NEW YORK STATE OF OPPORTUNITY.

Department of Environmental Conservation

NONPOINT SOURCE POLLUTION MANAGEMENT PROGRAM

Annual Report for April 1, 2018 to March 31, 2019

www.dec.ny.gov

Nonpoint Source Pollution Program Mission

The goals of New York's Nonpoint Source Program are to control pollution from nonpoint sources to the waters of the state and to protect, maintain and restore waters of the state that are vulnerable to, or are impaired by nonpoint source pollution.

About the Nonpoint Source Pollution Program

New York's NPS Program is established under the leadership of the New York State Department of Environmental Conservation (NYSDEC), as NYSDEC is the state lead agency for the Federal Clean Water Act Section 319 Program and many other closely related programs. Significant state agency partnerships and program roles are shared with:

- New York State Department of Agriculture and Markets (NYSDAM)
- New York State Soil and Water Conservation Committee (NYSSWCC)
- New York State Department of State (NYSDOS)
- New York State Department of Health (NYSDOH)
- New York State Environmental Facilities Corporation (NYSEFC)
- New York State Department of Transportation (NYSDOT)

These state agency partnerships are complemented by regional and local partnerships, with special emphasis on county Soil and Water Conservation Districts (SWCD), county health agencies, county and regional planning agencies, and watershed coalitions. Key federal agency partnerships include the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Agriculture (USDA). New York's NPS program places highest priority on the management of sources of nutrients in the landscape, with significant priorities also assigned to management of pathogen and sediment sources. The program was updated in 2014 in accordance with EPA's nonpoint source program guidance.

Objectives of the Nonpoint Source Pollution Program

Objective 1: Develop watershed management plans, and other comprehensive and strategic plans to improve the management of nonpoint pollution sources on a watershed basis

Objective 2: Implement watershed projects to reduce nonpoint source pollution of waters of the state

Objective 3: Assess the quality of waters of the state related to nonpoint source pollution

Objective 4: Protect and maintain unimpaired waters of the state from additional nonpoint source pollution, and restore or prevent further degradation of waters of the state impaired by nonpoint source pollution

Objective 5: Integrate management of nonpoint pollution sources into applicable state and local agency programs (including both regulatory and non-regulatory programs), and provide overall policy coordination among state, local and federal agencies

Objective 6: Develop and maintain the capacity of state, regional and local agencies and organizations to provide nonpoint source management assistance to communities and landowners through assessment, planning, technical support and education

Major Accomplishments

During the annual reporting year (April 1, 2018 to March 31, 2019), NYSDEC and its partners initiated and completed a variety of nonpoint source projects and reduced the amount of NPS pollutants entering New York lakes, streams, and rivers through implementation of state programs. Projects initiated during the reporting period resulted in a reduction of 16,621 pounds of nitrogen, 4,781 pounds of phosphorus, and 4,676 tons of sediment per year. $44.2M of state funding was dedicated, within the reporting period, to projects that implement best management practices (BMPs) to reduce nonpoint source pollution. This report describes New York's reporting measures and accomplishments for each of the nonpoint source program's six objectives.

Objective 1: Develop watershed management plans, and other comprehensive and strategic plans to improve the management of nonpoint pollution sources on a watershed basis

Watershed management planning is conducted directly by, or through the support and guidance of, several NPS Program partner agencies, including NYSDOS and the NYSSWCC. Partnerships for watershed planning have also been established through the state's major basin and estuary programs (e.g. Chesapeake Bay Program, Hudson River Estuary Program, NYC Watershed Program, Mohawk River Basin Program, Lake Champlain Basin Program). The Great Lakes Basin Program has completed two Nine Element Watershed Plans for the Black and Genesee Rivers. The Chesapeake Bay Program has completed several watershed implementation plans (WIP) to meet the goals and objectives of the Chesapeake Bay total maximum daily load (TMDL).

At the local level, watershed planning is conducted by regional and county planning agencies, watershed coalitions (Appendix A), and Soil and Water Conservation Districts (SWCDs). County Water Quality Coordinating Committees (CWQCC) develop and update County Water Quality Strategies that address NPS issues at the local level. Watershed plans are also developed through partnerships with regional basin planning commissions and other states for New York's significant interstate and international waters. Development of watershed management plans by local governments has also been supported through the New York Coastal Nonpoint Pollution Control Program and funded through the Local Waterfront Revitalization Program (LWRP). Approximately 23,195 square miles of watershed area in New York State are now covered by watershed plans completed by watershed coalitions or other planning entities.

Objective 1: Reporting Measure Accomplishments

Reporting Measure	Accomplishment
Watershed area (cumulative statewide) covered by watershed plans which are consistent with the Section 319 NPS Program and Grant Guidelines	Nine Element plans are in development for the following watersheds: • Canandaigua Lake, • Skaneateles Lake, • Seneca/Keuka Lakes, • Oneida Lake, • Owasco Lake, • Wappinger's Creek, • and Lake Erie/Niagara River watersheds
Watershed area (cumulative statewide) covered by watershed plans completed by watershed coalitions and other planning entities	No major watershed plans were completed during the reporting period. The area covered by watershed plans remains at 23,019 square miles.
Number of updated County Water Quality Strategies	No County Water Quality Strategies were updated in this period.
Number of Agricultural Environmental Management (AEM) Strategic Plans updated or revised through the AEM Framework	50 Soil and Water Conservation Districts participated in the AEM Base Program. All 50 Districts revised their AEM 5-Year Strategic Plans during this fiscal year, as well as their tactical, Year 14 AEM Annual Action Plans designed to implement their AEM Strategy.
Watershed area (cumulative statewide) addressed by TMDLs or other specific NPS pollutant load reduction goals	Two TMDLs were completed during this time period (Honeoye & Conesus Lakes). The cumulative watershed area addressed by TMDLs for nutrients, acid rain, and pathogens statewide is 6,355 square miles.

Objective 1 Highlight: Agricultural Environmental Management (AEM) Highlights for 2018

The AEM program is the cornerstone for the advancement of the environmental stewardship programs that are administered by the State Committee, in partnership with Soil & Water Conservation Districts (SWCD). The AEM framework relies on strong technical support and relationship building between local conservation partners and farmers and does so in a way where farm business objectives are kept in mind in order to enhance agriculture's long-term economic viability. AEM continues to evolve to meet agricultural and environmental needs. New priorities include more emphasis on soil health, climate resiliency, as well as outreach to farmers of all sizes and commodities, to encourage more farmer participation in AEM.

AEM Base Program provides technical assistance funding for SWCDs to work with farmers. Such work provides quality, high priority projects for implementation, which may be further assisted through the competitive cost-share programs such Agricultural Nonpoint Source, Climate Resilient Farming, and various other local, state and federal programs.
The 2018-19 (Year 14) AEM Base Funding Program provided $2.5 million in reimbursement of SWCD technical assistance to farmers. In AEM Base Year 14, 50 SWCDs provided technical assistance to put conservation on the land by:

- Introducing 531 new farms into AEM;
- Conducting 398 environmental assessments;
- Developing 319 farm conservation plans;
- Implementing 211 conservation practices.
- Evaluating/updating 449 farm conservation plans / BMPs

Objective 2: Implement watershed projects to reduce nonpoint source pollution of waters of the state.

New York continued to implement watershed projects to support NPS Program objectives using state funds. The primary programs used to implement nonpoint source projects include:

- Agricultural Nonpoint Source Control and Abatement (AgNPS) Program, providing support to producers for implementation of agricultural NPS watershed projects; and
- Water Quality Improvement Program (WQIP), providing support to municipalities and SWCDs for implementation of non-agricultural NPS watershed projects.

Both programs are fully supported through New York's Environmental Protection Fund. BMPs initiated through both programs can be found in Appendix B. Other programs used to implement nonpoint source projects include but are not limited to: Local Waterfront Revitalization Program (LWRP), Finger Lakes-Lake Ontario Watershed Protection Alliance (FLLOWPA) Grants, Hudson River Estuary Program Grants, Mohawk River Watershed Grants and New York City Department of Environmental Protection Green Infrastructure Grant Program.

New York leverages state dollars to receive grant funding from federal agencies to implement multiple programs, including but not limited to the following programs:

- Clean Water State Revolving Fund (CWSRF), providing low-cost financing to communities to implement water quality infrastructure projects with funding from EPA;
- Green Innovation Grant Program (GIGP), providing support for implementation of NPS watershed projects with funding from EPA;
- Regional Conservation Partnership Program (RCPP), a partnership between USDA Natural Resource Conservation Program (NRCS) and other agencies to help producers install and maintain conservation activities through existing NRCS conservation programs; and
- Chesapeake Bay Implementation Grant (CBIG), a grant provided by EPA to states located in the Chesapeake Bay watershed for restoration activities that will reduce nutrient pollution.

A full list of funding programs and program descriptions can be found in Appendix C.

Objective 2: Reporting Measure Accomplishments

Reporting Measure	Accomplishment
Number of cost-shared watershed projects initiated	89 projects
Number of specific cost-shared BMPs initiated	45 BMP types (See Appendix B for list of initiated practices)
Estimated load reductions for initiated projects through AgNPS & non-AgNPS	Nitrogen: 16,621 pounds Phosphorus: 4,781 pounds Sediment: 4,676 tons
Funding provided to support cost-shared watershed projects (through AgNPS and WQIP programs)	$44,169,034 in State Fiscal Year 2018
Number cost-shared watershed projects completed	29 projects were completed during the reporting period (see Appendix D for list of completed projects).
Number of specific cost-shared BMPs completed	78 BMPs
Number of GRTS entries for AgNPS & non-AgNPS	89

Objective 2 Highlight: Lake Champlain Basin Stormwater Improvement Project

The Lake Champlain Watershed in New York State is contained in five counties in the state. Warren County is one of these counties in the watershed. The Lake Champlain Watershed comprises 25% of the county, while the Upper Hudson River Watershed comprises the rest. It is within this part of the county, that the Warren County Soil & Water Conservation District successfully submitted a proposal for water quality improvement projects in that portion of the Lake Champlain Watershed. These projects were jointly proposed for Warren County's portion of the watershed were of the following types:

- Rain gardens – three locations
    - In each of these locations, the Towns of Queensbury and Bolton constructed rain gardens as a final step of treatment for stormwater in these towns. The rain gardens had various kinds of pretreatment ahead of these systems, including rock forebays and porous pavers with tile drains.
- Drywell construction – seven locations
    - In each of these locations, the Towns of Queensbury, Lake George, and Bolton installed drywells to capture stormwater runoff.
- Catch basin construction – three locations
    - In each of these locations, the Towns of Queensbury and Bolton, catch basins were installed to facilitate stormwater collection. Some were simple installations that replaced existing catch basins. Other were more advanced.
        - The Queensbury installation was structured to include:
            - two timber framed bioretention basins, which are filled with an engineered rain garden mix and planted with native flowers and grasses
            - the second basin has an overflow stand pipe with a grate to convey stormwater during severe storms to a grassed swale. If the catch basin is blinded off by leaves, there is a rock lined ditch for stormwater to access the system. At the overflow outlet, instead of riprap, scour protection mats were installed that allows grass to grow.

- Filter log placement – four locations
    - In each of these locations, the Towns of Queensbury, Hague, and Lake George, filter logs were used to address stormwater. The logs were used in various combination with other practices, such as rolled erosion blankets, and seed mixes.
- Rock lined ditch construction – one location

    - The Town of Bolton utilized rock lined ditch construction to reduce erosion to a nearby brook, due to high groundwater and high velocity stormwater runoff.
- Bioretention areas constructed – one location
    - The Town of Hague utilized a bioretention area to accept stormwater runoff from their highway garage property and planted it with hardy native shrubs. The bioretention area holds 8 inches of stormwater and covers approximately 1,800 square feet. A drywell was included to capture overflow and additional stormwater sheet flow.

- Drainage culvert outlet stabilization – one location
    - The Town of Hague stabilized an existing culvert outlet with fractured rocks, check dams, and filter fabric to stabilize the sandy slopes.
- Sediment basin cleanout – numerous locations
    - Seven basins located on Hague Brook, Jenkins Brook, Indian Brook, Artist Falls, English Brook, and Huddle Brook were cleaned of sediment. All necessary BMPs were implemented to protect water quality.

Objective 3: Assess the quality of waters of the state related to nonpoint source pollution

New York evaluates water quality issues related to nonpoint sources within the context of its Statewide Waters Monitoring and Assessment Program (SWMP). The components of this monitoring program include:

- Rotating Integrated Basin Studies (RIBS) program for rivers and streams;
- Lake Classification and Inventory (LCI) program for lakes and ponds;
- Stream Biomonitoring Program and Toxicity Testing Program;
- Citizens Statewide Lake Assessment Program (CSLAP), a volunteer-based lake assessment program;
- Water Assessments by Volunteer Evaluators (WAVE), a volunteer-based stream assessment program; and
- Monitoring activities by other DEC Programs and other state and local agencies.

Monitoring program descriptions can be found in Appendix C. The SWMP includes three types of monitoring activities:

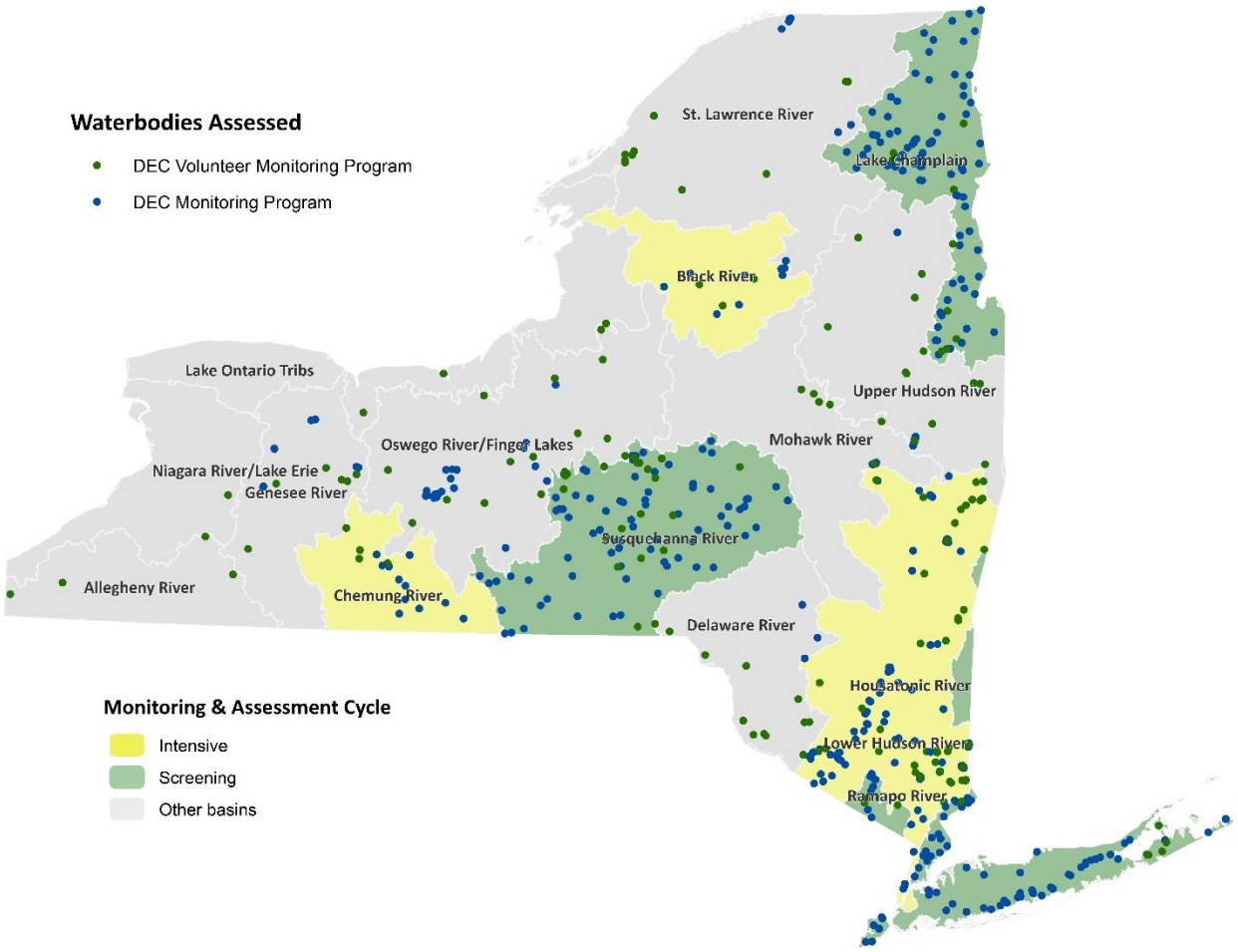
1. Water quality screening is conducted to provide a qualitative assessment of water quality at a large number of sampling sites (e.g., on-site biological sampling and visual lake surveys).
2. Intensive basin monitoring employs more frequent, comprehensive and integrated multi-media sampling to provide more detailed water quality information for a smaller number of waterbodies in selected drainage basins.
3. Routine trend monitoring provides continuous (annual) sampling at fixed sites across the state to monitor basic water quality characteristics, establish baseline conditions and evaluate long-term trends.

All monitoring activities, from the multiple programs, are linked with the Waterbody Inventory/Priorities Waterbodies List (WI/PWL). The WI/PWL is a compilation of water quality information for all individual waterbodies (lakes, rivers, streams, estuaries and coastlines) in the state. The WI/PWL includes waterbody fact sheets that outline the most recent assessment of the waterbody, identification of water quality problems and sources, and summary of activities taken to restore and protect each individual waterbody. The WI/PWL incorporates input from the public, along with state and local agencies and serves as a basis for setting NPS management priorities to guide the selection of BMP implementation projects for state financial assistance.

Objective 3: Reporting Measure Accomplishments

Reporting Measure	Accomplishment
Percent of waterbodies assessed (cumulative statewide)	55%

Major drainage basins are monitored on a five-year rotating schedule. Screening basin monitoring was conducted in the Lake Champlain, Susquehanna River and Ramapo River basins during the reporting period. Intensive basin monitoring was conducted in the Black River, Chemung River, Housatonic River and Lower Hudson basins. During the reporting year, 700 locations on 491 waterbodies were assessed through DEC programs (points shown on map below).



Objective 3 Highlight:

Harmful Algal Blooms (HABS) Program Guide

Harmful Algal Blooms (HABs) in freshwater generally consist of cyanobacteria (also referred to as blue-green algae). Cyanobacteria are naturally present in low numbers in most marine and freshwater systems but under certain conditions, particularly high nutrients and warm temperatures, the organisms can begin to multiply rapidly and form blooms. Several types of cyanobacteria have the potential to produce toxins and other harmful compounds that can pose a health risk to people and animals through ingestion, skin contact, or inhalation. DEC suggests avoiding contact with any water that is discolored or has algal scums on the surface

The purpose of this guide is to describe how the New York State DEC identifies and documents cyanobacteria HABs throughout the state, communicates health risks to the public, provides guidance on bloom management, and conducts research. The primary audience for this guide is New York State agency staff, but the guide may be useful to others, particularly the wide range of partners involved in addressing HABs in New York. The DEC HABs Program uses a combination of visual surveillance, chlorophyll concentration (specifically, the portion of total chlorophyll that can be fluoroscopically attributed to cyanobacteria, also known as blue-green chlorophyll) and total microcystins concentration (a toxin produced by cyanobacteria) to determine a bloom status (Suspicious, Confirmed, or Confirmed with High Toxins Blooms). The status system provides a uniform way to rapidly communicate information about HABs throughout the state.

DEC receives HABs reports from state agency staff, the public, and several collaborating partners. DEC staff work to support structured monitoring on waterbodies prone to HABs through existing monitoring programs and site-specific partnerships.

Rapid and effective outreach is a critical component of the DEC HABs Program. Communication of information about HABs serves to inform the public's recreational choices. DEC maintains a HABs website of current and archived bloom locations, called NYHABS (New York HAB System), as well as maintains a shared inter-agency database for rapid communication of bloom occurrences and sampling results. The DEC HABs Program publishes annual and cumulative summaries of bloom reports.

The program guide can be found at http://www.dec.ny.gov/docs/water_pdf/ habsprogramguide.pdf

Objective 4: Protect and maintain unimpaired waters of the state from additional nonpoint source pollution, and restore or prevent further degradation of waters of the state impaired by nonpoint source pollution

The fundamental priority of New York's NPS Program is to protect and restore all waters of the state, including both surface and ground waters, for beneficial uses. Impaired waters, as identified on the WI/PWL and the federal Section 303(d) list of impaired waters, may be "fully restored" and/or "partially restored" by the strategic implementation of watershed projects selected by priority ranking procedures established in state funding program protocols, and other actions, leading to their removal from the 303(d) list.

"Partially restored" includes either of the following:

- A water that is impaired for more than one use, but is restored for one or more (but not all) of those uses, and
- A water that has a use that is impaired by more than one pollutant, but meets the criteria for one or more (but not all) of those pollutants.

"Fully restored" means that all uses for the waterbody are now being met.

The Section 303(d) list is updated every two years. The review and update of the WI/PWL assessment information is a continuous process. Waterbody assessment fact sheets are updated as sampling results and/or other water quality information becomes available. Updates typically align with the DEC's five-year rotating basin schedule; however, fact sheets may be revised more frequently if needed.

2016 Delisted Waterbodies

The Final NYS 2016 Section 303(d) List was partially approved by EPA on July 21, 2017. The following waterbodies were delisted from the 2014 list:

- Great Valley Creek, Middle, and minor tributaries (0201-0012) was delisted due to reassessment indicating that uses are fully supported.
- Tunungwant (Tuna) Creek and tributaries (0201-0002) was delisted due to reassessment indicating that uses are fully supported.
- Olean Creek, Upper, and tributaries (0201-0050) was delisted due to reassessment showing only minor impacts.
- Cuba Lake (0201-0016) was delisted due to reassessment indicating that uses are fully supported.
- Upper Cassadaga Lake (0202-0001) was delisted due to reassessment indicating that uses are fully supported.
- Genesee River, Lower Main Stem and Middle Main Stem (0401-0001 and 0401-0003), was delisted due to reassessment showing only minor impacts. The Lower Genesee River continues to be listed on the 303(d) list in Part 2b and Part 3a as an impaired water for fish consumption. for PCBs, dioxin and mirex contamination.
- Bradner Creek and tributaries delisted due to inadequate justification of the original listing.
- The completion of the TMDL for Acid Impaired Lakes in the Adirondack Park in 2014 caused the delisting of 51 lakes for acid/base (pH) pollution from atmospheric deposition in the Black River, Saint Lawrence River, and Upper Hudson River Drainage Basins in Lewis, Hamilton, Herkimer, and St. Lawrence Counties. For complete list https://www.dec.ny.gov/docs/water_pdf/303ddelisted2016.pdf

Objective 4: Reporting Measure Accomplishments

Reporting Measure	Accomplishment
Percent of waters identified as having a significant nonpoint source contribution to an impairment, based on the NYS Waterbody Inventory/Priority Waterbodies List (WI/PWL)	42% of impaired waterbodies
Number of newly identified as "impaired" waters and added to the final Section 303(d) list of impaired waters due to nonpoint sources	The 2016 NYS Section 303(d) list identified 12 (new) waterbodies as “impaired” due to nonpoint sources. The Final 2016 Section 303(d) list was approved/partially approved to EPA on July 21, 2017.
Percent of waters assessed as having "No Known Impact" (fully supporting), and thus needing protection	43%

Below is a list of newly impaired waterbodies added to the Final NYS 2016 Section 303(d) list due to nonpoint sources:

Waterbody Name	County	Type	Cause/Pollutant	Suspected Source
Beaver Lake/Alma Pond (0201-0073)	Cattaraugus	Lake	Phosphorus	Other (internal loading)
Hulburt/Clymer Pond (0202-0079)	Chautauqua	Lake	Phosphorus	Agriculture
Dean Pond (0602-0077)	Cortland	Lake	Phosphorus	Agriculture
Reeder Creek and tributaries (0705-0074)	Seneca	River	Phosphorus	Unknown
Evens Lake (1402-0004)	Sullivan	Lake	Phosphorus	Municipal
The Lake in Central Park (1702-0105)	New York	Lake	Phosphorus	Urban/Storm Runoff
Harlem Meer (1702-0103)	New York	Lake	Phosphorus	Urban/Storm Runoff
Meadow Lake (1702-0030)	Queens	Lake	Phosphorus	Urban/Storm Runoff
Willow Lake (1702-0031)	Queens	Lake	Phosphorus	Urban/Storm Runoff
Kissena Lake (1702-0258)	Queens	Lake	Phosphorus	Urban/Storm Runoff
Massapequa Cove and tidal tributaries (1701-0391)	Nassau	Estuary	Pathogens	Urban/Storm Runoff
Prospect Park Lake (1701-0196)	Kings	Lake	Phosphorus	Urban/Storm Runoff

Objective 5: Integrate management of nonpoint pollution sources into applicable state and local agency programs (including both regulatory and non-regulatory programs), and provide overall policy coordination among state, local and federal agencies

New York's NPS Program includes statewide and targeted voluntary and regulatory management approaches. Coordination between NPS partner agencies and other relevant environmental quality programs is facilitated through the New York Nonpoint Source Committee and through NPS Program participation in other relevant advisory and technical committees (such as the New York Water Management Advisory Committee, the State Soil and Water Conservation Committee, and the NRCS State Technical Committee).

Notable partnership activities during the reporting period included the following:

- Long Island Nitrogen Action Plan: LINAP is a multiyear initiative to reduce nitrogen in Long Island's surface and ground waters by DEC, the Long Island Regional Planning Council (LIRPC), and Suffolk and Nassau counties, with input from multiple partners and stakeholders. The LINAP Fertilizer Management Workgroup met several times to discuss the best management practices for turf grass fertilizers. In attendance at these workgroup meetings were various sectors, including landscapers, fertilizer manufactures, golf courses, environmental groups, and state and county government. The meetings provided a forum for healthy discussions on various turf grass fertilizer topics. The series of meetings has led to turf grass fertilizer recommendations that help consumers care for their lawns while lessening their environmental impacts. These recommendations (http://www.dec.ny.gov/docs/water_pdf/linapfertilizer.pdf) are available for download and can be printed for personal and professional use. Additionally, DEC provided the State Legislature with a draft bill based on the fertilizer recommendations. DEC continues to work closely with Suffolk County as they implement a grant program to incentive installation of innovative/alternative septic systems. Suffolk County has 360,000 residences on cesspools or septic systems. The innovative systems significantly reduce nitrogen in the effluent. New York has provided considerable financial support to the program.)
- National Water Quality Initiative (NWQI): Regular consultations were conducted with both NRCS and New York State Department of Environmental Conservation to determine water restoration priorities for the NWQI. Several sub-watersheds in the Lake Champlain basin were selected for this program.

NPS Program staff and NPS Committee representatives also routinely communicated and consulted on a variety of interagency NPS issues:

- Routine coordination meetings with DOH were conducted to review water supply protection and water quality management concerns.
- Watershed planning coordination meetings were conducted with DOS, which funds watershed planning by localities.
- Coordination meetings with the EFC were conducted to review CWSRF and GIGP issues
- NPS Program staff routinely participated in the Technical Advisory Committee (TAC) of the State Soil and Water Conservation Committee to review AEM Framework issues and implementation of the AgNPS Program.
- NPS partner agencies participated in regular meetings of other advisory and technical committees closely related to NPS management, notably the New York State Water Management Advisory Committee, the NYSSWCC State Committee and the NRCS State Technical Committee.
- NPS Program staff and other NPS partner agency staff participated in numerous interstate and federal meetings and conference calls which address national or regional coordination for NPS issues, notably the Coastal States Organization Coastal NPS Workgroup, the New England

Interstate Water Pollution Control Commission (NEIWPCC) Nonpoint Source Management Workgroup; the Association of Clean Water Administrators (ACWA) Section 319 Workgroup; the ACWA Watersheds Committee; and the ACWA TMDL Committee.

These state and federal level coordination activities were complemented by the participation of NPS Program staff and NPS partner agency staff in local coordination meetings of County Water Quality Coordinating Committees and meetings of watershed coalitions and local watershed planning and management committees.

Objective 5 Highlight: Harmful Algal Blooms (HABs) Action Plans for 12 priority lakes in New York – A Four Point Initiative

In his 2018 State of the State address, Governor Cuomo announced a four-point initiative to aggressively combat HABs in Upstate New York, with the goal to identify contributing factors fueling HABs, and implement innovative strategies to address their causes and protect water quality. Under this initiative, the Governor's Water Quality Rapid Response Team focused strategic planning efforts on 12 priority lakes across New York that have experienced or are vulnerable to HABs. These lakes are:

- Cayuga Lake
- Chautauqua Lake
- Conesus Lake
- Honeoye Lake
- Lake Carmel
- Lake Champlain
- Lake George
- Monhagen-Middletown Reservoir System
- Owasco Lake
- Palmer Lake
- Putnam Lake
- Skaneateles Lake

The team brought together national, state, and local experts to discuss the science of HABs, and held four regional summits that focused on conditions that were potentially affecting the waters and contributing to HABs formation, and immediate and long-range actions to reduce the frequency and /or treat HABs. Although the 12 selected lakes are unique and represent a wide range of conditions, the goal was to identify factors that lead to HABs in specific water bodies, and apply the information learned to other lakes facing similar threats. The Rapid Response Team, national stakeholders, and local steering committees worked together collaboratively to develop science-driven Action Plans for each of the 12 lakes to reduce the sources of pollution that spark algal blooms. The state will provide grant funding to implement the Action Plans, including new monitoring and treatment technologies.

The four points for this initiative were as follows:

1. **Priority Lake Identification** - Identify 12 priority waterbodies that represent a wide range of conditions and vulnerabilities—the lessons learned will be applied to other impacted waterbodies in the future.
2. **Regional Summits** - Convene four Regional Summits to bring together nation-leading experts with Steering Committees of local stakeholders.

3. **Action Plan Development** - Continue to engage the nation-leading experts and local Steering Committees to complete Action Plans for each priority waterbody, identifying the unique factors fueling HABs—and recommending tailored strategies to reduce blooms.
4. **Action Plan Implementation** - Provide grant funding to implement the Action Plans, including new monitoring and treatment technologies.

As a result of this initiative, twelve priority lakes were characterized, assessed, and implementation plans developed such that funding initiatives could be developed to address the harmful algal bloom spread throughout lakes in New York.

Objective 6: Develop and maintain the capacity of state, regional and local agencies and organizations to provide nonpoint source management assistance to communities and landowners through assessment, planning, technical support and education

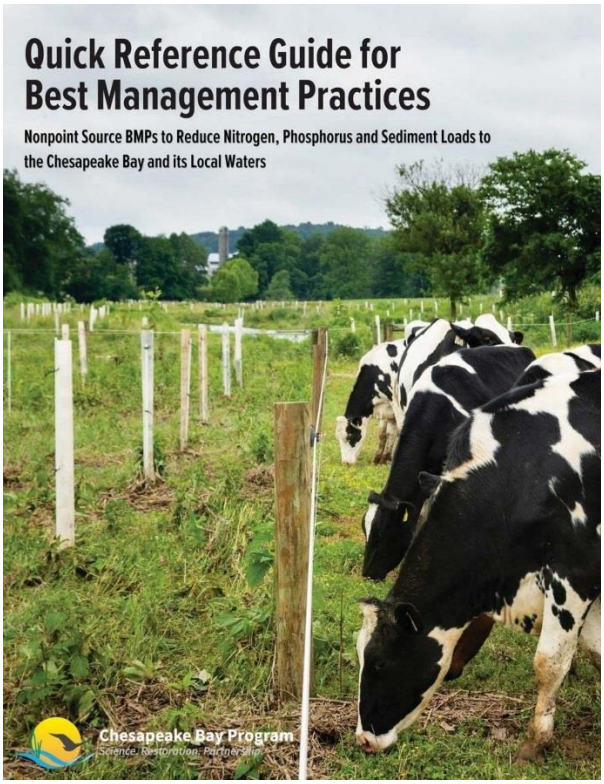
A key emphasis of the NPS Program has been to support local agency outreach to municipalities and landowners. Local partners providing outreach include County Water Quality Coordinating Committees, Soil and Water Conservation Districts (SWCDs), watershed coalitions, and planning and health agencies. Contributions from Cornell Cooperative Extension, Cornell Pro-Dairy, public water suppliers, and citizen groups complement this network to provide nonpoint source-related technical assistance and guidance to municipalities and landowners.

Trainings and technical guidance documents created to support local agencies' outreach efforts included:

- The NYS Annual Water Quality Symposium, conducted through a partnership with the New York State Conservation District Employees Association, provides an important forum for delivering nonpoint source technical guidance to local agencies. Nonpoint source management topics addressed during the 2019 Symposium included: comprehensive nutrient management planning, erosion and sediment control, stormwater practices, advanced GIS, forestry planning and harmful algal bloom updates.
- Dairy Acceleration Program, coordinated through Cornell University Pro-Dairy and Cornell University Cooperative Extension, provides education and planning services to dairy farmers to create more economically viable and environmentally sustainable operations.
- Conservation Skills Workshops, conducted through a partnership with New York State Conservation District Employees Association, USDA NRCS, and NYSSWCC, provide class and field trainings annually on various agricultural nonpoint source topics. Topics covered in 2019 workshops included: Basic surveying, wetland delineation, rural roads management, forestry practices, prescribed grazing and cropland conservation.

Post-Flood Emergency Stream Intervention Trainings were given by DEC staff, in cooperation with Soil and Water Conservation Districts. Trainings are geared toward municipal employees, local contractors, district staff, environmental organizations, and county legislators.

On the next page is the cover of the publication, along with an example BMP (stream restoration) shown in the publication



A-9. Stream Restoration (Ag)

General Information

New stream restoration techniques have been pioneered in the Chesapeake Bay watershed to restore streams. Approaches to stream restoration include natural channel design, regenerative stream channel and legacy sediment removal. Stream restoration projects require state and federal permits and thus extensive regulatory review. Projects often take multiple years from concept to construction, involving high costs and extensive effort from multiple stakeholders at the community, state and federal level. Note: This BMP reference sheet is targeted for the agricultural sector. See Sheets N-1: Stream Restoration (Urban and Non-Urban) and D-5: Urban Stream Restoration if interested in developed or general sectors, though the information is the same.

Figure A-9-1. Stream restoration projects can improve the health of aquatic resources and can be one of the more cost-effective practices to reduce nutrient and sediment loads in urban watersheds. A stream prior to restoration (top) that has an eroded stream bank and channel can be restored so that natural processes reduce the erosive energy of the stream flow during storm events. The bottom picture is the same stream shortly after completion of the project. Photos: US Fish and Wildlife Service

CBP Definition(s)

Natural Channel Design (NCD) applies the principles of stream geomorphology to maintain a state of dynamic equilibrium among water, sediment, and vegetation that creates a stable channel.

Legacy Sediment Removal (LSR) seeks to remove legacy sediments from the stream and its floodplain and thereby restore the natural potential of aquatic resources including a combination of streams, floodplains, and wetlands.

Regenerative Stream Channel (RSC, aka Regenerative Stormwater Conveyance) uses in-stream weirs in perennial streams to increase the interaction with the floodplain during smaller storm events. These projects may also include sand seepage wetlands and other habitats to increase the stream's connection with its floodplain. Only wet channel RSC practices are eligible as stream restoration projects. Dry channel RSC projects are considered a runoff reduction retrofit practice, which is not applicable to agricultural load sources (see Sheet D-2: Stormwater Retrofits).

Stream Restoration refers to any NCD, RSC, LSR or other restoration project that meets the qualifying conditions for credits, including environmental limitations and stream functional improvements.

Specifications or Key Qualifying Conditions

There are further protocol-specific qualifying criteria detailed in other resources listed under Additional Information below. All projects must meet the following criteria to be eligible for credit:

- Reach restored must be greater than 100ft in length.
- Reach restored must be actively enlarging or degrading.
- Reach restored MAY NOT be tidally influenced.
- The project MAY NOT be primarily designed to protect public infrastructure. Bank armoring and rip rap are not eligible for stream restoration credit.

- Restoration plan must utilize a comprehensive approach to stream restoration design, addressing long-term stability of the channel, banks, and floodplain.
- Must comply with all state and federal permitting requirements, including 404 and 401 permits.

Stream restoration is a carefully designed intervention to improve the hydrologic, hydraulic, geomorphic, water quality, and biological condition of degraded urban streams, and must not be implemented for the sole purpose of nutrient or sediment reduction. Restoration projects should be developed through a functional assessment process, such as the stream functions pyramid (Harman et al., 2012) or functional equivalent.

Nitrogen, Phosphorus and Sediment Reductions

There are three general protocols to define the pollutant load reductions from stream restoration practices. There is also a default rate for historic projects and new projects that cannot conform to the recommended reporting requirements.

- Protocol 1. Credit for prevented sediment during storm flow
- Protocol 2. Credit for in-stream nitrogen processing during base flow
- Protocol 3. Credit for reconnection to the floodplain

For details on how to use the protocols consult the resources listed under Additional Information.

Table A-9-1. Summary of stream restoration protocols for nitrogen, phosphorus and sediment reductions

Protocol	TN (lbs/ linear ft/ year)	TP (lbs/ linear ft/ year)	TSS (lbs/ linear ft/ year)
Protocol 1. Prevented sediment	Site-specific	Site-specific	Site-specific
Protocol 2. In-stream nitrogen processing	Site-specific	N/A	N/A
Protocol 3. Floodplain reconnection	Site-specific	Site-specific	Site-specific
Default for existing/non-conforming projects*	0.075	0.068	248**

*The existing/non-conforming rates were adjusted following a test drive period. These adjustments are explained in Appendix G of the expert panel report.
**Because small stream loads are explicitly modeled in the Phase 6 tools, no sediment delivery factors are needed to reduce the default edge-of-field rate of 248 lbs of TSS/linear ft/year published by the panel.

Specific Reporting and Modeling Information

Applicable Land Use Types (or other load sources) Treated by the BMP:

- Stream Bed and Bank

The practice can only be applied to the "Stream Bed and Bank" load source, but it is recommended to distinguish the BMP based on its sector using the appropriate secondary BMP designation of either "Urban Stream Restoration" or "Non-Urban Stream Restoration."

Brief Description of BMP Simulation in the Model

All stream restoration practices are *Load Reduction BMPs*, which means they are modeled as a simple removal of pounds of nitrogen, phosphorus and/or sediment from the edge-of-stream load. To calculate the pounds reduced for each protocol, follow the methods and examples described in the panel report and other resources listed under Additional Information. The protocols are additive. So, a project that reduces 100 lbs TN under Protocol 1, 25 lbs TN under Protocol 2, and 30 lbs TN under Protocol 3 has a net reduction of 155 lbs TN. As another example, pretend the project design is unknown for a project planned to restore 1,000 linear feet of a

degraded stream. Using the default rate for that project yields reductions of 7.5 lbs TN, 6.8 lbs TP and 24,800 lbs TSS, which would be removed from the edge-of-stream load in the Watershed Model. Load reduction BMPs such as stream restoration cannot remove more pounds of nitrogen, phosphorus or sediment than are available in a watershed, however. So, the Watershed Model does enforce maximum reductions that are described in Section 6.5.4.1 of the Watershed Model documentation.

Annual or Cumulative? Cumulative (10-year credit duration for non-urban stream restoration)

Can this practice be combined with other BMPs? Yes.

Key Elements for State BMP Reporting through NEIEN

- *BMP Name:*
  - Non-Urban Stream Restoration Protocol
  - Non-Urban Stream Restoration
- *Measurement unit(s): Length restored (feet); Protocol 1 TN (lbs); Protocol 1 TP (lbs); Protocol 1 TSS (lbs); Protocol 2 TN (lbs); Protocol 3 TN (lbs); Protocol 3 TP (Lbs); Protocol 3 TSS (lbs)*
- *Load Source:* Stream Bed and Bank
- *Geographic location:* Approved NEIEN geographies: County; County (CBW only); Hydrologic Unit Code (HUC12, HUC10, HUC8, HUC6, HUC4); State (CBW only)
- *Date of implementation:* Year the project was completed.

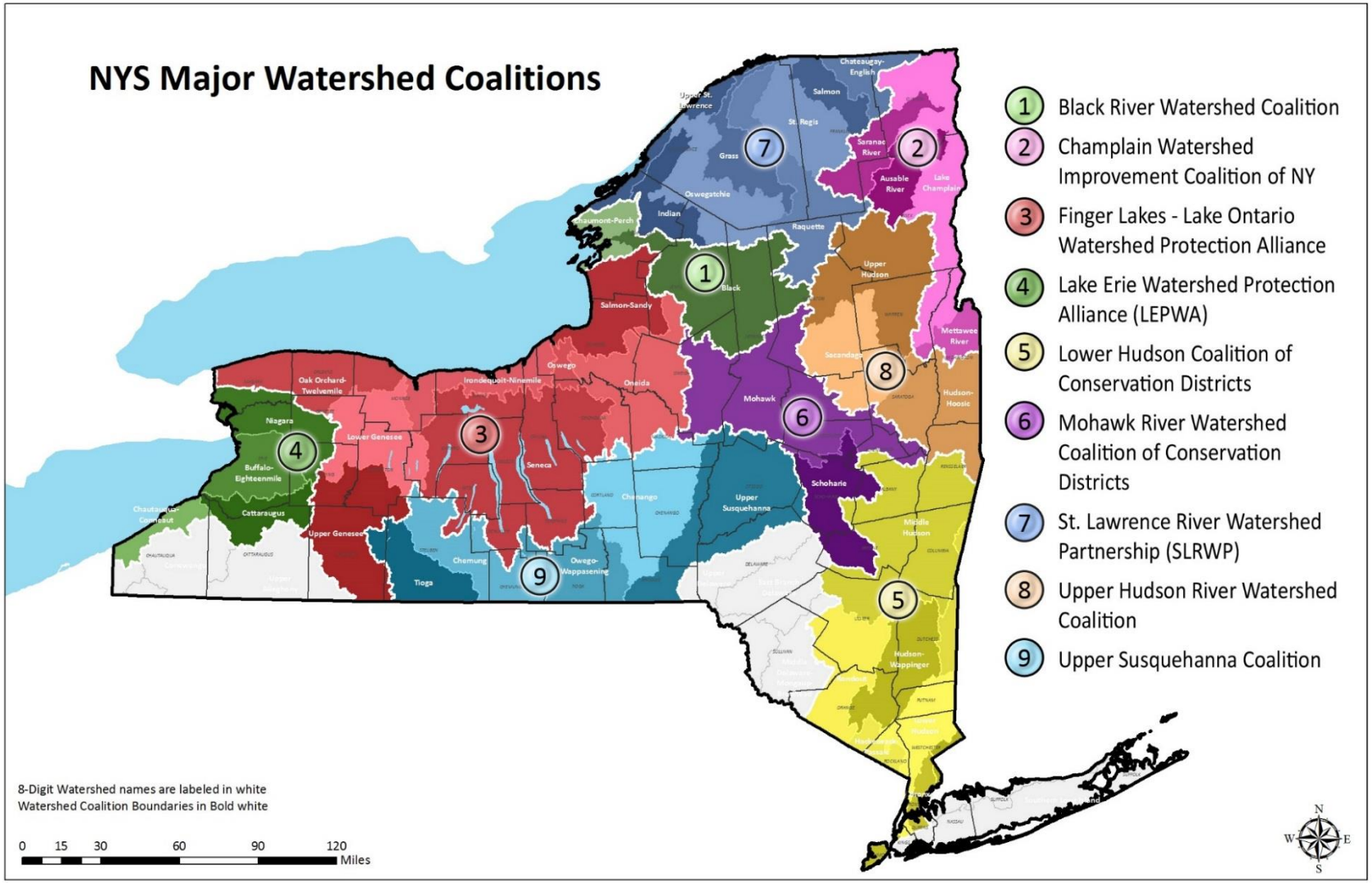
Table A-9-2. Synonymous BMP names for Watershed Model, NEIEN and other sources

CBP or Expert Panel term	NEIEN BMP name	Other common practice names
Stream Restoration (Ag)	Non-Urban Stream Restoration Protocol*	natural channel design, legacy sediment removal, regenerative stream channel or regenerative stormwater conveyance (wet channel only)
Stream Restoration (Ag)	Non-Urban Stream Restoration**	

* Uses protocols 1-3 summarized in Table A-9-1. Requires unit of feet in addition to the pounds reduced for each respective protocol.
** For use when specific project design is not known. Requires unit of feet.

The guide is available online at:
https://www.dec.ny.gov/docs/water_pdf/cbbmpguide18.pdf

Appendix A: Watershed Coalition Map



Appendix B: Initiated Cost Shared BMPs

BMP Type	Units to be Installed	
Access Control (Use Exclusion)	82	Acres
Agriculture-Animal Feeding Operations	1	Acres
Agrochemical Mixing Facility	143	Feet
Animal Trails and Walkways	4,920	Feet
Closure of Waste Impoundments	4	Units
Composting Facility	2	Units
Conservation Cover	4	Acres
Cover Crop	6250	Acres
Critical Area Planting	37	Acres
Diversion	10,091	Feet
Erosion and Sediment Control	87	Acres
Fence	26,387	Feet
Filter Strip	9	Acres
Forage and Biomass Planting	134	Acres
Heavy Use Area Protection	8	Acres
Infiltration Basin	6	Acres
Irrigation Storage Reservoir	150	Acres
Lined Waterway or Outlet	412	Feet
Livestock Pipeline	5,550	Feet
Manure (Waste) Transfer	79	Units
Mulching	757	Acres
Nutrient Management	6,469	Acres
Pond	8	Acres
Prescribed Grazing	643	Acres
Pumping Plant	28	Units
Raingarden/ Bioretention Basin	6	Acres
Riparian Buffers - Vegetative	3	Acres
Riparian Forest Buffer	93	Acres
Riparian Herbaceous Cover	60	Acres
Roof Runoff Management	66	Units
Spring Development	10	Units
Stream Crossing	20	Units
Streambank & Shoreline Protection	22	Acres
Strip Cropping	104	Units
Subsurface Drain	16,833	Feet
Tree/Shrub Establishment	46	Acres
Underground Outlet	12,559	Feet
Waste Facility Cover	30	Units

BMP Type	Units to be Installed	
Waste Storage Facility	71	Units
Wastewater Treatment Strip	5	Units
Water & Sediment Control Basin	2	Units
Water Well	8	Units
Watering Facility	107	Units
Wetland Creation	1	Acre
Wetland Restoration	4	Acres

Appendix C: Nonpoint Source Funding Program Descriptions

STATE AND LOCAL FUNDING SOURCES

New York State Agricultural Environmental Management (AEM) Program

Eligible applicants:	County Soil and Water Conservation Districts administer and implement AEM at the local level through. SWCDs engage local partners such as Cooperative Extension, NRCS, AEM Certified Planners, Certified Crop Advisors, USDA Technical Service Providers, and agri-businesses
Summary of program:	The New York State Agricultural Environmental Management (AEM) Program supports farmers in their efforts to protect water quality and conserve natural resources, while enhancing farm viability. New York's AEM Program helps farmers protect water quality by providing a framework to assess environmental stewardship and coordinate technical and financial assistance from the Federal, State, and local levels to address priority water quality issues on the farm.
Website:	http://www.nys-soilandwater.org/

Agricultural Nonpoint Source Abatement and Control Program (ANSACP)

Eligible applicants:	Soil and Water Conservation Districts
Summary of program:	Competitive financial assistance program available to Soil and Water Conservation Districts that provides funding to plan, design, and implement priority BMPs, as well as cost-share funding to farmers to implement BMPs.
Website:	https://www.nys-soilandwater.org/aem/nonpoint.html

Climate Resilient Farming Program (CRF)

Eligible applicants:	Soil and Water Conservation Districts
Summary of program:	Competitive financial assistance program with funds applied for and awarded through county Soil and Water Conservation Districts on behalf of farmers in one of three project categories: agricultural waste storage cover and flare for methane reduction, on-farm water management, and soil health systems.
Website:	https://www.agriculture.ny.gov/soil-and-water/climate-resilient-farming

Water Quality Improvement Project (WQIP) Program

Eligible applicants:	Municipalities, municipal corporations, soil and water conservation districts
Summary of program:	Provides funding statewide for non-agricultural nonpoint source projects implementing best management practices
Website:	http://www.dec.ny.gov/pubs/4774.html

Clean Water Act Section 604(b) Funding

Eligible applicants:	Regional public comprehensive planning organizations in New York State and interstate planning organizations working in New York State
Summary of program:	Provides funding for to regional planning organizations for planning activities
Website:	http://www.dec.ny.gov/lands/53122.html

Finger Lakes – Lake Ontario Watershed Protection Alliance (FLLOWPA)

Eligible applicants:	25 counties in the Finger Lakes and Lake Ontario watershed receive FLLOWPA funding. Those eligible to receive a portion of the funding distributed to the 25 counties varies by county.
Summary of program:	Provides funding for to regional planning organizations for planning activities
Website:	http://www.fllowpa.org/county.html

Hudson River Estuary Program Grants

Eligible applicants:	Municipalities and not-for-profit corporations with a 501(c)(3) designation. Projects must be within the Hudson River estuary geographic boundaries.
Summary of program:	In prior years, funds have been awarded for green infrastructure improvements for stormwater management.
Website:	http://www.dec.ny.gov/lands/5091.html

Environmental Justice Community Impact Grant Program

Eligible applicants:	Community-based organizations that must also meet several other criteria, as explained on the below website.
Summary of program:	Previously awarded projects have included green infrastructure demonstration projects. In the 2012 grant cycle, smaller "Green Gems" projects must involve education, stewardship, and/or monitoring activities related to parks, open space, community gardens or green infrastructure.
Website:	http://www.dec.ny.gov/public/31226.html

Urban & Community Forestry Program Cost Share Grants

Eligible applicants:	Municipalities and not-for-profit corporations acting on behalf of a public ownership interest in the property or acting on behalf of a public property owner.
Summary of program:	Street tree planting, one eligible project type, may fit well with green infrastructure projects.
Website:	http://www.dec.ny.gov/lands/5285.html

Environmental Facilities Corporation Green Innovation Grant Program (GIGP)

Eligible applicants:	Any county, city, town, village, district corporation, county or town improvement district, Indian reservation wholly within NYS, any public benefit corporation, public authority and certain New York State agencies, as well as other organizations empowered to develop a project, as described on the below website.
Summary of program:	Provides funding for eight specific green infrastructure practices: permeable pavement; bio-retention; green roofs and green walls; stormwater street trees/urban forestry programs; riparian buffers, floodplains and/or wetlands; downspout disconnection; stream daylighting; and stormwater harvesting and reuse.
Website:	https://www.efc.ny.gov/GIGP

Department of State Local Waterfront Revitalization Program (LWRP) Grants

Eligible applicants:	Villages, towns, or cities, and counties which are located along New York's costs or inland waterways designated pursuant to Executive Law, Article 42.
Summary of program:	The LWRP grant program provides matching grants on a competitive basis to revitalize communities and waterfronts. Funding is available for both planning and implementation, and funded projects may include green infrastructure components.
Website:	http://www.dos.ny.gov/opd/grantOpportunities/epf_lwrpGrants.html

NYS Energy, Research and Development Authority Cleaner Greener Communities Program Phase II Implementation Grants

Eligible applicants:	Local governments, private companies, non-governmental organizations, and other entities with projects in NYS.
Summary of program:	This program is an effort to fund implementation of large-scale, high-profile projects that support the goals of each region's sustainability planning efforts. Category 2 (Planning Initiatives) Projects may include green infrastructure planning. Some Category 3 (Community-Scale Sustainability) Projects are required to meet green infrastructure prerequisites.
Website:	http://www.gliccc.org/wp-content/uploads/2011/07/NYS-Energy-Research-and-Development-Authority-Phase-2.pdf

NYS Homes & Community Renewal Community Development Block Grant – Public Infrastructure Funds

Eligible applicants:	Town, City or Villages with population less than 50,000, counties with a population less than 200,000 designated principal cities of Metropolitan Statistical Areas.
Summary of program:	Funding is available for drinking water, clean water and stormwater; and public works. Green infrastructure components may be a part of these larger public infrastructure projects.
Website:	http://www.nyshcr.org/AboutUs/Offices/CommunityRenewal/FundingOpportunities.htm

Greenway Communities Grant Program

Eligible applicants:	Municipalities that have adopted a resolution stating the community's agreement with the Greenway criteria.
Summary of program:	Site planning/design projects may include green infrastructure.
Website:	https://hudsongreenway.ny.gov/grants-funding

New York City Department of Environmental Protection Green Infrastructure Grant Program

Eligible applicants:	Private property owners in combined sewer areas of New York City
Summary of program:	Funds are available for design and construction of green infrastructure projects such as blue or green roofs, rain gardens, porous pavement, and rainwater harvesting.
Website:	https://www1.nyc.gov/site/dep/water/green-infrastructure-grant-program.page

City of Binghamton Green Stormwater and Landscaping Management Fund

Eligible applicants:	Residential property owners, non-profits, and small business owners in the City of Binghamton.
Summary of program:	This grant was created to help homeowners and businesses pursue small green infrastructure projects that will contribute to the City's resilience to flooding and help improve water quality. Total project area must be less than 5,000 square feet.
Website:	http://www.binghamton-ny.gov/sites/default/files/files/GSLMF%20Application%202014%20Final.pdf

Onondaga County "Save the Rain" Program: Green Improvement Fund (GIF)

Eligible applicants:	Owners of a commercial business or not-for-profit facility located within the Green Improvement Fund boundary.
Summary of program:	The grant is intended to offer assistance to applicants installing GI technologies as an aspect of the development, and/or retrofitting of certain classes of privately owned properties (commercial, business, and not-for-profit owned properties) in specific geographical locations within the Clinton, Harbor Brook, and Midland combined sewer system, as outlined in the Green Improvement Fund Program Boundary Map, and generally located in the City of Syracuse.
Website:	http://savetherain.us/green-improvement-fund-gif/

Onondaga County "Save the Rain" Program: Suburban Green Infrastructure Program (SGIP)

Eligible applicants:	Municipal entities within Onondaga County that are planning projects to reduced inflow and infiltration to the sanitary sewer system. Projects must be on municipal property within the Onondaga County sewer system.
Summary of program:	The program is designed to support the development of green infrastructure and stormwater mitigation techniques on public property within the Onondaga County sanitary sewer district but outside of the City of Syracuse.
Website:	http://savetherain.us/sgip/

City of Binghamton 50/50 Stormwater Management Fund & Green Stormwater and Landscaping

Eligible applicants:	Landowners and developers
Summary of program:	An incentive program for landowners and developers to implement green infrastructure practices that exceed the requirements of the City of Binghamton Erosion Control and Stormwater Management Ordinance. Approved projects are eligible for a 50 percent match, not to exceed $25,000, toward the cost of installation of green infrastructure. Developments funded through this program will function as case studies to demonstrate the cost, construction techniques and maintenance requirements of green infrastructure.
Website:	http://www.binghamton-ny.gov/grant-opportunities

FEDERAL FUNDING SOURCES

EPA Urban Water Small Grants

Eligible applicants:	States, local governments, territories, Indian Tribes, and possessions of the U.S., public and private universities and colleges, public or private nonprofit institutions/organizations, intertribal consortia, and interstate agencies.
Summary of program:	Grants are available to fund research, investigations, experiments, training, surveys, studies, and demonstrations that will advance the restoration of urban waters by improving water quality through activities that also support community revitalization and other local priorities. Depending on each fiscal year's Request for Proposals, this may include green infrastructure.
Website:	https://www.epa.gov/urbanwaters/urban-waters-small-grants

EPA Great Lakes Shoreline Cities Green Infrastructure Grants

Eligible applicants:	Cities with shoreline that directly touches one of the Great Lakes or a connecting channel, with a population greater than 25,000 and less than 50,000.
Summary of program:	Grants to eligible shoreline cities to fund green infrastructure projects that will improve Great Lakes water quality. Green infrastructure projects must be within ½ mile of the shoreline of a Great Lake or connecting channel. Available funding for each application was capped at $250,000. Project stage funded: Implementation
Website:	https://www.epa.gov/great-lakes-funding/great-lakes-shoreline-cities-grants

EPA Great Lakes Restoration Initiative (GLRI)

Eligible applicants:	Non-federal governmental entities, including state agencies, interstate agencies, federal-recognized Indian tribes and tribal organizations, and local governments; institutions of higher learning; and nonprofit organizations. In 2014, green infrastructure projects conducted by a municipality located directly on the shore of a Great Lake or a Great Lakes connecting channel are ineligible. Green infrastructure projects conducted by other eligible applicants are eligible.
Summary of program:	Green infrastructure projects that improve habitat and other ecosystem functions in the Great Lakes are eligible for funding.
Website:	https://www.epa.gov/great-lakes-funding/great-lakes-restoration-initiative-glri

EPA Challenge Cost Share Grant Program

Eligible applicants:	U.S. non-federal organization and tribal agencies
Summary of program:	Green infrastructure projects that improve habitat and other ecosystem functions in the Great Lakes are eligible for funding.
Website:	https://www.epa.gov/great-lakes-funding/great-lakes-restoration-initiative-glri

National Fish and Wildlife Foundation Chesapeake Bay Stewardship Fund

Eligible applicants:	Non-profit 501© organizations, local governments and agencies, state government agencies and academic institutions. Projects must be implemented entirely within the Chesapeake Bay watershed.
Summary of program:	Nonpoint source best management practices meeting Chesapeake Bay priorities
Website:	https://www.nfwf.org/chesapeake/Pages/home.aspx

National Fish and Wildlife Foundation Delaware River Restoration Fund

Eligible applicants:	Non-profit organizations and local governments. Projects must be implemented entirely within the Delaware River watershed.
Summary of program:	Nonpoint source best management practices to benefit the Delaware River basin.
Website:	https://www.nfwf.org/delaware/Pages/home.aspx

National Fish and Wildlife Foundation Urban Waters Restoration

Eligible applicants:	Any entity that can receive grants. While partnerships are encouraged to include state and federal agencies as partners, those entities **may not** serve as the grantee **unless** the community partners demonstrate that the state or federal agency is best suited to coordinate the community-based project.
Summary of program:	In 2014, project priorities include addressing developing educational programs to provide training to schools, businesses, community groups and homeowners on how to implement green infrastructure practices including sustainable forestry practices; or designing projects intended to control rain water though green infrastructure tools such as tree canopy, permeable pavement, green street designs, bioswales, planter boxes and green roofs, to reduce stormwater flow, controlling flooding and slowing run-off into surface water.
Website:	http://www.nfwf.org/fivestar/Pages/home.aspx#.VDblP1OZ1gp

National Fish and Wildlife Foundation Long Island Sound Futures Fund

Eligible applicants:	Non-profit 501© organizations; state, tribal, and local governments; and academic or educational institutions. Nonpoint source or stormwater management, education, and fish passage projects may be in any portion of the Long Island Sound and its watersheds within the states of Connecticut and New York, but must demonstrate a quantifiable and measurable impact on improving Long Island Sound or its ecosystem.
Summary of program:	Funding priorities include planning and implementing green infrastructure projects.
Website:	http://www.nfwf.org/lisff/Pages/home.aspx#.VdbnIlOZ1gp

FEMA Hazard Mitigation Grants

Eligible applicants:	States, local governments, tribes, private non-profit organizations
Summary of program:	Provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. FEMA Hazard Mitigation grants will fund green infrastructure if a benefit-cost analysis shows that the damages saved from the project exceed the cost of the project.
Website:	https://www.fema.gov/hazard-mitigation-grant-program

USDA-FSA Conservation Reserve Program (CRP)

Eligible applicants:	Landowners with eligible land
Summary of program:	CRP is a voluntary program for agricultural landowners. Through CRP, farmers can receive annual rental payments and cost-share assistance to establish long-term, resource conserving covers on eligible farmland.
Website:	http://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/index

USDA-FSA Conservation Reserve Enhancement Program (CREP)

Eligible applicants:	Landowners with eligible land
Summary of program:	The Conservation Reserve Enhancement Program (CREP) is an offshoot of the Conservation Reserve Program (CRP). CREP targets high-priority conservation issues identified by local, state, or tribal governments or non-governmental organizations. In exchange for removing environmentally sensitive land from production and introducing conservation practices, farmers, ranchers, and agricultural land owners are paid an annual rental rate and incentive payments.
Website:	http://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-enhancement/index

USDA-FSA Debt for Nature (DFN) Program

Eligible applicants:	Landowners with eligible FSA loans and land
Summary of program:	Debt for Nature (DFN) is available to persons with Farm Service Agency (FSA) loans secured by real estate. These individuals may qualify for cancellation of a portion of their FSA indebtedness in exchange for a conservation contract with a term of 50, 30, or 10 years. The conservation contract is a voluntary legal agreement that restricts the type and amount of development that may take place on portions of the landowner's property. Contracts may be established on marginal cropland and other environmentally sensitive lands for conservation, recreation, and wildlife purposes.
Website:	https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/FactSheets/archived-fact-sheets/debtfornature07.pdf

USDA-FSA Farmable Wetlands Program (FWP)

Eligible applicants:	Landowners with eligible land
Summary of program:	The Farmable Wetlands Program (FWP) is a voluntary program is designed to restore previously farmed wetlands and wetland buffer to improve both vegetation and water flow. Participants must agree to restore the wetlands, establish plant cover, and to not use enrolled land for commercial purposes.
Website:	http://www.fsa.usda.gov/programs-and-services/conservation-programs/farmable-wetlands/index

USDA-NRCS Agricultural Conservation Easement Program (ACEP)

Eligible applicants:	Landowners with eligible land
Summary of program:	The Agricultural Conservation Easement Program (ACEP) provides financial and technical assistance to help conserve agricultural lands and wetlands and their related benefits. Under the Agricultural Land Easements component, NRCS helps Indian tribes, state and local governments and non-governmental organizations protect working agricultural lands and limit non-agricultural uses of the land. Under the Wetlands Reserve Easements component, NRCS helps to restore, protect and enhance enrolled wetlands.
Website:	http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/acep/

USDA-NRCS Agricultural Management Assistance (AMA) Program

Eligible applicants:	Landowners with eligible land
Summary of program:	The Agricultural Management Assistance (AMA) provides financial and technical assistance to agricultural producers to voluntarily address issues such as water management, water quality, and erosion control by incorporating conservation into their farming operations.
Website:	http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/ama/

USDA-NRCS Conservation Stewardship Program (CSP)

Eligible applicants:	Landowners with eligible land
Summary of program:	The Conservation Stewardship Program (CSP) helps agricultural producers maintain and improve their existing conservation systems and adopt additional conservation activities to address priority resources concerns.
Website:	http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/csp/

USDA-NRCS Environmental Quality Incentives Program (EQIP)

Eligible applicants:	Landowners with eligible land
Summary of program:	The Environmental Quality Incentives Program (EQIP) is a voluntary program that provides financial and technical assistance to agricultural producers to plan and implement conservation practices that improve soil, water, plant, animal, air and related natural resources on agricultural land and non-industrial private forestland. EQIP may also help producers meet Federal, State, Tribal, and local environmental regulations.
Website:	http://www.nrcs.usda.gov/wps/portal/nrcs/main/ny/programs/financial/eqip/

USDA-NRCS Healthy Forests Reserve Program (HFRP)

Eligible applicants:	Landowners with eligible land
Summary of program:	The purpose of the Healthy Forests Reserve Program (HFRP) is to assist landowners, on a voluntary basis, in restoring, enhancing and protecting forestland resources on private lands through easements, 30-year contracts and 10-year cost-share agreements.
Website:	http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/forests/

Regional Conservation Partnership Program (RCPP)

Eligible applicants:	Agricultural or silvicultural producer associations, farmer cooperatives or other groups of producers, state or local governments, American Indian tribes, municipal water treatment entities, water and irrigation districts, conservation-driven nongovernmental organizations and institutions of higher education
Summary of program:	The Regional Conservation Partnership Program (RCPP) promotes coordination between Natural Resource Conservation Service (NRCS) and its partners to deliver conservation assistance to producers and landowners. NRCS provides assistance to producers through partnership agreements and through program contracts or easement agreements.
Website:	https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/rcpp/

USDA-NRCS Watershed and Flood Prevention Operations (WFPO) Program

Eligible applicants:	States, local governments and Tribes
Summary of program:	The Watershed and Flood Prevention Operations (WFPO) Program provides technical and financial assistance to plan and implement authorized watershed project plans for the purpose of: watershed protection, flood mitigation, water quality improvements, soil erosion reduction, rural, municipal and industrial water supply, irrigation, water management, sediment control, fish and wildlife enhancement, and hydropower.
Website:	http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/wfpo/

Appendix D: Completed Projects and Reductions

Project Title	Nitrogen Reduction (lbs./yr.)	Phosphorus Reduction (lbs./yr.)	Sediment Reduction (tons/yr.)
Southern Cayuga Runoff Mgt Project Sweylokan Farms	0	784	160
Constructed Wetland for Cresent Creek (Tributary to Chautauqua Lake)	24,151	1,266	72
Onondaga County Critical Area Seeding Project	37,028	18,512	18,512
Schuyler and Chemung Counties Multiple Barrier Approach to Flood Damage Repair and Prevention	3,850	1,925	1,925
Schuyler and Chemung Counties Road Ditch Stabilization Flood Damage Repair and Prevention Implementation and Training	7,406	3,703	3,703
Southern Tier Natural Infrastructure Implementation: wetland construction and floodplain berm removal	724	62	2
Streambank and Aquatic Habitat Restoration for Sodus Creek	280	587	46
Ausable River Exclusion and Sedimentation Reduction	2273	135	67
Building Soil Health with Cover Crops	5,605	1,977	22

Project Title	Nitrogen Reduction (lbs./yr.)	Phosphorus Reduction (lbs./yr.)	Sediment Reduction (tons/yr.)
Canandaigua Lake Watershed Ag Program Phase IX	2,134	270	79
Chesapeake Bay Watershed Imp. Project #3	27,717	5,345	56
Compost Based BMPs- Tompkins County Demonstration Project	14	2	1
Controlled Access and Buffer System	1,364	164	31
Controlled and Limited Livestock Access using Riparian Buffers	2,837	810	6
Cover Crops 2014	7,600	105	29
Dean Creek Headwaters BMP Imp.	789	343	8
East Park Street Neighborhood Storm Water Improvements	1	0	0
FLCC/CMAC Stormwater Project	1	1	1
French Creek Water Quality Improvement Project	5,527	676	30

Project Title	Nitrogen Reduction (lbs./yr.)	Phosphorus Reduction (lbs./yr.)	Sediment Reduction (tons/yr.)
Honeoye Inlet Restoration Project	10,911	0	1073
Lake Champlain Riparian Protection Grant	214	21	4
Mettawee River CAFO Compliance and HAS Cover Crop	6,516	403	23
MidNorth Cayuga Lake Watershed Tier IV	48,487	7,614	81
Northern Owasco Lake Tier IV	11,240	1587	17
Schuyler Co SWCD - Schuyler and Chemung Counties Catharine Creek and Seneca Lake Watersheds Sediment and Nutrient Reduction Project	200	100	100
Schuyler County Stream and Road Ditch Stabilization	10,000	5,000	5,000
Susquehanna Cover Crop Initiative for Improving Soil Health	20153	268	78
Town of East Hampton Green Reach Infrastructure Demonstration ("G.R.I.D.") Project at Three Mile Harbor	985	0	0
Warren County Stormwater Improvement Project	15	3	1

Appendix E: Monitoring Program Descriptions

Citizens Statewide Lake Assessment Program (CSLAP): CSLAP is a volunteer lake monitoring and education program managed by DEC and the New York Federation of Lake Associations (NYSFOLA). The data collected through the program is used to understand lake conditions and develop lake management plans. To participate in the program, lakes first need to be a member of the NYSFOLA (http://www.nysfola.org/). More information about the program can be found at: http://www.dec.ny.gov/chemical/81576.html.

Lake Classification and Inventory (LCI) Program: DEC conducts water quality sampling of lakes, ponds, and reservoirs through the LCI program. The LCI monitoring program collects data that supports water quality assessments and management activities including: updating the WI/PWL, identifying water bodies not meeting their designated uses for inclusion on the New York State Section 303(d) List, preparing the New York State 305(b) Water Quality Report, supporting the development of TMDL plans and evaluating the effectiveness of TMDL implementation, supporting the development of nutrient criteria in New York State, expanding the inventory of waterbodies infested with aquatic invasive species, and aiding in the identification of and response to harmful algal blooms. For more information about the program can be found at: http://www.dec.ny.gov/chemical/31411.html.

Rotating Integrated Basin Studies (RIBS) Program: The objectives of DEC's RIBS program are program are to assess water quality of all waters of the state, including the documentation of good quality waters and the identification of water quality problems; identify long-term water quality trends; characterize naturally occurring or background conditions; and establish baseline conditions for use in measuring the effectiveness of site-specific restoration and protection activities. The program is designed so that all major drainage basins in the state are monitored every five years. RIBS program water quality data and information are used to support assessment and management functions within NYSDEC Division of Water (DOW), including the Waterbody Inventory/Priority Waterbodies List (WI/PWL), New York State's Clean Water Act Section 305(b) Water Quality Report, and Section 303(d) List of Impaired Waters of the state. For more information about the program can be found at: http://www.dec.ny.gov/chemical/30951.html.

Stream Biomonitoring Monitoring Unit: DEC's Stream Biomonitoring Unit Department of uses aquatic macroinvertebrates to monitor the water quality of the State's rivers and streams. Biomonitoring surveys are primarily assessed by collecting benthic (bottom dwelling) macroinvertebrate samples from riffle habitats in streams and rivers. Fish and algae communities are also used in intensive surveys to assess the magnitude and type of environmental stress or impact in waterbodies. More information about the program can be found at: http://www.dec.ny.gov/chemical/23847.html.

Toxicity Testing Unit (TTU): DEC's Toxicity Testing program is a component of the RIBS program. Bioassays are used to identify toxicity in surface waters and sediments. Tests on ambient surface waters are conducted using the water flea (*Ceriodaphnia dubia*), to identify toxic effects on survival and reproduction. Collected sediments are also analyzed using the Microtox® toxicity testing system, which uses the bioluminescent bacterium, *Vibrio fischeri*, to look for the presence of toxicity in bottom sediments. The TTU also provides technical oversight of Whole Effluent Toxicity (WET) testing programs required at some industrial, municipal and remediation facilities as part of the State Pollutant Discharge Elimination Systems (SPDES) permit program. More information about the program can be found at: http://www.dec.ny.gov/chemical/29854.html.

Water Assessments by Volunteer Evaluators (WAVE) Program: WAVE is a citizen-based water quality assessment developed by DEC. The purpose of WAVE is to enable citizen scientists to collect biological data for assessment of water quality on streams in New York State. The WAVE data augment the professional monitoring conducted by DEC's Stream Biomonitoring Unit. WAVE data classified as "Possibly Impaired" serve as a red flag for sites that may deserve further investigation at the professional level.