New York State
Nonpoint Source
Management Program

Annual Report
April 2009

Division of Water
New York State Department of
Environmental Conservation

TABLE OF CONTENTS

Section 1 INTRODUCTION - NATIONAL PROGRAM ACTIVITY MEASURES

1.0 Introduction
1.1 National Program Activity Measures

Section 2 SUMMARY OF ACCOMPLISHMENTS FOR THE REPORTING PERIOD

2.0 Summary of Accomplishments for the Reporting Period
2.1 Stormwater Management
2.2 Agricultural Environmental Management
2.3 Onsite Wastewater Treatment Systems Management
2.4 Hydrologic and Habitat Modification
2.5 Watershed Management
2.6 Coastal Nonpoint Pollution Control Program

Section 3 WATERSHED ASSESSMENT AND NONPOINT SOURCES

3.0 Watershed Assessment and Nonpoint Sources
3.1 Statewide Waters Monitoring Program - Background
3.2 Updated Drainage Basin Studies - Nonpoint Source Factors

1.0 INTRODUCTION

This report describing progress in implementing the state's Nonpoint Source Management Program is intended to satisfy the requirement of the workplan for the Performance Partnership Grant (PPG) Base Program between the New York State Department of Environmental Conservation (NYSDEC) Division of Water (DOW) and the United States Environmental Protection Agency (EPA), Region 2. This report addresses progress and accomplishments for the period from April 1, 2008 through March 31, 2009. This report also includes discussion of progress and accomplishments in previous years to provide a context for more recent program activities, and to establish continuity in the annual reporting.

The New York Nonpoint Source Management Program was established in 1990 and revised in 2000. The program's mission comprises three major components: (1) to control, reduce or treat polluted runoff through structural, operational or vegetative management practices; (2) to conduct local implementation, coordination and evaluation on a watershed basis; and (3) to coordinate all agencies and partners involved in managing nonpoint sources of pollution through the New York Nonpoint Source Coordinating Committee (NPSCC).

Toward this mission, New York defined long-term goals which placed special emphasis on three principal activities: (1) establishing and fostering partnerships to coordinate and implement county and local nonpoint source management; (2) assisting counties, local governments, landowners, and other organizations with incentives and funding to implement nonpoint source pollution controls and outreach; and (3) identifying approved nonpoint source management practices and supporting nonpoint source outreach and education activities.

The 2000 Nonpoint Source Management Program identified four priority categories of nonpoint source pollution to focus the development and implementation of controls. These categories are the basis of defining key areas of nonpoint source management:

- Stormwater Management ("Urban, Construction and Roadway Runoff" in 2000 NPS report);
- Agricultural Environmental Management.
- Onsite Wastewater Systems Management;
- Hydrologic Habitat Modification; and

Section 2 of this report presents a summary of accomplishments during the reporting period for these categories of the Nonpoint Source Management Program. In addition, Section 2 also summarizes accomplishments for two additional nonpoint source initiatives in New York:

- Coastal Nonpoint Source Management; and
- Watershed Management

Section 3 of this report presents information from New York's Watershed Assessment Program that addresses water quality issues related to nonpoint sources.

1.1 NATIONAL PROGRAM ACTIVITY MEASURES

The following measures of program activities are reported as required by EPA, as defined by EPA. This section does not include EPA Program Activity Measures (PAMs) that are reported in the Grants Reporting and Tracking System (GRTS).

A. Waterbodies identified by the State as being primarily nonpoint source-impaired that will be partially or fully restored.

Waterbody Name(s):

Niagara River, Lower (0101-0027) partially restored, 4 organics now meet WQS

Niagara River, Upper (0101-0006) partially restored, 4 organics now meet WQS

Quassaic Creek, Lower and minor tribs (1301-0079) considered restored (minor impacts), candidate for delisting in the 2010 Section 303(d) List cycle

Rudd Pond (1601-0001) considered restored (minor impacts), candidate for delisting in the 2010 Section 303(d) List cycle

Shingle Kill and tribs (1309-0008) considered restored (no known impacts), candidate for delisting in the 2010 Section 303(d) List cycle

Snyders Lake (1301-0043) considered restored (minor impacts), candidate for delisting in the 2010 Section 303(d) List cycle

Comment:
Other partially restored waterbodies include:
Onondaga Lake, northern end (0702-0003) for ammonia
Onondaga Lake, southern end (0702-0021) for ammonia
However, nonpoint source reduction activities that contributed to these restorations were likely to have been secondary to the primary municipal point source reductions

Definitions (EPA) :

"Partially restored" includes either of the following:
a) A water that is impaired for more than one use, but is restored for one or more (but not all) of those uses, and b) 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.

"Restored waters" means any waterbody that has been restored. These waters may be counted regardless of whether the restoration was supported with or without Section 319(h) funding. States do not need to show which nonpoint management actions took place to restore the water, but simply verify that the water is primarily nonpoint source-impaired, and that it has been "partially" or "fully" restored. However, a waterbody cannot be counted simply because it was delisted from a state's 303(d) list for reasons other than actual restoration (e.g., it is determined that it was inappropriately listed from the start, it has a TMDL done for it, etc.).

The definition of a "primarily" nonpoint source-impaired waterbody is left to the states' professional judgment. EPA does not expect a state to do a detailed analysis when deciding on whether a waterbody is "primarily" nonpoint source-impaired. A precise determination is difficult especially when considering a listed water flowing through both permitted MS4 areas and non-permitted areas.

B. Number of watershed-based plans (and water miles/acres covered), supported under State Nonpoint Source Management Programs since the beginning of FY '02 that have been substantially implemented.

Number:
None

Comment: Although the Skaneateles Lake Watershed Plan has been substantially implemented, it pre-dates 2002 and it was developed for water quality protection, not to remove an impairment. Watershed-based planning in New York State is primarily focused on water quality protection, and is not designed according to the EPA definition: Substantially-implemented means that only those actions called for in the initial plan specifically geared towards removing the impairment(s) have been implemented.

2.0 SUMMARY OF ACCOMPLISHMENTS FOR THE REPORTING PERIOD

The following six sections briefly describe key components of New York's Nonpoint Source Management Program and summarize principal accomplishments for the reporting period from April 1, 2008 through March 31, 2009, including some discussion of progress and accomplishments in previous years to provide a context for more recent program activities. Certain activities that were in progress at the conclusion of the reporting period, but not yet completed, have also been included.

2.1 STORMWATER MANAGEMENT

The Stormwater Management Program is a principal priority of New York's Water Management Program and a key component of the Nonpoint Source Management Program. The program's comprehensive approach places special emphasis on consistent implementation of technical standards for management of stormwater from construction sites, development of local legal authority, and on project review during the local land use planning process. Continuing

education to professionals involved with development projects and municipal stormwater management and outreach to local officials are also important elements of the program. Finally, the program provides grant assistance to localities for the development of municipal stormwater management programs. On January 8, 2003, the DEC first issued two general permits to support implementation of the federal Stormwater Phase II program, one for Municipal Separate Storm Sewer Systems (MS4s) in urbanized areas and one for construction activities, as part of the State Pollutant Discharge Elimination System (SPDES).

On April 16, 2008 NYSDEC issued two renewed stormwater permits, one for MS4 (GP-0-08-002) and the other for construction activities(GP-0-08-001). Those permits are designed to address the principal goals of the stormwater program identified above. In response to significant public comments the NYSDEC is hosting a series of twelve monthly permit review meetings, starting in July 2008 and ending in July 2009. In October 2009, the NYSDEC will make draft renewal permits available for review in consideration of input received at the meetings.

The principal goal of the Stormwater Management Program is to reduce the impacts of stormwater discharges that preclude, impair or stress New York's waters, as reported in the NYS Priority Waterbodies List. Another key objective is to prevent stormwater impacts from causing future water quality impairments. The program is intended to prevent or correct such stormwater-related problems as closed beaches and shellfish beds, spoiled fishing and swimming, excessive weed growth, destruction of aquatic habitat, soil erosion, and flooding.

Accomplishments for the Reporting Period:

1. Permit Restrictions and Requirements

In fiscal year 2008 – 2009, 1,519 sites were authorized under the construction stormwater permit. 9479.6 acres were authorized to be disturbed. 1,000 of those sites were required to install post construction controls for 7,344.4 disturbed acres and 2,598.49 new impervious acres.

2. Grants to Regional Planning Agencies for Stormwater Management Program Support

Despite declining Clean Water Act funding, the NYSDEC continues to provide mini-grants to Regional Planning Boards to assist in MS4 program development and oversight including outreach to MS4s and interested parties, assistance to MS4s developing Stormwater Management Plans (SWMPs) and review of MS4 Annual Reports.

3. Support of Soil and Water Conservation District Involvement in Stormwater Program

The NYSDEC continues to endorse, and seeks to fund, a program to reimburse Soil and Water Conservation Districts (SWCD) for activities related to Stormwater Phase II construction activities including: construction site complaint investigations; construction site compliance checks; site plan review; and technical assistance for pre-construction site remediation. In

addition, NYSDEC is working with SWCDs as partners in training interested parties in stormwater concepts, rules and regulations.

4. Technical Training for the Stormwater Program

A significant amount of technical stormwater training was performed during State Fiscal Year (SFY) 2008-09. A major accomplishment was the rollout of stormwater training for the mandated erosion and sediment control (ESC) training under GP-0-08-001. To satisfy requirements, contractors and certain qualified inspectors must obtain 4 hours of training to demonstrate knowledge in ESC principles and practices. Training must be completed no later than May 1, 2010 (and renewed every 3 years).

During the SFY 2008-09, NYSDEC developed and endorsed its 4-hour course titled "Protecting New York's Natural Resources with Better Construction Site Management." This course was developed for delivery through county SWCDs across the State. A train-the-trainer workshop was held September 30, 2008 for eligible SWCD trainers ~ *Certified Professionals in ESC (CPESC)*. Most of the 50 trainers on the eligible trainer list are CPESC SWCD staff, and a mentoring program is in place to add more CPESC SWCD trainers to the list. During the year, NYSDEC worked with NYS Builders' Association (NYSBA) to produce an on-line version of the 4-hour course as well. This training option should be available in 2009-10.

In addition to establishing the 4-hour ESC course content and a cadre of eligible trainers, NYSDEC worked with the NYSSWCC and NYCDEA to develop administrative practices that would be acceptable to NYSDEC and SWCDs. NYSDEC produced a trainer CD and distributed it for the roll out of training. The CD includes instructions, course curriculum, administrative procedures, and related documents including attendance sheets, scan able trainee form, and certificate/wallet card templates. Each eligible trainer received the CD with his/her wallet card and trainer ID. An access database was created for scanning trainee form (or data via Excel file), and internal procedures were adopted for QA of trainee data before data entry. A number is assigned to each wallet card assigned to a trainee that completes training.

During the year ending March 31, 2009, SWCDs held thirty-five 4-hour ESC training events; over 2,400 wallet cards were issued to contractors and inspectors who completed training. The number of training events by DEC region were: R1 - 1; R2 - 0; R3 - 1; R4 - 10; R5 - 2; R6 - 0; R7 - 6; R8 - 3, and R9 - 1. Fees averaged $68 per person; excluding one event that was fully subsidized by the Central NY regional planning group and a large fee for an event that was part of a 3-day NYSBA conference. Stormwater coalition and planning groups co-sponsored with SWCDs to hold 66% of these events; 23% of the events were privately held. The NYSDEC Stormwater Calendar web page was updated monthly to advise public of known stormwater training and education opportunities ~ http://www.dec.ny.gov/chemical/8699.html#NYSDEC.

A second category of stormwater training regards training targeted for code enforcement officers (CEOs) and municipal officials. NYSDEC estimates that over 1,285 code enforcement officers and municipal officials were trained at 24 events during SFY 2008-09. At least 7 of the events offered NYS Department of State (NYSDOS) approved continuing education credit for CEOs

and/or municipal planning board/ZBA members. These events were sponsored by regional planning and development boards (8), stormwater coalitions (7), and county SWCDs/planning (5). Training events were also conducted by statewide associations (3), representing building officials (NYSBOC) and public works (APWA-New York Chapter), and NYSDEC Region 1 (1). Most training was targeted to group sizes of less than 30 and 30 to 49 but three events were in the 100 to 199 range. The number of training events by DEC region were: R1 - 1; R2 - 0; R3 - 1; R4 - 10; R5 - 2; R6 - 0; R7 - 6; R8 - 3, R9 - 1. NYSDEC expects there were additional events for which there is not any information. CEOs and municipal officers received training on: regulations (29%), CEO compliance inspections and site plan review in MS4s (33%), MS4 SWPPP Reviews (13%) and other training (25%), i.e., better site design, IDDE, Design Manual and floodplain management.

NYSDEC is involved in these training activities for CEOs and municipal officials on 3 fronts. Often, NYSDEC staff serve as presenters for workshops. As mentioned previously, NYSDEC funds its regional planning partners to provide training. In addition, NYSDEC has workgroups to create and authorize stormwater courses that provide continuing education credits for CEOs and municipal planning and ZBA members. Two new courses were developed (i.e., the 2-hour compliance inspection and the 1-hour regulatory overview) and authorized by NYSDOS for use during the SFY. NYSDEC coordinated with NYSDOS to approve and schedule the presentation of *existing* courses as well.

A third category of technical stormwater training was performed through NYSDEC endorsement of the Stormwater Outreach Program of the College of the Environmental Science and Forestry at the State University of New York in Syracuse (SUNY-ESF). The college held 24 one-day stormwater courses at 4 locations across the State (Buffalo, Syracuse, Albany and Fishkill) from 4/1/08 to 3/31/09. Over 782 consulting engineers, code enforcement officers, town engineers, municipal officials, planners, developers, contractors, landscape architects, resource management specialists, and others completed this training. NYSDEC regional staff presented at many of the courses. Trainees paid on average $215 per day for this training. SUNY-ESF courses provide professional development hours (PDHs) that count toward the NYS continuing education requirement for engineers and land surveyors and continuing education units (CEUs and professional development units (PDUs). Course offerings for the year ending March 31, 2009 were: fundamentals of watershed hydrology (I and II); hydraulics/soils; natural and created wetlands; fundamentals in ESC (which can also satisfy the mandated GP-0-08-001 requirement for contractors and certain qualified inspectors); stormwater practices for redevelopment and retrofitting; advanced watercourse hydrology and hydraulics (I and II); site planning for low impact development; stormwater and the development process/SEQR; SWPPP Review for MS4s; and the preparation and implementation of SWPPPS.

Finally, NYSDEC endorsed courses by the EnviroCert International, Inc, in support of stormwater professionals and practitioners. Under GP-0-08-001, Certified Professionals for Erosion and Sediment Control (CPESC) are qualified inspectors who can conduct construction site inspections for an owner or operator in NYS. At least three review classes and exams were held during the year for individuals seeking to obtain the CPESC certification. There are 290 listed as active CPESC in the State ~ http://www.cpesc.org/cc-info/cc-dir-list.asp .

5. Enhanced Phosphorus Removal.

On April 16, 2008, NYSDEC published the final Enhanced Phosphorus Removal Standards. See www.dec.ny.gov/chemical/29072.html for the complete document.

6. Multi-Sector General Permit - Notice of Intent or Termination (NOIT)

The Integrated Compliance Information System (ICIS) database currently includes 1379 effective Multi Sector General Permits (MSGPs). Of these, 304 are facilities that were not previously permitted under GP-98-03.

2.2 AGRICULTURAL ENVIRONMENTAL MANAGEMENT

The Agricultural Environmental Management (AEM) Program, under the direction of the NYS Soil and Water Conservation Committee (NYSSWCC) and the Department of Agriculture and Markets (NYSDAM), coordinates state and local agencies and the private sector to provide technical and financial assistance to address environmental and nonpoint source issues on farms. AEM is based on a tiered planning and implementation approach on individual farms, and is most effective where accomplished on a comprehensive basis across a priority watershed. AEM assesses farm practices related to environmental concerns, develops management plans to address those concerns, implements Best Management Practices to reduce environmental impacts, and evaluates resulting environmental improvements. AEM is the umbrella initiative used to implement New York's Agricultural Nonpoint Source Abatement and Control Grant Program and the Conservation Reserve Enhancement Program (CREP). AEM is also a key tool in participation in Federal Farm Bill Programs and Concentrated Animal Feeding Operations (CAFO) compliance in New York State. The AEM Certification Program certifies public and private sector professionals as Comprehensive Nutrient Management Planners and provides a foundation for the NYSDEC CAFO Permit Program.

The AEM Program has four general goals. The primary goal is to enhance and grow a voluntary program by encouraging proactive environmental stewardship through adequate technical assistance and incentives. New York intends to reinforce AEM as the primary framework for coordination and delivery of local, state and federal agriculturally related environmental and nonpoint source programs. The AEM Program also is designed to project a consistent message to all stakeholders through coordinated and comprehensive communication. Finally, the AEM Program is intended to establish and nurture farmer, neighbor and community communications on a broad range of environmental concerns.

The NYSSWCC provides coordination and direction for the AEM Program. Its voting and advisory members represent a broad range of agricultural and community interests, federal, state and local agencies and academic institutions. The AEM partnership also includes other organizations and citizen groups, such as the American Farmland Trust and the Citizens

Campaign for the Environment. Linkage to the broader membership of the NPSCC is provided by NYSSWCC participation in that committee.

The overall priority for funding AEM related projects is to support planning, implementation and evaluation projects on individual farms that form the core of the program. Additionally, a key funding priority is supporting AEM training. AEM planning projects typically address farm environmental assessments or individualized Comprehensive Nutrient Management Plans (CNMP). Implementation projects cover a wide range of BMPs, including manure storage, barnyard runoff and pasture management, erosion control and waste management. Evaluation projects focus on achievements and stewardship at individual farms. The significant majority of funding for planning and implementation activities is from the NYS Environmental Protection Fund (EPF) through the Agricultural Nonpoint Source Abatement and Control Program. In 2005, the AEM Base program was established to provide non-competitive funding to Districts to carry out annual AEM priorities. This has been continued to provide a stable and reliable level of funding for AEM at the county level

Principal Accomplishments from Previous Reporting Periods:

Round XI of the Agricultural Nonpoint Source Abatement and Control Grant Program – awarded **$6,131,095** from the EPF for 32 contracts that support the AEM Program. Projects included 5 planning and 27 implementation contracts. Each of the 5 planning contracts have provided funding for AEM Tier III planning on several farms for the development of individualized CNMPs. The 27 implementation contracts funded through Round XI cost-shared a wide variety of BMPs, including barnyard runoff management systems, manure storage systems, pasture management projects, and a variety of other practices that address waste management and erosion control.

Round XII of the Agricultural Nonpoint source Abatement and Control Grant Program - awarded **$5,332,233** from the EPF for 31 contracts that help farmers protect the state's soil and water resources from agricultural runoff. Projects included 2 planning and 29 implementation contracts.

Round XIII of the Agricultural Nonpoint source Abatement and Control Grant Program – awarded **$10,204,369** from the EPF for 42 contracts that support the AEM Program by funding 2 planning contracts and 39 implementation contracts. The vast majority of projects include multiple farmers and BMPs. A total of 273 farmers will receive assistance to develop CNMPs or employ BMPs for the protection of New York State's watersheds.

Non competitive funding source for AEM – With AEM participation exceeding 25 percent of the state's 36,000 farms, the NYSDAM, in partnership with the United States Department of Agriculture's Natural Resource Conservation Service (NRCS), the NYSSWCC and County SWCDs, accelerated AEM efforts at the local level by establishing a noncompetitive funding source for AEM activities. This program provides SWCDs with non-competitive funding through the EPF to develop and implement five-year strategic plans. Funded activities include Tier 1, Tier 2, Tier 3a (Conservation Plan), Tier 4 (implementation projects) and Tier 5. In

addition to enabling more farms to participate, this initiative has increased conservation planning activities statewide and protected past investments through conservation plan updates and BMP evaluation. As of this date, two years of this program have been completed. A total of 53 counties are currently participating in the base program.

Principal Accomplishments for the Current Reporting Period:

1. Round XIV of the Agricultural Nonpoint source Abatement and Control Grant Program

New York awarded $13,081,294 from the EPF for 55 contracts that support the AEM Program by funding 2 planning contracts and 53 implementation contracts. The vast majority of projects include multiple farmers and BMPs. Over 375 farmers will receive assistance to develop CNMPs or employ BMPs for the protection of New York State's watersheds. Round 14 represents the single highest allocation of funding for this program.

2. Round XV of the Agricultural Nonpoint source Abatement and Control Grant Program

Round XV was approved and released in early October 2008. The Division did build on the momentum of last round with another highly prescribed request for funding. Pursuant to the RFP opening on January 5, 2009, 86 proposals were received requesting nearly $25 million in EPF. These proposals were ranked and are awaiting authorization to release awards.

3. Non competitive funding source for AEM

In 2008, Year 5 of the AEM Base Funding Program was launched utilizing $ 1.8 million from the EPF. Most Districts had the opportunity to earn $40,000. Select Districts were given the opportunity to pilot an enhanced funding level of up to $75,000. Districts could apply for the pilot if they had a full time AEM or NRCS Certified Planner on staff, and earned at least 75% of the funds requested in AEM Base Program Year 2. Year 4 concludes on May 6, 2009 and Year 5 commences on May 7, 2009.

4. 2008 Regional AEM Strategic Plan Workshops

In 2008, the State Committee elected to hold four regional AEM Strategic Planning Workshops in lieu of the statewide AEM training session normally held in November to provide Districts with the tools necessary to improve their strategy for the coming years. The State Committee deliberated on this decision citing the need to provide an in depth interactive workshop on how to develop, implement, and evaluate an effective strategy to guide county agricultural conservation programming. State Committee staff convened multiple meetings in preparation of the workshops. Many of the staff possessed skills in strategic planning but there was still a major need to research and discuss the appropriate components of an effective strategy, which was completed prior to the first session.

Workshops were held on July 16 in Albany, July 17 in Binghamton, July 22 in Batavia, and July 23rd in Syracuse. The sessions commenced with a welcome address delivered by Jeff Ten Eyck, AEM Program Manager, and continued with a discussion of the AEM Blueprint. The focus of this presentation was to reinforce the mission of AEM on a state level and discuss a course to

take AEM into the future. State Committee staff launched the main presentation on the development of local AEM Strategic Plans, which included six group activities corresponding with defined steps that should be taken in drafting the AEM Strategies. Presenters were careful to not dictate how each strategy should be developed. They emphasized the importance of the necessary steps and tools to effectively craft a useful strategy, and suggesting that a good strategy should incorporate the following steps:

1. Getting Ready – Identify who should be involved in the planning process and create a committee of stakeholders, partners, and a core group to develop, implement and evaluate the strategy. Group Activity 1 - Identify members of an AEM Strategic Plan committee.
2. Writing a Mission Statement – A mission statement should summarize the what, how, and why of your program and allow others to know the course of the program. Group Activity 2 - Write a mission statement for the District's Tree and Shrub Program.
3. Assessing the Situation – Identify planning units *(a planning unit is most often reflective of a watershed or basin, but could also be an aquifer zone, specific farm type or size, or county-wide issues)*, collect and analyze data, identify and prioritize issues and opportunities, conduct an analysis of strengths, weaknesses, opportunities, and threats (SWOT), and develop goals and objectives. Group Activity 3 - Identify the information and data needed to make sound decisions. Group Activity 4 - Identify and prioritize issues and opportunities using a provided watershed case study. Group Activity 5 - Conduct a SWOT analysis of their local AEM Program.
4. Developing Goals and Objectives – What were the issues identified; what do you want to accomplish; what is the change that is to happen? Group Activity 6 - Develop goals and needed objectives to address issues, opportunities and situations in the watershed case study.
5. Implementation – The strategy should be used to create an annual action plan (AAP). It should utilize other programs such as the Farm Bill to implement portions of the strategy. The strategic plan should also address other issues such as training and increasing capacity.
6. Evaluation – How will success be measured? When will progress be evaluated? Who will be involved? Are adjustments necessary?
7. Completing the Written Strategic Plan – The draft should include: a mission statement, identification of stakeholders and partners, description of planning units, priority issues, goals and objectives, roles and responsibilities, and a timeline for evaluation, review and updates.

5. Other Accomplishments (the following list is not comprehensive, but explains some of the AEM Curriculum Development accomplishments and future needs):

AEM Curriculum Development

The purpose of the AEM Curriculum Development deliverable was to develop a training program to enhance technical capacity for Districts, CCE, AEM Certified Planners and other partners for the effective delivery of agricultural conservation services to farmers. As a part of this effort, funding supported was provided for Curriculum Development for Training of

Nutrient Management Professionals sponsored by the Cornel University Nutrient Management Spear Program, Cropware Training for Nutrient Management Professionals, and AEM Training Guidelines Development sponsored by the State Committee in consultation with Tom DeRue, former District Manager in Ontario County.

Curriculum Development for Training of Nutrient Management Professionals sponsored by the Cornell University Nutrient Management Spear Program

The purpose of this project was to develop an outline for a comprehensive curriculum focusing on the use and familiarization with NYS reference material such as the NRCS 590, NYS crop fertility guidelines, NYS Phosphorus Runoff Index, and NYS Nitrogen Leaching Index. The focus of the training series is on increasing the overall knowledge base with available reference material and nutrient management implementation challenges on the types of farms, soils, and topography found in New York. With many emerging nutrient management planners in the state since the last training series in 2003 and a continued recognition of the importance of nutrient management to water quality, it is an opportune time to offer this curriculum in support of AEM Progressive Planning efforts. This curriculum has allowed new professionals and those wanting a refresher to understand and implement general and NYS-specific guidelines for nutrient management planning. The training outline was piloted at the March 2008 Annual Water Quality Symposium and was offered at the 2009 Symposium. Components have also been offered at various other trainings.

Cropware Training for Nutrient Management Professionals

The purpose of this project was to renovate Cropware training materials and implement two day sessions around the state to train existing and emerging nutrient management planners on the tools available to them for improved nutrient management planning. Two day training sessions were held, and more are planned for 2009 in the western, central and eastern regions.

AEM Training Guidelines Development

The purpose of this project was to analyze the technical capacity of Districts, and the need to uphold and enhance capacity in those that are sound, and those that are struggling respectively. As a result of the study, it was concluded with support from State Committee staff and the CDEA, that a comprehensive engineering and training strategy/structure is a critical need for Districts and their partners. The Ohio Department of Natural Resources' (DNR) Technical Development Program was looked at as a model for a successful curriculum. The cornerstone of the Ohio Program is the Division of Soil and Water's regional engineering structure. There are five regional licensed engineers, and one licensed engineer in the central office, responsible for providing engineering assistance to the Districts and the administration of the Technical Development Program, which includes the development and instruction of the curriculum. The "Ohio Plan" is transferable to New York and is predicated on the funding needed to implement proper staffing and engineering resources. The State Committee passed a motion at the December 2008 meeting to provide all necessary support to the Technical Development Program. The Ohio DNR was receptive to the request for a copy of the Level 1 curriculum

including presentations, references and tools, and engineers from Ohio presented at the 2009 Water Quality Symposium.

AEM Groundwater Risk Assessment Map Pilot (Phase 1)

The purpose of this project is to develop a pilot groundwater risk assessment map for improved AEM planning. Conservation planners and farmers require better tools to identify areas in the landscape that exhibit an increased risk of groundwater contamination originating from surface activities. Widespread field observation indicates that elevated risk areas occur at intersections of specific bedrock and surface features. Therefore, assembling GIS level data, geological, surface features and other pertinent information is needed to identify various situations where additional management may need to be considered for groundwater protection. Phase 1 deliverables include the assembly of the following GIS layers which will lead into the Phase 2 GIS pilot project to advance groundwater risk assessment. The pilot map covered Genesee, Livingston, and Monroe Counties.

- Bedrock geology map: see 'bedrock geology' at www.nysm.nysed.gov/gis/
- Soils: NRCS
- Surface Features (rock outcrops, quarries, etc.)
- Surface Water
- Aerial photo
- Aquifers
- Elevations (for depressions and disappearing streams)
- Municipal boundaries
- Roads

AEM Groundwater Risk Assessment Map Pilot (Phase 2)

The deliverables for Phase 2 of this project is to complete the following:

- Provide technical assistance to Principal Investigator for Phase 1
- Analyze base layers from Phase 1 and develop layers for the three county region to identify potential areas of elevated risk, such as:
    - Shallow soils over limestone bedrock
    - Closed depressions via sink analysis
    - Locations of Disappearing streams
    - Surface features (e.g. rock outcrops, quarries)
- Develop an ArcGIS project with data frames for viewing layers derived from Phase II and the base layers assembled in Phase I.
- Create PDF Risk Assessment Summary Maps for the region.
- Package ArcGIS project files, models, metadata, result layers, base layers, PDF files, and brief user instructions on a DVD for distribution to conservation planners.

Agricultural Environmental Management (AEM):

· AEM is codified in law (2000)

- Over 12,000 farms are participating in AEM, with local programs established in 54 counties.

- Over $73 million has been allocated to local AEM programs to assess, plan, and implement BMPs on NYS farms.

- Growing AEM Certification program with 43 planners certified to develop CNMPs and over 300 resource professionals have received training on conservation planning by the NYSSWCC since 1999.

- Activated the CNMP Quality Control Program and conducted 21 CNMP Planner Quality Control Reviews.

- AEM Tier II Worksheets expanded to address NYS's diverse agricultural industry (including: equine operations, irrigation management, greenhouses, fruits and vegetables, and Long Island agricultural operations).

- AEM is recognized as part of USDA-NRCS planning policy in NYS.

- AEM is recognized in the NYS Nonpoint Source Water Quality Management Strategy and the NYS Source Water Assessment as the program to address nonpoint source pollution originating from agriculture.

- AEM addressed objectives of the NPS Management Program by funding the development and implementation of County AEM Strategies that provide an analysis of the problems in priority watersheds caused by agricultural NPS pollution from agriculture.

- Produced and distributed AEM Annual Reports, brochures, CREP marketing materials, Ag. NPS Brochure and CNMP Fact Sheet to Federal, State, and local stakeholders.

- Developed and made available AEM and CREP Display for statewide and local use.

- Produced a national television broadcast on five different states, featuring an AEM segment for NYS.

- Numerous articles published including recognition in EPA's Nonpoint Source Success Stories Volume III.

- AEM *Working with the Media' –Level 1& 2* Workshops have trained approximately 500 AEM partners, including SWCD, AEM Planners, and Farmers.

- AEM information, draft news articles, and media tips were routinely provided to AEM partners through the *AEM Outreach Network*.

- Direct media assistance was also provided by the AEM Outreach Coordinator related to editorial responses, preparation for press interviews and media events.

- AEM Articles were published in Small Farms Quarterly, Conservation District's Employees Association FYI and the Auburn Citizen. The 2006 AEM '*Agriculture in the News Awards'* were publicized locally by winning SWCDs, and in the February 6, 2007 issue of Country Folks.

2.3 ONSITE WASTEWATER TREATMENT SYSTEMS MANAGEMENT

The Onsite Wastewater Treatment Systems (OWTS) Management Program is a coordinated effort involving state, local and inter-municipal agencies, academic institutions and the private sector which is intended to improve the performance and reduce the environmental impacts of onsite systems. The comprehensive management approach includes providing continuing education to professionals involved with onsite wastewater systems (installers, inspectors, engineers, maintenance providers, regulators and planners) and to owners of onsite systems. The program places special emphasis on encouraging and promoting periodic inspections and maintenance of onsite systems, improved guidance for regulators and other professionals, and the updating of regulations and development of new legislation. Finally, the OWTS Program provides assistance to localities through improving means to receive grants for replacing failed onsite systems and writing grants for local management of onsite systems.

The principal goal of the OWTS Program is to reduce the nonpoint source impacts of failing or improperly installed onsite systems that preclude, impair or stress New York's waters, as reported in the NYS Priority Waterbodies List. Toward this goal, New York targets key communities for federal or state-funded mini-grants to inspect or manage onsite systems and works with federal, regional and state organizations to address community wastewater treatment needs with improved onsite systems, hybrid wastewater systems, or centralized sewers and treatment plants. Another important goal of the OWTS Program is to promote use of onsite systems as an alternative to, or in conjunction with, new sewers and expanded wastewater treatment plants, particularly in difficult topography or in communities that cannot afford the conventional centralized sewer and treatment system upgrades or installation. The term used in the industry is "centralized management of decentralized wastewater treatment systems."

Finally, the OWTS Program goals place emphasis on a self-sustaining training program for continuing education of OWTS professionals including fundamentals of OWTSs, site and soil evaluation, and the proper design, installation and inspection of OWTSs. In addition, presentations have been developed for educating municipal officials, and residential and commercial owners of onsite systems on providing the proper inspection and maintenance for their systems through service providers and, for innovative systems, according to manufacturer recommendations.

The OWTS Workgroup of the NPSCC provides coordination of statewide activities related to these objectives. It includes representation from key state, regional and local agencies,

academic institutions, community assistance associations, and the private sector. Key partners at the local level include County Water Quality Coordinating Committees (WQCC) and their members. The New York Onsite Wastewater Treatment Training Network (OTN), administered by the SUNY College at Delhi, is the primary mechanism for outreach and education related to onsite wastewater treatment.

Emphases in 2008 have been on completing and presenting the OTN Design Course, negotiation of two OWTS Demonstration Sites (currently not funded), revisions to the 1988 DEC Design Standards for Intermediate-sized Wastewater Treatment Systems, Phase II Stormwater IDDE inquiries, and assisting with the development of the new Water Pollution Control Linked Deposit program to fund residences and small businesses with failing on-site wastewater treatment systems. The OWTS Workgroup meetings have been merged with the OTN Board of Director meetings. Two video-conferences on wastewater technologies were also held for both state and county agency staff.

The overall priorities for funding OWTS-related projects are to support the education programs of the OTN, to negotiate for future funding of the OTN, and to investigate additional funding opportunities for OTN and OWTS workgroup members. Evaluation of opportunities to implement local OWTS projects through the American Recovery and Resource Act address green infrastructure, energy efficient upgrades, and innovative and sustainable decentralized options for wastewater treatment. Local projects have historically included sponsoring OWTS inspection programs, support of pump-out efforts, sampling programs, or feasibility studies (maps, plans and engineering reports). The Onsite Training Network has been supported through PPG funding, while grants to localities have been supported through a combination of EPF and PPG funds.

Accomplishments for the Reporting Period

1. Onsite Wastewater Treatment Systems (OWTS) Workgroup

Members of the OWTS Workgroup, an interagency coordination group, have participated as directors, members or contributors of time and talent in many meetings of the OTN Board of Directors, OTN Executive Board (Officers), OTN Curriculum Committee (Design Course) and the DEC Design Standards Workgroup, and related industry groups. The workgroup members generally provide for coordination of onsite wastewater activities, projects and events between industry partners, academic institutions, watershed groups, and federal, state and county agency staff. The workgroup members continue to advise on state and federal funding priorities, and also address outreach, and education, predominantly through support and involvement in the OTN.

2. New York Onsite Wastewater Treatment Training Network

The New York Onsite Wastewater Treatment Training Network (OTN) serves to enhance New York State's utilization of modern onsite and decentralized wastewater treatment technologies through training of industry professionals, policy makers and property owners.

The OTN provides hands-on training to those involved in the onsite industry. Training is designed to improve regulatory compliance as well as the utilization and performance evaluation of new and emerging technologies in the State. NYSDEC entered into an agreement with the State University of New York College of Technology at Delhi to provide opportunities for training and increased technical knowledge for onsite professionals. Specialized instructors are available to provide training both at Delhi College and at sites throughout the state. Workshops are customized to the various areas involved in onsite wastewater treatment technologies.

Professionals who can greatly benefit from the various training programs include: code enforcement officers, designers, health officials, inspectors, installers, maintenance technicians, planning officials, property owners, and pumpers.

The OTN Board of Directors includes representatives from the NYSDEC, New York State Department of Health (NYSDOH), NYSDOS, New York City Department of Environmental Protection (NYCDEP), and SUNY-Delhi. The Board met eight times in the 2008 - 2009 State Fiscal Year. The Board provides oversight of the outreach and education activities including curriculum development, instructor recruitment and training, and promotion and marketing of training. Significant emphasis is placed on development and maintenance of the cadre of trainers.

Training Courses: Four primary courses are currently offered, a fifth course on the Design of small OWTS was completed in the summer, presented to a group of NYSDOH staff and other OTN instructors and directors in October 2008, and as a paid course in February 2009. All courses are approved for continuing education credit by the NYSDEC, NYSDOS and the State Education Department.

- **Fundamentals of Onsite Wastewater Treatment Systems**: This two-day course provides an introduction to the biology of wastewater treatment, system design, system components, the importance of soil classification, recognition of system failure, and the technologies available to avoid pollution. Course structure is highly interactive, and includes classroom exercises and reference manuals.

- **Soil Analysis for Onsite Wastewater Treatment Systems**: This one-day course provides guidelines for making soil evaluations and other field investigations for onsite septic systems. Soil characteristics, data collection, seasonal effects, soil texture and test pit analysis are all discussed. A New York soils video, PowerPoint presentations, hands-on exercises and, whenever possible, a short field trip are all used to convey the course concepts. The workshop is intended for all individuals with an interest in Onsite Wastewater Treatment, especially code enforcement officers and other field professionals including system installers.

- **Inspection of Existing Onsite Wastewater Treatment Systems:** This one-day course is designed to review the purpose of inspections and issues involving environmental safety, identify physical and biological hazards, examine new and old technology systems, review concepts of hydrology and soils, teach blueprint reading, and provide installation tips.

- **Certified Onsite Wastewater Installer Training Course**: This one-day course presents information and guidance for the proper installation of onsite wastewater treatment systems. Installers gain a thorough knowledge of the proper methods of installation that result in acceptable systems ready for inspection and operation. The participants complete a written examination and those participants passing the exam are issued a certification number.

- **Small Scale Onsite Wastewater System Design I:** This two-day comprehensive technical course covers the design of conventional, alternative and enhanced residential onsite wastewater treatment systems for new installations. Students are introduced to site evaluation, waste characterization, and design of new residential onsite systems that conform to NYS regulatory requirements. The OTN Site Evaluation Guide provides a structured approach to design elements. Real-world class exercises allow participants to apply important installation concepts. (Prerequisite OTN Courses: Fundamentals and Soil Analysis).

OTN Cadre of Trainers: Two new trainers were added to the OTN in 2008-09. One with work experience in OWTS inspection and design review from Putnam County Health Department with land both within and outside of the NYC Water Supply Watershed, and the other is recently retired from NYC DEP. Another instructor also from the NYC DEP returned to more active participation.

Funding of the OTN: The development of the training program has been supported by PPG funds through MOUs between the NYSDEC and the College. The College and industry have contributed with cash and in-kind services. OTN members contribute a significant amount of time to management of the OTN organization. The PPG funding that passes through NYSDEC to SUNY-Delhi has been reduced to $50,000 in the 2009 – 2010 state fiscal year, and is the last of the cooperative agreements remaining.

Additional funding for the OTN, Inc. was a prime focus in SFY 08-09. The following partnership funding sources were researched and solicited, or donated:
- $15,000 USEPA Non-Construction grant
- $8,700 OTN funds
- Funds to be raised through OTN 2009-2010 course revenues
- Manufacturer's financial support

OTN Outreach: The OTN has presented onsite wastewater workshops and other presentations at local government, lake association, and industrial conferences and meetings during the reporting period. Examples of these presentations include:

- NYS Federation of Lake Associations Annual Meeting (May 2008)
- NYS Conference of Environ. Health Directors Semi-Annual Meeting (September 2008)

- CWC Local Government Day (October 2008) - info to local code enforcement officers.
- NYS Society of Professional Engineers meeting (October 2008)
- NYS Association of Towns (February 2009)
- Engineers Week (February 2009)

- The EPA-funded Skaneateles Lake Demonstration Project had little EPA funding, but the City of Syracuse in partnership with SUNY-Delhi, OWTS technology manufacturers and industry held the annual two-day classroom and field tour educational event May 28 & 29, 2008 for state and county agency staff and watershed professionals.

3. NYSDEC Design Standards for Intermediate-sized Wastewater Treatment Systems

NYSDEC Central and Regional office staff began a workgroup to revise the 1988 DEC Design Standards for Intermediate-sized Wastewater Treatment Systems. These standards apply to private, commercial and institutional systems with design flow rates greater than 1,000 gallons per day. No upper limit of flow rate is identified. However, if the facility is owned by a municipality a separate set of standards applies - the Great Lakes-Upper Mississippi River Basin (Ten State) Recommended Standards for Wastewater Facilities.

The Design Standards workgroup formed in early 2007 continued working through SFY 2008-2009. Several conference calls, and two technical video-presentations were held in SFY '08-'09. A draft revision was circulated internal to DEC in September 2008 with a response-to-Regional-comments document produced by Central Office staff.

A rescheduling of the document production was developed in January 2009 followed by a round of conference calls to the Regional Workgroup members as a follow up to the September draft version. Regional Workgroup members were to provide comments and revised text on a schedule based on the Table of Contents and running through May 2009.

In addition, members of industry have provided presentations and references, and the OTN Board of Directors / OWTS Workgroup members have provided comment and review of identified revisions. Presentations included the use of gravelless technologies (Infiltrator, Geo-Matrix and Elgen). Other work involved updating the grease interceptor and sand filter section of the 1988 Design Standards based on other state and national changes.

The Design Standards Workgroup has referenced and made use of the NYSDOH revisions to the Public Health Code (Appendix 75-A) toward one identified goal of being consistent with those standards. A second draft of the DEC Design Standards for Intermediate-sized Wastewater Treatment Systems is nearing completion.

4. Funding Local Implementation Projects

There were not any new local implementation projects related to onsite wastewater treatment systems funded during the reporting period through the Water Quality Improvement Projects (WQIP) program. Round 9 awards were previously announced in 2007.

One of the Round 9 projects was a local lakefront area that was closed out in 2008: the Warren County SWCD, *Loon Lake On-Site Wastewater Improvement Program ($15,500)*. Another Round 9 project will be closed out in the summer of 2009. It served as the site for a series of OTN classroom and field training events. The OTN considered developing an OWTS Demonstration Site in the Otsego Lake Watershed that would have tracked the phosphorus-reducing OWTSs funded by that project. Until a sponsoring agency to partner with the OTN for funding is identified, demonstration site investigations are on hold

Another 2006 grant to a county for stormwater work included the OTN's OWTS Inspection training in relation to Illicit Discharge Detection and Elimination. The OTN training was held March 27 & 28 of 2008.

2.4 HYDROLOGIC AND HABITAT MODIFICATION

The Hydrologic and Habitat Modification (HHM) initiative is a key component of New York's Nonpoint Source Management Program. HHM includes a wide range of physical modifications to rivers and streams. These physical alterations affect stream-bank erosion, interfere with the water cycle, generate pollutant loadings, impact water quality, reduce or degrade wetlands and other streamside, riparian habitat, acerbate flooding, and change stream hydrology and hydraulics (including extremely low flows). The HHM program activities promote the implementation of scientifically supported measures to reestablish the structure, function and dynamics of river and stream ecosystems within watersheds.

The goals of the HHM initiative are to collaborate among stakeholders to: facilitate the protection and restoration of rivers and streams; promote needed institutional and administrative improvements; and cultivate local stewardship. The program's objectives include the development of science based tools and guidance, the training of stream professionals and other targeted audiences in appropriate stream restoration and protection methods and practices, raised awareness of projects that demonstrate reduced stream corridor impacts, and the advancing of education at the local level on sound land use and floodplain management. Finally, program staff collaborates with stakeholders both inside and outside of NYSDEC, recognizing the importance of improvements in regulatory and administrative practices, research, and water quality monitoring.

The HHM Workgroup of the NPSCC provides coordination of statewide activities related to these objectives. The Workgroup includes members from over 15 federal, state and local agencies, academic institutions and non-governmental organizations. Key partners at the local level would include WQCC and their members (SWCDs, health and planning agencies, municipal representatives, and citizen and volunteer groups) and other groups that may not be directly involved with the WQCC such as watershed coalitions or other student and citizen volunteer organizations. Workgroup meetings are held at least semi-annually to exchange information on relevant research, tools and stakeholder achievements and to collaborate on

needed regulatory and administrative changes. Member stakeholders spearhead subgroup tasks assigned by the Workgroup.

The overall priority for funded HHM related projects has supported training, research and technology implementation for restoring and protecting New York's rivers and streams. Examples of such projects include: (1) regionalizing the geomorphology characteristics for New York State streams; (2) development of stream corridor health maps; (3) developing and implementing strategic plans for selective stream barrier mitigation; (4) establishment of riparian buffers; (5) research on roadside ditch management; (6) screening dams for removal and mitigation; and (7) providing professional training in applied river and stream morphology (based on the Rosgen classification system and methodology).

Site-specific stream and aquatic habitat restoration projects have been funded with PPG or EPF dollars. In addition, projects have received financial support from other agencies and organizations, including NYCDEP, the NYSDEC Hudson River Estuary Program (HREP), the NYSDEC Division of Fish and Wildlife and Marine Resources (DFWMR), other state and federal agencies, universities and environmental organizations. Multi-partner projects addressing stream and aquatic habitat restoration are central to the success of reducing the impacts of HHM in New York streams and rivers.

Accomplishments for the Reporting Period

1. Education and Information Exchange - HHM Workgroup meetings

May 14, 2008, Town Hall of Dryden in Cortland County. Presentations were by Cornell academics; Rebecca Schneider, Ph.D. discussed findings from Cornell Roadside Ditch Research; and Marci Meixler (Aquatic Research Specialist/Doctoral Graduate Student) reviewed GIS modeling on Cornell Streamside Health and Vulnerability Mapping. In the afternoon, members toured the new Root Pruning Method (RPM) facility in Dryden and a 3,000 linear feet stream restoration project, which used RPM plant material, in the nearby Town of Caroline.

November 5, 2008, NYSDEC headquarters in Albany. Presentations by: Dave Burns and Jenn Grieser (NYCDEP Stream Management Program) on research findings from NYCDEP Riparian Restoration Projects; Rich Lewis (NYS Agriculture and Markets and State CREP Coordinator) on Ecosystem Based Management Approach to Restoring Stream Buffers in NY; Doug Sheppard (NYSDEC-DFWMR) on recently completed NY Barrier Mitigation Projects; and George Schuler (The Nature Conservancy) on Efforts of the Collaborative Group on Emergency Flood Response. A DVD on the Barrile Six Mile Creek Restoration Project was viewed after the meeting for interested members.

At meetings, Workgroup members also shared updates on member activities:
(1) New York State Department of Transportation (NYSDOT) led Interagency Aquatics Connections Team,

(2) NYSDOS led Watershed Plans: Protecting and Restoring Water Quality guide and EPF funding;
(3) US Army Corps Engineers regional conditions on culverts for Nationwide Permits;
(4) US Fish & Wildlife Service Fish Passage Projects and its Fish and Mitigation Fund;
(5) US Geologic Survey Hydraulic-Geometry Regional Curves and StreamSTATS;
(6) NYSDEC Region 3 – HREP led Riparian Buffer Initiative;
(7) NYSDEC DFWMR led shoreline protection guidance and Part 608 Protection of Waters, and general permit for temporary crossings;
(8) NYSDEC DOW led dam safety and water quality/in-stream flow rule regulatory activities as well as specific HHM Workgroup related activities.

2. Emergency Flood Response

Post-Flood Emergency Stream Intervention Contractor Training

In April 2008, an application was developed for State Emergency Management Office (SEMO) funding to spearhead a multi-faceted $100,000 project involving numerous federal, state, regional, and local government and non-governmental partners statewide. The project proposed a more comprehensive, coordinated, and collaborative effort for emergency flood response and for pre-flood training and outreach at the local level. It proposed mechanisms to raise awareness on stream dynamics locally and on proper techniques to identify priority streams for stream health restoration on a watershed basis, subsequent to a flood hazard event. Key outcomes: (1) to develop criteria for candidates qualified/experienced for being on retainer of a SEMO list of stream professionals that could be contacted in the event of an actual hazard flood event (individuals would have dual role of presenting pre/during flood training on stream dynamics as well); (2) to expand upon a piloting of Delaware SWCD project in the NYCDEP watershed to develop and deliver classroom and in-stream contractor training and certification for statewide application; (3) to develop curriculum for 1-hour presentation to local elected officials; (4) to purchase additional EmRiver tables for classroom training of contractors statewide; and (5) to develop mechanisms to pass mini-grants from NYSSWCC to County SWCDs to conduct contractor training and outreach to local elected officials through SWCDs of counties across the State with “approved” Hazard Management Plans.

While the grant proposal was not funded, the process of working with stakeholders to develop it generated progress on two fronts. First, a collaborative was established to develop a roadmap toward a comprehensive, sound science river management program. Second, the pilot project in Delaware County is being implemented as a catalyst that can lead to other key components mentioned in the grant proposal. Currently, the project on post-flood intervention is piloting classroom and in-field training for contractors who would be called into flood emergencies within NY City Watershed in Delaware County. Training for targeted local government stakeholders as well as other program elements for statewide applicability could follow as regulatory agencies are satisfied with work being done by trained contractors in this pilot project.

On March 31, 2009, the Project Advisory Committee for the Delaware County pilot project met. The draft PowerPoint and contractor training materials were presented to the advisory group for

input, and the group discussed longer term outcomes. Three classroom trainings were planned for April followed by in-stream contractor training at 3 stream restoration projects in the summer.

Emergency Flood Response Collaborative Group
Trout Unlimited presented its "Draft Comprehensive Floodplain and Emergency Response Policy" to HHM Workgroup in November 2007. At the time, the group established volunteers to work on two groups; to identify minimum qualifications/criteria for listing "stream team" professionals who assess and prioritize post-flood emergency stream restoration; and recommendations for funds to retain such professionals in the event of a flood emergency.

NYCDEP hosted a July 10, 2008 meeting of groups, to start working on a new Emergency Flood Response Collaborative Group. Staff attended representing: NYCDEP, Trout Unlimited, TNC, USDA-NRCS, USGS, HREP, NYSA&M, NYSDEC, NYSDOT and Delaware and Greene County SWCDs. Obstacles and opportunities were discussed regarding "regulatory guidance" and "training" needs.

At the July meeting, the Collaborative Group tasked member volunteers with the development of a vision/roadmap. This was drafted and submitted for discussion at the DEC Flood Summit in Hudson Valley area on October 16, 2008. No formal action has been taken to date, but there have been informal discussions within DEC on how to move it forward. Key roadmap steps are: (1) establish agency-municipal stakeholder coordination; (2) develop – deliver coordinated education and outreach; (3) direct available funding streams more efficiently; and (4) establish clear policy which supports comprehensive and collaborative river system management across NYS.

3. Flow Standard in 6NYCRR Part 703 Surface Water Quality Standards Regulations

NYSDEC began work on internal technical standards (TOGS) for implementing the narrative water quality rule for the parameter "flow." An Advisory Group of non-NYSDEC agency and non-governmental representatives will be convened for input on development of the draft TOGS in July 2009. The final rule went into effect on February 16, 2008 and is online at http://www.dec.ny.gov/chemical/27985.html

4. Regionalization of Channel Geomorphology Characteristics for Streams of New York State - Regional Curves for NYS

USGS Regional Curves are completed for all 8 Upstate regions in New York (Long Island is not covered): Tug Hill/Adirondacks (Regions 1 and 2), East of Hudson (Region 3), Catskills (Regions 4 and 4a), Central NY (Region 5), Southern Tier (Region 6), and Finger Lakes (Region 7). These are on-line: http://ny.cf.er.usgs.gov/nyprojectsearch/projects/2457-A29-1.html. The curves have been developed by physiographic region and by Rosgen stream type so that stream-channel professionals can use as part of tool box in defining stable reach characteristics for restoration projects in the State.

The Statewide report was completed in 2008-09 and is being prepared for publication (expected by October 2009). It summarizes the nine year (2000-2008) statewide cooperative effort to develop regional bank full discharge and channel characteristics models through a process established by NYCDEP Stream Management Program. The project was led by USGS and overseen by the HHM Workgroup. Other cooperators were NYSDOT and the County SWCDs of Greene and Delaware. The Statewide report provides a discussion of uses for the Regional Curves as well.

Future goals, pending available funding, are to develop a working link for incorporating Regional Curves data to the USGS Streamstats web tool (currently available in a provisional beta test site), and to prepare an article for possible journal publication.

5. Barrier Mitigation (including Dam Removal)

Applicant's Guide
The draft Barrier Mitigation Guide continues to be worked on. Presently the new Dam Safety regulations are undergoing public review and comment (May 2009). NYSDEC expects the rule to be promulgated later in 2009, and the applicant's guide will be a priority to complete. As dam safety regulatory requirements go into effect, more dam removals in the state can be anticipated, and there would be demand for this guidance.

Development of this guide was initiated in 2006 after the HHM Workgroup established a Barrier Mitigation Forum. The Forum, included staff representing Federal and State agencies, and a variety of non-governmental organizations, met 3 times to deliberate on current regulatory issues (particularly given the pending dam safety rulemaking) and needs. Then, the Forum charged a small subgroup to prepare guidance for potential project sponsors of barrier mitigation, particularly dam removal, in NY. The group met several times and draft guidance was presented at the HHM Workgroup meeting on January 26, 2007. The Forum subgroup met again in the fall 2007, and made recommendations to streamline it. The intent is that it will be dynamic, living guide that will be updated as experience with these types of projects grows; a pre-cursor to an "applicant's guide" to barrier mitigation in NYS.

Professional Screening Tool - Barrier Mitigation Assessment Protocol
The final report and companion CD, for this protocol for screening candidate non-federal dams for possible removal or mitigation, was posted to the USFWS web site in May 2008 (go to: http://nyfo.fws.gov/fwc/dam_mitigation.htm). The report will be posted to the NYSDEC Water web pages when the NYSDEC nonpoint source web pages go are posted.

6. Strategic Plan

The Plan to Restore and Protect New York Rivers and Streams from the Impacts of Hydrologic and Habitat Modifications was completed in 2005 and contains a mission statement, goals, objectives and a plan for future HHM-related activities. The HHM Workgroup prepared this *Plan* over an extended period of deliberation. It was initially presented, as a draft, in 2004 to the NPSCC Steering Committee. Letters of support were gathered for the plan in 2005. The

Plan is ready to add to DEC Water nonpoint source web pages when these are posted. As part of the posting, links could be added to show progress on *Plan* elements since 2005, making it a visionary, dynamic planning document for future HHM work efforts. In March 2009 the *Plan* was shared with Division of Lands and Forests in support of the DEC riparian buffer initiative called for in the *2009 NYS Open Space Conservation Plan.*

7. Floodplain Management

The NYSDEC Flood Protection Community Assistance Program

More than 1,400 New York communities participate in the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP). NYSDEC administers the State Flood Protection Community Assistance Program, to reduce flood risk to life and property, by assisting local communities in implementing NFIP regulations and maintaining State and local participation in the national program.

Floodplain Managers Training

NYSDEC helps to support the NYS Floodplain and Stormwater Managers Association (NYSFSMA) ~ http://ny.floods.org/. The NYSFSMA is a state chapter of the Association of State Floodplain Managers. NYSFSMA has an annual conference, newsletters and training activities. In addition, NYSDEC conducts floodplain management training, with at least twelve workshops across the state each year. Generally, over 200 people each year attend the training sessions. NYSDEC and NYSFSMA promote the Certified Floodplain Manager exam in New York. There are currently 48 CFMs in New York and that number is growing annually.

Modernization of Floodplain Maps

The Federal Emergency Management Agency (FEMA) and NYSDEC have partnered in the development of modernized Digital Flood Insurance Rate Maps throughout the state. This is the completion of a five year Map Modernization plan. Since the beginning of the Map Modernization program, new effective Digital Flood Insurance Rate Maps have been finalized in Cayuga, Schoharie, Clinton, Monroe, Westchester, Monroe, Orange, Nassau, Suffolk and Greene Counties, part of Erie County, and the City of New York. Preliminary maps are currently in place in Dutchess, Onondaga, Cortland, Niagara, and Sullivan Counties, and part of Ulster County. Between now and fall 2009, preliminary maps are anticipated in Rockland, Chenango, Delaware, Broome, Montgomery, Otsego, Tioga, Albany, Herkimer, Putnam, and Schenectady Counties and the remainder of Erie County. Oswego, Oneida and Chemung Counties will be completed in the following year. Funding will be needed for new mapping in the remainder of the state.

8. Statewide Professional Training

Natural stream channel assessment and design courses were developed and a series of three courses were taught by the Greene County SWCD in the Lake Champlain and Schoharie/Catskill regions. There is growing interest at the Greene County SWCD to provide another series of training courses, but there are currently no resources to support this effort.

2.5 WATERSHED MANAGEMENT

The Watershed Management Program evaluates and assesses monitoring data and other information to determine the quality of water resources in the state. A key element of the program is the development of specific management plans and recommendations for priority watersheds in New York State. These plans are designed to coordinate the actions of the DOW, other DEC divisions and state agencies, along with federal and local partners to restore and protect the designated use of New York's waters. The intent is to provide direction to the nonpoint source management program and other water programs, so that individual actions can be assessed in the context of their importance to water quality.

The primary objective of watershed management is to analyze the assimilative capacity of all water bodies to maintain their designated uses. For commonly monitored pollutants, this objective would be to quantify loads from point and nonpoint sources through a watershed-based plan or, where warranted, a more formal Total Maximum Daily Load (TMDL). Ideally, the water quality impact on all downstream water bodies could be assessed for any action that would guide regulatory and voluntary incentive-based programs. The federal government, primarily through the NRCS and EPA, is a major funding source for nonpoint source actions directed by water quality management. The state's water quality management activities establish the need for action and set priorities that address federal mandates and state objectives. Local governments help to identify water quality problems, and opportunities to protect or restore water quality while leveraging local resources to achieve broader natural resource and community benefits.

Coordination of New York's Watershed Management Program activities is achieved through several mechanisms. First, the New York Water Management Advisory Committee provides for general coordination and communication among state, federal and local agencies, along with academic institutions, citizen and community groups and the business and private sector. Additional coordination regarding nonpoint source and watershed management activities is provided by the NPSCC. Coordination for activities for specific watersheds and basins is provided by participation in various watershed or basin commissions, coalitions and workgroups. Examples include the Delaware River Basin Commission, the Susquehanna River Basin Commission, the Great Lakes Basin Commission, the Upper Susquehanna Coalition and other groups.

The funding priority for watershed management focuses on achieving nonpoint source reductions to support the reasonable assurance provisions of TMDLs, and resolve other impairments on the 303(d) list. This priority is balanced with the state commitment to address lesser impacts or protection concerns expressed on the Priority Waterbodies List, and provide the groundwater protection and remediation directed by the Brownfields legislation. An example of a watershed based plan that has substantially addressed the nonpoint source concerns from agriculture, is the Skaneateles Lake Watershed, where the City of Syracuse has successfully leveraged its resources to protect its source of drinking water with Farm Bill and EPF funds.

Accomplishments for the Reporting Period

1. Long Island Sound

The program worked with Nassau and Suffolk County to assess nonpoint source contributions to embayments and potential management measures that would result in nitrogen reductions for the TMDL for dissolved oxygen. New York continued to work with EPA, Connecticut and upstream states (Vermont, New Hampshire and Massachusetts) to employ the AVGWLF watershed model to assess nonpoint sources to the Sound, develop tools to identify cost effective reduction strategies, and assess the benefits to dissolved oxygen levels in Long Island Sound.

2. Croton Reservoir (NYC Drinking Water Supply)

The Croton Watershed Phase II Phosphorus Total Maximum Daily Load (TMDL) Implementation Plan was formally issued on January 14, 2009. The implementation plan includes, among other recommendations, specific phosphorus load reductions for traditional MS4s and NYSDOT in order for those entities to undertake an approvable retrofit program as required by the MS4 General Permit. Both Westchester and Putnam Counties are the recipients of grants from the NYSDOS which will enable them to develop a retrofit plan and continue to work with MS4s in this effort. The implementation plan utilized the MS4 General Permit heightened requirements as a driver for pollution reduction; it utilized high intensity developed areas and their modeled outputs to allocate reduction loads to individual MS4s. Retrofit plans, phosphorus reduction calculations, construction schedules and funding source descriptions are all due to the Department annually.

3. Hudson River

Watershed groups are actively planning and implementing watershed conservation projects in approximately 12 tributaries. Engaging over 750 volunteers on 50 projects, the Estuary Trees for Tribs program has planted over 7,000 shrubs and trees on over 22,000 feet of streambank this past spring and fall.

The program completed course scale mapping of riparian health and vulnerability analysis for entire esturarian watershed and a fine scale mapping in the Moodna Creek watershed using with aerial photos with six –inch resolution aerial to hand digitize boundaries.

The Hudson River Estuary Program has assisted in establishing and supporting the development of 11 watershed conservation programs on the tributaries of the Hudson. As evidenced of the success of the Estuary Program's support to local watershed capacity building, the Saw Mill River Coalition received a Targeted Watershed Grant from EPA for $890,000. The Estuary Program has provided education for more than 30 local governments and watershed groups on local laws and techniques to reduce stormwater impacts on local water resources through low impact development, better site design, and floodplain management. Also, several municipalities adopted local land use ordinances to protect important habitats and water quality.

4. Long Island South Shore Estuary Waters

Through cooperation with the South Shore Estuary Program, began assessing nitrogen loads to water impaired by hypoxia or exhibiting ecosystem stress. EPA funding for Nutrient Assessment and Management in Shallow Coastal Embayments initiated a project that will derive nutrient management recommendations and criteria for Hempstead Bay. Ecosystem conceptual model of nitrogen loadings mass balance, transport, cycling, and natural stressors will examine causality between nutrients and possible use impairments, e.g. sea lettuce (*Ulva*.) Gap analyses and nutrient control prioritization will direct fieldwork.

5. Great Lakes

The Lake Erie LaMP 2008 Report features information about Remedial Action Plans in Areas of Concern and watershed implementation projects; assessment and monitoring; and significant and emerging issues. The 2008 Report also sets into motion a two-year intensive focus on the state of nutrient science within the lake and development of strategies to improve the management of nutrient loadings to the lake.

With EPA contractor support, the program has assessed relative loads, including nonpoint sources, of PCBs to Lake Ontario, in preparation for a TMDL to restore the impairment to fish consumption.

The Lake Ontario LaMP partners are getting to the bottom of changes to the lower food web. This year, LaMP agencies are working together on a detailed science investigation of the entire lake focusing on:

- the lower food web and its relationship to declining populations of fish, including impacts of invasive species and low nutrient levels;
- understanding altered lake dynamics that have led to relatively low nutrient levels in offshore waters coupled with much higher nutrient levels in the nearshore zone; and
- the status of legacy and new chemical pollutants and their impact on the lake.

Specific projects to reduce NPS:

- Reducing Agricultural Erosion and Sediment in the Oak Orchard Watershed, $33,250
  Orleans County Soil & Water Conservation District, Albion, NY (2008)
- Sensitive Site Erosion Control, $18,620
  Yates County Soil & Water Conservation District, Penn Yan, NY (2008)
- Reducing Agricultural Soil Loss in Onondaga County, NY, $40,000
  Skaneateles Lake Watershed Agricultural Program, LaFayette, NY (2008)

6. Peconic Estuary

In an effort to employ highly concentrated and comprehensive watershed based stormwater management in the Peconic Estuary, a USEPA recognized "Estuary of National Significance" located on the eastern tip of Long Island, NY, the Peconic Estuary Program (PEP) has developed and initiated implementation of detailed subwatershed management plans for several

embayments impaired by nonpoint sources. Through the PEP Impacted Shellfishing Waters Management Initiative, Program staff have worked closely with, and engaged Towns, citizens, civic associations and various other parties to address necessary structural and non structural improvements on the watershed scale and integrate Phase II stormwater programs in order to meet water quality goals and watershed management priorities.

By focusing efforts in and around pathogen impaired waters with approved Total Maximum Daily Loads (TMDLs) and shellfish growing areas (SGA's), PEP anticipates improving water quality, reopening closed SGA's and preventing additional closures, enhancing critical habitat, and fostering community awareness of nonpoint source and stormwater pollution. PEP's efforts to protect and restore the biologic, ecologic, economic, and aesthetic integrity of its impaired creek system watersheds has been met with overwhelming support, and millions of dollars of funding to support this effort has been secured from federal, state, county and municipal entities. Increased coordinated monitoring between NYSDEC and Suffolk County Department of Health Services will help assess the level of success of highly concentrated efforts in meeting water quality restoration goals and restoring beneficial uses. This stormwater focus is done within the broader program for nonpoint source management which addresses sources such as waterfowl/domestic pet wastes, agricultural stewardship and the golf course challenge.

7. Chesapeake Bay Tributary Strategy

The Upper Susquehanna Coalition (USC) prepared a tributary strategy implementation plan to outline the level of agricultural practices over the next two years

New York targets implementation based on landowner interest and high potential for nutrient and sediment reduction and habitat improvement. The Upper Susquehanna Coalition and its partners initiated and nutrient management on over 11,000 acres of cropland and prescribed grazing on 5797 acres of pasture and row crops. Grazing generates wall-to-wall buffers, reduces nutrient sources and runoff and helps sustain farms.

The USC continued to document agricultural best management practices.

8. Small Lakes Nutrient Reduction Plans

DEC continued to collect nonpoint source and lake water quality data to assess nonpoint source contribution to lake impairments and work with EPA provided contract support to calibrate watershed models for NY watersheds, and to draft TMDLs for DEC proposal. Three additional lake TMDLs for phosphorus were completed and approved by EPA.

9. Groundwater

New York State began implementation of a geographic information system to support a state-wide groundwater protection and remediation strategy. This included an environmental information management system for intra-department use and undertaking a Groundwater

Quality Data Exchange Project with EPA and NYSDOH that will facilitate access to water quality and source water assessment information associated with public water systems.

10. Genesee Watershed

The program continued to assess NPS loads to impaired lakes, and through NYSDOS funding began a watershed management plan in the Black Creek watershed.

2.6 COASTAL NONPOINT POLLUTION CONTROL PROGRAM

New York's Coastal Nonpoint Pollution Control Program builds on existing coastal management and nonpoint source pollution control programs to protect and restore coastal water quality. The program document was jointly prepared by NYSDOS and NYSDEC pursuant to the Federal Coastal Zone Act Reauthorization Amendment, Section 6217, and was submitted to the NOAA Office of Coastal Resource Management and EPA in June 1995. Rather than creating a separate program, New York's approach was to advance the implementation of management measures to control nonpoint pollution to coastal waters by building upon existing regulatory and incentive based programs that collectively address nonpoint sources of pollution from agriculture, forestry, urban areas (construction, onsite wastewater disposal, road runoff), marinas and boating, and hydrologic modification.

New York's coastal nonpoint area is large, covering over 60 percent of New York State, including the watersheds of Lake Ontario, Lake Erie, the Finger Lakes, the St. Lawrence River, the Hudson River, the Atlantic Ocean and Long Island Sound. Conditional approval of the program was given in November 1997. New York State provided supplemental information, describing existing strength and building capacity where needed, and New York's Coastal Nonpoint Pollution Control Program was fully approved in December 2006.

The overriding goal of New York's Coastal Nonpoint Pollution Control Program is to protect and restore coastal water quality by preventing and reducing pollution. This is advanced through the implementation of a suite of management measures known to be effective in significantly reducing and preventing pollution from sources contributing to water quality impairments or posing threats to water quality.

A key objective of the program is to enhance coordination and technical and financial assistance to municipalities in New York's many nonpoint related programs. Coordination of the different elements of the Coastal Nonpoint Pollution Control Program is accomplished primarily through regular meeting of the NPSCC and its workgroups. NYSDOS and NYSDEC communicate with other key state agencies (Agriculture and Markets, NYSDOT, NYSDOH), federal agencies, regional councils, and local agencies and organizations, legislative commissions and citizen groups, and academic institutions, largely through this forum.

Funding priorities for coastal nonpoint source pollution control efforts in New York include the support of watershed management planning, and providing technical and financial

assistance to municipalities for specific projects in key watersheds to implement these plans. Watershed management planning priorities include education and outreach, technical assistance and direct financial support for the preparation of specific watershed management plans. The priorities for municipal technical assistance include assistance in planning and design for streambank stabilization, stormwater treatment system retrofits, acquisition of land, and assessment of local laws and practices related to pollution management. Funds have been provided for specific projects across the state, including the Great Lakes Basin, Long Island's South Shore Estuary, the Long Island Sound, the Lake George Watershed, the Finger Lakes Watershed, and the Hudson River Basin.

Accomplishments for the Reporting Period

1. New York State Framework for Local Watershed Management Planning

The framework for the preparation of local watershed management plans developed in cooperation with the DOW in May 2003 continued to be advanced and refined as an effective means for local governments to follow when developing locally specific plans to advance local and statewide water quality goals. The framework was incorporated into the watershed planning multi-media project described below.

2. Preparation of Watershed Management Plans

Technical and financial assistance, provided by NYSDOS (through the EPF, Local Waterfront Revitalization Program, was provided to municipalities to prepare watershed management plans. These plans include characterization of the watershed, identification of water quality and quantity (including altered hydrology) and habitat impairments or threats, as well as known or suspected causes. These plans have identified stormwater outfalls and focus on identifying opportunities and setting priorities for protective and corrective actions to protect and improve water quality and aquatic habitats. Recommendations include capital projects to reduce point and nonpoint sources of pollution, and changes in local laws and municipal operations to be advanced through implementation strategies. The NYSDOS works with local and state agencies, local watershed groups, and other community groups to prepare and implement watershed plans.

Across New York State there are 228 communities covering 4,600 square miles of watershed that have prepared or are working on intermunicipal watershed plans in partnership with NYSDOS. Since 1994, NYSDOS has awarded over $21 million to prepare and implement waterbody and watershed management plans, with $4 million having been awarded in 2007. In 2007, NYSDOS assisted local municipalities and local watershed groups in the completion of the Honeoye Lake Watershed Management Plan and the Scudders Pond Subwatershed Plan. Additionally, work has begun on the Ausable River, Black River, Black Creek, Oatka Creek, Beaver Dam Creek, and Chautauqua Lake watershed management plans. To address the hydromodification management measure, a targeted assessment of anadromous fish passage barriers on five priority streams of Long Island's South Shore Estuary was carried out.

3. Water Pollution Control Linked Deposit Program

NYSDOS, in cooperation with the Environmental Facilities Corporation the Department of Agriculture and Markets, and NYSDOH, is establishing the Water Pollution Control Linked Deposit Program. The Water Pollution Control Linked Deposit Program will provide reduced-interest loans to owners of residential and small business on-site wastewater treatment systems in order to prevent an increase in nutrients in waterbodies and to enhance source water or ensure watershed protection. Reduced interest loans will also be available for agricultural nonpoint source pollution control projects to reduce, abate, control, or prevent nonpoint source pollution originating from agricultural sources. Application materials have been drafted and rule-making is underway.

4. Municipal Assessment of Nonpoint Programs and Practices

Technical and financial assistance from NYSDOS supported the preparation of assessments of the nonpoint source pollution control practices and programs for the 31 villages and the one city on the South Shore of Long Island and municipalities in the Lake George watershed. This effort built on the methodology prepared by NYSDOS for the South Shore Estuary Reserve. The methodology was further refined and applied to watersheds of Conesus and Cayuga Lakes through a partnership between the Genesee-Finger lakes Regional Planning Council and NYSDOS. The effort culminated in the preparation of a manual "*Protecting Water Resource through Local Controls and practices: An Assessment Manual for New York Municipalities"* which organizes problems, threats, and approaches by pollution categories such as agriculture and urban development. The manual contains case study descriptions, guidance for selecting practices and making changes to local laws to control nonpoint pollution and sample laws and practices. The assessment methodology was subsequently applied to the Honeoye Lake watershed. NYSDOS and the Genesee-Finger Lakes Regional Planning Council continued to distribute the manual and present materials at conferences and workshops, including the NY Upstate Chapter of the American Planning Association's Annual Conference and the Tug Hill Local Government Day, and the Annual State Water Quality Symposium.

5. Watershed Planning and Implementation Multimedia Project

In partnership with the NYSDEC and partly through consulting services, NYSDOS prepared a motivational video and guidebook on watershed planning and implementation entitled, *Watershed Plans: Protecting and Restoring Water Quality*. The materials have been finalized and will soon be posted at www.nyswaterfronts.com. Each of these educational materials is designed to stand alone and complement one another. Coordination by NYSDOS and the NYSDEC ensured that the materials complement and advance New York's Phase II Stormwater Management Program, in addition to implementing New York's Coastal Nonpoint Program. NYSDOS has been promoting the guidebook at various conferences and workshops throughout the State. Some of these included the Genesee-Finger Lakes Regional Planning Council's Local Government Workshop , the NY Upstate Chapter of the American Planning Association's Annual Conference, and the Paul Smith's Adirondack Watershed Institute Water Quality Conference, a NPSCC meeting devoted to the topic of watershed planning and implementation,

and the Annual Water Quality Symposium. NYSDOS will continue to present and distribute the multi-media informational project throughout the State.

3.0 WATERSHED ASSESSMENT AND NONPOINT SOURCES

New York's Watershed Assessment Program addresses water quality issues related to nonpoint sources within the context of its comprehensive Statewide Waters Monitoring and Assessment Program. This program, described in more detail in the following section, includes rotating drainage basin studies which form the basis of the analysis for this annual report, as presented in Section 3.2**.**

3.1 STATEWIDE WATERS MONITORING PROGRAM - BACKGROUND

The Statewide Waters Monitoring Program (SWMP) is a conglomeration of various component monitoring programs within the Division of Water. These component programs include the Division's long-running statewide ambient water quality monitoring programs for rivers (the Rotating Integrated Basin Studies, or RIBS, Sampling Program) and for lakes (the Lake Classification and Inventory), the Citizens Statewide Lake Assessment Program (CSLAP) which uses volunteers to conduct additional lake monitoring, the Stream Biomonitoring Program and Toxicity Testing Program which provide biological monitoring components, a regulatory sampling program to monitor point source compliance, and other efforts. Monitoring activities by other divisions of NYSDEC, as well as in other agencies and groups outside the department also contribute information to the evaluation and assessment of rivers, lakes, groundwater, marine waters and estuaries, and wetlands in New York State. But the foundation of the department's ambient water quality monitoring and assessment effort remains the Statewide Waters Monitoring Program.

The SWMP represents the latest iteration of a state water quality monitoring program that was established in the 1960s. The stated objectives of the program are numerous and varied. These objectives include: the comprehensive assessment of water quality of all waters of the state, including the documentation of *good* quality waters; analysis of long-term water quality trends; comprehensive and integrated multi-media sampling; the characterization of naturally occurring or background conditions; and the establishment of baseline conditions for measuring the effectiveness of site-specific restoration and protection activities.

In order to address the number and variety of monitoring objectives, component programs within the Statewide Waters Monitoring Program are designed around three separate types of monitoring networks and activities. Each of these operates concurrently, yet somewhat independently, and focuses on distinctly different objectives.

1. **Water Quality Screening** is conducted to provide a *qualitative* assessment of water quality at a large number of sampling sites with minimal resource (staff and analytic) expense. On-site biological (macroinvertebrate) sampling and visual lake surveys are examples of screening efforts.

2. Intensive Basin Monitoring employs more frequent as well as more comprehensive and integrated multi-media sampling (water chemistry, bottom sediment chemistry, toxicity testing, macroinvertebrates, fish, habitat assessments) to provide more detailed water quality information for a smaller number waterbodies in selected drainage basins.

3. Routine Trend Monitoring provides continuous (annual) sampling of water quality and conditions at fixed sites across the state. This effort is designed to monitor basic water quality characteristics, establish baseline conditions and evaluate long-term trends. The water quality data and information currently generated by the SWMP are used to support many water quality monitoring and assessment functions within DOW. Specifically, SWMP data/information is used in the compiling of the Waterbody Inventory/Priority Waterbody List (WI/PWL), the compilation of New York State's Clean Water Act Section 305(b) Water Quality Report and Section 303(d) Impaired Waters List, and the selection of locations for intensive surveys and special water quality monitoring projects.

Comprehensive Assessment Strategy

Once collected, monitoring data is reviewed to determine water quality conditions and the degree to which various waterbody uses are supported. The Clean Water Act directs states to consider not only state-generated data, but all existing and readily available water quality data and information in conducting their assessments. Given the public interest in environmental issues and the wide range of water quality monitoring activities currently being conducted at a variety of levels, consideration of such a volume of information could be an overwhelming task. In response, DOW has adopted a continuous water quality assessment process that accommodates a wide range of participants, and various levels of water quality data and information. This process is the division's *Comprehensive Assessment Strategy*. Three key elements of this strategy are described below.

Rotating Drainage Basin Schedules

A rotating drainage basin strategy focuses monitoring and assessment activities on smaller portions of the state for a period of time and then turns attention to other parts of the state. The rotating schedule adopted by New York State calls for the initiation of coordinated efforts in two or three drainage basins each year, resulting in an assessment of the entire state within a five-year cycle. The rotating basin schedule was first used by division monitoring programs in response to diminishing resources which prevented sampling the whole state at one time. But due to the success of this approach in delivering the monitoring program, the adoption of a common basin rotation schedule has since been extended to other division assessment and management programs as well. This coordinated schedule also facilitates the integration of monitoring, assessment and management programs and moves the division toward a more unified water program. Because of these aspects, the rotating basin schedule was adopted as the framework for the Comprehensive Assessment Strategy.

Enhanced Communication and Information Sharing

The goal of incorporating "all available data and information" into the Comprehensive

Assessment Strategy requires communication with and information sharing among not only DOW program staff, but with water quality "partners" in other NYSDEC divisions, other state and county agencies and local groups outside the department. Realization of this goal also requires a process that actively facilitates communication and encourages the exchange of information. The schedule of Comprehensive Assessment Strategy activities (outlined below) institutionalizes interagency and public participation in the process with a series of water quality partnership meetings and workshops throughout the five-year monitoring, assessment and management cycle.

The Waterbody Inventory/Priority Waterbodies List (WI/PWL)

A third critical aspect of the Comprehensive Assessment Strategy is the linkage of all these monitoring activities with the Waterbody Inventory/Priority Waterbodies List (WI/PWL), the division's inventory of water quality information for waterbodies throughout the state. The WI/PWL incorporates monitoring data and information from DOW programs, as well as other NYSDEC divisions and other agencies. The WI/PWL also includes a significant public participation component, incorporating input from the public through a Water Management Advisory Committee, NPSCC, WQCCs, citizen advisory committees for Remedial Action Plans and Lake Management Plans, and other means.

Each year two or three major drainage basins (encompassing, on average, about 20% of the state) become the focus of new three-year Comprehensive Assessment Strategy efforts. At the conclusion of these monitoring and assessment activities, water quality management components become the focus of Years 4 and 5 (and beyond). As the cycle runs its course, new studies on 2 or 3 other basins (comprising another 20% of the state) begin each year.

Year One: Identification of Water Quality Issues and Water Quality Screening

The first year of a Comprehensive Assessment Strategy effort in a basin begins with a review of current available information – including the division's Waterbody Inventory/Priority Waterbodies List (WI/PWL) – to identify pertinent water quality problems and issues. Regional staff, other division and agency monitoring units and the network of local/county WQCC and other water quality partners are also consulted to determine where monitoring efforts in the basin should focus. In addition to the identification of water quality issues, *Year One* Statewide Waters Monitoring Program activities include Biological Screening Network sampling. This effort uses qualitative biological assessments to identify waters that support uses and waters that require further study. A similar screening effort for lake waterbodies and lake use assessments at previously unassessed lakes is also under development; as are attempts to incorporate water quality screening and problem verification efforts (fishery community and habitat assessment, facility toxicity testing, shellfish area assessment, etc.) by other NYS DEC monitoring programs at other waters in the targeted basins.

The goal of these screening activities is to conduct an evaluation of **all** river and lake waterbodies in a basin study area over a period of two sampling cycles (10 years). Such a *census* approach has distinct advantages over *targeted* monitoring designs (which are often biased toward "problem" waters and result in skewed inferences regarding statewide use support) and

random/probabilistic monitoring (which provides a statistical evaluation of statewide water quality, but limited segment-specific information). However, targeted monitoring is a key component in the second year of monitoring (see below). Additionally, a pilot study to determine a possible role for random/probabilistic monitoring in the Statewide Waters Monitoring Program is continuing.

Year Two: Intensive/Chemical Network Monitoring

The results of the *Year One* water quality review and water quality screening are used to develop more intensive basin monitoring plans for selected waters in the target watersheds. The Intensive/Chemical Network monitoring component of the Statewide Waters Monitoring Program incorporates a wide range of water quality monitoring including chemical analyses of contaminants in water, bottom sediment, whole organisms (benthic macroinvertebrates) and fish flesh samples, as well as more detailed biological assessments and ambient toxicity evaluations. Much of this sampling is conducted by the Statewide Waters Monitoring Program staff. However, the goals of the Comprehensive Assessment Strategy have led to the incorporation of data and information from other sources into its water quality evaluations. These may include a number of other division/department activities, such as lake studies and management programs, fishery habitat and community assessment, fish tissue contaminant sampling, chemical sampling of facility effluents, groundwater quality evaluation, pollutant track-down efforts, and nonpoint source monitoring. Additional data for water quality assessments are also generated by monitoring programs conducted by many other governmental agencies and public interest groups outside NYS DEC. These monitoring programs, which may focus on large watersheds or individual waterbody segments, provide chemical constituent data and/or aquatic resource information including macroinvertebrate, plant and fish community assessments. Efforts to better incorporate other agency (USGS, USF&W, USEPA, local health and planning agencies) as well as citizen volunteer (lake associations, county WQCCs, colleges and universities) monitoring activities into the intensive monitoring plan are also being developed.

Year Three: Water Quality Evaluation/Assessment and WI/PWL Update

The third year of the Comprehensive Assessment Strategy focuses on the evaluation and assessment of results from the multi-faceted monitoring during the first two years of effort. This evaluation and assessment component uses monitoring data and information to compare against a wide range of water quality indicators to determine the level of use support in the waters of the state. The water quality evaluation and assessment culminates in an update of the WI/PWL for the basin study area. The methodology for evaluating monitoring data and information against specific indicators to determine the level of use support and an assessment of water quality is integral to Section 303(d) List development. Like the monitoring effort, the WI/PWL update process involves the solicitation of input from a wide range of water quality professionals (from both within and outside the division/department) as well as a significant public participation component. Accommodation of such a wide range of participants is managed through NYS DEC regional staff involvement and a network of local/county WQCCs.

Year Four: Watershed Restoration and Protection Strategies Development

The completion of a basin WI/PWL marks the end of the monitoring and assessment efforts within that basin. Armed with all available water quality information, the focus of division programs turns toward the management, protection and, where necessary, the restoration of water resources in the state. The primary activity in the fourth year of the cycle is the development of strategies to address restoration and protection of waters assessed in the targeted basins. These strategies strive to bring together all appropriate agencies and stakeholders to focus all available tools (grant dollars, technical assistance and other resources) to address the priority water quality and natural resource needs of a basin and identify a detailed action plan.

Year Five (and beyond): Implementation of Management Strategies

Completed strategies may include recommendations and specific commitments by water quality partners to implement various components of the strategy. The development and implementation of management/restoration strategies and activities extends through Years 4 and 5 and beyond.

3.2 UPDATED DRAINAGE BASIN STUDIES - NONPOINT SOURCE FACTORS

For the purposes of this report, the waterbody assessment contained in the updated WI/PWL reports for selected drainage basins provide the basis for interpreting progress of the Nonpoint Source Management Program. Summary results for the waters in the most recently updated basins are presented in Tables 3-1 through 3-10.

These tables show measures of improvements, no change, or decline in water quality in waters of the targeted basin. These are summarized according to different categories of nonpoint sources and also reflect different levels of water quality impacts.

The information presented in the tables shows the number of waterbody segments in each basin which have shown improvements (change from one level of impact to a lower level of impact, such as "stressed/threatened >NKI (no known impact)"). These improved segments are associated with major sources of impacts, which are primarily nonpoint sources. The source categories are abbreviated in the tables as follows:

Ag -	agriculture
Atm -	atmospheric
Spill -	petroleum spills
Constr -	construction
Deicer -	winter deicing salts & abrasives
HHM -	hydrologic habitat modification
Sed -	contaminated sediments
Landfill -	solid waste disposal sites
OWTS -	onsite wastewater treatment systems
SBE -	streambank erosion (distinguished from contaminated sediments)
SW -	stormwater

UKN/Other - unknown or other categories
Urban - urban sources

The results Tables 3-1 through 3-10 only present information on waterbody segments for which data were available from earlier rounds of studies, i.e. only those segments for which a baseline assessment was available and for which some change or trend could be assessed. As each round progresses and more waters are assessed, it is expected that more detailed trend analysis can be conducted.

The specific observations from the results in each of the tables varies somewhat from basin to basin. However the primary observation from the combined results is that the assessed waterbody segments show a significant trend toward improvement, with 181 waterbody segments showing improvement, as compared with 66 showing some decline (while 197 segments showed no change). Of these 181 segments showing improvements, 95 experienced improvement that reflected the restoration of uses; while approximately one-third as many - 32 out of 66 segments showing some decline - had loss of use. The principal categories of nonpoint source pollution associated with improvements in the basins assessed are agriculture, hydrologic habitat modification, streambank erosion, and onsite wastewater treatment systems.

The overall trend from these results is toward improvement, based on the system of defined waterbody impacts. These improvements are generally associated with the priority categories of nonpoint sources that are the emphasis of New York's Nonpoint Source Management Program. Additional rounds of rotating drainage basin studies are expected to affirm a continuation of these trends into the future.

Note: Tables 3-1 through 3-10 do not include 45 segments where acid rain is the source of impact/impairment. Changes in the assessment for these segments are largely the result of modifications to the assessment methodology and not reflective of improved water quality

Table 3-1: NPS Update December 2006 (from 2000 Baseline) -Allegheny															
Change in Assessment		All Sources	Agr	Rex	Cons	Deice	HHM	Con Sed	Landf ill	OWTS	SBE	SW	Unk/ Oth	Urb	ATM*
Stressed/Threatened>NKI		6	2	3							1				
Precluded/Impaired>NKI	Restored														
Impair/Precl>Stress/Threat	Restored	3	2	1											
Stressed>Threatened															
Precluded>Impaired															
TOTAL IMPROVED		9	4	4							1				
Precluded/Impaired>No Change		5	4							1					
Stressed/Threaten>No Change		8	6								1		1		
TOTAL NO CHANGE		13	10							1	1		1		
Stress/Threat>Precl/Impair	Degraded														
Threatened>Stressed		2	1		1										
Impaired>Precluded															
TOTAL DECLINED		2	1		1										
Total Segments															

Table 3-2: NPS Update December 2006 (from 2000 Baseline) -Black															
Change in Assessment		All Sources	Agr	Rex	Cons	Deice	HHM	Con Sed	Landf ill	OWTS	SBE	SW	Unk/ Oth	Urb	ATM*
Stressed/Threatened>NKI		1								1					
Precluded/Impaired>NKI	Restored														
Impair/Precl>Stress/Threat	Restored	1									1				
Stressed>Threatened		1								1					
Precluded>Impaired															
TOTAL IMPROVED		3								2	1				
Precluded/Impaired>No Change		7	1							1			5		
Stressed/Threaten>No Change		7	1				1			4			1		
TOTAL NO CHANGE		14	2				1			5			6		
Stress/Threat>Precl/Impair	Degraded	1								1					
Threatened>Stressed															
Impaired>Precluded															
TOTAL DECLINED		1								1					
Total Segments		18													

Table 3-3: NPS Update December 2006 (from 2000 Baseline) -Chemung															
Change in Assessment		All Sources	Agr	Rex	Cons	Deice	HHM	Con Sed	Landf ill	OWTS	SBE	SW	Unk/ Oth	Urb	ATM*
Stressed/Threatened>NKI		4	2				1				1				
Precluded/Impaired>NKI	Restored														
Impair/Precl>Stress/Threat	Restored	11		2					1	5	2		1		
Stressed>Threatened		2	1										1		
Precluded>Impaired															
TOTAL IMPROVED		17	3	2			1		1	5	3		2		
Precluded/Impaired>No Change		1											1		
Stressed/Threaten>No Change		6	2							1	3				
TOTAL NO CHANGE		7	2							1	3		1		
Stress/Threat>Precl/Impair	Degraded														
Threatened>Stressed		1									1				
Impaired>Precluded															
TOTAL DECLINED		1									1				
Total Segments		25													

Table 3-4: NPS Update December 2004 (from 2000 Baseline) -Mohawk														
Change in Assessment		All Sources	Agr	Spill	Cons	Deice	HHM	Con Sed	Land fill	OWTS	SBE	SW	Unk/ Oth	Urb
Stressed/Threatened>NKI		14	7		1	1					2	1		2
Precluded/Impaired>NKI	Restored	3									1		2	
Impair/Precl>Stress/Threat	Restored	11	1		1		5		1		1	1		1
Stressed>Threatened		4				1	1			2				
Precluded>Impaired		0												
TOTAL IMPROVED		32	8		2	2	6		1	2	4	2	2	3
Precluded/Impaired>No Change		4	2				1							1
Stressed/Threaten>No Change		21	10				3			4	1			3
TOTAL NO CHANGE		25	12				4			4	1			4
Stress/Threat>Precl/Impair	Degraded	8	2	2	1					2				1
Threatened>Stressed		4					3				1			
Impaired>Precluded		1											1	
TOTAL DECLINED		13	2	2	1		3			2	1		1	1
Total Segments		70	22	2	3	2	13		1	8	6	2	3	8

Table 3-5: NPS Update December 2004 (from 2000 Baseline) -Niagara														
Change in Assessment		All Sources	Agr	Spill	Cons	Deice	HHM	Con Sed	Landf ill	OWTS	SBE	SW	Unk/ Oth	Urb
Stressed/Threatened>NKI		9	3								6			
Precluded/Impaired>NKI	Restored	0												
Impair/Precl>Stress/Threat	Restored	3	2							1				
Stressed>Threatened		0												
Precluded>Impaired		2						2						
TOTAL IMPROVED		14	5					2		1	6			
Precluded/Impaired>No Change		8	1					2	1	1	1		2	
Stressed/Threaten>No Change		8									6			2
TOTAL NO CHANGE		16	1					2	1	1	7		2	2
Stress/Threat>Precl/Impair	Degraded	5					1	2		1			1	
Threatened>Stressed		7	3								3		1	
Impaired>Precluded		0												
TOTAL DECLINED		12	3				1	2		1	3		2	
Total Segments		42	9				1	6	1	3	16		4	2

Table 3-6: NPS Update December 2006 (from 2000 Baseline) - Upper Hudson															
Change in Assessment		All Sources	Agr	Rex	Cons	Deice	HHM	Con Sed	Landf ill	OWTS	SBE	SW	Unk/ Oth	Urb	ATM*
Stressed/Threatened>NKI		10	2	1	1	4					1		1		
Precluded/Impaired>NKI	Restored	3				1		1		1					
Impair/Precl>Stress/Threat	Restored	11	1				5	1		2			2		
Stressed>Threatened		2								1			1		
Precluded>Impaired		2			1		1								
TOTAL IMPROVED		28	3	1	2	5	6	2		4	1		4		
Precluded/Impaired>No Change		2						1					1		
Stressed/Threaten>No Change		12			2	2	1		1	3	1		1	1	
TOTAL NO CHANGE		14			2	2	1	1	1	3	1		2	1	
Stress/Threat>Precl/Impair	Degraded														
Threatened>Stressed		2	1		1										
Impaired>Precluded															
TOTAL DECLINED		2	1		1										
Total Segments		44													

Table 3-7: NPS Update December 2007 (from 2000 Baseline) -Lake Ontario Tribs															
Change in Assessment		All Sources	Agr	Rex	Cons	Deice	HHM	Con Sed	Landf ill	OWTS	SBE	SW	Unk/ Oth	Urb	ATM*
Stressed/Threatened>NKI		6	3				1		1				1		
Precluded/Impaired>NKI	Restored	1								1					
Impair/Precl>Stress/Threat	Restored	6	1		1				1	3					
Stressed>Threatened		1	1												
Precluded>Impaired		0													
TOTAL IMPROVED		14	5		1		1		2	4			1		
Precluded/Impaired>No Change		4						2						2	
Stressed/Threaten>No Change		12	8							2			1	1	
TOTAL NO CHANGE		16	8					2		2			1	3	
Stress/Threat>Precl/Impair	Degraded	7	1		2				1	3					
Threatened>Stressed		6	2		1		1		1	1					
Impaired>Precluded		0													
TOTAL DECLINED		13	3		3		1		2	4					
Total Segments		43	16		4		2	2	4	10			2	3	

Table 3-8: NPS Update December 2006 (from 2000 Baseline) -Oswego/Finger Lakes															
Change in Assessment		All Sources	Agr	Rex	Cons	Deice	HHM	Con Sed	Landf ill	OWTS	SBE	SW	Unk/ Oth	Urb	ATM*
Stressed/Threatened>NKI		13	6	1	2				1		3				
Precluded/Impaired>NKI	Restored	5	3				1			1					
Impair/Precl>Stress/Threat	Restored	20	5					1	1	3		1	6	3	
Stressed>Threatened		1	1												
Precluded>Impaired															
TOTAL IMPROVED		39	15	1	2		1	1	2	4	3	1	6	3	
Precluded/Impaired>No Change		5		1				2		1			1		
Stressed/Threaten>No Change		12	5				2		1	1	1		1	1	
TOTAL NO CHANGE		17	5	1			2	2	1	2	1		2	1	
Stress/Threat>Precl/Impair	Degraded	4					1				1			2	
Threatened>Stressed		5	5												
Impaired>Precluded		0													
TOTAL DECLINED		9	5				1				1			2	
Total Segments		65	25	2	2		4	3	3	6	5	1	8	6	

Table 3-9: NPS Update December 2008 (from 2000 Baseline) – Lower Hudson Basin (incl. Ramapo)															
Change in Assessment		All Sources	Agr	Rex	Cons	Deice	HHM	Con Sed	Landf ill	OWTS	SBE	SW	Unk/ Oth	Urb	ATM*
Stressed/Threatened>NKI		12	3							2				6	1
Precluded/Impaired>NKI	Restored	1												1	
Impair/Precl>Stress/Threat	Restored	8	1				3			2				2	
Stressed>Threatened		3			1		1				1				
Precluded>Impaired		1							1						
TOTAL IMPROVED		25	4		1		4		1	4	1			9	1
Precluded/Impaired>No Change		25						6	1	1	2			14	1
Stressed/Threaten>No Change		24	2	1	1				1	6			3	9	1
TOTAL NO CHANGE		49	2	1	1			6	2	7	2		3	23	2
Stress/Threat>Precl/Impair	Degraded	8	1		2					4				1	
Threatened>Stressed		0													
Impaired>Precluded		0													
TOTAL DECLINED		8	1		2					4				1	
Total Segments		82	7	1	4		4	6	3	15	3		3	33	3

Table 3-10: NPS Update December 2008 (from 2000 Baseline) –St. Lawrence Basin															
Change in Assessment		All Sources	Agr	Rex	Cons	Deice	HHM	Con Sed	Landf ill	OWTS	SBE	SW	Unk/ Oth	Urb	ATM*
Stressed/Threatened>NKI		3	2												1
Precluded/Impaired>NKI	Restored	1	1												
Impair/Precl>Stress/Threat	Restored	2								1			1		
Stressed>Threatened		1					1								
Precluded>Impaired		0													
TOTAL IMPROVED		7	3				1			1			1		1
Precluded/Impaired>No Change		9						2		2			5		
Stressed/Threaten>No Change		17	8				1			4			3	1	
TOTAL NO CHANGE		26	8				1	2		6			8	1	
Stress/Threat>Precl/Impair	Degraded	4	1							2					1
Threatened>Stressed		1		1											
Impaired>Precluded		0													
TOTAL DECLINED		5	1	1						2					1
Total Segments		38	12	1			2	2		9			9	1	2