm Pond, an 860 acre sub-basin located in historic downtown Framingham is listed on the 2014 Integrated List of Waters as a Category 5 Waters, “Waters requiring a TMDL,” for turbidity and excess algal growth. Stormwater runoff was identified in the Town’s Stormwater Master Plan as the main contributor of pollutant loading and inability to meet water quality standards. As such, the Town will retrofit existing drainage features at Farm Pond Park, and add BMPs at the corner of Winter Street and Fountain Street.

Project Goals:

Reduce sediment and nutrient loading to Farm Pond through the installation of stormwater BMPs at two sites. The secondary goal is to increase public awareness of the benefits of green infrastructure.

This project will install green infrastructure BMPs to reduce sediment and nutrient loading into Farm Pond. The project will focus on improving water quality at two of the eight stormwater outfalls that discharge directly to Farm Pond. The Fountain Street BMPs focus on the drainage system that discharges into the lower southwest corner of Farm Pond. A combination of bioretention swales, rain gardens, and a pervious pavement sidewalk will be installed at the corner of Winter Street and Fountain Street near the entrance of the Keefe Regional Technical High School. The Farm Pond Park BMPs focus on the drainage system around Farm Pond Park and its future skatepark on the western shore of Farm Pond. Existing stormwater BMPs will be retrofitted to bioretention features in conjunction with the installation of a new skatepark, with the potential to incorporate BMPs within the skatepark itself.

Project Tasks:

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

Project Cost: \$310,000

Funding: \$185,000 by the US EPA
\$125,000 by the Town of Framingham

Duration: 2017 – 2019

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 17-03/319

Project Title: Development of a Best Management Practice for Passively Removing Nitrogen From Onsite Septic Systems
NPS Category: Groundwater Disposal
Investigator: County of Barnstable
Location: Statewide Application

Description:

This project builds upon previous and successful efforts to identify potential means to remove nitrogen from septic system wastewater sources in a passive manner (Projects 14-01/319 and 15-07/319). The project draws upon broader collaboration with regional efforts (notably Long Island Sound and the newly formed New York State Center for Clean Water Technology) to further develop and prove a cost-effective non-proprietary means of enhancing nitrogen removal with a passive soils-based treatment system using lignocellulosic material (sawdust and wood chips) incorporated into the soil treatment area of a septic system to facilitate the removal of nitrogen, in onsite septic systems and to develop Best Management Practice guidelines for potential allowance in state environmental codes.

Project Goals:

Further the development of a non-proprietary cost-effective BM for the installation of septic system soil treatment areas (STA or soil absorption systems) that enhance nitrogen removal. This project will provide data necessary to formulate standardized design features that can be allowed by the Environmental Codes of the Commonwealth. The goals include the identification of those questions posed by regulators and system design practitioners, the design of experiments to answer those concerns and installation, and testing of up to three new promising non-proprietary candidate designs.

Project Tasks:

- 1: Revision of QAPP to accommodate sampling of non-proprietary passive nitrogen removal septic systems
- 2: Construct three prototype non-proprietary passive nitrogen removal septic systems
- 3: Monthly monitoring of installed non-proprietary systems
- 4: Conduct soil column experiments (including analyses) to validate and confirm treatment processes and use the analyses to alter designs and/or operational parameters
- 5: Outreach and Education
- 6: Reporting and Project Oversight

Project Cost: \$246,505

Funding: \$135,335 by the US EPA
\$111,170 by the County of Barnstable

Duration: 2017 – 2019

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 17-04/319

Project Title: ACPP Technical Providers for the Palmer River Watershed-Part 2
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 when farmers implement conservation practices and other nonpoint source BMPs.

Project Goals:

Dedicate technical and financial resources to address impairments under the National Water Quality Initiative. Through the Accelerated Conservation Planning Program (ACPP) it will deploy field staff to work with Palmer River watershed farmers to develop and implement conservation planning practices and nonpoint source BMPs to address NWQI goals. It will provide one conservation planner and one implementation contractor to serve as field staff dedicated to undertake the tasks and produce the deliverables as outlined herein. The goals of the project include completing as many farm conservation plans as possible and fully implementing as many of the completed plans as possible.

Project Tasks:

- 1: Quality Assurance and Project Evaluation
- 2: Develop and Implement Farm Conservation plans
- 3: Provide technical and regulatory support
- 4: Outreach and education
- 5: Access to Resources
- 6: Next National Water Quality Initiative Watershed
- 7: Evaluation for Regulatory Certainty Initiative
- 8: Reporting and Project Oversight

Project Cost: \$549,400

Funding: \$330,900 by the US EPA
\$218,500 by the MACD and project participants

Duration: 2017 – 2019

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 17-05/319

Project Title: West Monponsett Pond Nutrient Management Project
NPS Category: Resource Restoration
Investigator: Town of Halifax
Location: Taunton River Watershed

Description:

The Monponsett Ponds, consisting of West Monponsett Pond and East Monponsett Pond, are located in Halifax and Hanson. The ponds are relatively shallow water bodies that serve several public interests including drinking water supply, agricultural (cranberry) water supply and discharge, fisheries and wildlife habitat (including habitat for three state-listed species), flood control and recreation. The shallow waters in the ponds combined with the warm water temperatures and high nutrient content make them very susceptible to cyanobacteria toxin blooms which have resulted in multiple beach closures and serious health concerns. Since 2008 the Massachusetts Department of Public Health has issued many public health advisories for the pond, forcing the Town to close the beaches to swimming and boating.

West Monponsett Pond is listed on the 2014 Integrated List of Waters as a Category 5 water body impaired for phosphorus, excess algal growth, and proliferation of non-native aquatic plants. This project will undertake in-lake sequestration of phosphorus as part of the remediation strategy to restore water quality to meet water quality standards.

Project Goals:

Sequester the phosphorus in the lake sediment and reduce the concentration cyanobacteria that produce dangerous toxins through aluminum sulfate (alum) treatment. Ultimately the goal is to move West Monponsett Pond from the 303d list of impaired waters by addressing a major contributor of total phosphorus, internal sediment.

Project Tasks:

- 1: Quality Assurance and Project Evaluation
- 2: Permitting
- 3: First Phase Buffered Alum Treatments
- 4 Second Phase Buffered Alum Treatments
- 5: Outreach and Education
- 6: Reporting and Project Oversight

Project Cost: \$619,705

Funding: \$331,500 by the US EPA
\$288,205 by the Town of Halifax

Duration: 2017 – 2019

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 17-06/319

Project Title: Using the Science of Fluvial Geomorphology to Develop River Corridor Management Tools to Project the Health and Improve the Resiliency of the Deerfield Watershed
NPS Category: Healthy Watersheds
Investigator: Franklin Regional Council of Governments
Location: Deerfield River

Description:

This project will identify river corridors using fluvial geomorphology and take advantage of relatively inexpensive opportunities to protect river corridors using tools like the River Corridor Protection Overlay District and River Corridor Easement. Protecting these areas will help to avoid further degradation and destabilization that comes from floodplain and corridor encroachment and create opportunities for future restoration. The river corridor maps developed as part of this project will provide municipalities, riverine landowners, land trusts, and others with a powerful tool to improve ecological function, increase flood resiliency, reduce downstream flooding and sediment loading, better protect infrastructure against erosion, and increase watershed resiliency to future climate change.

Project Goals:

Develop a *River Corridor Mapping and Management Toolkit* for river corridors that provide strategies for limiting encroachment along rivers; identify areas susceptible to channel migrations; and help prioritize river and floodplain restoration projects and river corridor protection opportunities. The BMPs include: A cost-effective, scientifically defensible river corridor mapping protocol that is based on the science of fluvial geomorphology, and two management tools to accompany the mapping: a River Corridor Protection Overlay Zoning District Bylaw and a River Corridor Easement.

Project Tasks:

- 1: Quality Assurance and Project Evaluation
- 2: Finalize the Draft Model River Corridor Protection Overlay Zoning District Bylaw
- 3: Provide Technical Assistance to the Ashfield and Conway Planning Boards to Adopt the River Corridor Protection Overlay District
- 4: Develop a Model River Corridor Easement Tool for Massachusetts and List of Prioritized Projects for Implementation in the South and North River Watersheds
- 5: Develop Cost-effective Corridor Mapping Protocol for Massachusetts and Pilot it in the North River Watershed.
- 6: Install Stormwater BMP in Parking Lot Retrofit
- 7: Climate Pilot Study for the Deerfield River Watershed
- 8: Public Education and Outreach
- 9: Reporting and Project Oversight

Project Cost: \$273,281

Funding: \$155,000 by the US EPA
\$118,281 by the Franklin Regional Council of Governments

Duration: 2017 – 2019

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 17-07/319

Project Title: Egerton Road Green Infrastructure Demonstration Project
NPS Category: Resource Restoration
Investigator: Mystic River Watershed Association
Location: Alewife Brook which is an important tributary to the Mystic River

Description:

The Mystic River Watershed is a heavily urbanized watershed that suffers from nonpoint source pollution, a long history of industrial pollution and sanitary and combined sewer overflows. Stormwater pollution from the Alewife Brook and Mill Brook sub-watersheds play a strong role in determining the water quality and recreational value of the Mystic River. Both Alewife Brook and the Mystic River are Category 5 impaired water bodies.

Project Goals:

- Install green infrastructure that will reduce nutrient and other nonpoint source pollution inputs from stormwater runoff to Alewife Brook and the Mystic River.
- Increase community knowledge of the problem of stormwater pollution and the benefits of green infrastructure.
- Increase the Town's capacity and experience in green infrastructure installations, increasing the likelihood of future efficiencies and success.
- Increase public support in Arlington for future green infrastructure investments.

Implement a green infrastructure retrofit at a site previously identified as best meeting technical criteria and community needs by a 604b-funded study. The Egerton Road site was identified as the most feasible location for a green infrastructure retrofit in the *Alewife and Mill Brook: Mystic Headwaters Project* (13-01/604b) after a process of GIS feasibility analysis, phosphorus modeling, site prioritization and stakeholder engagement. The site is located at the intersection of Egerton and Herbert Road. This project will divert runoff into two curb extensions on either side of the street, each containing a sediment forebay and bioretention basin. This project will also install a pre-treatment structure at Coral and Park Streets to capture sediment that otherwise eventually drains into the Mystic River.

Project Tasks:

- 1: Quality Assurance and Project Evaluation
- 2: Design and Construct Stormwater Management BMPs
- 3: Installation of Pre-Treatment Structure at Coral and Park Streets
- 4: BMP Operation and Maintenance Plan
- 5: Outreach and Education
- 6: Reporting and Project Oversight

Project Cost: \$91,985

Funding: \$54,834 by the US EPA
\$37,151 by the Mystic River Watershed Association and project partners.

Duration: 2017 – 2019

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 17-08/319

Project Title: Mitigation of Erosion Impacts at Bartholomew's Cobble and Naumkeag
NPS Category: Healthy Watersheds
Investigator: The Trustees of Reservations
Location: Housatonic River

Description:

Bartholomew's Cobble (Sheffield) and Naumkeag (Stockbridge) are suffering from severe erosion and sedimentation into high quality wetland resources which appear to be triggered by poor stormwater management practices exacerbated by climate change. Increased storm intensity and frequency has caused existing sizes and configurations of swales and pipes used to collect and convey water to become overwhelmed, resulting in water flowing in concentrated patterns across the fragile soils on steep slopes. Erosion and sedimentation affect sensitive wetland habitats and state-listed rare species, both at the site where water cuts through land, and where it deposits the resulting sediments.

Project Goals:

Implement a set of preventative and restorative measures which will reduce the ongoing erosion and runoff problems that have been exacerbated by the change in storm frequency and intensity due to climate change at two properties within the Housatonic Watershed. This project will restore valuable rare wetland species and wetland habitats at both sites. It will implement measures that are suitable for the natural landscapes in the area and are effective, yet low cost, methods that public works departments and private organizations (particularly those with limited financial resources) could replicate with their own staff and equipment. In addition, measures will take into account the projected changes in storm frequency and intensity under the projected future climate.

The primary approach to managing erosion and sedimentation depends on reducing runoff and managing it near its source through infiltration, storage, and evapotranspiration. This will be achieved by identifying and addressing source control of rainfall and groundwater before it begins to channelize and cause erosion across the steep slopes of the individual properties.

Project Tasks:

- 1: Quality Assurance and Project Evaluation
- 2: Design and Construct Stormwater Management BMPs- Bartholomew's Cobble
- 3: Design and Construct Stormwater Management BMPs- Naumkeag
- 4: BMP Operation and Maintenance Plan
- 5: Outreach and Education
- 6: Reporting and Project Oversight

Project Cost: \$271,214

Funding: \$162,800 by the US EPA
\$108,414 by the Trustees of Reservations

Duration: 2017 – 2019

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 17-09/319

Project Title: Stormwater BMPs: Sevenmile River Watershed
NPS Category: Resource Restoration
Investigator: Town of Spencer
Location: Sevenmile River in the Chicopee River Watershed

Description:

This project will protect the Category 2 listing of the Sevenmile River (Chicopee River Watershed) in Spencer along with the Town's public water supply aquifer through the design and construction of stormwater BMPs for drainage areas predominantly along Meadow Road from Pleasant Street (Route 31) to West Main Street (Route 9). Stormwater management in these tributary areas generally consists of piped drainage infrastructure that discharges to Sevenmile River without treatment. The BMPs will be sited on Town land and will receive flow from existing stormwater collection systems that have concentrated the runoff. The stormwater controls will be designed to treat runoff prior to discharge into Sevenmile River and the Town's Aquifer Protection District and, where feasible, to intercept, treat and recharge stormwater.

Project Goals:

Construct stormwater BMPs to protect the high-quality water resource of the Sevenmile River such as bioretention/rain gardens, infiltration basins and constructed vegetated wetlands. A public outreach and education program will inform residents of the stormwater BMPs and of project progress and educate and encourage them to participate in reducing nonpoint source pollution.

The project will utilize a mixture of structural and non-structural BMPs. They will promote treatment, storage/detention and infiltration (where possible) prior to discharge into Sevenmile River. BMPs may include bioretention/rain gardens, infiltration and constructed vegetated wetlands that will capture first-flush stormwater runoff contaminants. Soil investigations will be performed to determine site-specific suitability for infiltration BMPs.

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: \$177,500

Funding: \$106,500 by the US EPA
\$ 71,000 by the Town of Spencer

Duration: 2017 – 2019

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 18-01/319

Project Title: Internal Phosphorus Load Inactivation for Lake Attitash

NPS Category: Resource Restoration

Investigator: City of Amesbury

Location: Merrimac River Watershed

Description:

Lake Attitash is a secondary drinking water supply that experiences frequent cyanobacteria or Harmful Algal Blooms (HABs) caused by excess phosphorus. The EPA, CDC, WHO and MADPH all agree that drinking water containing toxins from a HAB have adverse health risks including; liver, kidney and neurological damage. The MA DPH monitored the lake from 2009-2012 and issued more than a dozen health advisories during this period. Frequent blooms result from excess internal loading, and they threaten Amesbury's drinking water supply and the public. It is not possible to avoid having water from Lake Attitash being sent to Amesbury's drinking water intake during high flow conditions.

Efforts by EPA, MassDEP, Amesbury, Merrimac and the Lake Attitash Association (LAA) to lower inputs of nutrients have been implemented over the past 30 years. Nearly all drainage within the watershed of the lake has been improved through a 2002 demonstration grant and two 319 grant projects (01-20/319 and 11-07/319). Large scale public education efforts have been implemented as part of these efforts and continue, and restrictive ordinances have been implemented to reduce phosphorus inputs to the lake. Agriculture was a major source of phosphorus loading in the past. Through the efforts of LAA and MADAR these inputs have been drastically reduced. The source of continued high levels of phosphorus has been identified as the lake sediment.

Project Goals:

Sequester the phosphorus in the lake sediment over the 194 acres of Lake Attitash where anoxia occurs. Treatment of surficial sediment will lead to decreased cyanobacteria abundance, which in turn, will increase water clarity and deep water oxygen levels. Achieving this goal will reduce the risk to Amesbury's drinking water supply and the public encountering Lake Attitash.

Aluminum compounds will be applied to an area of 194 acres at a dose of at least 40 g/m². The application of aluminum treatment will remove phosphorus from the water column. Treatments will be applied to the pond with application rates and timing to be determined following review by local and state government staff.

Project Tasks:

- 1: Quality Assurance and Project Evaluation
- 2: Watershed Based Plan
- 3: Permitting
- 4: Aluminum Treatment
- 5: Outreach and Education
- 6: Reporting and Project Oversight

Project Cost: \$587,000

Funding: \$352,000 by the US EPA
\$235,000 by the City of Amesbury and Project Partners

Duration: 2018 – 2020

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 18-02/319

Project Title: Revision of Massachusetts Watershed-based Plans
NPS Category: Outreach and Education
Investigator: Geosyntec Consultants Inc.
Location: Statewide

Description:

This project will build on the success of the Massachusetts Watershed Based Plans (WBP) web-based tool with two tasks designed to (1) support MassDEP partners in completing technically robust completed WBPs, and (2) provide technical and programmatic support to the MassDEP NPS Program for the WBP tool.

Project Goals:

- Provide field engineering support to complete WBPs: Working with MassDEP's partner organizations, provide targeted science and engineering support as needed to complete WBPs for ten watersheds. This task is designed based on lessons learned from the 2016 WBP pilot projects, and will focus on providing the engineering and planning technical assistance identified as most needed by partner organizations for completion of WBPs, including field assessment of BMP locations, selection, sizing, etc.
- Provide NPS Program Support: Promote successful and increased use of the WBP tool by supporting MassDEP NPS Program staff through (1) ongoing website hosting and technical support and (2) development of a WBP Review Criteria and Scoresheet that NPS Program staff can use for evaluation of completed WBPs and to provide constructive feedback to project partners.

Project Tasks:

- 1: BMP Engineering and Design Assistance to Complete WBPs
 - 1A: Compile and Review Existing Data, Prepare WBP Element A and B
 - 1B: Watershed Field Investigations
 - 1C: Recommend Watershed Improvements, Element C
 - 1D: Complete WBP Elements D-I
 - 1E: Complete WBPs
- 2: MassDEP NPS Program and User Support for WBP Tool
 - 2A: Develop WBP Checklist, Review Criteria and Scoresheet
 - 2B: Update WBP Element C Guidance
 - 2C: Continued Website Hosting, Public Outreach Support and Technical Support for WBP Users and NPS Staff
 - 2D: Meetings & Communication
- 3: Reporting and Project Oversight

Project Cost: \$259,892

Funding: \$155,935 by the US EPA
\$103,957 by Geosyntec Consultants, Inc. and Project Partners

Duration: 2018 – 2020

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 18-03/319

Project Title: Public-Private Partnership for Stormwater Green Infrastructure
NPS Category: Resource Restoration
Investigator: Town of Franklin
Location: Charles River Watershed

Description:

Franklin lies at the headwaters of the Charles River for which stormwater runoff has been identified as the main contributor of pollutant loading and inability to meet water quality standards. The Charles River is listed as impaired due to flow alteration, mercury, nutrients, noxious aquatic plants, organic enrichment/low DO and turbidity. Nutrients and pathogens TMDLs have been completed for the Upper Charles River watershed. Tributaries of the Charles River within Franklin have been listed as impaired on the Integrated List and require a TMDL study to restore water quality. Mill River is classified as Category 5 (TMDL required) for thermal modifications and other habitat alterations.

Project Goals:

Improve water quality in the impaired waters of the Upper Charles River watershed, specifically the Mill River subwatershed in the Town of Franklin. This goal will be achieved by: reducing pollutant loading in the Mill River subwatershed by continuing BMP retrofits and enhancements to maximize the water quality benefits with available resources.

This project will continue the implementation of a watershed-wide water quality improvement strategy and build upon the success of publicly-funded, previously implemented projects within the watershed. The strategy includes incorporating structural and non-structural BMPs within the Mill River subwatershed:

- Four bioretention areas at the proposed Fairfield condominiums at Dean Avenue
- Removal of unnecessary pavement and installation of a rain garden at the end of Griffin Road.

Project Tasks:

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

Project Cost: \$210,220

Funding: \$125,000 by the US EPA
\$ 85,220 by the Town of Franklin

Duration: 2018 – 2020

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 18-04/319

Project Title: Stormwater Fee Development for Westford's Stormwater Management Master Plan
NPS Category: Stormwater Utility
Investigator: Town of Westford
Location: Merrimack River and SuAsCo Watersheds (Assabet and Concord Rivers)

Description:

Over the past five years, the Town of Westford has demonstrated its commitment to stormwater management through development of a long-term Stormwater Management Master Plan (SWMMP). One element of the plan, completed in 2016, was an in-depth funding study which recommended that the Town pursue development of a fee-funded stormwater utility. The Town Board of Selectmen voiced its support to move forward with the next phase of utility development with a vote in May 2017 that approved \$72,000 in funding for this effort.

Project Goals:

- Propose a rate structure that will generate sufficient revenue to cover stormwater management program costs;
- Prepare a detailed plan specific to the Town's existing administrative structure that will allow for a seamless implementation of the proposed stormwater utility; and
- Bring the proposed stormwater utility to the Board of Selectmen and ultimately Town Meeting for approval and adoption.

The goals of the SWMMP for watershed protection, water quality monitoring and improvements, and proactive drainage system operation and maintenance cannot be achieved without a long-term funding source. Through implementation of a utility, the Town of Westford seeks to ensure the execution of projects identified in its SWMMP and ongoing proactive stormwater management.

Project Tasks:

- 1: Refine Stormwater 5-Year Program Costs
- 2: Develop Rate Structure, Rates, Billing Mechanics
- 3: Obtain Input and Support from Town Leadership and Stakeholders
- 4: Finalize Utility Structure & Management
- 5: Prepare for Billing
- 6: Post Go-Live Support
- 7: Public Education & Outreach
 - 7a: Phase 1: Stormwater Management Master Plan Outreach
 - 7b: Phase 2: Stormwater Fee Outreach
- 8: Reporting and Project Oversight

Project Cost: \$178,522

Funding: \$ 99,982 by the US EPA
\$ 78,540 by the Town of Westford

Duration: 2018 – 2020

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 18-05/319

Project Title: Phase 1 Implementation of Bellingham's Subwatershed Management Plan
NPS Category: Resource Restoration
Investigator: Town of Bellingham
Location: Charles River Watershed

Description:

This project consists of the final design and construction of two infiltration basins and one infiltration trench, along with creation of a landscaped park that reduces 0.36 acres of directly connected impervious cover, at the Town's Municipal Center. The BMPs are a high-priority recommendation from work completed in 2011 under a 604(b) grant titled "Subwatershed Management Plan for Bellingham, MA". Currently, stormwater runoff from the Municipal Center parking area discharges without treatment to the Charles River Watershed which results in the discharge of pollutants including nutrients, pathogens, and sediments.

As documented in the Massachusetts 2014 Integrated List of Waters, the segment of the Charles River (MA72-04) near the proposed project is listed as a Category 5 Water impaired by E. coli and other pollutants. In addition, there is a final TMDL for Nutrients in the Upper/Middle Charles River and a final TMDL for pathogens.

Project Goals:

1) Substantially reducing the loading of nutrients, sediment, pathogens, oil, and other contaminants from entering the river through treatment and reduction of stormwater runoff. 2) Increasing groundwater recharge in the Watershed. 3) Providing highly visible demonstration BMPs at a site widely used by Town citizens that will provide education to residents about stormwater runoff, steps they can take to reduce pollution, and unique water quality and ecological issues of the Charles River in Bellingham. 4) Providing outreach and education regarding stormwater pollution and treatment strategies to the general public, in a manner to motivate individual pollution reduction actions. 5) Enhancing local knowledge and expertise within the Bellingham Public Works Department in the design, construction and maintenance of infiltration BMPs for stormwater treatment, as the Town continues to implement its pollution reduction plans.

Project Tasks:

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

Project Cost: \$163,770

Funding: \$ 97,895 by the US EPA
\$ 65,875 by the Town of Bellingham

Duration: 2018 – 2020

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 18-06/319

Project Title: Pequit and Beaver Meadow Brook BMP Retrofit Project
NPS Category: Resource Restoration
Investigator: Town of Canton
Location: Boston Harbor Watershed

Description:

Pequit and Beaver Meadow Brooks, which drain into the East Branch of the Neponset River (Boston Harbor watershed), are listed as a Category 5 for dissolved oxygen and Category 4a for pathogens. Reducing the loading is anticipated to be a major step in improving water quality in both waterbodies.

This project implements recommendations from the FY2016 SWMI Grant “Mitigation and Minimization Alternatives to Improve Streamflow in the Neponset River Watershed” BRP 2016-06 and also draws on lessons learned during an earlier 604b grant (2009-01/604).

Project Goals:

Partially implement the Neponset Bacteria TMDL, address other sources of water quality impairments in Beaver Meadow and Pequit Brooks and areas downstream, and ultimately to achieve full attainment of designated uses in these waterbodies. The project also seeks to raise awareness throughout the Town about the need and opportunity to reduce stormwater pollution and to encourage adoption of behaviors such as proper pet waste and yard waste management that will support the achievement of these objectives.

The project will construct structural BMPs at the Dean S. Luce School and Devoll Field in Canton. At the Devoll Field a constructed water quality swale will capture, cleanse and convey runoff from a snow storage field to a raingarden prior to discharge into environmental resources. Rain gardens are proposed at four highly-visible Dean S. Luce School locations. Installation of concrete steps to remediate an existing erosion problem behind the school and will include a LID cascading swale. The structural BMPs will be complemented by a comprehensive outreach and education campaign using a combination of an initial press release, a mailing to all town residents, and interpretive signage on site, as further detailed in the scope of services below.

Project Tasks:

- 1: Quality Assurance and Project Evaluation
- 2: Engineering and Permitting
- 3: BMP Construction
- 4: BMP Operation and Maintenance Plan
- 5: Outreach and Technology Transfer
- 6: Reporting and Project Oversight

Project Cost: \$241,992

Funding: \$144,784 by the US EPA
\$ 97,208 by the Town of Canton

Duration: 2018 – 2020

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 18-07/319

Project Title: Crosby Lane Stormwater Treatment and Salt Marsh Restoration Project
NPS Category: Resource Restoration
Investigator: Town of Brewster
Location: Cape Cod Watershed

Description:

The project will address pollutant loads to Namskaket Creek and a tidal restriction on Crosby Lane in Brewster. The site is located in the western end of the Inner Cape Cod Bay Area of Critical Environmental Concern (ACEC) where Crosby Lane crosses a restricted tidal creek which flows into the Namskaket Creek estuary located to the east. This area of the ACEC contains high-quality waters and coastal resources including: an Outstanding Resource Water (ORW); brackish wetlands that connect to the Namskaket salt marsh (which provides important habitat and serves as a nitrogen sink to protect coastal water quality).

The road and a parking lot for the Crosby Landing Beach drain into the Crosby Lane tidal creek that connects to the Namskaket estuary: the estuary is a category 4A water body with a TMDL for fecal coliform bacteria. The stormwater treatment will reduce the pathogen load to the estuary. Replacing an undersized culvert on Crosby Lane will greatly improve tidal flow to a tidally-restricted salt marsh that drains to Namskaket Marsh to the east.

Project Goals:

1) treat stormwater runoff from Crosby Lane and Crosby Landing Beach parking lot through installation of green stormwater infrastructure (bioretention basin, sediment forebay and vegetated swales); and 2) restore tidal flow and restore salt marsh by replacing the undersized 12" culvert under the road with a 5'x5' culvert. The larger tidal culvert will also accommodate changing precipitation and groundwater elevations as climate change and sea level rise occur, thus enhancing coastal resilience.

Project Tasks:

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

Project Cost: \$463,500

Funding: \$105,000 by the US EPA
\$358,500 by the Town of Brewster and Project Partners

Duration: 2018 – 2020

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 18-08/319

Project Title: Knob Hill Road Stormwater Improvements

NPS Category: Resource Restoration

Investigator: Town of Great Barrington

Location: Housatonic River Watershed

Description:

Lake Mansfield is impaired and listed under category 4c due to invasive macrophyte (aquatic plant) species. Nonpoint source runoff pollutes the lake with sediment, leading to shallower and warmer waters, and thereby making it easier for invasive plants to grow. In addition to physical problems associated with sediment deposition, sediment particles readily transport pollutants such as metals, nutrients, and pathogens.

Project Goals:

Address the storm drainage from Knob Hill Road as there are no catch basins on the road and sediment-laden stormwater flows directly into the southern end of Lake Mansfield, and develop construction plans for a lake outlet control structure to allow high water to flow out of the lake reducing erosion and water level drawdowns to control invasive weeds.

Knob Hill Road will be reconstructed with a new drainage system, curbing and new pavement, and will include deep sump catch basins with oil hoods that will capture sediment and pollutants. In addition, a hydrodynamic separator unit will be installed to further remove suspended sediments and pollutants. In addition to the 604(b)-related work the boat ramp will be reconstructed to reduce erosion and will include the installation of a BMP to capture stormwater runoff from the parking lot, road, and adjacent hillside. This project will also include the design and permitting of a lake outlet water-level control structure to control invasive plants and decrease erosion in the buffer zone.

Project Tasks:

- 1: Quality Assurance and Project Evaluation
- 2: Design and Construct Stormwater Management BMPs
- 3: Boat Launch Reconstruction with a BMP
- 4: Outlet Control Structure Design and Permitting
- 5: BMP Operation and Maintenance Plan
- 6: Outreach and Education
- 7: Reporting and Project Oversight

Project Cost: \$479,000

Funding: \$288,925 by the US EPA
\$190,075 by the Town of Great Barrington and Project Partners

Duration: 2018 – 2020

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 18-09/319

Project Title: Armory Village Green Infrastructure Project

NPS Category: Resource Restoration

Investigator: Town of Millbury

Location: Blackstone River Watershed

Description:

In Millbury the Blackstone River is classified as a Category 5 Water due to up to 17 different causes of impairment including trash, chronic aquatic toxicity, excessive algal growth, phosphorous, foam/scum/oil slicks, and turbidity, all of which are exacerbated by stormwater flowing directly into the river. The intersection of Main and Elm Streets forms the heart of the downtown area and is situated approximately 500 feet up from the Blackstone River.

Project Goals:

(1) reduce sediment and nutrient loads as well as the quantity/velocity of stormwater flows to the Blackstone River through the use of green infrastructure features including bioretention bump outs and rain gardens, tree box filters, flow-through planters, tree planting, expansion of open space areas, and selective application of permeable paving surfaces; (2) provide education and outreach on the types and benefits of Green Infrastructure features to community members and public officials; and (3) demonstrate the use of infiltration-based green infrastructure within the public right-of-way to promote stakeholder support for their use within other areas of the Town that contribute considerable stormwater flows into the Blackstone River.

This project will bring Low Impact Development (LID) and green infrastructure practices to the intersection of Main and Elm Streets, Upper and Lower Commons, and a portion of South Main Street. This targeted area has the potential to address stormwater issues in that portion of Millbury Center that is highly visible, upslope of and in closest proximity to the Blackstone River.

Project Tasks:

- 1: Quality Assurance and Project Evaluation
- 2: Engineering and Permitting
- 3: Construct Stormwater Management BMPs
- 4: BMP Operation and Maintenance Plan
- 5: Outreach and Education
- 6: Reporting and Project Oversight

Project Cost: \$250,000

Funding: \$150,000 by the US EPA
\$100,000 by the Town of Millbury and Project Partners

Duration: 2018 – 2020

APPENDIX

319 NONPOINT SOURCE PROGRAM PROJECTS 1990-2013

- 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 District
- 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 Association
- 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 Department
- 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 EOEEA: DFWELE, Riverways Program
- 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 EOEEA: DFWELE, Riverways Program
- 93-03/319 Artificial Recharge Evaluation and Guidance to Municipalities**
by Pioneer Valley Planning Commission
- 93-04/319 H₂Ome 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**

- EOEEA: 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 Program
- 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 UMass, 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 UMass, 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
- 12-01/319 Investigating Means of Improving Onsite Septic Systems for Removal of Contaminants of Emerging Concern**
by the Barnstable County Department of Health and the Environment
- 12-02/319 Decreasing Phosphorus in Cranberry Waters by Implementation of Best Management Practices**
by UMass - Amherst
- 12-03/319 Minimizing Non-Point Source Pollution from Horse Facilities through Installation and Demonstration of Best Management Practices**

- by UMass - Amherst
- 12-04/319 Massachusetts Stormwater Outreach and Education Program 2012**
by UMass – Amherst
- 13-01/319 Continued Investigation of Contaminants of Emerging Concern Discharged from Onsite Systems with Emphasis on Endocrine Disrupting Compounds**
by the Barnstable County Department of Health and the Environment
- 13-02/319 Stormwater BMPs in the Provincetown Watershed**
by the Town of Provincetown
- 13-03/319 Sediment Management BMPs for the South River in Conway**
by the Franklin Regional Council of Governments and participating communities
- 13-04/319 Reducing Stormwater Pollution in the Western Millers River Watershed with Low Impact Development**
by the Franklin Regional Council of Governments and participating communities
- 13-05/319 Manchaug Pond Water Quality Improvement - Phase 2**
by the Manchaug Pond Foundation
- 13-06/319 Massachusetts Nonpoint Source Pollution Management Manual, Update, and Enhancement**
by Geosyntec and project participants
- 13-07/319 City of Boston Porous Pavement Green Alley NPS Demonstration Project**
by the City of Boston
- 13-08/319 ACPP Technical Providers for the Palmer River Watershed**
by the Rehoboth Agricultural Commission
by the Bristol County Conservation District
by Participating Producers
- 13-09/319 Development of the 2014 Massachusetts Nonpoint Source Management Plan**
by Geosyntec Consultants