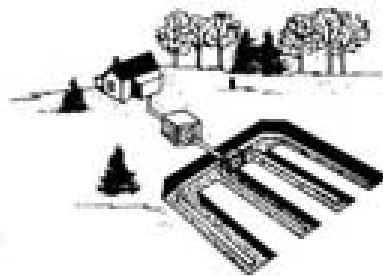


# CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

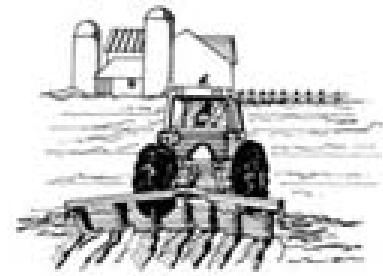
## NONPOINT SOURCE MANAGEMENT PROGRAM 2008 ANNUAL REPORT



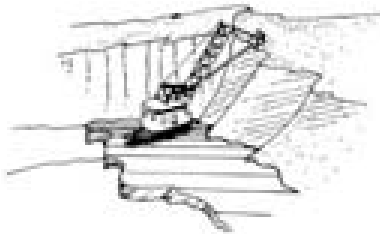
Construction



Wastewater Disposal



Agriculture



Mining



Home & Garden



Logging

*Nonpoint Source (NPS) pollution is usually caused by rainwater from cities, impervious paved areas, construction sites, and farms. NPS pollution occurs when rainfall, snowmelt, or irrigation, runs over land or through the ground, picks up pollutants, and deposits them into rivers, lakes, and groundwater. NPS pollutants also includes adverse changes to the vegetation, shape, and flow of streams and other aquatic systems.*

January 2010  
Commissioner Amy Marrella, Commissioner  
79 Elm Street  
Hartford, Ct 06106-5127

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## **I. INTRODUCTION**

The Connecticut Department of Environmental Protection (CT DEP) Nonpoint Source (NPS) Program works to abate known water quality impairments and prevent significant threats to water quality from nonpoint source pollution. A significant strength of the program is its networked approach to nonpoint source management. CT DEP has formed partnerships with a wide range of public agencies, industry organizations, and private (citizens) groups to implement nonpoint source management. Connecticut's NPS Program is well-balanced, with an appropriate mix of statewide programs and geographically targeted watershed projects. The state NPS Program includes all the components required under the federal Clean Water Act (CWA) Section 319(h) (Nonpoint Source Management Programs).

### Resources

The CT DEP NPS Program is supported by both federal and state funds. The CT DEP Bureau of Water Protection and Land Reuse (BWPLR) administers grants funded under the Clean Water Act (CWA) Section 319(h). From FY90-08, Section 319 grants totaling almost \$23 million have supported 434 projects and CT DEP NPS Program staff salaries. Of these 434 projects, 156 projects were active between beginning January 2008 and December 2008. CT DEP closed out 29 projects in during this period. Since FY97, 25-30 percent of the total Section 319 allocation to Connecticut has been awarded as part of the state's Performance Partnership Grant (PPG), primarily to support NPS Program-related staff positions. The remaining allocation funded projects that are generally targeted to watersheds identified by the state as impaired (i.e., not meeting state water quality standards), and/or for which the development of total maximum daily load (TMDL) analyses are required.

CT DEP State funds support staff in other units that are involved in various aspects of NPS management. State bond and other special legislative acts provide funds for special projects and grant programs targeting specific resources. Coastal Zone Management Act (CZMA) funds, awarded by the National Oceanic and Atmospheric Administration (NOAA), support CT DEP Office of Long Island Sound Programs (OLISP) nonpoint source management efforts in the coastal area. Numerous other funding sources, from other federal and state agencies, and private foundations, are utilized when available.

## **II. CT DEP NPS MANAGEMENT STRUCTURE**

The NPS Program is responsible for coordinating the NPS management activities of various units throughout the CT DEP, as well as those being conducted by other state, county, and municipal organizations within the state. Numerous NPS Program activities are implemented by the BWPLR, which is organized into three divisions with the following responsibilities:

Planning and Standards Division (PSD): Adopts water quality standards and classifications for the state's surface and groundwater resources; monitors and assesses the quality of water resources; administers the TMDL program, watershed, and lakes management programs; conducts NPS Program planning and coordination; manages the planning, design, construction

and permitting of municipal sewage treatment facilities; administers the state's revolving fund, the Clean Water Fund (CWF); and provides support functions for the other bureau divisions for necessary planning, program development, and technical and administrative assistance.

Inland Water Resources Division (IWRD): Regulates activities in the state's inland wetlands, watercourses, and flood plains, including oversight of municipal Inland Wetland Agencies; enforces the state's inland wetland and floodplain protection statutes; manages allocation of water resources through diversion permitting; and prevents or mitigates natural disasters through flood warning, emergency recovery efforts from flooding, and dam safety programs.

Office of Long Island Sound Program (OLISP): The CT DEP Office of Long Island Sound Programs (OLISP) also has NPS management responsibilities. OLISP administers the state's Coastal Zone Management Program, and is responsible for developing and administering in conjunction with the BWPLR, the state Coastal Nonpoint Pollution Control Program (CNPCP) pursuant to Section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA). OLISP also is responsible for administering statutes related to coastal NPS problems, including the state's Tidal Wetlands Act and Structures, Dredging, and Fill Act.

Remediation/Sites Clean-up: The Remediation Division oversees the investigation and remediation of environmental contamination and the redevelopment of contaminated properties. The Division's goal is to clean up contaminated sites to meet Connecticut's Remediation Standards Regulations, which ensure that human health and the environment are protected. The Remediation Division staff, with the help of Licensed Environmental Professionals (LEPs), oversees the clean-up of hundreds of contaminated sites across Connecticut.

There are also several other CT DEP units that perform NPS Program support activities. The CT DEP Office of Communication and Publications supports outreach and education on NPS issues to municipal agencies, the general public, and teachers. The Office of Information Management (OIM) houses the department's Geographic Information System (GIS) staff, whose members are responsible for collecting and digitizing all manner of data relevant to water resource management in the state. The GIS Office is responsible for coordinating GIS activities that involve CT DEP and other federal, state, and local government agencies. Over the past couple of years, the GIS Office has expanded its program to include GIS activities and issues that relate specifically to NPS management.

### **Program Coordination**

The CT DEP NPS Program Coordinator is responsible for the overall management of the program, and for coordination of state, regional, and local NPS management activities. This involves working closely with EPA, the USDA Natural Resources Conservation Service (NRCS), the University of Connecticut Cooperative Extension System (UConn/CES), the soil and water conservation districts, and other NPS Program partners. The coordinator is also responsible for the technical review, ranking, and implementation of all Section 319 NPS grant-

supported projects, including reporting on progress to EPA, coordinating NPS meetings, and organizing issue-based groups involved in NPS management.

One of the major tasks of the NPS Coordinator is working with CT DEP Watershed Managers to identify, prioritize, and oversee watershed projects being conducted by local organizations, including the Connecticut soil and water conservation districts (SWCDs) and their partners. The NPS Program Coordinator continues to ensure that Connecticut's program meets the requirements of CWA Section 319 and associated state statutes and regulations.

In 2008, Section 319 funds in the PPG were used to support the following staff: NPS program coordinator, Water Bureau administrative assistant, two watershed managers, two subsurface staff, one full time cartographer and one position for data management (305[b]). These staff help integrate NPS Program goals and objectives into their own programmatic areas.

CT DEP is an active participant in the New England Interstate Water Pollution Control Commission's (NEIWPCC) NPS Work Group. The purpose of the work group is to promote technical transfer among NPS managers at the federal, state, regional, and local levels in the New England states, and New York.

### **Monitoring and Data Management**

Section 319 funds support two staff positions in the Bureau of Water Protection and Land Reuse (BWPLR), water quality monitoring and data management unit: the Volunteer Monitoring Coordinator and the 305(b) Assessment Database (ADB) Manager providing technical support to prepare the biennial Integrated Report.

The Volunteer Monitoring Coordinator:

The Volunteer Monitoring Coordinator facilitates training in sampling procedures and data quality methods to volunteer monitoring organizations to assure results meet DEP criteria for use in Integrated Report, and assists in evaluating and assessing Connecticut water bodies based on water quality monitoring data. This includes working closely with monitoring programs funded under Section 319, like the Connecticut River Watch Program, and the Earthwatch (formerly Harborwatch/Riverwatch) program in the Norwalk River watershed. One of the major program responsibilities is to review and assist with the development of Quality Assurance Project Plans (QAPP), which assure the scientific reliability of data collected for these federally funded projects. DEP and EPA must approve these plans. This program has led to volunteer monitoring data being integrated with DEP data to increase our knowledge of the conditions of Connecticut's waters.

The 2008 summary report for the Rapid Bioassessment in Wadeable Streams and Rivers by Volunteer Monitors (RVB) can be seen on the DEP web page under the Bureau of Water Protection and Land Reuse, volunteer monitoring heading ([http://www.ct.gov/dep/cwp/view.asp?a=2719&q=325606&depNav\\_GID=1654](http://www.ct.gov/dep/cwp/view.asp?a=2719&q=325606&depNav_GID=1654)). This program enables citizen groups to collect useful data for DEP by combining the utility of invertebrate indicators with a non-technical methodology. Prior to sampling, a three-hour training session was held where over 300 individuals participated in this water quality-monitoring program.

Participants have included watershed associations, college ecology classes, town conservation commissions, and sporting clubs.

Number of monitoring locations	<b>96</b>
Number of waterbodies monitored	<b>105</b>
Number of individual participants	<b>350</b>
Number of groups	<b>20</b>
Number of groups participating for the first time	<b>6</b>
Number of returning groups	<b>14</b>



Rapid Bioassessment in Wadeable Streams/Rivers by Volunteer Monitors

Data collected according to the RBV protocol can be used as a screening tool to identify stream sections with either very high or very low water quality. The documentation of key indicator organisms in a section of a stream provides a record of the benthic community present for a collection date and time. Since the program inception in 1999, volunteer monitoring data has

been used to assess more than 323 river miles as fully supporting Aquatic Life Use in the 305(b) water quality report to Congress.

The 305(b) Assessment Database (ADB) Manager:

The 305(b) Assessment Database (ADB) Manager assures water quality assessments are entered into the ADB, and mapped using Arcview 9.x to provide a geographic representation of Connecticut's water quality assessments for all water-body types in support of the biennial submission of the Integrated Report (formerly referred to as the "Water Quality Report to Congress" or 305(b) Report, as required under Section 305(b) of the federal Clean Water Act (CWA) and Connecticut Impaired Waters List, which is required by Section 303(d) of the CWA).

CT DEP evaluates water quality based on results from data collections within CT DEP, and results data shared by the U.S. Geological Survey (USGS), Volunteer, municipal, academic, and Project SEARCH monitoring. The resulting water quality assessments are stored by "segment identifiers" (segment ID), a unique identifier derived from a combination of the Connecticut basin code, and segment number in the ADB. This information is extracted into the Integrated Report biennially, and shared with EPA and the public.

Updating the Assessment Database (ADB) is an ongoing process, based upon monitoring results from all available field work. On April 1<sup>st</sup> 2008, the Integrated Report, including a written report of Connecticut Water's assessed by segment ID, a copy of the Assessment Database (ADB), electronic copies of Connecticut's assessed waters called "shape files", and the Impaired Waters list (303(d) list) were submitted to EPA and posted on the DEP web page, released to the public.

### **Outreach and Education**

Project SEARCH is a collaborative program of the CT DEP and The Children's Museum. The project provides equipment, training, and technical support to high school and middle school teachers who have incorporated a water quality monitoring program as part of their science curriculum. Funding for this program, which was initiated through a National Science Foundation grant, is now provided by CT DEP General Funds and Section 319.

In 2008, Project SEARCH continued to work with teachers and students from over 85 public and private high schools and middle schools across Connecticut to collect water quality data on rivers and streams within their communities. Schools collected water chemistry data, assessed habitat quality (including potential NPS pollution), and surveyed benthic macroinvertebrate communities in the fall and spring at their monitoring sites. SEARCH staff conducted 98 school site visits including 71 field sampling trips to provide technical support to teachers and collect replicate data for the project QAPP, 19 classroom training sessions with students on SEARCH methods, and 8 planning and introductory sessions with teachers establishing new SEARCH programs in their curricula.

SEARCH staff conducted a 3-day workshop in August to train new teachers entering the program. A total of 13 teachers participated in these SEARCH workshop. A field-intensive



program has been developed and is used to build teacher confidence with implementing the monitoring techniques with their students. The involved teachers participate in all components of the SEARCH program and determine the water quality of the training site at the completion of the workshop. An estimated 95 teachers and 2,000 students in grades 9-12 participated in SEARCH activities throughout the calendar year.

Water quality data was collected from 66 sites on 58 rivers and streams. SEARCH staff collected 49 replicate samples for the project's Quality Assurance/Quality Control (QA/QC) analysis, and prepared annual reports, *Project SEARCH: Water Quality Data Summary Report 2007* and *2008*, that summarized the results of the stream surveys. SEARCH staff successfully integrated NPS issues into new data collection sheets the schools use during their trips. Several schools have started to collect the NPS data in addition to their other data. New teachers receive training on the use of the sheet and discuss NPS issues and sources with their students during the summer workshop. Several schools have continued their use of the GIS land use/cover mapping component to the program to facilitate understanding of NPS issues with their students. At the conclusion of the GIS lessons, the students will be able to generate watershed maps of their stream with land use types highlighted and connected to their water quality samples.

### **Geographic Information**

The NPS Program receives GIS support services from trained Bureau of Water Protection and Land Reuse (BWPLR) staff and from the Office of Information Management (OIM). GIS services relevant to NPS management include maintaining the NPS Online Viewer and the DEP GIS Data Download websites, assisting NPS Program staff both with the use of desktop GIS and with materials and guidance for GIS projects, including updating data layers, such as the Aquifer Protection Areas, Surface/Ground Water Quality Classifications, and creating maps representing Connecticut hydrology for presentations and for public use.

### **III. PROGRAM HIGHLIGHTS**

In 2008, grantees completed twenty-nine nonpoint source projects. Below are a few of the completed projects and their accomplishments.

- The North Central Conservation District continued its Hockanum River Watershed NPS Program working with municipalities, businesses and local residents within the watershed to improve nonpoint source pollution management. Their efforts focused on identifying priority NPS control projects, continuing business outreach and the Best Management Practices program. Outcomes from this project will directly improve water quality and habitat in the Hockanum River. Stream bank and stormwater outfalls that were repaired will reduce sediment and erosion within the stream and aquatic habitat was improved at two locations.
- Soundkeeper worked with DEP and the city of Norwalk to install 15 catch basin filters, which prevent oil, grease, sediment and bacteria from becoming a potential pollutant for the Long Island Sound. The basins were installed in residential, less-heavy traffic and mixed-use areas where they were tested under normal conditions and heavy rain and



snow events. The filters were successful in catching inches of sediment in addition to waste including paper, plastics, and wrappers.

- The Rivers Alliance of Connecticut coordinated a Watershed Association Small Grants Program. They administer grants ranging from \$500 to \$15,000. The grants were awarded to watershed organizations for training of volunteers, water-quality monitoring equipment, outreach and education related to watershed issues, GIS mapping, river clean-ups, community workshops, and the creation or improvement of buffer zones. The DEP assisted with project development, review and selection. Funds were awards to organizations like the Connecticut Audubon Society, Farmington River Watershed Association, SoundWaters, and Connecticut's Conservation Districts. The program successfully helped 36 local watershed organizations, many of them start-ups.
- Rivers Alliance of Connecticut also circulated surveys to elicit information on local regulatory protections against nonpoint source pollution of the state's waters. Responses were obtained from 38 municipalities and 15 organizations for a total of 52. Rivers Alliance analyzed the responses to determine what level of protection is generally in place, what works well or poorly, and what new or expanded nonpoint source protections are particularly desired by communities. Respondents' recommendations for strengthening protections against nonpoint source pollution gave top priority to a strong regulatory structure and education of officials, municipal employees and residents. Rivers Alliance maintains a model ordinance and regulation page on its website ([www.riversalliance.org](http://www.riversalliance.org)) which provides frequent updates.
- The North Central Conservation District worked with the University of Connecticut's Program of Landscape Architecture and the DEP to prevent stormwater runoff in and around Bushnell Park in Hartford, CT from polluting the Park River. UConn designed the project which included permeable pavers as an alternative to existing concrete sidewalks to improve infiltration. Pervious hard-scaping was also installed on heavily traveled areas and soft landscaping to promote infiltration and allow re-vegetation. Best management practices were used to reduce sediment loss, stormwater flow and polluted runoff. Open areas were protected from pedestrian traffic with posts and rail fencing. Approximately 70 feet of compacted and eroded area was restored. The project successfully demonstrated landscape measures to reduce impairments from urban runoff.
- The DEP and the city of Meriden, headed a project to eliminate bank erosion and sediment transport resulting from pedestrian and unauthorized recreational vehicles crossing three tributaries of the Quinnipiac River. A trail was paved and formal crossing structures were installed. In addition, the bank was stabilized using riprap and native vegetation in order to prevent erosion. The trail is a wonderful resource for residents and is used for walking, jogging, bicycling and roller blading.
- The Eastern Connecticut Resource Conservation and Development Area hosted a Land Use Leadership Alliance Training Program (LULA), which offered local leaders the opportunity to learn about practical land use, natural resource management, agricultural viability, community participation and collaborative decision-making techniques. The program empowered local commissions to make decisions that foster sustainable land use as well as protecting key environmental resources. The program involved lectures conducted by staff and guest speakers, case studies, interactive sessions, and the handout

of useful reference material. 319 funds provided the DEP with equipment to complete the Rapid Bioassessment for Volunteers Program and purchase an EnviroScope nonpoint source model, which was utilized for outreach and education on NPS pollution. 319 funds were also made available to complete a study on energy availability from agricultural byproducts for farms in the Housatonic River watershed, which would assist in reducing nutrient pollution from farms and greenhouse gas emissions and providing healthier rural economies.

- The Lake Lillinonah Authority analyzed historical and new water quality data collected from three rivers leading to Lake Lillinonah to estimate nutrient loads. The DEP and the US Geological Survey (USGS) assisted in collecting data on thermal and chemical stratification, flow velocity and direction. This project identified the Housatonic River as contributing over 70% of the total phosphorus load, which will be used to develop a management plan for the watershed. They also acquired data from within the lake to determine nutrient concentrations and physical processes that may affect the occurrence of algae blooms. Nine sample stations were monitored, from which the data collected will assist in developing nutrient total maximum daily loads (TMDLs).
- The Connecticut Conference of Municipalities and the DEP developed a program to assist 124 municipalities in complying with Phase II of the federal storm water regulations. They purchased software to assist in creating, registering, implementing, managing and reporting of the required municipal plans. In addition, software training and workshops were offered. 72 municipalities took advantage of this program and participated.
- The Connecticut River Coastal Conservation District worked with the city of New Britain to plan, prioritize and implement measures to improve water quality in Willow Brook, a tributary of the Mattabesset River. To protect the brook from surface runoff, 17,000 square feet of riparian buffer was created out of native vegetation that was previously grass. Two swirl concentrator water quality units were also retrofitted into the nearby parking lot to address untreated stormwater. The City voluntarily moved a discus/hammer throw practice area to reduce the pedestrian traffic to that facility and it allowed for additional plating of riparian buffer vegetation. The project resulted in an enhanced riparian buffer that will protect the brook from adjacent land uses and land maintenance practices. It also resulted in the treatment of previously untreated stormwater runoff from paved parking lots.
- University of Connecticut held a workshop at the Torrington campus to educate 17 farmers and agricultural service providers about the proper composting of dead animals. Topics of discussion included public health, availability of funds, the scientific background of composting dead animals and dead animals as food for wildlife. This project continues to be successful. At least 5 farmers have continued to maintain their nutrient management plans after the incentive payments from the Environmental Quality Incentives Program (EQIP) had ended.
- Baystate Environmental Consultants, Inc. designed a sedimentation forebay and dredging plan for Allen Brook Pond which is located in Wharton Brook State Park in Wallingford.
- The University of Connecticut's Department of Plant Science and Cooperative Extension System recruited agricultural producers and green industry professionals to reduce the

use of pesticides and nutrients within the Quinebaug and Shetucket Watersheds. Integrated pest management (IPM) training consisted of on-site demonstration projects, individual and group meetings and season-long consultations on proper IPM and nutrient best management practices. Growers were taught effective preventative and alternative pest control strategies, nutrient management and the use of environmentally safe pesticides. Owners and managers with the potential to compost manure received additional seasonal consultations and education materials. In addition, general public education programs were developed and implemented. During the growing season, 16 participants, covering 1274 acres, put in place an IPM or nutrient management program. The project succeeded in reducing the use of 25 of the 54 pesticides used and eliminated the use of twelve products completely. In total, pesticide use was reduced by 786.2 pounds or 18%.

- The Jordan Cove Urban Watershed Project in Waterford was designed to develop a comparison between a traditional subdivision and a subdivision utilizing low impact development techniques and best management practices for pollution prevention. The emphasis for this last year of a 10-year project was on data analysis and educational outreach. The development of the low impact subdivision resulted in a 97% decrease in stormwater runoff.
- The town of Thompson worked with NRCS to install riparian buffers on public land along a 2,000 foot section of the French River in North Grosvenor Dale. NRCS completed the site surveys and buffer designs, as well as provided oversight during installation. Two riparian buffer workshops were conducted for area towns and interested residents.
- The Nonpoint Education for Municipal Officials (NEMO) Project was created to provide local land use decision-makers with the tools necessary to understand the impacts of nonpoint source pollution and share development practices that minimize pollution impacts. NEMO developed web-based tools to assist municipalities in this process. This includes the development of a new interactive mapping website and educational module which provides the tools necessary for municipalities to utilize statewide databases available for land use planning and site design evaluation, titled the Community Resource Inventory Online. These maps have been accessed by thousands of Connecticut residents assisting them in local planning and development decisions. The site has also been featured in numerous state, regional and national conferences and publications and is the subject of a replication effort in other states. This program continues to be an effective model for inducing changes to town regulations and policies intended to protect water quality. Examples include the town of North Stonington holding workshops on topics including economic development, the use of the Community Resource Inventory, and open space planning. The town of Waterford assembled a Site Planning Task force, held roundtable meetings to discuss town regulations and practices, and created a guidance document on the use of stream buffers and coastal protection strategies.
- The Connecticut River Coastal Conservation District worked with DEP to install a Pet Waste Best Management Practices Implementation Program at Schreeder Pond in Chatfield Hollow State Park in Killingworth. To address dog waste as a potential source of indicator bacteria, the program focused on educating dog owners on the necessity of

collecting their pet's waste. Five dog waste stations were installed in the park, which hold biodegradable bags, a waste bin, and a sign to notify park users. Educational materials were distributed to veterinarian offices, pet stores, dog walkers in the form of "goodie" bags, and press releases distributed the information to the local media. In the short-term, the project was successful in changing the behavior of some park visitors and in raising awareness of why dog waste is a pollutant. The TMDL requires a 5% reduction in bacteria loadings, so compliance by only a portion of dog owners visiting the park can make a large difference.

- The Eastern Connecticut Resource Conservation and Development Area, Inc. worked with the agricultural community to meet the concentrated animal feeding operation regulations. A survey was conducted on food waste to obtain information on the availability of food waste, quantities of waste, costs of disposal, willingness to participate, alternative methods and the potential for obstacles. A webpage was developed ([www.ctnm.org](http://www.ctnm.org)) to keep the community updated on current CT nutrient management issues and to show the result of nutrient management studies. This survey along with the previous statewide and local nutrient management studies provides important insight and information in the efforts to address nutrient management issues in CT.
- The Connecticut Federation of Lakes held the New England Chapter of North American Lake Management Society (NECNALMS) Conference at the University of Connecticut. Presentation topics included lake and watershed management, application of TMDLs, implementation of BMPs, impacts of invasive aquatic plants on lake ecosystems, eutrophication, stormwater runoff control and public outreach. 319 funds were made available for DEP employees and others to attend this event.
- Funding was provided to complete a watershed-based plan for the Coginchaug River Watershed using the EPA's nine element plan. The nine elements are:
  1. Identify causes and sources of impairment
  2. Estimate expected load reductions
  3. Describe needed NPS management measures
  4. Estimate needed technical and financial assistance
  5. Public information and education
  6. Implementation schedule for NPS management measures
  7. Measurable milestones
  8. Performance criteria
  9. Monitoring plan

Future plans will be to implement the watershed-based plan in hopes to delist segments of this 303(d) listed watershed.

- Earthplace provided funding to conduct weekly sampling of bacteria at 18 sample sites throughout the Saugatuck River Watershed. The project provides baseline data on seasonal water quality through sampling of indicator bacteria, fecal coliform and E. coli. To the extent possible, the point and nonpoint sources of the bacterial were identified. Best management practices will be laid out to reduce the pollution from these sources.
- Connecticut's five Conservation Districts assisted the DEP in investigating impaired waters by compiling information for a centralized database, locating opportunities for

investigating impairments and surveying the potential for stormwater management projects. In addition, they provided recommendations for best management practices, NPS pollution management, erosion and sedimentation control issues and technical services on a watershed basis in support of changes required by new regulations.

- Connecticut's five Conservation Districts also provided technical reviews and on-site assistance for the impaired waterbodies. The Districts assisted the DEP in the assessment and development of Total Maximum Daily Loads (TMDLs) for the waterbodies by completing Stream Walks and Track Down Surveys. Utilizing the survey information, the districts worked with the DEP to complete watershed protection plans and develop implementation schedules for impaired waters. As an alternative, districts could conduct stormwater retrofits or other priority projects. In addition, the districts investigated, identified, and reported on stormwater discharges requiring retrofits to improve NPS pollution control and prevention in the impaired waterbodies.
- The Thames River Basin Partnership is a cooperative made up of agencies, municipalities, educational institutions, companies and individuals interested in protecting the environmental health of the Thames River Basin. The Thames River Basin Coordinator was provided funding to continue working towards inter-agency and inter-municipal cooperation on watershed issues. The Coordinator directed the public outreach program to educate the public about the watershed and its major issues. The Coordinator also facilitated nonpoint source activities and projects in support of the partnership's mission to reduce pollution in the basin.
- The AFO/CAFO Project Series' primary objective was to provide training to NRCS's Environmental Quality Incentive Program (EQIP) participants on establishing and maintaining Nutrient Management Plans (NMPs). The NMPs are recommendations for manure and fertilizer application and nutrient management techniques. The project also developed a recordkeeping database for agricultural producers to utilize to improve the reliability of data, reduce errors, improve analysis and enhance technical implementations required to develop and implement a NMP. In addition, the project provided training on the uses and implications of using nutrients like nitrogen and phosphorus and the importance of nutrient management. This training provided methods to minimize the risk of surface water or groundwater contamination from the application of manure nutrients on cropland and pasture. It is expected that an average of five new EQIP contracts will be signed each year, covering 1,500 acres of cropland per year. Five farms have continued to maintain their NMPs even though their EQIP funding has ended.
- The Northwest Conservation District performed surveys throughout the watershed of Mill Brook, to gather information that can be used to design and implement plans to improve water quality and remove the stream from EPA's 303d list of impaired waters. In addition, the District completed over 50 technical reviews of development projects for municipalities.
- Connecticut River Coastal Conservation District worked with the NRCS on identifying and addressing the causes and sources of water quality impairments in the Mattabesset River Regional Basin. The District gathered existing watershed data and information as well as planned, publicized and coordinated a series of education and outreach activities to inform and engage watershed residents including a community forum, river clean-up,

paddle trip and rapid bioassessment for volunteers. The District also planned and conducted a water quality study of Coginchaug tributary streams to locate areas contributing to bacteria loading and build public awareness of water quality issues and human impacts on rivers. The project was very successful, drawing over 140 people and generating interest in efforts to improve water quality. In addition, the water quality study uncovered several “hot spots” that are likely contributing to high levels of bacteria.

- The Eastern Connecticut Conservation District introduced equipment that would address the problem of agricultural runoff by introducing and demonstrating a new method of manure incorporation in the Little River Watershed. The equipment involved was an Aerway aerator, which as it runs over the soil, will create openings in the surface. This procedure is followed by the application of liquid dairy manure, which will readily enter the soil through the holes created by the aerator. Through this project, the District acquired the equipment, educated dairy farmers on its use and applicability to their lands, and made the equipment available for use at no cost to three local farmers. Through feedback from the farmers and runoff monitoring studies conducted by the University of Connecticut, results indicate the using the Aerway machine accomplished the goals of facilitating immediate manure incorporation and reducing nutrient runoff.

#### **IV. WATERSHED MANAGEMENT PROGRAM**

##### **Watershed Management**

The CT DEP has been in a comprehensive, multi-media “watershed approach” for over a decade now. CT DEP has developed a watershed management strategy that establishes the framework within which the CT DEP will work through a networked approach with federal, state, and municipal governments and non-government agencies and organizations to conduct watershed management and strengthen the state’s ability to control nonpoint source pollution. The CT DEP has organized and focused base program staff, establishing five “major basins” overseen by three watershed managers, and continues to target grant funds based on watershed priorities.

Consistent with this approach, CT DEP offers competitive annual Section 319 grants to watershed initiatives for the priority watersheds, and to statewide NPS initiatives for transfer to local watershed management efforts. EPA has encouraged 9 element Watershed Based Plans to be drafted throughout the nation. As CT DEP continues to award funding and approves more of these 9-element Watershed Based Plans, focus will redirect to implementation of recommended best management practices (“BMP”) in these Plans. In urban watersheds, these BMPs will be implemented with support from CT DEP Low Impact Development resources (see section Low Impact Development Program)

In the past, CT DEP has targeted the Norwalk, Quinnipiac, Hockanum, Mattabesset, Pequabuck, Scantic, Sasco, and Fenger River watersheds. CT DEP continues to work on focused watershed management initiatives for the Little, Quinebaug and Shetucket rivers in the Thames River basin, the Pomperaug River and Steel Brook in the Housatonic River basin, the Niantic in the Southeast coastal basin, the Saugatuck in the Southwest coastal basin, and other priority watersheds. The watershed approach is also being used to restore lake water quality, building upon studies and

plans developed with funds provided by the state Lake Water Quality Grant Program, the federal Clean Lakes Program (pursuant to section 314 of the C.W.A), and Section 319 grants.

The NPS Coordinator works closely with Watershed Management and Coordination (WMC) staff and other NPS Program partners to select and manage watershed projects for Section 319 funding. Generally, the goals and objectives for watershed programs include the protection, restoration and improvement of water quality, habitat for fisheries and other wildlife, and recreational opportunities. As described in the state's Enhanced State Nonpoint Source Management Program, watershed management priorities are determined by a variety of mechanisms, including watershed and stream corridor assessments, the Consolidated Assessment and Listing Methodology (CALM) reporting and targeted NPS assessments. The primary purposes of the CALM data analyses are to determine the extent that all waters are attaining water quality standards, to identify waters that are impaired and need to be added to the 303(d) list, and to identify waters that can be removed from the list because they are attaining standards. The CT DEP WMC Section administers river and lake watershed management programs in cooperation with other CT DEP programs, other state and federal agencies, and nongovernmental organizations. The WMC Section includes coordinator positions for the five major river basins, to oversee and coordinate watershed management activities there: Thames, Connecticut, Housatonic, Central Coastal, and Southwest Coastal Basins. The watershed program addresses NPS-related water quality problems on a comprehensive basis throughout an entire watershed. The role of the WMC basin coordinators include:

- Coordinating CT DEP base program activities in priority watersheds
- Serving as liaison between CT DEP and other state and federal agencies, municipalities, citizen groups, watershed associations, and other partners
- Leading local municipalities to form stakeholder groups to draft approved 9 element Watershed Based Plans throughout the State.
- Assisting in the development of additional basin reports, watershed assessments, TMDLs, and watershed management plans that address local and regional watershed management goals.
- Providing education and outreach on watershed issues, including the CT DEP web site, fact sheets, meetings, workshops, and conference
- Helping to manage NPS control projects financed in part with funds from the federal Clean Water Act Sections 319, 604(b), 104(b)(3), and state River Restoration Grants; and NPS education and outreach, and capacity building for nongovernmental organizations

CT DEP continues to encourage the growth of new and existing non-governmental watershed organizations, partnerships and initiatives in priority watersheds, by directing funds to the Rivers Alliance of Connecticut to administer the Watershed Assistance Small Grants Program (WASGP). The WASGP was established in 2002 through the Section 319 (FY '01) program to provide small grants to start up and growing organizations, and those who have not had ready access to some of the more traditional sources of funding. In this program, 27 watershed groups have been active in watershed management activities related to NPS pollution education and controls, water monitoring, and water resource and land-use management and education. The



program is well received and effective at improving watershed protection and reducing NPS pollution. During 2008, emphasis continued on completing progress on previously provided assistance grants, and preparing for a new round of grants in 2009. The Rivers Alliance is also assisting CT DEP in developing and promoting model municipal tools and regulatory options to reduce and control NPS pollution. CT DEP and Rivers Alliance are focusing on an in-depth study of towns' needs, useful tools, model regulatory language and non-regulatory efforts that will be suitable for towns to adopt or modify as they see necessary.

Other watershed management initiatives during 2008 include:

- Continuing to evaluate and implement CT DEP watershed management strategies to improve watershed management and strengthen the state's ability to control NPS pollution. DEP programs continued to coordinate efforts that influence land use development, creating stronger municipal relationships, offering assistance to municipalities making land use decisions, and promoting low impact development tools;
- Examining a long-term approach to solving complicated water quality impairments in the main stem tributaries in Thames basin;
- Working with the NPS Program to focus on 303(d)-listed impaired waters, causes and sources of impairments, and implementation projects to fix impairment;
- Continuing implementation of the watershed management plan in the Niantic River basin, finalized in 2006. The plan covers all 9 elements of an EPA watershed-based plan, build out conditions, and other CT DEP NPS and watershed management assessment, planning and implementation needs.
- Finalizing the Coginchaug Watershed Based Plan, located in the Connecticut basin. In 2008, DEP continued its statewide work with municipal and local stakeholders to approve this 9 element watershed based plan and begin discussions for implementation of best management practices.  
[http://www.ct.gov/dep/cwp/view.asp?a=2719&q=379296&depNav\\_GID=1654](http://www.ct.gov/dep/cwp/view.asp?a=2719&q=379296&depNav_GID=1654)
- Using SEP funds for Enforcement Actions, funding was made available to all municipalities in the the Farmington River Watershed to apply for a Municipal Land Use Evaluation ("MLUE") Grant for municipalities to form local stakeholder groups, hire external assistance as needed by the town, including legal, planning and/ or engineering expertise, and revising local regulations to remove barriers to low impact development and encourage land use practices to protect valuable resources in the watershed .

Connecticut's soil and water conservation districts ("Conservation Districts") have an integral role in nonpoint source (NPS) pollution by delivering technical assistance and to municipalities and landowners. Technical and educational services provided include erosion and sedimentation

control, management and controls of NPS pollution, management of storm water runoff, and promotion of watershed management with recommendations for best management practices. Districts work within communities by partnering with various public and private stakeholders to formulate and implement watershed management plans and local initiatives to preserve the health of watersheds. Partners include among others, CT DEP, NRCS, municipalities, regional planning entities, as well as natural resource and land preservation groups. In 2008, Conservation Districts used their base section 319 funds to provide assistance to municipal leaders, commissions, staff, residential, commercial, and agricultural land users by:

- Providing technical information and assistance on natural resource problems by preparing site plan reviews and on-site inspections, and providing recommendations for management of NPS pollution, erosion, sedimentation controls, conducting pollution source trackdowns, and storm water management including stormwater retrofit opportunities;
- Planning and presenting technical assistance, natural resource training workshops and hands-on assistance to land use decision makers and landowners on, for example, channel restoration and restoration of stream banks; management of erosion and sediment control, nutrient management, stormwater management; best management for forestry practices, and integrated pest management;
- Providing on-call detailed information and recommendations to ensure protection of wetlands, streams, rivers, groundwater, watersheds and land from storm water run-off, and to address problems resulting from the lack of erosion and sedimentation controls.

Rivers Alliance of Connecticut received Section 319 Nonpoint Source (NPS) grant funds to conduct a broad survey of towns and local environmental organizations on their practices and policies for water quality protection. The survey results rendered valuable information on current issues of concern, which will help Rivers Alliance develop future educational and resource opportunities. They also compiled and posted on their web site several ordinances and regulations from Connecticut towns which serve as examples of new and effective or innovative ways to address nonpoint source pollution

(see:

<http://www.riversalliance.org/ModelOrdinances/modelordinances.cfm>).

### **Watershed Management and Low Impact Development**

**Low Impact Development (LID)** is a land use planning and site design strategy for the management of stormwater runoff that uses small scale controls integrated throughout a site to infiltrate, filter, store, detain, and evaporate stormwater close to its source, replicating the pre-development hydrology of a site. LID techniques decrease surface runoff, erosion, and non-point source pollution and conserve natural site features to improve water quality and regulate water quantity. Photo: A Connecticut Rain Garden.



The CT DEP Bureau of Water Protection and Land Reuse Planning and Standards Division continued support under the Watershed Management Program by promoting Low Impact Development (LID) techniques to reduce stormwater and nonpoint source pollution runoff. The LID program worked with statewide partners at the municipal, state and federal levels to provide information and outreach materials and technical coordination in the application of LID techniques. This program builds relationships and promotes LID management practices with municipal land use agencies and public and private stakeholders in order to protect, conserve and restore the water resources of the state.

The role of the LID Program includes:

- Supporting the work of the Watershed Managers in protecting and restoring water quality by serving as a liaison between CT DEP and other state and federal agencies, municipalities, citizen groups, watershed associations, and others through the coordination of LID recommendations for watershed-based plans and implementation efforts.
- Providing assistance to municipalities to review regulations and ordinances into local zoning, subdivision or wetlands codes to remove barriers to low impact development.
- Providing best management practices through outreach materials and technical coordination to municipalities, planners, watershed associations and contractors.
- Providing education and outreach on LID and nonpoint source pollution topics and funding opportunities through the CT DEP web site, fact sheets, brochures, meetings, workshops, and conferences.
- Integration of LID projects into CT DEP base program activities.

Some of the CT DEP Low Impact Development accomplishments for 2008 included:

- Hiring an LID Coordinator to assist the Nonpoint Source and Watershed Management Programs with implementation of approved 9 element Watershed Based Plan recommendations and other LID projects.
- Supported the work of the Watershed Managers and provided stakeholder capacity building through participation at statewide conferences, local workshops, regional watershed meetings and with interagency workgroups.
- Incorporation of LID education and outreach materials, including the first in a series of brochures on LID practices into the CT DEP Watershed Management webpage online at: [www.ct.gov/dep/watershed](http://www.ct.gov/dep/watershed)
- Technical review of site specific LID practices in coordination with other DEP programs to assist municipalities, and other state agencies with development proposals.

### **Southwest Coast Basin**

The Southwest Coast Basin consists of a series of mostly north to south flowing streams that discharge to Long Island Sound between Stratford, CT and Port Chester, NY. The Southwest

Coast Basin encompasses approximately 448 square miles, 57 of which are in New York State, and is home to approximately 650,000 people. The basin can be further subdivided into five regional basins: Southwest Shoreline, Southwest Eastern Complex, Saugatuck, Norwalk, and Southwest Western Complex. The northern half of the basin watershed is relatively rural, characterized by small towns, farmland and forest, much of which surrounds public water supply reservoirs. The southern half of the watershed tends to be more urbanized and commercial, dominated by the major transportation corridor surrounding I-95 and US 1.

### Byram River

The Byram watershed is in the towns of Greenwich Connecticut and Port Chester/Bedford, New York. The major issues in this watershed are: flooding, especially in the Pemberwick area, water quality, storm sewer overflows (SSOs), illicit discharges, combined sewer overflows (CSOs) from Port Chester, NY into the estuary, sediment quality due to its industrial legacy, contaminated sediments, and the plan to develop a watershed-based management plan.

The Byram River Watershed Coalition has been organized with the following focuses: water quality, watershed-based plan development, public access and mitigation of flooding and erosion. Government agencies have met approximately quarterly with NY Department of Environmental Conservation (DEC) to discuss pathogen issues discovered by monitoring performed by Greenwich, IEC, Westchester County Health, and Port Chester. A number of illicit discharges and cross connections have been eliminated in the Port Chester area, but ambient monitoring still indicates significant dry-weather sewage discharges coming from the Port Chester stormwater systems.

Watershed stakeholders include, but are not limited to the Town of Greenwich, IEC, Byram River Watershed Coalition, Westchester County Health, Port Chester, Southwest Conservation District, Westchester County Planning/Conservation District, Bedford, Save our Shores, Save the Sound/Connecticut Fund for the Environment, and Citizens Campaign for the Environment and SoundKeeper.

### Mianus River

The Mianus River watershed is in the towns of Greenwich and Stamford, Connecticut. The major issues in this watershed are land preservation, riparian restoration, heavy use of parks, NPS pollution, and goose management.

South West Regional Planning Agency has been funded to develop a watershed-based plan for nonpoint source pollution. The City of Stamford has worked with local park users to enhance the trail system to lessen impacts to the river at Mianus River Park. Volunteer labor has been managed very successfully to implement trail and river corridor management projects. Plans are underway to provide some hardened access points to alleviate conflicts between heavy traffic and riparian restoration. In some areas, temporary fencing has been an effective tool in restoring vegetation by limiting human and animal traffic. River herring runs continue to improve in response to improved fish passage over existing dams.

Watershed stakeholders include, but are not limited to the Mianus River Watershed Council, Greenwich, Stamford, Mianus River Greenway Alliance, SWRPA, Aquarion, and Mianus River Gorge Preserve.

### Mill/Rippowam River

The Mill/Rippowam watershed is located in Stamford, Connecticut. The major issues in this watershed include the Mill River Restoration Project, which includes two dam breaches and significant bulkhead removals with resultant riparian restoration and flood mitigation, as well as an effort to develop a watershed-based management plan.

The City of Stamford is nearing completion of a major project to restore a more natural riparian condition and mitigate flooding in the lower end of the Mill River, in cooperation with the US Army Corps of Engineers. Bulkheads are being removed, two dams are being breached, and streambank slopes are being restored and managed for multiple uses. The City has also allocated funding for a watershed-based plan to address water quality and stormwater. Preliminary survey and organizational meetings have been held.

Watershed stakeholders include, but are not limited to Stamford, the Mill River Collaborative, and the US Army Corps of Engineers.

### Noroton River/ Holly Pond/Goodwives/Stoney/Tokeneke Rivers/Gorham's Pond

The Norton River/Holly Pond watersheds are located in Stamford, Connecticut. Goodwives/Stoney/Tokeneke Rivers/Gorham's Pond watersheds are located in Darien, Connecticut. Major issues in these watersheds include sedimentation, NPS pollution, and flooding.

The City of Stamford has initiated a Holly Pond Sedimentation Study and Improvement Design Project. The Town of Darien is planning significant work to mitigate flooding in the town's watercourses, beginning with construction of a basin that will provide flood mitigation for Stony Brook.

Watershed stakeholders include, but are not limited to Stamford, Darien, SoundWaters, and the Darien Land Trust.

### Five Mile River

The Five Mile River watershed is located in New Canaan, Norwalk and Darien, Connecticut. Major issues in the watersheds include flooding, erosion and sedimentation, water quality issues from point and nonpoint source pollution, treated effluent dominated in late summer, and development of a watershed-based management plan.

Concerns have been voiced regarding frequent flooding, erosion and sedimentation, and degradation of water quality and riparian habitat. The Town of New Canaan had initiated a hydraulic and hydrologic study. SWRPA has been funded to complete a watershed-based plan to address nonpoint source pollution and water quality.

Watershed stakeholders include, but are not limited to Norwalk, New Canaan, Darien, Friends of the Five Mile River, and the West Norwalk Association.

#### Norwalk / Silvermine / Comstock Rivers

The Norwalk/Silvermine/Comstock River watersheds are located in the Connecticut towns of Norwalk, Wilton, New Canaan, Weston, Ridgefield, Redding and Lewisboro, New York. Major issues in the watersheds include flooding, erosion and sedimentation, and water quality issues including nutrients from Publically Owned Treatment Works (POTWs) and pathogens from nonpoint source pollution.

The river's flow can be strongly influenced by treated wastewater effluent in late summer. There is an industrial legacy and high zinc concentrations in sediments may have some effect upon aquatic life use support. Volunteer water quality monitoring has been active and has led to correction of many pollution sources. A bacteria Total Maximum Daily Load (TMDL) has been written and is being implemented with the assistance of the municipalities and the Norwalk River Watershed Initiative. CT DEP has undertaken a stressor analysis study focusing on nutrients and dissolved oxygen, and the role of wastewater discharges and impoundments on water quality and aquatic life use support. Citizen's water quality monitoring and a part time NRWI Watershed Coordinator continue despite the loss of State funding. Management of excess non-migratory Canada Geese has been identified as a priority project and funded by CT 319 funding. The goals are threefold: egg oiling, harassment with dogs, and educating people to not feed geese. Two dam removal projects are being planned on the Norwalk River. Engineering design and permitting will be completed by NRCS, under contract to CT DEP, at Merwin Meadows Dam in Wilton. A similar design project at Flock Process Dam in Norwalk has been delayed due to funding problems.

The South West Regional Planning Agency has received funding to update the Norwalk River Watershed Initiative's Action Plan to comply with EPA's nine element format for watershed-based plans.

Watershed stakeholders include, but are not limited to the Norwalk River Watershed Initiative, Norwalk River Watershed Association, Harbor Watch/River Watch, Trout Unlimited, Norwalk Maritime Museum, Norwalk, Wilton, New Canaan, Ridgefield, Redding, Weston, Lewisboro, Southwest Conservation District, South Norwalk Water and Electric, and SoundKeeper.

#### Saugatuck / Aspetuck Rivers

The Saugatuck and Aspetuck River Watersheds are located in Westport, Weston Easton, Redding, Newtown, Wilton, Fairfield, and Danbury, Connecticut. Major issues in the

watersheds include land preservation, water quality, NPS, shellfish, water diversions and low flow, citizens monitoring, goose management, and The Nature Conservancy-Aquarion Low Flow Reservoir Management Model.

The Saugatuck River Watershed Partnership has had success with municipal support for its Conservation Compact. Several watershed workshops have been held focusing on stormwater and nonpoint source pollution. Citizen's water quality monitoring has been successfully implemented in both the Saugatuck and Aspetuck River watershed. The South West Regional Planning Agency has received funding to create a watershed-based plan to address bacteria and nonpoint source pollution.

Watershed stakeholders include, but are not limited to the Saugatuck River Watershed Partnership, The Nature Conservancy, Harbor Watch/River Watch, Aquarion, Westport, Fairfield, Weston, Newtown, Wilton, Fairfield, Ridgefield, Danbury, Easton, Trout Unlimited, Land Trust, USGS, Highstead Arboretum, SouthWest Conservation District, and Soundkeeper.

#### Sherwood Mill Pond

Sherwood Mill Pond is located in the town of Westport, Connecticut. The Town of Westport and Harbor Watch River Watch have been actively seeking out bacteria sources through Citizen's Water Quality Monitoring efforts to supplement efforts by the Westport-Weston Health District.

Watershed stakeholders include, but are not limited to Westport, Harbor Watch/River Watch, and the Westport-Weston Health District.

#### Sasco Brook

Sasco Brook watershed is located in the town of Westport, Connecticut. Major issues in the watersheds include water quality, citizens monitoring, NPS pollution, goose management, hobby farms/animals, watershed-based management plan, and the bacteria TMDL.

Nonpoint source management continues to be a primary concern. Education of horse owners to use best management practices for manure management has been successful. The identification of outfalls that serve areas where septic systems may fail continues. The Town of Westport is working on a draft watershed-based plan to address sources of bacteria in the Brook.

Watershed stakeholders include, but are not limited to Westport, Fairfield, Sasco Brook Water Pollution Abatement Committee, HarborWatch/Riverwatch, SouthWest Conservation District, Natural Resources Conservation District, and the CT Department of Agriculture Aquaculture Division.

#### Mill River



The Mill River watershed is located in the towns of Fairfield, Easton, Trumbull and Monroe, Connecticut. Major issues in the watersheds include water quality, water quantity, lead and bacteria TMDLs, and riparian restoration.

The Mill River Wetland Committee continues to work on educational programs in schools. Other organizations such as the League of Women Voters and the Fairfield garden clubs have taken an active role in public education and outreach, as well as riparian restoration and invasive species control at local parks and dedicated open spaces.

Watershed stakeholders include, but are not limited to Fairfield, RiverLab / Mill River Wetland Committee, Fairfield Garden Clubs, and the League of Women Voters.

#### Ash Creek / Rooster River

Ash Creek and Rooster River watersheds are located in the towns of Bridgeport and Fairfield, Connecticut. Major issues in the watersheds include water quality, CSOs, riparian restoration and preservation, and the bacteria TMDL.

Conservation efforts in the watershed coalesced around opposition to several large dock proposals and spread to other areas such as habitat restoration.

Watershed stakeholders include, but are not limited to the Ash Creek Conservation Association and the Connecticut Conservation Association.

#### Pequonnock River

The Pequonnock River watershed is located in the towns of Bridgeport, Trumbull and Monroe, Connecticut. Major issues in the watersheds include water quality, riparian and habitat restoration, flooding, and a watershed-based plan.

A collaborative effort is underway to develop a watershed-based plan with the City of Bridgeport and Southwest Conservation District taking the lead. Interest in organizing a Pequonnock River Watershed Partnership has been strong. A Citizen's Water Quality Monitoring program has been designed and implemented by Harbor Watch/River Watch.

Watershed stakeholders include, but are not limited to Save the Sound, Bridgeport, Harbor Watch/River Watch Trout Unlimited, USDA/NRCS, and Beardsley Zoo.

#### **Housatonic Major Basin**

The Housatonic River has been extensively harnessed for hydroelectric power generation. In Connecticut, FirstLight Power Resources operates five hydroelectric facilities on the Housatonic River: Falls Village, Bulls Bridge, Rocky River (associated with Candlewood Lake), Shepaug (dam forms Lake Lillinonah) and Stevenson (dam forms Lake Zoar). A new license covering all of these facilities was issued by the Federal Energy Regulatory Commission (FERC) in June

2004. The license includes a Water Quality Certificate issued by CT DEP. In addition to these five plants, McCallum Enterprises operates a hydropower facility at Derby Dam (dam forms Lake Housatonic).

To date, the major issues affecting water quality of the Housatonic River in Connecticut have revolved around eutrophication, dissolved oxygen levels and PCBs. The first two issues are primarily associated with the three lower impoundments on the river – Lake Lillinonah, Lake Zoar and Lake Housatonic. It has been found that excessive amounts of phosphorus from upstream sources are causing serious algal blooms in these lakes. Reduction in phosphorus levels at upstream wastewater treatment plants, as well as the disappearance of some point sources, has helped to lower nutrient levels and improve water quality. However, eutrophication problems persist, particularly in Lake Lillinonah.

The Housatonic PCB issue was first identified in the late 1970's and is primarily associated with releases from the General Electric Company (GE) facility in Pittsfield, MA. As a result of a Consent Decree, approved by the U.S. District Court in October 2000, involving GE, U.S. EPA (EPA) and other federal entities, the State of Connecticut, Commonwealth of Massachusetts and City of Pittsfield, clean-up of PCBs in the most heavily contaminated portions of the river (close to the GE facility) is underway. In-river remediation activities are being addressed in three distinct phases known as: the ½ mile (on the East Branch of the Housatonic, immediately adjacent to and downstream of the GE facility); the 1 ½ mile (on the East Branch of the Housatonic, commencing immediately below the ½ mile and ending at the confluence of the East and West Branches); and Rest of River (from the confluence of the East and West Branches which form the mainstem of the Housatonic, down through MA and CT to Long Island Sound).

The Housatonic River and the lands within its watershed constitute an important recreational resource. There are hundreds of acres of public recreation land within the watershed, including the Appalachian Trail, which runs along the river for five miles between Kent and Cornwall. In Connecticut, the northern portion of the river offers catch-and-release Trout Management Areas, Smallmouth Bass Management Areas and seasonal Class I-IV whitewater boating opportunities. Meanwhile, the four lakes in the watershed - Lillinonah, Zoar, Housatonic and Candlewood - are popular areas for boating, fishing and swimming. In 2001, the Housatonic Main Stem was officially designated by the State as the "Housatonic Riverbelt Greenway". It is hoped that this planning designation will encourage towns and other groups to work together and create a contiguous greenway along the river corridor.

During 2008:

- With regard to the Housatonic GE-PCB remediation project:
  - GE submitted a Corrective Measures Study (CMS) to EPA. This study evaluates potential clean-up alternatives for Rest of River. The study includes eight alternatives for remediating contaminated sediment in the river; seven alternatives for remediating contaminated soil in the adjacent floodplain; and five alternatives for treatment and disposition of contaminated soil/sediment.

- EPA completed its review of the CMS, taking into account informal public input, and provided comments to GE which requires them to address over 150 inadequacies and other items.
- These actions represent two more steps forward in the process of determining whether additional PCB clean-up actions will be undertaken in the Rest of River area.
- GE voluntarily agreed to continue PCB monitoring in fish and aquatic invertebrates in the Housatonic River in Connecticut for the 2008 season, although there is no longer a formal CT DEP – GE Cooperative Agreement in effect.
- The Northwest Conservation District completed a track down survey and mini-watershed-based plan for Mill Brook, a small tributary to the mainstem of the Housatonic River in Cornwall, CT. This project was done under a 319 block grant.

### Naugatuck Regional Basin

The Naugatuck River is the largest tributary of the Housatonic River, with a watershed of approximately 311 square miles in parts of 27 municipalities. The mainstem of the Naugatuck River forms in Torrington and flows south for 40 miles to Derby, where it enters the Housatonic River only 11 miles from Long Island Sound. The Naugatuck River watershed has the potential for excellent cold-water fish habitat and has historically supported anadromous fish runs. The existence of these runs ceased during the industrial revolution due to the construction of numerous dams and poor water quality. Although the river has a long history and reputation as one of the most polluted in the state and country, it has been recovering as a result of restoration efforts by CT DEP and other stakeholders initiated in the late 1960s. The primary objectives of the restoration efforts are to restore water quality and anadromous fish passage. Secondary goals include providing passage for recreational boating, reducing sediment deposition in impoundments, removing safety hazards, reducing flood levels, and establishing greenways. While initial efforts focused on eliminating or reducing gross point source pollution, more recent efforts have involved advanced wastewater treatment, NPS management, and fish habitat restoration. These efforts have been led by the CT DEP, watershed municipalities, Naugatuck Valley Chapter of Trout Unlimited, Naugatuck River Watershed Association, the U.S. Army Corps of Engineers, and the SWCDs.

Based on a wasteload allocation (WLA) analysis completed by CT DEP in 1988, five of the six major municipal wastewater treatment facilities were upgraded to advanced treatment between 1992 and 2001, and the sixth was linked to the new Waterbury facility. In conjunction with the upgrade of the Waterbury wastewater treatment plant (WWTP), by far the largest of the six plants, a mitigation plan was developed that included: dam removals or construction of fish passage facilities at seven dams in the watershed, tributary habitat enhancements, river corridor revegetation, water quality monitoring, and assignment of a full-time CT DEP field inspector to the watershed. In 1999, four dams on the Naugatuck were removed or breached (Freight Street, Platts Mill, Union City, and Anaconda). In 2004, the Chase Brass Dam on the Waterbury/Watertown section of the river was removed by the City of Waterbury Plans is

underway to construct fish and canoe/kayak passage around Tingue Dam in Seymour. In 1998-99, a fish ladder was constructed at the Kinneytown Dam, the southern-most dam on the river, as a condition to issuance of a federal hydropower license. Once all of this work is complete, over 30 miles of the lower Naugatuck River up to the Thomaston Flood Control Dam will be opened for anadromous fish passage. As water quality in the river has improved over the years, CT DEP Fisheries has expanded its fish-stocking program of trout and broodstock salmon on certain sections of the river, and has designated the Naugatuck Mainstem - from the confluence of the East and West Branches in Torrington to the Kinneytown Dam in Seymour - as a Trophy Trout Stream. In 2001, the portion of the Naugatuck River between Thomaston and Derby was officially designated by the State as a “greenway” area.

During 2008:

- “A Total Maximum Daily Load Analysis for Recreational Uses of the Naugatuck River Regional Basin” was completed and approved for indicator bacteria. Specific waterbodies included in the TMDL analysis are: the Naugatuck River, Great Brook, Steele Brook, Mad River, Hop Brook, and Long Meadow Pond Brook. Information in this TMDL is being referenced for Steele Brook watershed-based plan being drafted by USDA NRCS for CT DEP and Town of Watertown.

## **Connecticut River Major Basin**

### Scantic Regional Basin

The Scantic Regional Watershed covers an area of almost 114 square miles, of which 83 are in Connecticut. It flows in a southwesterly direction from Massachusetts before entering the Connecticut River north of Hartford. The watershed encompasses parts of six towns - Somers, East Windsor, Enfield, Stafford, South Windsor, and Ellington. Land use in the watershed includes agriculture, mixed residential, light industry, and forest. Water quality problems include turbidity and sedimentation resulting from agricultural runoff and urban development, nutrient enrichment, and, to a lesser degree, bacterial contamination.

The Scantic River Watershed continues to hold public outreach and recreational events, including stream water quality monitoring using CT DEP’s Rapid Bioassessment in Wadeable Streams & Rivers by Volunteer Monitors (RBV) methodology.

### Broad Brook Subregional Basin

The Broad Brook Watershed covers nearly 16 square miles, including Ellington, East Windsor Somers and Tolland. Predominantly undeveloped or pastureland, this area has been impaired by nutrients, organic enrichment/low dissolved oxygen and pathogens, likely caused by agricultural sources.

The USDA Natural Resources Conservation Service (NRCS) received a Clean Water Act Section 319 NPS grant to develop a watershed-based plan (WBP) for the Broad Brook Watershed in Ellington and East Windsor. This plan will be finalized in 2010. USGS recently reported on the high levels of nitrogen in the basin and ground water; additionally, CT DEP has data regarding bacteria load.

The WBP will provide federal, state and local entities and the public with a comprehensive water quality improvement plan by employing a watershed wide assessment and management planning approach. The WBP will strengthen the likelihood that practices addressing systemic issues (i.e. root causes of the water quality impairments) will be considered, evaluated and implemented, not only to meet individual pollutant standards and criteria, but to satisfy related physical and biological management needs to the extent possible. The WBP will also satisfy Section 319 NPS guidance to become eligible for future Section 319 NPS implementation funding. Equally important, this project will exemplify how cooperative partnerships between local, state and federal governments and other organizations can enhance local capacity to implement the WBP.

Additional assistance is being provided by the North Central Conservation District (NCCD) who also received a Section 319 NPS grant to assist in community outreach and municipal regulation review associated with preparation of Broad Brook watershed-based plan. The NCCD recently conducted a study with Section 319 NPS funds to identify significant nonpoint sources of pollution, proposing BMP solutions to the municipalities within the Broad Brook Watershed.

### Farmington Regional Basin

The Farmington Regional Watershed covers 607 square miles in two states, including sixteen Connecticut towns (Avon, Barkhamsted, Bloomfield, Bristol, Burlington, Canton, Colebrook, East Granby, Farmington, Granby, Hartland, New Hartford, Simsbury, West Hartford, Windsor, and Windsor Locks). Beginning in the rural Berkshire Mountains in Massachusetts, flowing through the Connecticut highland region and Farmington Valley, then out to the Connecticut River in Windsor; it provides 100% of the drinking water for over 600,000 people living in the Greater Hartford area and the Farmington Valley. The main stem of the Farmington River and the West Branch flows for 81 miles, and overall receives over 35 million gallons per day of treated wastewater from 9 publicly owned sewage treatment plants. The watershed is 2/3 forested, with equal amounts of agriculture and development, and supports abundant recreational opportunities; unique fish, wildlife, and plant habitats; hydropower generation; and is the first River in Connecticut to have a section federally designated as Wild & Scenic - one of only six in New England.

The US Forest Service (USFS) is in the process of conducting a two-phase study for the Highlands, a geographic region which cuts through the upper portion of northwest Connecticut which received federal funding for assessment. The Highlands Study covers a designated area within four states: PA, NJ, NY and CT and identifies significant natural resources and threats from a landscape perspective. This study is currently being conducted in CT and PA so that these states can formally become part of the Highlands Region. (NJ and NY have already

received formal designation.) Designation will allow CT to qualify to receive Highlands funding approved by Congress. Funding can be used for purchase of lands that fall with priority natural resource areas identified through the USFS Highlands Study.

The Farmington River Coordinating Committee (FRCC), the stakeholder group (consisting of the National Park Service, CTDEP, Metropolitan District Commission (MDC), Farmington River Watershed Association (FRWA), the towns of Hartland, Barkhamsted, New Hartford, Canton and Colebrook, and the Farmington River Anglers Association) oversees the implementation of the Upper Farmington River Management Plan for the Wild & Scenic section (non-regulatory, advisory only). The FRCC, in cooperation and coordination with the MDC, FRWA, CT DEP State Parks, completed a project with Section 319 NPS grant funds to re-grade and stabilize a roadway embankment within Nepaug State Forest that was a source of erosion and sediment to the Farmington River.

A request for proposals has been drafted for the Farmington watershed towns. The grant to these towns will focus on Municipal Land Use Evaluation grants. Funding will be made available thru the Supplemental Environmental Project funding. These grants will support the review of existing municipal regulations and ordinances. Major steps within the process include forming a stakeholders committee to review land use regulations for barriers to low impact development, and contracting with specific special services to draft regulatory revisions specific to local land use practices to encourage responsible land use management. These services included legal counsel, planning consultants, stormwater engineering assistance, and natural resource specialists.

### Farmington River Subregional Basin

The Lower Farmington River and Salmon Brook Wild & Scenic Study Committee was approved by Congress in late 2006 to determine the eligibility of these waterbodies for possible federal Wild & Scenic designation by the National Park Service (this study area is a continuation from the existing federally designated 14-mile segment of the Farmington River, downstream to the Rainbow Dam and includes both branches of Salmon Brook). Wild & Scenic designation will provide the ten communities (Avon, Bloomfield, Burlington, Canton, East Granby, Farmington, Granby, Hartland, Simsbury, and Windsor) with the knowledge, tools and resources to ensure that growth is approached in a way that is compatible with preserving the region's outstanding resource values. The valuable attributes currently being considered are geology, water quality, biological diversity, cultural landscape, and recreation. Also serving on the Study Committee is CT DEP, the Farmington River Watershed Association, and Stanley Works.

As part of the Wild & Scenic designation process, a locally supported management plan must be developed to provide for the long-term protection of these valuable attributes. This will provide an invaluable opportunity for the lower Farmington River and Salmon Brook watershed towns to come together, mobilize public participation, and fulfill a locally-shaped vision for their communities to protect and preserve these highly valuable water resources. The management plan would guide the actions of a locally led coordinating committee who would oversee the plan's implementation (non-regulatory, advisory only), similar to the FRCC above.

### Salmon Brook Subregional Basin

See above.

### West Branch Salmon Brook Subregional Basin

See above.

### Pequabuck River Subregional Basin

The Pequabuck River watershed lies in the Central Connecticut Valley and collects drainage from both the Poland River and Coppermine Brook Subregional Basins, eventually discharging to the Farmington River. The Pequabuck River watershed alone is 29 square miles, but combined with the Poland and Coppermine watersheds totals nearly 58 square miles. This larger area covers six towns (Bristol, Burlington, Farmington, Harwinton, Plainville and Plymouth) and has three Water Pollution Control Facilities (WPCF) discharging their effluent into the Pequabuck River. Although there has been a drastic reduction in bacteria and nutrients since the late 1980s, much work still needs to be done to improve the water quality of the river. E-coli bacteria levels still exceed the permissible limit for non-contact recreation and nitrogen is present in a significant amount. The Pequabuck River serves as a water source for various industrial and recreational purposes, as well.

The Central Connecticut Regional Planning Agency and the Pequabuck River Watershed Association rolled out to the general public the Pequabuck River Watershed Management Plan (including the Poland River and Coppermine Brook) which was written with a Section 319 NPS grant.

### Poland River Subregional Basin

See above.

### Coppermine Brook Subregional Basin

See above.

### Park Regional Basin

The Park River's 77 square mile watershed covers the Greater Hartford Area (major towns include Bloomfield, East Hartford, Hartford, Newington, Rocky Hill, West Hartford, Wethersfield and Windsor; also portions of East Granby, Farmington, Glastonbury, Manchester, South Windsor and Windsor Locks). This highly urbanized, largely impoverished and minority community is plagued by Combined Sewer Overflows, Sanitary Sewer Overflows, as well as having its river and stream systems channelized and otherwise altered to convey stormwater, sewer overflows, and flood waters.

The Metropolitan District Commission (MDC) has developed a Long-Term Control Plan to reduce the impact of Combined Sewer Overflow discharges into the Connecticut River from the



Park River and Wethersfield Cove. The fundamental purpose of the LTCP is to improve water quality by updating aged sewer infrastructure. Proposed activities include system-wide sewer cleaning assessment, capacity improvements and repairs; 80 miles of sewer separation, new drains and larger sewers; a 2 mile storage tunnel; a 2.5 mile microtunnel; treatment plant improvements to increase capacity and remove nitrogen; and relining and building new pipes to eliminate local overflows.

CT DEP's Municipal Facilities section is using Supplemental Environmental Project (SEP) funds to address public education and outreach related to combined sewer overflows. These are exacerbated by illicit connections which violate local sewer ordinances; however, in some communities the municipal officials may condone the connections in areas where separate storm sewers do not exist or are not accessible. Educational efforts are needed to find ways to communicate with the public and other officials that these connections are harmful to public health and the environment and to identify the means or enticements to eliminate the illicit connections and prevent future connections from being made. The targeted audience for education may include, but is not limited to, homeowners, building officials, and plumbers.

The Eastern Connecticut Resource Conservation and Development Program (RC&D) has partnered with the USDA Natural Resources Conservation Service, the City of Hartford, Hartford Housing Authority, and Capitol Region Council of Governments (CROG) to design and construct the Park River Greenway, a 1.8 mile multi-use trail, along the South Branch Park River. This is a component of a \$500,000 grant from CT DEP.

The City of Hartford is sponsoring a bike committee to assess potential bike paths that would connect the Park River Greenway, the East Coast Greenway, and other city routes. The East Coast Greenway is the nation's first long-distance urban trail system; a city-to-city transportation corridor for cyclists, hikers, and other non-motorized users. By connecting existing and planned trails, a continuous, safe, green route 3,000 miles long is being formed linking Calais, Maine at the Canadian border with Key West, Florida. It incorporates waterfront esplanades, park paths, abandoned railroad corridors, canal towpaths, and highway corridors, and in many areas it temporarily follows streets and roads to link these completed trail sections together.

#### North Branch Park River Subregional Basin

The MDC recently initiated its Clean Water Project to address Combined Sewer Overflows, Sanitary Sewer Overflows, and nitrogen removal. A Supplemental Environmental Project (SEP) in the amount of \$140,000 from a civil penalty of \$425,000 from a Consent Order between EPA and the MDC, has been reserved for the development of a Watershed-Based Plan (WBP) for the North Branch Park River Watershed for MDC's failure to correct CSOs. The proposed project will primarily take place in the towns of Bloomfield, Hartford and West Hartford. A sum of \$72,500 is being held in reserve for yet-to-be-identified project implementation upon completion of the WBP.

The WBP will follow the EPA-approved Clean Water Act Section 319 required Nine Element planning points. The Plan will complement the effort to control point sources of pollution by

addressing, at a watershed scale, nonpoint source pollution, land use policies and practices, stormwater and river restoration and protection, education and outreach, and implementation to further advance water quality improvements and quality of life. It will also serve as a potential model for other urban watershed plans and to address the unique challenges and needs of urban rivers and waterways, their value as a natural resource, and their role in improving livability in an urban environment.

The WBP will assess current conditions, identify threats and opportunities for improvements, foster stewardship by the community, and serve as a model for other urbanized watersheds. The plan will characterize water and land resource conditions and nonpoint source pollution sources within the watershed. Based on this assessment, the plan will estimate the pollution load reductions and improved conditions that can be expected once the plan's management measures are implemented to achieve water quality standards. Besides the measurable water quality improvements, the plan will revitalize an urban river by maintaining and restoring natural systems within an urban environment, and improve public recreation and use. The plan will also provide for public education and outreach to inform businesses and residents about nonpoint source pollution, thereby promoting a constituency for sustainable development and demonstrating the value of collaboratively and cooperatively working on ways to better manage land and water resources.

The Farmington River Watershed Association (FRWA) has "adopted" under its stewardship the contiguous North Branch Park River Watershed and, together with the Park River Watershed Revitalization Initiative, will assist in the development of the WBP.

### Hockanum Regional Basin

The Hockanum Regional Watershed encompasses 77 square miles in north central Connecticut and is a major tributary of the Connecticut River. It originates in the hills near Shenipsit Lake in Ellington and flows southwesterly into the Connecticut River Valley to its confluence with the Connecticut River in East Hartford. The Hockanum River is approximately 25 miles long, draining large portions of Manchester, Vernon, Ellington, and Tolland, and smaller portions of East Hartford, South Windsor, Bolton, Stafford, Glastonbury, and Somers. The major water quality issues include high turbidity and floatables, organic enrichment and algal growth, and elevated bacteria in various reaches of the Hockanum River and its impoundments. It gets progressively worse as it flows through the increasingly urbanized landscapes of the major population centers of Vernon, Manchester, and East Hartford. Potential sources include municipal point sources (landfills and wastewater treatment plants), urban runoff and storm sewers, agriculture, channelization and habitat modification, and erosion and sedimentation.

### Hockanum River Subregional Basin

The North Central Conservation District (NCCD) received Section 319 NPS and River Restoration grants to construct improvements of stormwater outfalls, bank stabilization, fish habitat enhancement, and river access on the Hockanum River in the Rockville section of Vernon. The project was completed.

The Friends of the Hockanum River Linear Park of Vernon, the Hockanum River Watershed Association, and other watershed groups, together with the North Central Conservation District and the Connecticut River Watch Program, are actively involved in protection and restoration efforts throughout the watershed. The CT DEP provided a Section 319 NPS Watershed Assistance Small Grant to the North Central Conservation District and the Hockanum River Watershed Association to help disseminate the State of the Watershed Report on the Hockanum River, previously funded by 604(b) grant funds.

#### Tankerhoosen River Subregional Basin

The Friends of the Hockanum River Linear Park of Vernon also received a Section 319 NPS Watershed Assistance Small Grant to review local planning & zoning regulations for reducing imperviousness, as well as a previously receiving a Long Island Sound Futures Fund grant with the Hockanum River Watershed Association to collect and evaluate chemical and biological water quality monitoring data in the Tankerhoosen River Watershed.

They additionally received a LISFF grant to develop a watershed management plan for the Tankerhoosen. This watershed management plan was completed in March, 2009 and can be found at: [http://www.ct.gov/dep/cwp/view.asp?a=2719&q=379296&depNav\\_GID=1654](http://www.ct.gov/dep/cwp/view.asp?a=2719&q=379296&depNav_GID=1654).

#### Mattabeset Regional Basin

The Mattabeset Regional Watershed has a drainage area of almost 109 square miles over more than ten towns (Berlin, Cromwell, Durham, Guilford, Middlefield, Middletown, Newington, New Britain, Rocky Hill, and Southington) and the Mattabeset River itself is a major tributary to the Connecticut River. The Mattabeset River flows for 18 miles in a southeasterly direction before entering the Connecticut River just north of Middletown. Land use in the watershed is nearly 50% forest cover and high-density urban development, with commercial development right up to the riverbank in many cases. Water quality and biological monitoring have documented significant degraded biological activity due to sedimentation, mostly as a result of urban development.

The Mattabeset River Regional Basin has a Total Maximum Daily Load (TMDL) analysis based on indicator bacteria. Achievement of the TMDL is directly linked to incorporation of the provisions of the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4) by municipalities, as well as the implementation of other BMPs to address nonpoint sources. Nonpoint sources of E. coli bacteria in the basin include failed collection systems, urban runoff and storm sewers, waterfowl, agriculture, and failed or inadequate septic systems. BMPs for the management of NPS sources include nuisance wildlife control plans, pet waste ordinances, septic system testing and maintenance, and farm animal waste management systems.

The Connecticut River Coastal Conservation District (CRCCD) has been systematically gathering and compiling water quality monitoring data, conducting education and outreach efforts, evaluating watersheds with Streamwalks and Track Down Surveys, designing and implementing stormwater retrofits, providing technical NPS assistance to municipalities, and preparing watershed management plans throughout the Mattabeset Watershed. Besides numerous Section 319 NPS grants, they received a Long Island Sound Futures Grant to conduct a Comparative Subwatershed Analysis of the Mattabeset Watershed as the first step towards developing small watershed restoration plans to address known water quality impairments.

#### Willow Brook Subregional Basin

The Connecticut River Coastal Conservation District (CRCCD) received a Section 319 NPS grant to develop and implement site-specific recommendations to address elevated turbidity and bacteria levels in Willow Brook, including stormwater retrofits and streambank stabilization. The CRCCD is working with the Town of New Britain Public Works Department to improve stormwater issues at the town's park located in Cromwell.

#### Willow Brook Local Basin

Not to be confused with the Willow Brook noted above, this stream is also located in Cromwell. The CRCCD conducted a track-down survey with Section 319 NPS grant funds to identify several potential sources of pollution, suggested NPS management solutions, and prioritized the sites which were presented in a report to the municipality. The report also addresses EPA's 9 criteria for a watershed-based plan, albeit at the local basin scale.

#### Coginchaug River Subregional Basin

The Coginchaug River watershed has a drainage area of 28 square miles (predominantly in Middlefield, Durham, Middletown, and Guilford) which is about half undeveloped and the rest equally divided between agriculture and development. The Coginchaug River is the major tributary to the Mattabeset River, and flows northerly where its confluence is just west of the Connecticut River. Indicator bacteria is the major impairment with suspected sources being agriculture, crop-related sources, intensive animal feeding operations, natural sources, waterfowl, and other unknowns.

The USDA Natural Resources Conservation Service (NRCS) received a Section 319 NPS grant to develop a watershed-based plan (WBP) to address the Mattabeset TMDL for bacteria and the Long Island Sound TMDL for nitrogen. The WBP was finalized in July 2008 and provides guidance on how to manage, at a watershed scale, nonpoint source pollution, land use policies and practices, stormwater and river protection, education and outreach, and implementation efforts to further advance water quality improvements. The NRCS has assessed current conditions; identifying threats and opportunities for improvements while fostering stewardship by the community.

The WBP characterizes water and land resource conditions and nonpoint source pollution sources within the watershed. Landscape features and characteristics were examined using GIS-based maps to assess the spatial relationships between impairments and land use/land cover types. This analysis then determined the potential for pollutant load reductions related to the impairment, load reduction goals, and other features and benefits essential to sound watershed management and healthy biological conditions in the stream network. The plan describes both “place-based” (site specific) and regional BMPs that will be needed to achieve the load reductions, as well as provide an estimate of the technical and financial assistance funds needed to implement the plan. The plan can be found at:

[http://www.ct.gov/dep/cwp/view.asp?a=2719&q=379296&depNav\\_GID=1654](http://www.ct.gov/dep/cwp/view.asp?a=2719&q=379296&depNav_GID=1654)

The Connecticut River Coastal Conservation District (CRCCD) also received a Section 319 NPS grant to assist in the collection and compilation of data, and education and outreach efforts. The plan will provide for public education and outreach to inform businesses and residents about nonpoint source pollution, thereby promoting a constituency for sustainable development and demonstrating the value of collaboratively and cooperatively working on ways to better manage land and water resources. The plan satisfies Section 319 NPS guidance while providing broader benefits to federal and state watershed management efforts in Connecticut and the NRCS Watershed Planning Process.

#### Salmon Regional Basin

In 2008, Project Manager Shelley Green of the Nature Conservancy/Connecticut Chapter convened an Advisory Committee, accomplished a 10-town regional conservation compact signing ceremony with full town leader representation, successfully applied for LISS Futures Fund grant funding to develop a Municipal Land Use Evaluation Project to provide information to the participating towns on tools and practices to accomplish several recommendations (especially being proactive of watershed health and cool- and cold-water stream habitats) contained in the 2007 Conservation Action Plan, and targeted land acquisition negotiations with CT DEP, TNC, local land trusts and the basin towns. A RFQ was issued, and the primary deliverable will be a report containing text, data, and maps that will provide a detailed audit of municipal plans, policies, and practices related to conserving the integrity of watershed resources (e.g., via stormwater management, impervious cover, forest cover, wetland regulation upland review areas). It also will include a set of recommendations to municipalities. The final report will be due in approximately nine months from consultant selection.

#### Blackledge River Subregional Basin

The Connecticut River Coastal Conservation District received a Section 319 NPS grant to develop and implement a pet waste education and clean-up campaign at Gay City State Park to reduce excessive bacteria. Signage and distribution of various educational materials on pet waste management were specifically designed for this purpose.

#### Eightmile Regional Basin

In 2008, a new USGS stream gauge station was established on the East Branch of the Eightmile River, collecting flow data and made available in a real-time format through the USGS website.

Congress granted National Wild and Scenic designation to the Eightmile River on April 29<sup>th</sup> and the bill was signed into law by President Bush in May. The designation places the Eightmile River in company with eight other Wild and Scenic rivers in the northeastern U.S., and one of only two in the entire country that includes the entire watershed. The river will now be included within the Partnership Rivers program of the National Park Service and based on the philosophy of local control and collaboration. The designation will provide funding to implement the Watershed Management Plan and hire professional National Park Service staff in the coming year. The Coordinating Committee continued to meet regularly, with 4 committees pursuing Tier 1 and 2 action steps. A Conservation Land Summit was held in the fall, targeting watershed stakeholders to contribute perspectives on current and future land conservation measures to take in the watershed; a summary document is expected in early 2009. A RiverSmart public outreach campaign based on a successful RiverNetwork tool was rolled out in late 2008, seeking homeowners across the watershed to take a voluntary pledge to be a RiverSmart household to protect streams and rivers in their backyards.

## **South Central Coast Major Basin**

### Quinnipiac Regional Basin

The Quinnipiac Regional Watershed covers an area of 165 square miles, located in 12 towns (Bristol, Cheshire, East Haven, Farmington, Hamden, Meriden, New Britain, New Haven, North Haven, Plainville, Southington, and Wallingford). The Quinnipiac River itself flows 38 miles southward from the Plainville - New Britain border and enters Long Island Sound from New Haven Harbor. The watershed is heavily urbanized and faces several problems including stormwater discharges, contaminated sediments, habitat degradation, low flows during summer months, and flooding. Nonpoint source pollution in the watershed caused by stormwater runoff has led to the listing of the Quinnipiac main stem, Misery Brook, Sodom Brook, Harbor Brook, and Wharton Brook on the DEP's *List of Connecticut Waterbodies Not Meeting Water Quality Standards*. In June 2008, a Total Maximum Daily Load Analysis was developed for the entire basin to address excessive levels of indicator bacteria.

The Quinnipiac River Watershed Association (QRWA) has received several Section 319 NPS grants for outreach projects aimed at engaging the public and identifying NPS pollution through numerous streamwalks throughout the basin. As a result of their multi-year efforts, they have compiled a database of volunteers' observations and have provided recommendations to the towns for stream restoration. In an effort to educate river-side residents and municipalities about managing their land in ways that would help the Quinnipiac improve as a community resource, QRWA developed an outreach plan that was funded by a Clean Water Act Section §319 Grant.

### *Outreach Campaign and Project Partners*

Clean Water Act Section §319 Grant #04-23 included the distribution of Best Management Practices (BMP) materials to municipalities and landowners, a storm drain marking program to

educate communities about the link between stormwater runoff and nonpoint source pollution, the education of municipal commissioners, a series of streambank stabilization demonstration projects, and a rapid bioassessment of stream health by volunteers.

#### *BMP Material Preparation and Distribution*

The QRWA staff and volunteers distributed best practices literature through the QRWA *Quinnipiac Greenway Landowner's Guide*, QRWA *Abridged Quinnipiac Greenway Landowner's Guide*, Friends of the River posters, and Friends of the River pledge forms. An estimated 4,250 *Abridged Landowner's Guide* flyers were distributed to watershed residents, an estimated 100 *Greenway Landowner's Guide* to municipal regulators and 161 landowners pledged to follow BMPs on their property. Future plans include continuing work with town staff to expand the distribution of BMP materials.

#### *Storm Drain Marking Program*

QRWA hosted training sessions in 2007 and 2008 to prepare volunteers to perform storm drain marking in the Quinnipiac watershed municipalities. Volunteers distributed the QRWA *Abridged Quinnipiac Greenway Landowner's Guide* door-to-door as drains were marked, to inform neighbors of the water quality purpose of the project. A total of 69 volunteers participated in the storm drain project, marking approximately 1,147 drains in 17 neighborhoods in New Haven, Wallingford, and Meriden. Storm drain marking proved to be a popular, easily understood outreach activity. QRWA will continue marking as other sources of drain markers are identified, as volunteers were eager and willing to mark additional streets. QRWA is working directly with town staff to obtain new markers with town funds to expand drain marking and other outreach activities in the future. Towns are interested and cooperative due to the requirements of the CT DEP stormwater management general permit and because they wish to protect the health of the Quinnipiac River and its tributaries.

#### *Outreach to Municipal Commissions*

QRWA developed municipality-specific PowerPoint presentations for land use board meetings. The QRWA presented findings of Streamwalk problem assessments performed in their community, recommendations for landscape management from the *Landowner's Guide*, and a request for town partnership on the outreach campaign. Requests to towns included recruiting "Friends of the River" - residents and businesses who agreed to adopt best landscaping practices in order to reduce nonpoint source pollution.

Meetings with municipal commissions introduced the concept of linking land use and water quality and offered QRWA the opportunity to further educate and assist town staff in protecting local water resources. Presentations were made to one commission in each of eight main stem municipalities consisting of Plainville, Southington, Cheshire, Meriden, Wallingford, North Haven, Hamden, and New Haven in Spring 2007. All commissions appeared greatly interested in the results of Streamwalk and the identification of impairments in their municipality. Several towns will require sign off of the medallion/decal design with a person of authority as a condition of municipal partnership. Most of the *Landowner's Guide* materials were distributed during the campaign and it is unlikely that funding will be available to print more guides. Future



plans include pursuing approval to add the *Landowner's Guide* to other municipal websites in addition to Southington.

#### *Streambank Stabilization Projects*

QRWA devised four buffer restoration demonstration projects on municipally owned land in four municipalities of the watershed. Criteria for inclusion included: obvious impaired water quality, as indicated by algae bloom and aquatic weed growth, a highly visible public recreation site, absent vegetative buffer, and connection to the Quinnipiac River via a tributary. The four sites selected were:

- Recreation Park Pond, connected to Misery Brook, Southington;
- Baldwin Pond, an impoundment of Harbor Brook, Meriden;
- Wharton Brook at Doolittle Park, Wallingford; and
- Todd's Pond, an impoundment on an unnamed tributary of the Quinnipiac at North Haven

QRWA sought to restore working buffers at these sites and educate the community on the value of replacing mowed grass or bare soil with vegetative buffers to filter runoff, stabilize banks, shade water and provide habitat. QRWA was able to get agreement for the projects and fence the sites to mark no-mow areas (Southington, Meriden and Wallingford) or vegetation protection areas (North Haven), but were not able to complete planting at all four sites as was intended. The public feeding of geese and ducks at Southington, Meriden and North Haven was identified as an unexpected but significant obstacle to buffer restoration. QRWA has the support of the four municipalities and has future plans to complete the vegetation at all sites.

#### *Rapid Bioassessment by Volunteers*

The final component of the #04-23 Grant was a rapid bioassessment day (RBV) and training session held in November 2007, in cooperation with CT DEP's monitoring section staff. QRWA recruited and trained volunteers to perform assessment of stream health in selected Quinnipiac tributaries by means of invertebrate collections. Twenty QRWA volunteers and staff participated in training and sampling and found that the majority of streams sampled were moderately impaired. Volunteers returned collected samples to a CT DEP representative. The RBV event proved to be a popular activity, bringing volunteers out even in cold and rainy weather. QRWA will likely participate in future collections in cooperation with CT DEP.

QRWA also used Section 319 NPS funds to conduct a business outreach project in the Quinnipiac Basin. To date, a list of builders has been assembled for commercial outreach on best management practices and a contractor has been identified for peer education on low impact development practices. QRWA is expected to prepare education and outreach materials targeted toward businesses, conduct volunteer training and outreach sessions, compile and analyze response data, and report on the outreach activities by October 2009.

#### Quinnipiac River Subregional Basin

Wallace Dam is the first dam from Long Island Sound along the Quinnipiac River. A second breached dam in Wallingford is passable by anadromous fish and a fish ladder has been constructed at a third dam in Meriden. After these three impoundments, the river is open to fish passage up to the Town of Southington. In 1999, The Quinnipiac River Watershed Association (QRWA) received a Section 319 NPS Grant to arrange for a transfer of land to allow a fish ladder to be built at the dam and to contract an engineering service to document existing conditions and provide a final design and specifications for the fish ladder. After several years of extensive negotiations, the landowner transferred their portion of ownership of the dam to the town of Wallingford, giving the town 100% ownership of the dam. The town is supportive of the project. Complete removal of the dam is not feasible due to third party water rights. A contractor completed design and specifications for the fish ladder. With guidance from CT DEP Fisheries, construction drawings and project costs for a number of design variations were developed. Save the Sound is currently preparing an application for a General Dam Repair Permit from DEP's Inland Water Resources Division.

The City of Meriden received a Section 319 NPS grant to reduce sedimentation from excessive and improper trail use to eliminate bank erosion and sediment transport resulting from pedestrian and unauthorized vehicle crossing of three unnamed tributaries of the Quinnipiac River in the Gorge area. Technical assistance on how to remediate the erosion sites was provided by the USDA Natural Resources Conservation Service (NRCS) and CT DEP Fisheries, which dovetailed with the City's efforts to reconstruct the open space trail through the Quinnipiac River Gorge. The trail was paved, formal crossing structures were installed at the three tributaries, and bank erosion was stabilized using riprap and native vegetation. The City additionally posted educational kiosks on the project. The final report received in February 2008 details the success of the project and described the use and popularity of the trail as exceeding expectations.

#### Wharton Brook Subregional Basin

The Wharton Brook watershed covers 7.65 square miles, the majority of which lies within the Town of Wallingford. Its confluence with the Quinnipiac River is just to the west in North Haven. The area is highly developed with a high percentage of imperviousness. As typical for most urbanized watersheds, sources of NPS pollution are construction, erosion and sedimentation, land development, urban runoff and storm sewers, and other unknown sources. Allen Brook, a tributary, is especially affected by golf course runoff and wildlife, specifically geese.

South Central Eastern Regional Complex:

#### Chatfield Hollow Brook Subregional Basin

The Connecticut River Coastal Conservation District (CRCCD) received a Section 319 NPS grant to develop and implement a pet waste education and clean-up campaign at Chatfield Hollow State Park to reduce excessive bacteria. Five pet waste stations were installed, along with signage and distribution of various educational materials specifically designed for this purpose. The final report indicated that the project was successful in changing the behavior of

some park visitors and in raising awareness of why dog waste is a nonpoint source pollutant. In particular, a critical aspect contributing to the success of this project was the personal interactions between CRCCD staff and park users. Printed educational materials were of great value but personal interactions proved most effective in educating park users about the link between uncollected dog waste and environmental health. The TMDL only requires a 5% reduction in bacterial loadings so compliance by a small number of visitors could make a large difference. The CT DEP plans to continue efforts to reduce dog waste as a nonpoint source pollutant in this park.

South Central Western Regional Complex:

#### West River Subregional Basin

Yale School of Forestry and Environmental Studies is facilitating local stakeholder interests in improving the water quality of the urbanized sections of the West River in New Haven/West Haven. A long list of experienced and notable individuals/entities have participated, leading to the creation of a West River list serve for future communications.

#### **Thames River Major Basin**

The Thames Major Drainage Basin comprises nine regional drainage basins: Thames Main Stem, French, Five Mile, Moosup, Pachaug, Quinebaug, Shetucket, Natchaug, Willimantic and Yantic. The upper reaches of the Quinebaug River and the French River are located in south-central Massachusetts, and smaller percentages of the French, Fivemile, Moosup and Pachaug basins originate in neighboring Rhode Island. The northern half of the basin is relatively rural, characterized by small towns, farmland and forest. However, a variety of pressures have caused the disappearance or further segmentation of many farms and privately-owned forest lands. In 1994 Congress designated the Quinebaug and Shetucket Rivers Valley National Heritage Corridor, whose mission is to preserve the significant natural and cultural resources of the region while encouraging compatible economic development. The southern half of the basin trends to more urbanized and industrial land uses where urban re-development and suburban expansion has occurred. Recent development and multiple expansion phases of two Tribal Nations casino resorts have created a national tourism destination area and a new force as regional employers. The basin's proximity to urban areas of Hartford, Springfield, Worcester and Providence has increased development pressures not seen in several decades. A large-scale re-development proposal for the former Norwich State Hospital property in Preston and Norwich, associated transportation improvement proposals, and regional water supply planning and distribution systems in southeastern Connecticut are recent additions to regional development pressures.

Significant accomplishments in 2008 included the following:

#### French River Basin

The Town of Thompson Together coalition, along with the Massachusetts-based French River Connection and other watershed stakeholders, continue action strategy development for water quality and watershed issues along the French River, and across State boundaries. Existing state

and federal agency water monitoring data is being shared. CT DEP provided some Section 319 NPS funds to the Quinebaug-Shetucket Heritage Corridor Water Subcommittee Coordinator to fund necessary water quality equipment for a citizen monitoring project in Thompson, CT, while the Coordinator also obtained funding support for the Commonwealth of Massachusetts to obtain water quality monitoring equipment for citizen monitoring work in the Dudley, Oxford and Webster, MA communities within the French River watershed. Data collected within Thompson was provided to CT DEP Water Monitoring program for integration in the upcoming Connecticut 2008 Integrated Water Quality Assessment report. A CT DEP Section 319 grant agreement with USDA-NRCS was executed to design and develop community support and participation in a riparian buffer project on a highly visible municipal parcel along the French River, with the project slated for completion in late 2007. Initial project deliverables and community participation were successfully completed, town volunteers and community leaders raised necessary funds and obtained local permits, and town volunteers were scheduled to begin riparian plantings in the spring of 2008.

During 2008:

NRCS successfully completed the French River Riparian Buffer Demonstration Project in Riverside Park along the French River. Final planting design led to town installation of a rain garden collecting runoff from a small park gazebo, 1000 feet of riparian area plantings of native perennials, shrubs and trees, interpretive signage and recreational amenities including pet waste collecting stations, picnic benches and a river fishing access site. Trained town volunteers and town maintenance staff have plans to continue raising funds to extend riparian plantings twice in 2009 and to extend the adjacent park walking trail to connect to the town's nearby Community Center. The town is considering additional stream corridor enhancement proposals identified in the final report's streamside assessment report.

The Town of Thompson:

This tri-watershed community (French/Quinebaug/Fivemile) completed a town wide trail inventory; the Conservation and Open Space Committee developed a quality Open Space Inventory and Plan; and an active town committee coordinated annual large-scale river cleanups along the French and Quinebaug Rivers. The Town Planner is engaging in regional planning and coordination planning efforts for regional trails, public water access and greenway designation proposals, and requested 2 ERT reviews – one for a residential subdivision with frontage on the Five Mile River and one for a pond-river-wetland complex resource inventory (Long Pond). In 2007 and 2008, DEP participated in the two Environmental Review Team site visits and reports requested by the Town, one for Little Pond and one for a residential subdivision proposal along the banks of the Fivemile River. Town land use commissions incorporated ERT report sections in their decision-making efforts related to each site. The town collaborated with the U.S. Army Corps of Engineers staff assigned at the 200-acre West Thompson Lake Flood Control project to develop and open a hiking trail and car-top boat launch at the Fabyan Road bridge crossing site, downstream to the West Thompson Lake Boat Launch. Plans call for a designated water trail along this section as part of the 2009 Source To Sea Expedition coordinated by the region's The Last Green Valley.

## Quinebaug River Basin

### Town of Brooklyn:

The implementation phase of the Day Street-Westview Drive stormwater quality management project was completed in 2006. This included acquisition of a conservation and drainage easement within a privately owned parcel to provide for a significant portion of the designed stormwater treatment train in the upper watershed. Installations included a sediment forebay and water quality swale in one area, a large serpentine water quality swale in a second area, several deep sump catch basins along two residential streets, and a downstream detention basin. Targeted local outreach was completed and is maintained by the Conservation Commission and First Selectman's office. CT DEP and the Town will be monitoring the approved commercial development of the private land and its consistency with the installation of stormwater quality improvements made elsewhere on the property. The Town leveraged this project to attract an additional State (STEAP) grant award to design a downstream Town Park that receives this treated stormwater and improved access along the Quinebaug River. The Town has chosen a final park design and seeks other funding assistance. A portion of this Park is subject to a USDA-NRCS Wildlife Habitat Improvement Project award to the Town of Brooklyn to control invasive plant species within the riparian and upland habits of this Quinebaug River segment.

### In 2008:

- The Town completed design work on the Riverside Park site. First phase site amenity installations, including a car-top boat launch site to the Quinebaug River, is slated for completion in spring 2009.
- The Town coordinated stormwater management approvals of the privately developed commercial parcel where the 2006 stormwater project was initially completed, including perimeter fencing for litter and access control to the serpentine water quality swale and associated conservation easement area.
- The Town's Conservation Commission is planning to extend outreach to commercial businesses in the area, not reached during the initial outreach phase of the storm drain marking/literature program.

### Eastern Connecticut Conservation District (ECCD):

- A *Phragmites* (reed grass) control project was initially completed at Roseland Lake, in the Muddy Brook/Little River sub-regional watershed of Woodstock that reduced the invasive non-native wetland plant by nearly 95%. The project was conducted by the CT DEP Wetland Habitat Management Program. The Roseland Park Trust, the Roseland Lake Homeowner's Association, the Town of Putnam Water Authority and other lake stakeholders continue to provide financial support for the project, towards working on reclaiming swimming and other water recreation opportunities along the Roseland Lake frontage. Continued outreach will continue to engage local stakeholders in ongoing monitoring and management. CT DEP incorporated the project outcomes within its 2006

and 2008 CALM document assessment of this impaired waterbody segment to reflect this successful invasive species management work.

- In 2008 the Eastern CT Conservation District continued to cooperate with DEP's Wildlife Division to monitor management efforts with the Phragmites control areas. Further, the preliminary work and associated landowner/community discussions have expanded to elements within the developing Muddy Brook water quality management project initiated by the District. This included an investigation of reported Canada goose population impacts on Roseland Lake water quality, Streamwalk surveys of contributing tributaries, as well as educational outreach at the Roseland Lake Park, dairy farm operators and the golf course operator in the local watershed.
- The District initiated a Section 319-funded Farm Nutrient Reduction Project within the Little River sub regional basin of the Quinebaug River, primarily in Woodstock. Developed as an implementation action of the 2006 Little River Sourcewater Protection Plan for the Town of Putnam, the District began research and communication with area dairy farmers holding surplus animal manure. Options were developed for acquisition of specific farming equipment that can incorporate liquid manure into selected fields of 3-6 farmers, following a plan amongst farmers to share, transport and maintain the equipment, while the District is to subcontract with the University of Connecticut water resources program to establish a water monitoring study on the effectiveness of the equipment use to incorporate manure and reduce polluted runoff into the receiving waterbodies listed as impaired for recreation use. In 2008 the Conservation District successfully completed this project with the acquisition of the Aerway-brand manure incorporation equipment, and a written plan composed by farmers establishing a shared seasonal use, transportation and maintenance by three area dairy farmers. A short-term water investigation by University of Connecticut researchers identified significant reduction in surface runoff volume and nutrient levels from a farm field where the equipment was used to incorporate liquid manure into the subsurface. Participating farmers identified a cost savings through reduction of chemical fertilization application, reduced odor, fuller incorporation of the dairy manure into the chosen farm fields, and reducing nutrient runoff. An annual fall county farm tour was used to highlight this project for 53 people, including 29 farmers, which included a live demonstration, newly developed outreach materials, and discussion of the pros and cons of the Aerway equipment for local farmers, with at least one additional farmer expressing interest to use the equipment in the 2009 growing season.
- The District initiated a Section 319-funded watershed management planning exercise for the upper Quinebaug River watershed contributing to the West Thompson Lake. The District is evaluating this section of the river and its tributaries, documenting possible contributing sources of pollutants and providing recommendations to reduce pollutant loading to the river. A number of federal and state agencies active in the area will be consulted. Initial work identifies the lack of local water quality monitoring data as a big obstacle. The resulting plan will likely be expanded to include a watershed-based plan formula following US EPA's nine elements. The plan is designed to provide guidance for improving the water quality in this impaired section of the Quinebaug River. The management plan is expected to be completed by mid-2008, and be transferable in

process, lessons learned, and some content focus on the adjacent Little River/Muddy River watershed in a Phase 2 Section 319-funded agreement with the District and CT DEP. In 2008, the Conservation District successfully completed this first phase water quality management project. The final report included results of activities conducted by ECCD that included an on-the-ground survey to determine likely sources of pollution, testing for failed septic systems using optical brighter pads, field trials at 2 farms to determine potential impact on nutrient retention or loss using new research approaches with manure stacking pads, a bioassessments workshop to engage local volunteers to contribute useful water quality data for CT DEP databases, and nitrogen soil testing on a total of 77 corn fields and cornstalk testing with results used by farmers to tailor nitrogen application rates to avoid excess nutrients. NPS management measures and recommended watershed locations with schedules were identified (ranged from increasing vegetated riparian buffers to adopting green lawn care practices to monitoring/repairing septic systems to revising town ordinances to incorporating stormwater BMPs with new development proposals). The approved report with DEP comments will be used by ECCD as a baseline for gap analysis needs identified in the adjacent Muddy Brook/ Little River watershed-based planning effort that began in 2008 and will be completed in 2009.

- The District initiated the Muddy Brook et al Water Quality Improvement Project in Woodstock (Phase 2 of upper Quinebaug watershed plan). Key stakeholders were identified and quarterly water quality data, which was locally collected, was reviewed and DEP guidance was provided for graphical depiction of the data. The Roseland Lake watershed was surveyed, along with local resident and landowner surveys, concerning an alleged Canada goose problem. ECCD staff continued to take the lead in coordination of the Little River Sourcewater Protection Team, which has a strong interest in the larger Little River watershed. The watershed project report with recommendations is scheduled for completion in the spring of 2009.

#### Quinebaug River Team (QRT):

QRT is an active sub-committee of the Natural Resource and Agriculture Committee in The Last Green Valley. QRT was formed to protect, improve and bring attention to the natural, historic and recreational resources of the Quinebaug River. The Phase II Visual Resource inventory in the lower Quinebaug River towns of Canterbury, Plainfield, Sterling, Griswold, Lisbon, Preston, and Norwich was completed in 2006. Information that includes possible NPS sources has since been shared at local land use commission and land trust meetings. Some information is being further developed for inclusion in the proposed 2009 Source to Sea Expedition by the Last Green Valley, Inc. This subcommittee is providing regional communication and umbrella coordination potential as the local watershed advocate for the Quinebaug River main stem, and could be a contributor to an upcoming Quinebaug River watershed-based plan. In 2008 the initial committee work results were chosen by The Last Green Valley, Inc. staff and committees in initial development of a large scale, spring 2009 Source to Sea Expedition planned for the full Quinebaug River basin and likely to include connections with adjacent regional watersheds. This will culminate in the development of formal water trail access and information sites, educational outreach, public display/events and social marketing campaign to change individual

behaviors towards improvement of water quality conditions in the Quinebaug and receiving Thames River estuary and Long Island Sound. The National Park Service/Rivers and Trails Conservation Assistance Program of Boston, MA has chosen this proposal to provide up to one year of technical assistance to realize recommended National Water Trail segment designations (up to 3) along the Quinebaug River and an effective 2009 Expedition.

#### Quinebaug/Shetucket River Watershed Integrated Pest Management (IPM) and Nutrient Loading Demonstration Project:

- Partially supported with a Section 319 NPS grant, University of Connecticut Department of Plant Sciences and Cooperative Extension Service continued to recruit IPM project cooperators in several agricultural commodity areas. The primary goal of this project was to reduce the use of pesticides and nutrients within the Quinebaug and Shetucket River watersheds that may pose a critical threat to aquifers and surface waters. This was accomplished by in-depth educational training programs for agricultural producers and green industry professionals. Training was implemented in the Quinebaug and Shetucket River watersheds in the following commodity areas: vegetable crops, fruit crops, nursery crops, greenhouse crops, field corn and turf grass. Depending on the commodity or clientele group, IPM education consisted of on-site demonstration projects, individual and group training sessions, twilight meetings, season-long consultations and meeting presentations. The programs provided recommendations for best management practices, particularly to reduce high-environmental-risk pesticides (e.g. those with high leaching potential) and excess nitrogen applications. The Nutrient Management component included the use of the Presidedress Soil Nitrate Test (PSNT). The soil testing was conducted by staff of the Eastern Connecticut Conservation District. Nitrate analysis and nutrient recommendations were provided by Dr. Tom Morris (University of Connecticut Extension Soil Specialist), and the University of Connecticut Soil Testing Laboratory. Post-season surveys of program participants were used to determine changes in pesticide and nutrient practices as a result of the program.
- A second goal of the project was to conduct educational programs for home gardeners, particularly for turf grass management. Collaboration was established with the UConn Cooperative Extension Residential Water Quality Project to achieve this goal. Additional education was provided via online internet courses, through the University of Connecticut Home and Garden newsletter, as well as training of Cooperative Extension Master Gardeners. IPM presentations were also made at public events. Geographic and watershed-based impairment focus in this reporting cycle was transitioning to the lower Thames River basin during this reporting period. In 2008, UCONN staff continued to recruit commodity owners/managers to be involved in IPM and Nutrient Management program for this growing season. Within the lower Thames River basin, farmers managing 114.5 acres were involved, and 87.5 acres within the Niantic River Basin (Southeast Coastal/Western Complex). On-site demonstration plots were established, with weather stations installed at 3 lower Thames River basin farms, providing data input for fruit disease models. A mating pheromone disruptor program at the largest black currant farm in the United States, a deep zone tillage demonstration project at a Niantic



farm, and incorporation of the high tech TomCast computer forecasting model to effectively apply fungicide applications to fruit crops were all highlights shared at several education and outreach events of twilight grower meetings (16 talks for 548 people), an annual NPS conference tour (60 people), and two statewide event displays (900 people).

### Woodstock Nutrient Management Feasibility Study

The CT DEP and Eastern Connecticut Resource Conservation and Development Area, Inc. (ECRCD) coordinated and used Section 319 NPS funding for a feasibility study to evaluate composting or anaerobically digesting dairy manure at a regional facility in the Woodstock area, tributary to the Quinebaug River. This area was identified as having surplus dairy manure in excess of what is needed for crop production on the farms that generate the manure. Conceptual designs and associated costs were developed for four alternatives. The revenue generating ability of the proposed facilities was evaluated through market analysis of composting products and energy costs. A food waste survey was conducted to identify local food waste producers who could benefit from alternative disposal options. A project website, [www.ctnm.org](http://www.ctnm.org) was developed to disseminate information about the project and the statewide nutrient management study of 2005, and a fact sheet was developed for the project. The project will continue with development of a business plan and marketing study to determine the direction future efforts will take in the Woodstock area. Funding from the CT DEP Section 319 NPS program and other State funding will be used in 2008 to start construction of a manure composting facility in North Canaan Connecticut. In 2008, a food waste survey was conducted to identify local food waste producers who could benefit from alternative disposal options. The survey obtained information on the availability of food waste and other organic wastes, quantities of waste, costs to dispose of waste, willingness of facilities to participate, and potential restrictions or obstacles. Several findings and conclusions were reported in the survey report, including the fact that large producers such as hotels, conference centers, and casinos should be considered a potential source of food waste, and that establishing food waste as a revenue source for a regional digester or composting facility would require a dedicated marketing effort to educate and establish relationships with local producers. This project phase also included the development of a marketing study and business plan for the Woodstock area. This Phase 2 will be completed in 2009 with the submission of the Woodstock Anaerobic Digester Business Plan. This business plan will be presented to support decision-making for investment in an anaerobic digester operated as a business center within the established family owned dairy farm LLC to manage manure and associated by-products produced by the farm's 700 lactating cows.

### Moosup River Basin

The Borderlands Project, initiated by The Nature Conservancy (TNC) in 2001, focuses on the Pawcatuck Borderlands forests and has since expanded by the Rhode Island Economic Policy Council and basin communities to include 20 towns on the Rhode Island and Connecticut border, and includes the Moosup River basin in Connecticut and Rhode Island. A research project to identify priorities for ecologically-based land conservation was completed in 2005 with support from a new landscape target initiative of TNC. High priority parcel mapping in this watershed revealed that aquatic habitat ranks strongly in several alternative conservation strategies. The

greatest threats to overall health of the area include future development, interruption of free-flowing streams, sewer discharges, roads and associated road runoff. Several headwaters and aquatic buffer areas which are most valuable to protect given these threats, were identified and acquisition methods and agencies were provided. Formation of a bi-state watershed council is encouraged to address these watershed-scale conservation planning priorities. TNC continued their planning focus in 2007 with a Conservation Area Planning (CAP) exercise for the Thames River basin, highlighting conservation strategies for priority aquatic targets that include the Moosup River. One CAP outcome was the proposal by TNC staff to access settlement funds from the US Fish and Wildlife Service (USFWS) to initiate the removal of the first fish passage barrier on the Moosup at Water Street. USFWS plans to announce a Yaworski Lagoon/Canterbury needs assessment and restoration plan in 2008 with predicted alternative preference for this barrier removal, which would open 5 miles of upstream watershed habitat for migratory fish species and other aquatic organisms.

A series of fish passage barriers have been identified along the mid Moosup River in Plainfield that effectively limit some anadromous fish species migration, as well as resident fish movement to varied river corridor habitats. The river corridor is identified by CT DEP as one of the highest quality cold water fisheries of the Quinebaug River watershed. A preliminary assessment began in 2001-03 as part of a Supplemental Environmental Project proposal by Kaman Aerospace in Moosup. That proposal was revisited in 2006 and 2007 by CT DEP Watershed Management and Inland Fisheries Division staffs in preparation for a competitive application to the Millennium Power/Quinebaug River Mitigation Management Team Phase 2 program. Seven barriers, including an abandoned water/steam distribution main pipe and several dams of varying construction styles used for water impoundment and/or hydropower generation needs, have been visited, photographed and reviewed for initial design and construction cost estimates to breach or remove the barriers. Tours of this river corridor segment were provided to several other agencies and potential stakeholders, in anticipation of a CT DEP formal project proposal in 2008-9. In 2008, the U.S. Fish and Wildlife Service released a preliminary Natural Resources Damage Assessment and Restoration Plan document that included a preferred alternative for removal of a lower Moosup River abandoned utility pipe (fish passage barrier) across the river channel. DEP is now in discussions with USFWS, TNC and the town of Plainfield towards application of these potential settlement funds to remove the pipe during seasonally low stream flow conditions of late summer 2009.

### Natchaug River Basin

The Naubesatuck Watershed Council completed a Section 319-funded project to develop a river Plan of Conservation (phase 1 data collection). Preliminary data was collected and augmented with late summer streamwalk assessments. A part-time coordinator reviewed action plan options including town-by-town resource plans to address more watershed-based planning and management opportunities. Several multi-town conversations were held to determine priority directions to take and likely partners to include. That process has led to a proposal coordinated by the Nature Conservancy-CT Chapter staff, Naubesatuck Watershed Council, Windham Region Council of Governments and CT DEP to initiate a Natchaug Conservation Area Planning (CAP) in late 2008. This process will be based on a successful application within the Salmon

River watershed and other locations in Connecticut. This process will develop a set of focal conservation targets that represent the Natchaug Basin biodiversity, key ecological attributes and measureable indicators, and determination of current and desired status. The process will first acquire the support from each of the watershed town's governing bodies. Nonpoint source pollution topical areas will include review of CT DOT and local highway department road operations and management of infrastructure with real and potential degrading impacts to generally high quality water resources in this watershed. The Green Valley Institute has started development of a watershed-wide Natural Resources Inventory, linked to a co-occurring resource analysis tool to identify key parcels in this watershed from the perspective of water quality protection and connectivity on the landscape. In 2008 the CAP process was used to coordinate the initial stakeholder workshops – a kickoff meeting for municipal CEOs, town representatives, local conservation organizations, state and local agencies and the University of Connecticut in June. The workshop yielded an enthusiastic response to illustrate continued need for strong partnerships to help balance growth and conservation in the watershed while minimizing challenges to quality and quantity of the basin's waters; a first workshop in to identify conservation targets, key ecological attributes and indicators of ecological viability (9 identified/7 retained). A second workshop is planned in early 2009 to identify and rank key threats the conservation targets, followed by a third workshop in the fall of 2009 to identify key strategies and actions for conservation of the basin's ecological targets.

The Nature Conservancy, CT Chapter applied for a North American Wetland Conservation Act (NAWCA) grant in 2007 towards large scale land protection (1,103 acres) in the upper Quinebaug and Natchaug River watersheds. This proposal seeks to permanently protect significant habitat through fee and conservation restriction acquisitions. This proposal will contribute to the achievement of the Atlantic Coast Joint Venture waterfowl goals in the Thames River Basin and the Long Island Sound. Much of the focus is on highly functional wetland systems that support base flow and excellent water quality in the targeted watersheds. Public benefits of the permanently protected lands will provide for water resource conservation, as well as for recreational and ecosystem services. Existing and pending CT DEP land acquisition matches are an integral part of a protection oriented strategic approach in this regional watershed, and meets the protection-oriented watershed strategies for the Natchaug River basin as well as some headwaters of the Quinebaug River basin. The request is for \$1,000,000 to TNC, with matching partners TNC, CT DEP, private landowners, Norcross Wildlife Foundation, Wyndham Land Trust, and towns of Eastford and Woodstock contributing over \$3.2 million with a non-matching partner contributions totaling \$145,000. Field visits by grant reviewers and Connecticut project partners (including CT DEP) were made to potential acquisition parcels in late 2007 and a strong favorable review was provided. In 2008 TNC received notice of a project grant award and began working formally with DEP, UConn Cooperative Extension System's Green Valley Institute, USDA-NRCS, local land trusts and three private landowners to permanently protect 11 different tracks totaling 1,100 acres within the Natchaug River regional watershed. The properties comprise 268 acres of critically important wetlands, more than seven miles of streams, and 832 acres of forest. The transactions will include both fee and conservation easement purchases, including the 98-acre Still River Preserve acquired by the Conservancy in December 2007. This effort is a significant step towards the Conservancy's larger conservation initiative throughout the Thames River Basin.

## Shetucket River Basin

The CT DEP Diadromous Fish Restoration program continued monitoring of newly installed or revamped fish passage facilities at hydroelectric power generating facilities in the Taftville section of Norwich, and for Norwich Department of Public Utilities hydropower generation facility at the upstream Occum Dam. Diadromous fish species were reported as passing both facilities in their upriver migration in 2006 and 2007. Migratory river herring can now travel up the Thames River watershed to the base of the Scotland Dam in Scotland, which will incorporate fish passage plans as part of a Federal Energy Regulatory Commission (FERC) hydropower license reissuance by 2012.

In 2008 CT DEP continued to stock approximately 300 Atlantic salmon surplus broodstock (typically 4 years old, and between 3 and 15 pounds each) in the Shetucket River to expand a popular recreational fishery between the Occum and Scotland Dams along the main stem. This is a catch and release only fishery, open through the end of November. Fish passage became operational at the Tunnel Dam on the lowermost Quinebaug River in 2008, and some fish moving up the Shetucket were observed at the base of the new Tunnel Dam fish lift facility.

The current Scotland Dam hydropower generation FERC license was subject by its owners to the beginning of a long relicensing process in 2006. By mid-2007 a rather unique scenario unwound in the integrated relicensing process, as two applicants submitted notices of intent and preliminary resource assessment documents for the same facility – FirstLight Power and Norwich Department of Public Utilities. Both applicants are announcing run-of-river flow conditions through this facility, which can have significant benefit potential for water quality and aquatic life habitat needs in the river. CT DEP submitted review comments in 2007 with respect to water quality and flow regimes in this segment of the Shetucket River, reminding applicants to review their plans in light of the current impaired waters listing for Recreation, due to bacterial exceedances. In 2008, DEP program staff met with both applicants to review Study Plans for the Project and requested FERC identify environmental issues and concerns to be addressed in the environmental assessment for the Project. Studies will include water quality monitoring, Vegetation, Fish Passage, Freshwater Mussel Survey, Wetlands/Riparian/Littoral Habitat Inventory, Recreation, and Archaeological/Historic, all scheduled to be completed within a one year period for multi-agency review by mid-2009. Water quality study elements will produce baseline conditions and provide sufficient information to enable FERC staff to understand the current water quality conditions at the Project. Temperature and dissolved oxygen will be taken at profiles in several areas of the Project, and should include stressor times of warm, low flow summer conditions and before power generation events, as well as some nighttime profiles.

## Willimantic River Basin

Willimantic River Alliance (WRA):

A watershed assistance small grant was awarded to the Alliance by Rivers Alliance of Connecticut for the development of a watershed-wide website ([www.willimanticriver.org](http://www.willimanticriver.org)), and

development of incorporation paperwork to become a formalized nonprofit conservation organization. In 2005 WRA did officially incorporate as a 501(c)(3) nonprofit organization, elected a board of directors, initiated a Plan of Work, and completed a website containing a revised River Greenway and Recreation Guide, posted at: [www.willimanticriver.org](http://www.willimanticriver.org) . The WRA continued to research information and utilize opportunities to review and comment on larger development proposals and one state highway bridge replacement proposal; NPDES wastewater permitting reviews; University of Connecticut master water supply planning and management proposals, comment on and provide community outreach about the DEP-developed TMDL for the newly listed impaired Eagleville Brook tributary to the Willimantic River. WRA provided community network support and outreach to an updated streamwalk assessment developed by the Eastern Connecticut Conservation District. WRA has gained regional stature as a reputable watershed voice, represented in 2007 on a UConn-sponsored instream flow study and hydrogeologic study of their Willimantic well field. In 2008, the Alliance proposed a companion set of maps and text on the website for walks in riverside locations and along connecting trails. Visitors will enjoy riverside outings by making these scenic and historic places come alive with photos and text for guided walks in urban and rural settings.

The existing “Public Lands and Historical Sites” maps on the website have now all been modified to offer links to these photos and written guides. The guided walks are based on WRA's popular series of “Rambles” in the Alliance newsletter (a sample of previous Rambles can be found on our website). Links were provided to these guided walks for The Last Green Valley's proposed comprehensive guide to recreational features throughout the Corridor. The WRA website's format now allows for additional, new information to be posted as it becomes available.

Three objectives were met with the website-based Guide project completion during 2008:

- Provide a one-stop comprehensive resource for finding parks and historical sites to visit along the Willimantic River.
- Promote tourism in parks and along trails in the Willimantic River Greenway.
- Enable website visitors to learn more about the region and visit it for recreational outings.

The “Willimantic River Greenway Parks and Trail Guide” was placed online in April, 2008 and can be viewed at [www.WillimanticRiver.org](http://www.WillimanticRiver.org) .

- In 2008, the Alliance also participated in regional water conversations, including:
- a Mansfield Water Forum with focus on groundwater protection, followed later this year with a sponsored Wells Workshop for Homeowners;
- The University of Connecticut Water and Wastewater Advisory Committee;
- Opened an advisory role with the developing UConn Willimantic River Instream Flow study; and
- Joined an evolving Connecticut Water Trails Association and held a sponsored event along the Willimantic River Greenway.

## Willimantic Whitewater Partnership (WWP):

WWP continued its stakeholder organization with focus on the downtown Willimantic section of the Willimantic River.

- WWP's vision is to connect the City to the river by creating a world-class whitewater recreational park and a riverside park connecting historic, art and enterprise zones, joining three rail-trail recreational corridors, and restoring ecological and fisheries features through the removal or breaching of dams.
- WWP utilized a Partnership grant from the Quinebaug-Shetucket Heritage Corridor, Inc. to study lower Willimantic River sediments behind 2 dams that may be proposed for breaching or removal in support of the Willimantic Whitewater Park. Technical assistance and guidance was provided by CT DEP, by a NOAA Habitat Restoration grant program, and by consulting firms and others offering in-kind services.
- The Partnership is a key supporter of the annual Willimantic RiverFest, which attracts over 500 people to celebrate and learn about the historic and natural resources of the lower Willimantic River, including 80-100 boaters who travel the Willimantic River for 8 miles.
- Active Partnership planning in this lowermost river segment continues to build local capacity amongst community interests with regards to better stormwater management practices and smart growth planning from the small but economically stressed urban center.
- In 2008 the Partnership successfully acquired the Boland property on Bridge Street as the first segment of its planned Riverside Park and habitat improvement project. The Partnership received technical and funding assistance, and encumbrances through the CT DEP Greenways Award, a Bikes Belong Coalition, a Railroad Trestle Grant, and banking institution assistance from New Alliance Bank and Savings Institute. Considerable media outreach was achieved in 2008. Plans for 2009 include small building demolition, site surface aesthetic improvements, site remediation assessments and funding opportunities for addressing historic pollution on-site from former land uses including a gas station. Discussions continue with CT DEP and other agencies with regards to early proposals for development of an instream whitewater rodeo course tied to removal or notching the existing Boland Dam, as well as providing for effective fish passage.

## University of Connecticut / Willimantic River Wellfield:

Based on the findings and recommendations of the University's Water and Wastewater Master Plan (2007), University administration initiated an instream flow study to assess aquifer pumping on the Willimantic River along the mid Mansfield/Coventry town boundary. Modeled sustained yields at this wellfield are 1,400 gpm (2.016 mgd), whereas the total authorized

diversion amount is 1,600 gpm (2.3007 mgd). The firm of Milone and Macbroom were able to accomplish the bulk of required field work during 2008, but they were unable to get low flows. They still collected most of the data needed for the PHABSIM modeling, and were able to get in one short aquifer test to use for re-calibrating the groundwater model. Although they still want to collect data at low flow, which is unlikely to occur until next summer. The key preliminary finding was that wellfield withdrawals did exert an influence on the streamflow in the vicinity of the University's wellfield. Some interim recommendations on wellfield management were made in late 2008 that assume all the water pumped from the well field is coming from the river. The interim recommendations would be in place in the event that next summer is a low-flow year. They plan to complete the field work in 2009 and subsequently make final recommendations. The report will assist the University in its current strategy planning for the University water system. NPS pollutants do include altered stream flow, and thus this project is being followed by the NPS and Watershed Management program. The U.S. Geological Survey will, maintain an existing full water quality/flow stream gauge at the wellfield site, as well as install a full stream gage station at a preferred upstream location at the Merrow Bridge, running the 2 gauges concurrently through the completion of the project.

#### Thames River Main Stem/Basinwide

A FY2005 319 NPS grant was executed through the Eastern CT Conservation District (ECCD) for a part-time coordinator (20 hr/wk) to assist in implementing the Thames River Basin Partnership's Plan of Work and in expanding outreach capabilities. The TRBP Steering Committee also worked cooperatively with the Water Subcommittee of the Quinebaug-Shetucket Heritage Corridor, Inc to support an additional 5 hours/week for this coordinator to establish and promote a volunteer water monitoring network in the Corridor. The Partnership Steering Committee developed a job posting and in late 2005, and hired a Coordinator in spring 2006. With this funding support, the TRBP Coordinator was able to expand participation in the Partnership and at TRBP quarterly meetings; initiated a quarterly e-newsletter, the *Partners in Action Report*, to report on Partner Plan of Work activities; and initiated a new TRBP Subcommittee, the Poquetanuck Cove Preservation Committee, that applied for and received funding support for a multi-partner, multi-phased implementation project at Poquetanuck Cove, located between Ledyard and Preston, CT.

A FY2006 319 NPS grant was executed through the ECCD to continue a part-time coordinator (20 hr/wk) to assist in implementing the TRBP Plan of Works and in expanding outreach capabilities. The Coordinator developed educational materials to enhance the knowledge of the public about nonpoint pollution sources and impacts. This included the organization of a regional workshop on Low Impact Development for land use decision makers. In addition to outreach materials and events, the TRBP Coordinator successfully developed an outreach program specific to Total Maximum Daily Load (TMDL) information and expanded the website, [www.trbp.org](http://www.trbp.org). Quarterly meeting attendance and participation was improved significantly by inviting guest presenters to speak on TRBP Plan of Work topics. An outreach program focused on the impacts stormwater can have on water quality was introduced via a rain barrel promotion.

#### Thames River Basin Partnership (TRBP) Floating Workshop

In 2008, the part-time TRBP Coordinator position continued with a DEP Section 319 grant for a third funded year. The Coordinator's task accomplishments included development of a Rain Garden webpage at [www.thamesriverbasinpartnership.org/coventry.raingarden.htm](http://www.thamesriverbasinpartnership.org/coventry.raingarden.htm); a TMDL webpage at <http://www.thamesriverbasinpartnership.org/TMDL.htm>; and four quarterly TRBP Partners in Action newsletters, available online at [www.trbp.org/TRBPnewsletter.htm](http://www.trbp.org/TRBPnewsletter.htm). Other notable accomplishments include successful completion of the first Rain Barrel promotion program, where 58 barrels were sold and a follow up Conservation Gardening workshop was held.; streamwalk training for 11 people in Mansfield and RBV training in Ashford for 15 people focused new volunteer participation and awareness of the Willimantic and the Natchaug regional watersheds, and the Coordinator participated in a LISS Social Marketing workshop to improve effectiveness of current and future TRBP watershed outreach programs. The third year funding for this Coordinator role continues in 2009, and discussions are being held to broaden funding opportunities to continue this invaluable coordination of the regional partnership.

In 2008 the TRBP Floating Workshop 8 (Natchaug Watershed Basin: Water for People and Nature) was held at the Army Corps of Engineers Mansfield Hollow Flood Control Project, that includes the leased land encompassing Mansfield Hollow State Park, all within the Natchaug River regional watershed. Presentations were chosen from needs identified in the Annual Plan of Work and active partners, which included the keynote address by Mark Smith of The Nature Conservancy's Sustainable Waters Program, a QSHC Water Quality Monitoring Program update, and an introduction to the Corps site and operation. DEP Inland Fisheries staff provided an overview of the Northern Pike fish management program at the State Park, the local Naubesatuck Watershed Council discussed the Natchaug watershed with a focus on current conservation issues and actions, a TNC Quinebaug Highlands project update that utilized the recent CT Greenways designation for the three main Natchaug basin rivers, USDA-NRCS staff overview of managing invasive species and potential funding assistance by that agency, a discussion about invasive aquatic species by CT Agricultural Experiment Station staff, followed by an interpretive paddle by over 25 paddlers on the Lake and a wrap up site visit of a riparian buffer demonstration site. A workshop presentation is posted online at [www.thamesriverbasinpartnership.org/acrobat\\_files/FloatingWorkshop8slid.pdf](http://www.thamesriverbasinpartnership.org/acrobat_files/FloatingWorkshop8slid.pdf).

The Nature Conservancy (TNC):

In 2008:

The ACOE received a Congressional authorization to conduct a preliminary feasibility study. However, no funding was included in this authorization. DEP assisted TNC in developing a second request for Congressional funding, which may be approved in 2009. DEP continued to correspond with ACOE New England District and TNC-CT Chapter staff on future financial assistance options as a cooperating project partner beyond the feasibility study completion. In 2007 TNC-CT Chapter consulted with U.S. Army Corps of Engineers, CT DEP, and other agencies towards submission of a proposal to Congress to authorize the U.S. Army Corps of Engineers to conduct a preliminary feasibility study for water quality investigation needs with direct interest to the Corps mission in the Thames River Basin and Long Island Sound. The requested funding totals \$100,000 and the Corps' New England District Planning Branch is



supportive of the proposal. Congress should act on the authorization in early 2008; it is unclear whether funding will be attached to the authorization. This proposal is a direct outgrowth of the TNC-conducted Conservation Area Planning process for the Thames River Basin in 2006-07. DEP has submitted a letter of support for the proposal and interest to discuss a future cooperating agency status if and when the feasibility study is completed.

### **Southeast Coastal Major Basin**

#### Jordan Cove Urban Watershed National Monitoring Program Project:

In 2007, the project team moved beyond its investigative phase completion ceremony toward a targeted education and outreach phase of the project. The research monitoring station and key monitoring structures were closed out and removed across the now fully developed neighborhood project site. Lessons learned from the successful national monitoring project were shared with target audiences through talks, trade journal articles, peer-reviewed publications, conferences and a major website revision. A 30-minute PowerPoint presentation, and an interactive multi-media CD, were all developed by UConn staff in consultation with the project advisory team, and distributed to all 169 Connecticut municipalities. Over a dozen presentations were given by team members at professional conferences across the region and country. Several updated brochures and fact sheets were developed and linked to the project website ([www.jordancove.uconn.edu](http://www.jordancove.uconn.edu)), project team agencies and distributed to all Connecticut communities and New England state environmental agencies. At least 6 peer-reviewed articles were accepted for publication. Town staff and project team members continued to provide site tours of the project development to interested community planners, public works programs, and others. A final 319 reporting document was developed to CT DEP in 2007. A total of \$980,000 of Section 319 NPS funds was expended, with a non-federal match contribution total of nearly \$653,333 through the University of Connecticut, land owners, and the Town of Waterford. A final project report will be widely distributed in late 2008 signifying the completion of this project nearly 15 years in the making.

In 2008, the 319-funded project final report was completed, signifying the completion of this project nearly 15 years in the making. Nearly all of the 250 print copies were distributed. The report was added to the project website as well. The final report included enhancements to the conclusions section, covering topics of phased grading, need for a social scientist/economist on the project team, extra meetings for planning, the need for a local LID ordinance, promotion of cluster design, performance standards, promotion of the low mow/no mow conservation area, some rain garden issues, earthen berm and cellar hole construction benefits to project, and issues involving the property owners association. Every Connecticut municipality CEO was mailed a project packet with cover letter, project brochures, interactive CD and stormwater BMP wheel. The cover letter encouraged municipalities to further pursue the project website and to contact project team members for consideration of similar LID development projects. The project was completed though team members remained available for inquiries, project site tours, and presentations across the region to maintain awareness and understanding of the project goals and outcomes.

## Southeast Coastal Watershed - Western Complex:

### Niantic River Watershed Protection Plan (NRWPP)

In 2005 CT DEP awarded a NOAA-OCRM coastal NPS management grant to develop a watershed protection plan for NPS-impaired Niantic River and its watershed (within towns of East Lyme, Montville, Salem and Waterford). A twelve-month planning process was completed in September 2006 with the publication of the *Niantic River Watershed Protection Plan: Watershed-wide Strategies to Prevent Nonpoint Source Pollution*. The Plan includes an integration of nine key watershed plan elements required by DEP and U.S. EPA for support of implementation recommendations that are eligible for Section 319 NPS funds. Key findings in the areas of data assembly and results, zoning, environmental and monitoring include:

- 15+ stormwater outfalls discharge directly into the Niantic River.
- 5 local basin drainages are currently covered by over 10% impervious surfaces, and current local regulations can allow for 10 local basins to be covered by 10% or more impervious over, with one basin projected to be over 30% impervious cover.
- Stormwater modeling showed increased loading to the Niantic River from existing development. Any areas considered developable pose a risk for direct discharge to the lower river by increasing pollutant loading through its tributaries.
- Undeveloped areas upstream of the lower, more developed portion of the bigger watershed pose a great risk to increasing loads to town water supply reservoirs.
- Tracked development in the watershed since 1985 recorded over a thousand acres of forest conversion to either developed, barren or grassed lands.
- For zoning, a more effective approach to protect community water resources may be to match wetland protection requirements for a consistent watershed wide approach to protecting water quality.
- Eelgrass populations plummeted in 1999 but rebounded in 2003-04. The future of eelgrass in the coastal river is unclear and requires regular protection and monitoring.
- Measurement of water quality throughout the watershed is not currently a standard practice. To evaluate improvements through use of BMPs and planning changes, practical measurement techniques will be needed.
- Monitoring and inspection programs are already underway in towns of East Lyme and Waterford, but the potential for future development is the greatest in the upper reaches of the watershed.

The DEP Watershed Management program posted the document on its website at [http://www.ct.gov/dep/cwp/view.asp?a=2719&q=379296&depNav\\_GID=1654](http://www.ct.gov/dep/cwp/view.asp?a=2719&q=379296&depNav_GID=1654) . DEP programs continued to meet with local stakeholders in 2007 towards formation of a standing committee to gain local adoption of the Plan. A delay ensued with the local election results bringing in new town chief officials. DEP contracted with Eastern CT Conservation District, utilizing Section 319 funds, to fund a part-time position with existing District staff to provide a local coordinating role. The early results are promising, with new energy displayed by town staff and land use/shellfish commissions, local conservation and watershed organizations. There is a preliminary plan for a town CEO forum in early 2008 to garner political support to move the Plan document towards a useable community plan and basis for development of action strategies. Additional Plan priority recommendations that include water quality monitoring and community education/outreach were being pursued by DEP and local watershed stakeholders in future DEP contract agreements. An additional Plan recommendation is being addressed through the Connecticut Clean Marina Certification program, where DEP is working with at least one Niantic basin marina toward possible certification in 2008.

In 2008, the Niantic River Basin Coordinator position was partially funded with a CT DEP 319 grant to the Eastern Connecticut Conservation District for a part-time staff dedicated to assist in the implementation the 2006 Niantic River Watershed Protection Plan. The Coordinator worked 8-10 hours per week and accomplished many tasks in this first Coordinator year. Plan presentations were given to watershed town boards and commissions. Based on town land use committee and government leader feedback, a Plan Refinement Group was formed and met monthly through 2008 toward a draft Guided Summary Plan document, with updated Land Cover Maps, modified Impervious Surface Coverage maps, and a more user-friendly interface of the Plan. The Guided Summary will be distributed in early 2009. A summary report of outreach activities by this Coordinator and other relevant efforts in the watershed was developed and distributed to the watershed towns, for inclusion in three town's Stormwater MS4 General Permit reporting requirements. In addition, a summary of the Plan's recommendations, relative to each of the four basin towns, was collected for a document to share with basin towns and a future Advisory Committee or Watershed Board. Two grant funding applications were submitted in 2008 to further implement the Plan's recommendations; one to Rivers Alliance of Connecticut for assistance in establishing a Watershed Board, and the second to DEP for a Year 2 Section 319 grant to continue the Coordinator role for the watershed towns and other watershed partners. A project website was created at [www.nianticriverwatershed.org](http://www.nianticriverwatershed.org) .

Southeast Coastal Watershed- Eastern Complex:

#### Groton Utilities Drinking Water Quality Management Plan

The CT Department of Public Health is currently working with Groton Utilities and local communities to develop a water quality management plan for Groton Utilities and also to be used as a potential model for the State of Connecticut to protect public water supplies and still allow balance for prudent economic development. The Drinking Water Quality Management Plan (DWQMP) will address immediate concerns related to the protection of the purity of drinking water in Groton Utilities watershed. The CT DPH received funding from the EPA to initiate this process. Stakeholder involvement is key to project success and viability. DEP is an active

agency participant in the Advisory Committee meetings and is attempting to broaden the planning objectives to incorporate additional watershed-based needs and assessments, aligning with the nine key elements of a watershed-based plan. There currently are no listed impaired waterbodies within the Groton Utilities public watershed supply areas.

In 2008, DEP submitted comments to CT Department of Public Health for this Plan, as required by Special Act No. 06-6. Comments were provided as overreaching, planning and coordination with state water planning efforts, coordination with DEP water resource management programs and initiatives, and specific comments about the Groton water supply resources and management recommendations. One of the Special Act's intentions was to consider using this Plan as a pilot or model for other areas. DEP recommended the required report by DPH to the General Assembly include assessment of how this Plan addressed water supply planning issues developed earlier by the General Assembly's created Water Planning Council. Further comments included a recommendation for the Plan authors to utilize the Department's earlier document, "Protecting CT's Water Supply Watersheds, a Guide for Local Officials" (1993). That document uses the same watershed and stakeholder planning process described in the DWQMP, however, it has additional useful information on the broader state and local regulatory authorities related to water quality protection as well as non-regulatory measures. Before a DWQMP model is designed, that document and related information should be considered. It was suggested that the DWQMP clearly coordinate with existing local and regional water supply planning efforts and requirements, avoid redundancies and ensure coordination. It is especially important that the Groton Water Supply Plan be included in the implementation section of the plan regarding local protection and water utility land protection measures. DPH and other stakeholders were reminded that DEP water resource management efforts are more comprehensive under the federal Clean Water Act and must more fully consider all existing and potential uses of water, not just drinking water use. This includes recreational use, aquatic habitat for fish and other aquatic life, industrial, and agricultural use. A DWQMP plan would be very useful for addressing drinking water issues but may not address many other water-related concerns DEP may have related to water quality issues, including aquatic in-stream and riparian habitat, and water quantity. It was noted that DEP ambient water quality monitoring data indicates that most drinking water supply watersheds, including the Groton Utilities reservoir system, are of high quality. The DWQMP should highlight what Groton has done, and is currently doing, as an example of local coordination and protection efforts, including its special Water Resources Protection Zoning District for the reservoir watershed, local coordinated land use review process, and the greenway system of open space land. The DEP memo states these efforts are a significant reason why water quality conditions remain good in this watershed and they should be shared.

- In 2008, a citizen organization Clean Up Stonington Harbors (CUSH), enhanced its active membership campaign, lecture series and start up citizen science water monitoring program. Information that includes a water monitoring program is posted at [www.cushinc.org](http://www.cushinc.org). Twelve volunteers focused on 6 monitoring sites in 2008. Harbor Friendly Yards planning began in 2008. A four-page Yard Care Guide for the Coastal Homeowner was printed and distributed in 24,000 newspapers going to all residents of Mystic, Stonington and Pawcatuck, with grant funding from the Town of Stonington.

The organization's geographic focus includes all coastal harbors adjacent to the Town of Stonington, from Mystic River to Pawcatuck River, including waters off Barn Island. CUSH has two primary objectives: 1) Identify sources of nonpoint pollution to restore a healthy aquatic environment through water testing; and 2) reduce pollution by changing resident's habits through an educational process. In addition to these objectives, the group will provide rapid citizen feedback and work with local officials to improve harbor regulation and water quality management.

- In 2008, the University of Connecticut Turf Management Program initiated a Nitrogen Fertilizer Reduction in Coastal Lawns by Training and Education project. The main objective is to establish demonstration stations showing alternative, lower input turf species and best management nitrogen fertilizer practices. Five sites were initially chosen, though none in the Thames River or the Southeast Coastal basins. However, the Hole-in-Wall Beach in Niantic was the site of an innovative stormwater management project for a 93-parking space lot with high public visibility. UConn donated fescue seed to be planted in the area surrounding the various stormwater practices. UConn also established a 350 square foot demonstration site that utilized seven different lower input turf species. UConn staff conducted targeted training for municipal/turf industry professionals during the 2008 UConn Turf Field Day. Pre- and post-workshop surveys were conducted to ascertain the knowledge level and opportunities to modify turf management practices that reduce nutrient runoff potential to receiving waterbodies and Long Island Sound. Training was provided in web-based and in print media formats, aimed at changing fall fertilizer practices, broadening awareness of alternative inputs and use of slow-release fertilizers. The project has expanded through a Year 2 Section 319 funding assistance grant to UConn.

### **Pawcatuck River Major Basin**

- In the summer of 2007, CT DEP Water Monitoring Program, along with the CT Department of Agriculture/Aquaculture Bureau, assisted staff at the Rhode Island Department of Environmental Management in a sanitary survey along the Connecticut shoreline of the Pawcatuck River, towards a Bacteria TMDL for the Pawcatuck River. Staff identified some NPS sources associated with livestock entering the river and riparian areas, and information was shared with USDA-NRCS and other agencies involved with nutrient management programs. In 2008, DEP advised a local water monitoring program about the Department's provisions for incorporating volunteer monitoring information into the DEP water quality monitoring and assessment, encouraging a new basin venture to understand the time and effort commitment necessary to provide their data in a standardized format. All of the Department's water monitoring data is stored in a relational database and are available upon request.
- The Westerly Land Trust executed a land acquisition agreement for 2.5 acres of riverfront on the Connecticut side of the Pawcatuck River, identifying suspected bacteria and nutrient loading for an agricultural livestock (grazing heifer) land use activity as one target criteria for acquisition for downstream support of the Pawcatuck River and Little Narragansett Bay.

Both CT and RI USDA-NRCS agency offices are communicating with other larger dairy farm operators in the area to encourage signups for their various cost share practices that can further benefit water quality and wildlife habitat resources in the Pawcatuck basin. In 2005, the Nature Conservancy (TNC) and the Rhode Island Economic Policy Council began to formalize a watershed-wide conversation framed in smart growth and regional cooperation for the enlarged area known as the Borderlands. They had formerly focused on the unfragmented 136,000-acre forest land and critical watershed landscape area known by TNC as the Pawcatuck Borderlands.

The project progressed in this reporting cycle with several workshops in support of existing village centers within this region – including topics of transfer of development rights, alternative wastewater treatment technologies, economic development and affordable housing. The project is chronicled and communication amongst participants is enhanced with a project website posted at: <http://www.borderlandsproject.org/>. A Village Innovation Pilot program began in 2007 through a competitive application process. This is a strategic planning initiative to work with two Borderland towns to conserve critical lands by focusing appropriate growth into existing or planned village centers. The chosen towns are Exeter, Rhode Island within the Pawcatuck Major Basin, and the community of Killingly, CT, within the Thames Major Basin (Quinebaug/Fivemile). The pilot will also give organizers a stronger sense of the level of technical assistance needed by the communities' future programs. This intensive community visioning and planning initiative should develop strong potential for transferability to other Borderland towns in the Pawcatuck (and Thames) Basins, and develop local capacity to address nonpoint source pollution restoration and protection strategies and actions. The town of Killingly has already expressed interest to tie their new-found community village center visions to include integration of a stormwater retrofit project (within a streetscape improvement project) coordinated by the Thames River Basin Partnership Coordinator, under a Section 319 NPS grant. In 2008, the initiative really took off. It began with hiring a consultant team to lead our two towns - Killingly, CT and Exeter, RI - through Phase I. This phase involved an in depth Heart and Soul Visioning process. Both communities were very involved throughout and are now working diligently on developing priorities to be addressed in Phases II & III - Research and Recommendations and Implementation. Reflections on this innovative process included: 1) The innovation intent of this project was focused on how Borderlands communities can balance conservation and development, determining how to effectively act at the local and regional scales. So, while the Pilot has been significantly influenced by the Foundation's Heart & Soul Community Planning, it did not start with the same robust Heart & Soul approach as more recent projects. 2) The Pilot involves two states and two towns with related but unique growth and conservation challenges, adding to the level of complexity and coordination required. 3) The Borderlands Project lost an anchor partner in April 2008, which created challenges in the overarching regional partnership, project management and fundraising effort. 4) The towns arrived at visions that support village style development while preserving important natural, cultural and recreational resources. 5) The visioning process seemed to largely validate information that had been identified through past processes although new voices were added to the mix. 6) It was difficult to engage a cross section of the community in a proactive process using conventional planning events and outreach techniques, even when the content of those events included innovative tools. Involvement of youth had some limited success but there

remains untapped potential for this in the project. 7) Communicating the Pilot at the local level proved to be quite challenging given its regional foundation and bi-state nature. 8) Partners are interested and focused on how this process will influence town plans and decision making. Towns are looking forward to the more specific technical assistance that will occur in the next phases. 9) The opportunities for regional action are still emerging but there is a movement towards transfer of development rights (TDR) in a smaller sub-region of the Borderlands that includes Exeter. Also, Killingly residents and staff discovered a great interest in improving access to its water resources, which is an issue with local and regional implications. Partners indicated that some of the tools and methods used in Phase 1 could be models for other towns in the region. An important outcome of the Phase 1 process was consensus by project leaders of the following “best practices”:

- Go slow to go fast ;
- Set your local committee up for success;
- Present a process “road map”;
- Develop a media and communications strategy;
- Know your community networks;
- Tap into the urgency and interest in a proactive process;
- Create multiple paths for engagement; and finally,
- Identify actionable issues.

For more Borderlands Project information, the website remains active at [www.borderlandsproject.org](http://www.borderlandsproject.org). The notable NPS outcomes of Phase 2 involvement by the Town of Killingly will be reported in the Quinebaug and/or Fivemile River basin section(s) of this report in future years.

## **V. STATEWIDE MANAGEMENT PROGRAMS**

### **Inland Wetlands and Watercourses**

#### Inland Wetlands Management

The Wetlands Management Section provides day-to-day support to all 170 municipal Inland Wetlands Agencies in the state. As the majority of land use decisions are made at the local level, one of the most important functions of the Wetlands Management Section is conducting the Municipal Inland Wetland Commissioners Training Program. The training program helps commission members and staff to understand their roles and responsibilities under the Inland Wetlands and Watercourses Act (IWWA). It also provides skills in the identification of wetlands, wetland functions, site plan review, permitting, and enforcement as related to the IWWA. The CT DEP wetlands program staff utilized numerous training materials in presenting the training program, including documents funded under Section 319.

In 2008 there were:

- 534 total participants, representing

- 116 municipal Inland Wetlands Agencies, of which
- 277 individuals attended at least one of the three program segments, with
- 79 of these individuals attending all three segments and therefore received a 2008 certificate of program completion.

#### Erosion and Sediment Control

Since the publication of the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control (Guidelines), CT DEP provided detailed training, identified and corrected errors and then published a corrected electronic version on DEP's webpage

[http://www.ct.gov/dep/cwp/view.asp?a=2720&q=325660&depNav\\_GID=1654](http://www.ct.gov/dep/cwp/view.asp?a=2720&q=325660&depNav_GID=1654)

under Publications, Guidance Documents. Future potential work on the Guidelines includes producing a fully bookmarked / linked version for availability on the web and on compact disk. In the past several years the DEP has been working with the Connecticut Council on Soil and Water Conservation to develop visual training aids with the assistance of the Connecticut Conservation Districts with the goal of developing new training programs on soil erosion and sediment control.

#### Water Allocation

The Water Planning Council (WPC) was established by Public Act 01-177 to study eleven issues which fall into two distinct areas of investigation: water company management and natural resource management. The WPC consists of Commissioners, or their designees, from 4 state agencies, the Department of Environmental Protection, Department of Public Health, Department of Public Utility, and the Office of Policy and Management. The Water Planning Council established three Committees to investigate issues identified in PA 01-177. The Council meets the first Monday of every month at the Department of Public Utility Control. Contact: Sharon Mann, Administrator for the Council at (860) 827-2675.

All Annual Reports, minutes of WPC meetings, the Water Allocation Policy Planning Model, and several other important committee reports related to WPC activities are available on the Department of Public Utility Control website:

<http://www.dpuc.state.ct.us/DPUCINFO.nsf/ByWaterPlanning?OpenView&Start=1&ExpandView>

#### Flood and Erosion Control Projects

The CT DEP Flood and Erosion Control program as defined by CGS 25-69 thru 25-98 allows the DEP to implement studies and capital repair projects to reduce or eliminate damage caused by flooding and erosion. The statute was changed in 1982 to allow DEP to fund a portion of a dam repair as long as the dam was owned by a municipality.

The CT DEP Flood and Erosion Control program implements studies and capital repair projects to reduce or eliminate damage caused by flooding and erosion. The DEP is allocated funding



from the Connecticut General Assembly, and then awards grants on a cost-sharing basis with municipalities and special taxing districts. The CT DEP also provides technical assistance in cooperation with private consultants or government agencies like the NRCS and Army Corps of Engineers (ACOE).

CT DEP has started no new “Flood & Erosion Control” projects involving dams during the 2008 construction season. There have been many requests recently from municipalities asking DEP through this program to fund repairs to municipally owned dams. One project in particular has been bid and the municipality is waiting for funding to be approved by the bond commission before they award the bid.

Late in 2006 the ACOE inspected all of the riverine and coastal levees that they constructed. Several levees were found to be in immediate need of study and repair. Of note was the levee in East Hartford along the Connecticut River. This levee had previously been rated good, but due to a fresh look at the design plans, an area previously not maintained as a part of the system was discovered. The lack of maintenance of this “impervious blanket” led to large trees being allowed to grow in this area, affecting the effectiveness of the blanket. This was repaired in 2008 with cost sharing in the amount of \$4,000,000 from the State of CT DEP through the Flood and Erosion Control Board statutes. This repair was critical and therefore the repair was performed quickly. Due to ACOE questions raised during their initial inspection and file review and due to the fact that FEMA was re-mapping Hartford County, including East Hartford, additional studies were performed, leading to additional construction work being required in 2010. The DEP will aid the Town of East Hartford with additional funding for the future repairs, as well as we have aided the Town with technical expertise during the study and design portions of the levee review.

Other levees have required work. These levees are located in Hartford, Torrington and Waterbury/Watertown. The DEP happens to be responsible for maintenance for the Waterbury/Watertown levee, and we have completed our initial work to meet the minimum standards of the ACOE. However, some additional work needs to be performed at the levee, and the DEP is proceeding towards making those improvements.

The Torrington Levee, owned and operated by the City of Torrington is the only levee which did not meet the ACOE standards by the deadline. Therefore, the City’s levee has been deemed inactive by the ACOE, meaning that if the levee is damaged due to a storm event, the ACOE will not be allowed to fund repairs. Most of the problems with this levee have to do with many years of neglect, followed by environmental riverine enhancements which conflicted with the goals and design parameters of the original design. Torrington received \$200,000 from DEP to help clear debris and vegetation from the river channel to allow additional studies to take place. The City continues to move forward towards bringing this project into compliance with ACOE standards. The DEP IWRD continues to participate in helping the city meet all of its engineering goals while allowing as much riverine enhancements to remain intact.

The DEP entered into a three way agreement with The City of West Haven and the Lake Phipps Taxing District describing all of the monetary and long term obligations of each party. The dam

reconstruction was started in the summer of 2008 and will be completed in the fall of 2009. DEP is working with the Legislature to have the dam transferred from DEP to the Lake Phipps Taxing District. It was always the intent of the DEP that after the dam was fixed with a combination of state and local funds, that the dam would be turned back to the local taxing district.

The Flood events of 2007 have led to 2 Emergency Watershed Projects (EWP) being worked on in 2008. The Natural Resource Conservation Service (NRCS) funds 75% of the project costs and DEP funds the non-federal share of 25%. All of these projects protect infrastructure, but most of these projects protect the infrastructure by controlling the erosion that has created the threat.

CT DEP worked with the ACOE as they completed the Salmon River Ice Control Project. A heavy rain caused the ice to flow in the winter of 2007, a small channel carved out naturally during a recent flood operated as a emergency spillway and a great deal of ice by-passed the ice control structure. Several additional improvements were made to the ice control system in the summer of 2007. A camera is planned to be installed in 2008 which will give the ACOE and DEP the ability to monitor the operability of the ice control system.

The ACOE has been working on getting funding for performing preliminary investigations (this is the ACOE's term for their initial broad investigation of the flooding problem). Before the ACOE can agree to fund a project, they need to perform these preliminary investigations to determine if among other things that the project benefits outweigh potential costs. If the project meets this cost/benefit test, then the ACOE can move forward defining the project and getting local sponsors and agreements in place.

## **Lakes**

### Lakes Management Program

The goal of the Lakes Management Program is to protect and restore the ecological and recreational integrity of Connecticut's lakes and ponds through pollution prevention, pollution source abatement, and implementation of lake restoration technologies. The primary water quality concerns for Connecticut lakes are infestations of non native aquatic plants and eutrophication. Eutrophication is a form of water pollution caused by excessive enrichment with plant nutrients, organic matter, and sediments. Symptoms of eutrophication include dense algal blooms, nuisance weed beds, and depletion of oxygen in bottom waters. These conditions limit recreational opportunities and diminish ecological values.

The technical components of a lake water quality improvement project are developed through baseline monitoring, diagnostic/feasibility studies, and engineering studies. Implementation includes watershed management to address land use issues and control active sources of pollution. In-lake management is used to remediate undesirable lake conditions that cannot be addressed by watershed management alone. The development of a successful lake management program is dependent on active community participation. CT DEP is very active in meeting and communicating with property owners, lake associations, and town officials to promote and assist in lake and pond management projects.

Lake and pond projects are funded through a variety of federal, state, and local funding sources. Federal and state funding sources generally place priority on lakes with public access for recreation. At the federal level, CWA Section 314 provided funding for statewide baseline water quality assessments, and matching grants for diagnostic/feasibility studies and lake restoration projects. Since the phasing out of Section 314 funding, Section 319 funds have supported nonpoint source pollution control projects in lake watersheds.

### Lakes Grant Program

Connecticut DEP Lakes Grant Program funds lake restoration activities such as diagnostic water quality studies, land use planning, engineering feasibility studies, construction bid specifications development, storm water infrastructure improvements, dredging projects, and development of public education documents. The last year funding was available for the Lakes Grant Program was 2001.

Lake restoration projects are also conducted using bond funds authorized by the CT General Assembly and allocated by the State Bond Commission. In 2008, projects using state bond funds continued or began at Lake Pocotopaug, Silver Lake, and Quaddick Lake.

### CWA Section 319 Lake Projects

In 2006 and 2007, CWA Section 319 funds were used to develop the small grants program through the Connecticut Federation of Lakes. This program helps small and new lake groups become established and funds initial watershed assessments for lakes. In 2008 the Small Grants Program received more Section 319 funding to continue the program. CWA Section 319 also funded a lakes probabilistic monitoring program. In 2008 Connecticut College continued analyses of data from sixty lakes collected under contract with CT DEP. In 2008, CWA Section 319 funds were used to award a grant to the Lake Lillinonah Authority who hired a consulting limnologist to implement a comprehensive water quality-monitoring program. This monitoring effort is helping CT DEP develop a nutrient management strategy for Lake Lillinonah.

### Technical Assistance

The Lakes Management Program also provides technical assistance, as needed to municipalities, lakes groups, and DEP programs. In 2008 numerous FERC license articles for hydroelectric facilities were reviewed.

## **Groundwater**

The CT DEP develops and implements ground water protection strategies for all ground water resources, including public water supply wells. This includes ground water quality standards and classifications, ground water resource mapping, water supply planning, discharge permitting, water diversion permitting, site remediation, land use regulation in certain aquifer areas, technical assistance, pollution prevention, and a host of NPS control programs. One of the key components of this program is the Aquifer Protection Area (APA) Program, which provides comprehensive protection for major drinking water well fields in stratified drift aquifers. The

APA Program requires mapping of the "areas of contribution" and "recharge areas" to major well fields and regulating land use in those areas to minimize the potential for contamination of the water supply.

Preliminary APA mapping has been completed for all the state's major well fields (122) and provides a rough estimate of the contributing areas. Inventories of potentially regulated facilities and agricultural activities have also been conducted. Final mapping is a further refinement and will define the APA, the area subject to land use regulation. To date, plans for data collection and analysis have been submitted for 109 well fields, of which 107 have been approved. Final Level A mapping has been submitted for 87 well fields and 75 have been approved. GIS mapping of the APAs has been partially supported with FY93 and FY95-98 Section 319 funds.

The APA Land Use Regulations were adopted in February, 2004, and a Model Municipal Ordinance, along with guidance documents and forms necessary for implementation of the APA program were published in June, 2005. CT DEP continues to develop guidance on materials management plans, stormwater management plans, site plan review, planning and zoning coordination, water utility assistance, and other local guidance.

Municipalities are beginning program implementation, and the first step is to appoint a municipal aquifer protection agency (through adoption of a local ordinance). Thus far, 73 of the 78 towns have passed the required ordinance, and CT DEP continues to work with the remaining municipalities to implement this first step. Additionally, 42 have approved land use regulations in place, and have adopted APAs.

In 2008, CT DEP:

- Continued to work with the municipalities in the program to begin implementation of the program, providing extensive outreach and meeting with individual municipalities to assist with delineation of APAs and establishing local regulations;
- Held the annual municipal training program, a two-day workshop for Municipal Aquifer Protection Agencies, in May, 2008. The workshop which provided instruction on the adoption of local aquifer protection regulations, the delineation of aquifer protection boundaries, and a broad range of administrative and legal issues, was well attended and well received;
- Continued to keep the APA web site updated with new mapping as it becomes available, new guidance, examples and tracking tables; the Aquifer Protection Area Program web site is at [www.ct.gov/dep/aquiferprotection](http://www.ct.gov/dep/aquiferprotection)
- Provided technical assistance to numerous towns in response to inquiries and requests for assistance with aquifer protection issues;
- Completed work with the water utilities to develop a Municipal Assistance Program;
- Continued to collect and review data, including point and nonpoint pollution sources, land use/land cover, and water quality data;

- Continued to update the Water Quality Classifications and Leachate & Wastewater Discharge coverage for the Thames River major basin, as well as evaluated and approved (if appropriate) requests for reclassification of groundwater; and
- Completed work on a mapping project with the Connecticut Geological Survey to derive an “Aquifer Potential Map” for the state that is available in GIS format (the project utilizes federal Section 319 funding) and will shortly be available on the DEP website.

## **Long Island Sound**

Long Island Sound (LIS) is one of Connecticut’s most important natural and economic resources, serving as habitat to numerous fish and wildlife populations, a commercial and recreational resource to the citizens of CT and NY, and contributing an estimated \$8 billion annually to the regional economy. Improving water quality in LIS is a major goal to ensure healthy habitats and safe productive use by people living around LIS. Studies in the late 1980s identified hypoxia (low dissolved oxygen) occurring in the bottom waters of the western Sound as a result of excess nitrogen enrichment to LIS waters. CT and NY have implemented management actions including upgrading of sewage treatment plants (STPs) to remove more nitrogen from STP discharges entering LIS, thus alleviating the spread and intensity of hypoxia. Another challenge facing LIS are pressures for increased recreation and public access of the Sound, and commercial interests for energy and commerce. Habitat restoration projects are being carried out through a number of programs with the goal of preserving 923 acres of coastal and near shore habitat and 175 river miles of migratory fish passage in CT and NY by 2011. In addition, citizens, their elected officials, and agencies are working to implement the Long Island Sound Stewardship Initiative preserving 33 areas of ecological and recreational value and identifying additional areas to preserve and protect for future generations.

CT DEP's Long Island Sound management efforts revolve around two major programs: the Long Island Sound Study (LISS) estuary program, coordinated through the Bureau of Water Protection and Land Reuse Planning and Standards Division (BWPLR PSD) in cooperation with DEP's Coastal Management Program, which is administered by the Office of Long Island Sound Programs (OLISP).

### Long Island Sound Study

The Comprehensive Conservation and Management Plan (CCMP) for Long Island Sound, completed and approved by EPA and the states in 1994, identified low dissolved oxygen (hypoxia) as the primary water quality problem for the Sound and excess nitrogen loads as the primary cause of the problem. The CCMP also cites additional problems, including toxic contamination, pathogens, floatable debris, loss of fish and wildlife habitat, and land use and development pressures. Management efforts over the past several years have focused on reducing nitrogen loads to improve dissolved oxygen conditions and restoring degraded coastal habitats.

Nitrogen management efforts include installing advanced wastewater treatment equipment in new and existing municipal sewage treatment plants, eliminating raw sewage discharges through

combined sewer overflows (CSOs), and controlling NPS pollution. In 2001, EPA approved the CT DEP and the New York State Department of Environmental Conservation (NYS DEC) TMDL for nitrogen loads to Long Island Sound. The TMDL calls for an approximately 64 percent reduction in nitrogen loads from point sources and a 10 percent reduction in nitrogen loads from nonpoint sources from urban and agricultural land. In 2008, CT DEP in collaboration with EPA LISS and NYS DEC initiated revision of the 2001 TMDL. This was undertaken to address the change in the hypoxia model from LIS 3.0 to SWEM (System Wide Eutrophication Model), as well as work completed by the Connecticut River Workgroup (CTRW). The work completed by the CTRW provided a better estimate of nitrogen loading from both point and nonpoint sources from states upstream of Connecticut but included in the LIS watershed. This work also included a cost evaluation of best management practices and proposed target nitrogen reductions.

In 2002, the nitrogen credit trading program and a statewide general permit with nitrogen limits for 79 sewage treatment plants were initiated. Through 2008, seven annual credit exchange cycles have now been completed with oversight by CT DEP and a nitrogen credit advisory board. It is anticipated that the trading program and general permit will continue to enable the state to meet the nitrogen load reduction required by the TMDL more cost-effectively.

The LISS contracted with Manhattan College and HydroQual Inc. in developing a nonpoint source nutrient watershed modeling tool. A nitrogen-tracking program is being developed and the LISS Nonpoint Source Workgroup has begun fine-tuning and implementation of the approach. The program will allow managers to determine progress towards the 10% load allocation reduction in CT and NY specified in the TMDL. Work was completed on a Long Island Sound Riparian Buffer Toolbox that is posted on the LISS web site providing resources for local officials in drafting and implementing regulations to protect riparian areas. Riparian buffers can be a very effective means of reducing nonpoint source pollution to receiving waters in developed watersheds, similar to that of the Long Island Sound.

Identifying the causes of nonpoint source pollution and the relationship to human activities to the health of Long Island Sound is a priority area of concern for CTDEP and the Long Island Sound Study estuary partnership. LISS and CTDEP have contracted with the University of Connecticut's NEMO program and its Center for Land Use Education and Research (CLEAR) on projects to map land use and land cover in the coastal areas of Connecticut and New York. (see <http://clear.uconn.edu/>) The Long Island Sound Regional Impervious Surface Study, the Coastal Riparian Buffer Analysis, and the Coastal Area Land Cover Analysis Project are important tools available to municipal and environmental managers in guiding future development needs while protecting watershed health. (<http://clear.uconn.edu/research/index.htm>) These projects utilized GIS technology to identify land cover and land cover change within LIS watersheds and riparian corridors of coastal Connecticut. Riparian, or streamside, corridors are known to be environmentally important areas critical to stream stability, pollutant removal, and both aquatic and terrestrial wildlife habitat. Many of the threats posed to Long Island Sound are directly or indirectly the result of the urbanization of the watershed, particularly with the increase of impervious surfaces. Impacts related to the increase in impervious surfaces include: deterioration of water quality resulting in polluted surface

waters, reduced ground water recharge resulting in a decrease in available sub-surface ground water, and an increase in runoff volume resulting in flood control problems.

The LISS and CTDEP have also been investing time and funding in habitat restoration activities that are relevant to NPS pollution abatement. In 2006, the LISS adopted 33 Inaugural Coastal Stewardship Areas and in September 2006 Congress passed the Long Island Sound Stewardship Act of 2006, which was signed into law by President Bush (Public Law 109-359) in October. The bill authorizes up to \$25 million per year for stewardship projects, including acquisitions of environmentally-sensitive lands for LIS that will help protect sensitive habitats but also ensure protection of land conditions that are amenable to pollutant removal. LISS is also involved in CTDEP eelgrass protection evaluations, with a goal of establishing appropriate nitrogen loading criteria to protect eelgrass beds in eastern CT that have been in decline in recent years.

Connecticut and New York have made commitments to have 50% of their respective sub-watershed areas in the LIS watershed developing or implementing watershed management initiatives in collaboration with locally based public and private entities by 2014.

With funding from the Long Island Sound Study (LISS), CT DEP has also conducted extensive monitoring of Long Island Sound. The program is used to track changes in low dissolved oxygen levels as well as water temperature, nutrient levels and other parameters relevant to an extensive hypoxia impairment that affects the western half of Long Island Sound's bottom waters. In combination with upland monitoring described above, CT DEP and the LISS use these data to chart management progress, particularly for control of nitrogen, the primary pollutant leading to hypoxia.

([http://www.ct.gov/dep/cwp/view.asp?a=2719&q=325570&depNav\\_GID=1654](http://www.ct.gov/dep/cwp/view.asp?a=2719&q=325570&depNav_GID=1654) )

### **Coastal Zone Management**

OLISP and other DEP staff provided assistance to municipalities located within the Niantic River Watershed as implementation of the watershed protection plan continued into this reporting period. OLISP staff gave a PowerPoint presentation on the Niantic River watershed plan at a public meeting moderated by the new Niantic River Watershed Plan coordinator to reinvigorate watershed plan stakeholders and outline the next steps to be taken in implementing the plan. The presentation described the history of the establishment of the Niantic River watershed plan, outlined the process of watershed planning, and highlighted the key recommendations and implementation steps in the plan. The meeting also provided an opportunity for the watershed coordinator and OLISP and DEP staff to ascertain the stakeholder's level of interest in participating in the implementation of sub-committees to help condense the full plan into a more user-friendly document and to coordinate outreach and education efforts. We anticipate that watershed plan implementation will continue into future reporting periods.

During this reporting period OLISP staff participated in the 19<sup>th</sup> annual Nonpoint Source Pollution conference, held in Groton, Connecticut in May. OLISP staff participated in the conference planning process, including selecting conference speakers, posters, and the

conference's keynote speaker. OLISP staff moderated a plenary panel that profiled three partnerships in addressing nonpoint source pollution: staff from the Town of Tolland and the town's consulting engineer that recently developed an LID design manual; staff from the Town of Waterford and a representative of Connecticut's Nonpoint Education for Municipal Officials (NEMO) program who are working together to update Waterford's land use regulations and plans to incorporate LID practices; and staff from the Nassau County, New York's Department of Public Works, Water and Wastewater Engineering Unit and a representative of New York's NEMO program who are working with a county stormwater coalition comprised of over 50 municipal partners to implement EPA Phase II stormwater general permit requirements.

### Clean Marina Program

OLISP continues to implement the Clean Marina Program. By the end of 2008, approximately 30 marinas had taken a Clean Marina Pledge. However, the pledged list was not managed during this period. All facilities were maintained on the list without requiring a new pledge after a one-year period. Fourteen (14) marinas had been certified as "Clean Marinas" by the end of 2008.

The Clean Marina Program is a voluntary, incentive-based education and outreach campaign to encourage environmental compliance and the use of BMPs at the state's 275 coastal and inland boating facilities. The program also includes an outreach campaign to educate the state's boaters about environmentally sensitive boating practices. OLISP, in cooperation with the CT DEP Boating Division, developed the program to address the potential threats to water quality from both inland and coastal marinas, particularly in the form of NPS pollution.

In 2008:

- Clean Marina staff revised the recertification process to require an annual statement of maintenance of practices from each certified facility and a verification site visit every 5 years instead of every year.
- Clean Marina staff conducted Outreach at the following events:
  - The Hartford Boat Show
  - The CT Marine Trades Association's Annual Environmental Exposition
- Clean Marina staff conducted informal informational site visits to several CT marinas.
- Clean Marina staff conducted 4 certification visits resulting in 4 new certified facilities

Information on the Department's Clean Marina Program can be found at:  
[www.ct.gov/dep/cleanmarina](http://www.ct.gov/dep/cleanmarina).

### Vessel Sewage Management

Sewage from recreational and commercial boating on Long Island Sound continues to be a potential source of pathogen contamination to shellfish beds and swimming areas. In poorly



flushed areas with high boat concentrations this potential waste discharge may also contribute to nutrient enrichment. The CT DEP OLISP has primary responsibility for regulating marinas and related boating activities, including vessel sewage management.

Funding from the U.S. Fish and Wildlife Service through the Clean Vessel Act (CVA) grant program has allowed DEP OLISP to fund the construction, operation, and maintenance of a total of over 103 total pumpout facilities, including sixteen (16) pumpout boats, and 22 dump stations available to boaters at boating facilities along Connecticut's coastal waters.

EPA approved the application for designation of all Connecticut coastal waters in Long Island Sound and its navigable tributaries from the New York state boundary in the Byram River to Guilford as a No Discharge Area on June 2007. All Connecticut coastal waters are now a designated NDA. The current website is:

[http://www.ct.gov/dep/cwp/view.asp?a=2705&q=323816&depNav\\_GID=1635](http://www.ct.gov/dep/cwp/view.asp?a=2705&q=323816&depNav_GID=1635).

A directory of pumpout stations and boats can be found on the CTDEP website at: <http://dep.state.ct.us/olisp/cva/cva.htm>, along with a variety of information about Connecticut's Clean Vessel Act program.

## **Habitat Restoration**

Like many northeastern coastal states, Connecticut has lost much of its historic, natural tidal wetlands and other habitats to development and hydromodification (e.g., ditching, diking, draining, and filling). In reversing this trend, Connecticut has become nationally recognized for its leadership role in tidal wetland restoration, and has been an active participant on the LISS Habitat Restoration Team. In 1997, CT DEP established the Wetlands Habitat and Mosquito Management (WHAMM) Program, one of the first dedicated wetland habitat restoration programs in the country, with dedicated staff and specialized low ground pressure equipment. Connecticut also was the first state in the country to use funding from the federal Intermodal Surface Transportation Efficiency Act (ISTEA) for tidal wetland restoration where undersized culverts or tide gates associated with transportation routes have impacted the coastline. Since the early 1970s, CT DEP has used these programs and resources to restore over 1800 acres of tidal wetlands. In addition to restoring degraded habitat, OLISP also is involved in preventing degradation through improved management of exotic and nuisance species. In 1998, the LISS adopted a "Habitat Restoration Strategy" that sets a goal of restoring 2000 additional acres of coastal habitats such as tidal wetlands and coastal grasslands by 2008. In September 2006, the LISS set a new goal to restore or protect an additional 300 acres of coastal habitat and open up an additional 50 miles of riverine migratory corridor to diadromous fish from January 1, 2006 to December 31, 2011, and ultimately restore 2,000 acres by 2020.

In 2008:

Restoration occurred at a small tidal marsh at Chrisholm Marina in Chester – 0.25 acres; and at Old Field Creek marsh in West Haven – 11.7 acres, for a grand total of 11.95 acres of tidal wetlands restored.

In addition, WHAMM program performed Phragmites control at 21 new sites in Connecticut for a total of approximately 784 acres. These acres do not count toward DEP's restoration goal of 2000 acres.

Open marsh water management (OMWM) is a technique used on the salt and brackish marshes along the coast. OMWM can consist of creating ponds, new channels, or ponds with sill channels, and plugging old grid ditches. The idea behind OMWM is to provide habitat to sustain fish, which will eat mosquito larvae. In marsh restoration DEP uses this technique to increase flooding of phragmites and to restore fish and wildlife habitat through creation of surface water features that were eliminated by grid ditching, while at the same time not creating mosquito breeding areas.

A particularly important coastal habitat type is submerged aquatic vegetation dominated by eelgrass (*Zostera marina*). Historically, eelgrass grew in shallow water throughout the Sound, providing important habitat for fish and shellfish. In the 1930s, there was a major decline of eelgrass throughout its range on the Atlantic coastline. By the 1950s, eelgrass had returned to eastern Long Island Sound, but not to central and western coastal areas. CT DEP suspects that the excessive nitrogen loads associated with developed areas promoted greater phytoplankton production, which reduced light penetration necessary to support plant growth. Remaining eelgrass beds occur east of the Connecticut River, and the total acreage measured in 1993-94 was less than 700 acres. In 2002, the acreage of eelgrass had increased to over 1380 acres in CT (1598.5 overall). While some of this increase is likely due to differences in survey methodology (boat survey versus aerial photo analysis), much of this increase is due to natural 'recovery'. Most of the increase are associated with beds that in Long and Fishers Island Sounds. There is little change in the acreage of beds within coves, embayments and tidal rivers. Little Narragansett Bay continues to support no eelgrass beds and the beds in Clinton Harbor have disappeared. The only success story is the restoration of nearly 50 acres of eelgrass in Mumford Cove, the result of removing a sewage treatment plant discharge in 1987. Another aerial survey of eastern LIS was completed during summer 2006, and it was done using the same techniques as the 2002 survey. Results indicate that nearly 1900 acres of eelgrass were mapped overall, and 1668 of those acres are in CT waters.

### **Atmospheric Deposition**

CT DEP will be participating in a new committee on Critical Loads for both land and water. The short-term goals of the Committee will be to gather scientific data and information to fill gaps in critical load development in the US. Eventually, the findings will help define management goals that could benefit both terrestrial and aquatic environments.

A regional TMDL for mercury was coordinated through New England Interstate Water Pollution Control Commission (NEIWPCC) and included the New England states and New York. The TMDL gained approval from EPA in 2007. A large portion of the mercury comes from out of state sources via atmospheric transport and deposition, becoming part of the stormwater and nonpoint source load. The states and NEIWPCC have decided to submit a Section 319(g)

petition to EPA to request convening a management conference to address those out of state sources. The petition was submitted in October 2008, and a formal reply is awaited.

Connecticut and New York continue to work on the Long Island Sound TMDL for nitrogen. The contributions of atmospheric nitrogen are being reviewed, but are a substantial portion of the load. It is likely that the TMDL will look to Clean Air Act provisions and other agreements to provide atmospheric nitrogen source reductions under the TMDL. A draft is planned for the fall of 2009.

### **Fish Habitat Restoration**

The CT DEP Inland Fisheries Division has an active fish habitat restoration program, involving removal of barriers to fish passage, construction of fish passage facilities, and physical restoration of in-stream and riparian habitat features. CT DEP coordinates its restoration activities with many other federal, state, and town agencies and non-government organizations, including the U.S. Fish and Wildlife Service, NOAA, NRCS, EPA, State Water Conservation Districts, American Rivers, Trout Unlimited, the Connecticut River Watershed Council, and various other watershed groups and land trusts. Although Section 319 funds have only been used on a limited basis in the past, several fishway projects currently in the planning stage have received 319 funding and these types of projects will receive high priority in the future. Providing fish passage at the Wallace Dam (first barrier on the Quinnipiac River) in Wallingford has been a top priority for many years. Progress was achieved in 2007 when final designs for a Denil fishway at the Town-owned dam were completed. The project is now preparing applications for permits and it is hoped that construction could begin in 2010 using 319 funding.

Restoring habitat for native *diadromous* fish is a high priority in Connecticut. Diadromous species include *anadromous* and *catadromous* species. *Anadromous* species, which spend most of their lives in salt water and migrate up rivers to spawn in fresh water, include Atlantic salmon, blueback herring, alewife, and American shad. *Catadromous* species, which spend most of their lives in fresh water and migrate down rivers to spawn in salt water, include only the American eel.

### **Stormwater Management**

Stormwater permitting and compliance is conducted by the CT DEP Water Permitting and Enforcement Division (WPED) under the authority of the CWA National Pollutant Discharge Elimination System (NPDES) storm water provisions and supporting state statutes and regulations.

CT DEP regulates stormwater discharges from the following sources:

- Construction sites (sites 1-5 acres in size are not required to register with DEP if municipal approval have been obtained; sites 5 acres or more must register with CT DEP),

- Industrial activities (activities defined as “light” industries with no stormwater exposure submit a No Exposure Certification in lieu of a permit registration),
- Commercial sites with more than 5 acres of impervious area, and
- Municipal separate storm sewer system discharges.

Approximately 2100 facilities, towns or activities were registered under the various stormwater discharge general permits as of March, 2010, many of which have annual monitoring requirements. There were 1393 industrial operations, 382 construction sites, 214 commercial sites, and 114 MS4 activities. Additionally, 167 No Exposure Certifications were submitted as of March, 2010. DEP stormwater staff conducted 95 inspections and issued 107 Notices of Violations for stormwater related violations.

Accomplishments in 2008 include:

- CT DEP conducted compliance initiatives of sites with poor stormwater quality, including auto salvage yards and marinas.
- CT DEP reissued its construction, industrial, MS4, and commercial general permits in “as-is” form to maintain permit coverage while the Department works to reissue the permits in modified form.

### **Agricultural Nonpoint Source Management**

Confined animal feeding operations (CAFOs), an important source of agricultural pollution, are now defined by EPA as point sources. CT DEP, which is authorized by EPA to administer its NPDES permitting program, will implement the CAFO permitting program with a statewide general permit. CT DEP has determined that there are approximately 10 CAFOs and at least 35 animal feeding operations (AFOs) statewide. The DEP Commissioner has the discretion to decide that certain AFOs be regulated as CAFOs.

Under the general permit, each farm will be required to develop a Comprehensive Nutrient Management Plan (CNMP). Connecticut is using phosphorous-based manure application criteria for CNMPs. Recommendations for nutrient application rates are based on the agronomic critical ranges required for crop production as established by the UConn Soil Nutrient Analysis Laboratory, or UConn-recognized industry practice. Recommended rates are based on soil nutrient analyses and crop tissue tests, documented yield information, environmental risk and management capabilities.

In addition, NRCS and UConn/CES evaluate the adequacy of a farm’s land base with potential for fertilizer application for its capacity to utilize manure nutrients. NRCS will use the technical

guidance for developing CNMP's along with Field Office Technical Guide Practice Standards to develop CNMP's. CT DEP is working on the General Permit criteria.

Agricultural NPS program accomplishments during calendar years 2008 include:

- NRCS and UConn/CES assessed about 26 farms from FY08

NRCS and UConn/CES continued to work with agricultural producers to develop a user-friendly computerized record-keeping system to help them track nutrient use on their fields. The record-keeping program is being tested and developed for uploading to the UConn Soil Nutrient Analysis Laboratory's web site for ease of access by farmers. A new recommendation system for nitrogen management that relies on the field-by-field records of nutrient applications is being developed. UConn/CES has continued a 319-funded IPM/ICM program targeting coastal watersheds in Fairfield and New Haven counties, with a focus on outreach and education.

## **NEMO**

The NEMO (Nonpoint Education for Municipal Officials) program began in 1991, with the foundation that education – not regulation – is the most efficient and cost-effective, means of influencing land use decisions. Initial programming emphasized "linking town halls to land use and water quality" using build-out projections, remote sensing, impervious surface cover, and water quality ratings to show towns various scenarios for the future. CT DEP and UConn/NEMO have had a long and productive partnership on projects that support the state's Nonpoint Source Program. Early partnership efforts focused on applied landscape research and statewide educational efforts. For much of the last several years, the emphasis has been on the "Municipal Initiative"; which works intensively with towns and has resulted in many changes to local plans, regulations and development designs.

NEMO provided education on stormwater to numerous municipalities, groups, agencies and at conferences both in the state and regionally. During the project period, NEMO educators conducted 40 workshops or talks about LID and stormwater management to hundreds of local commissioners, professionals and the public. Education has been a key factor in preparing the state for the acceptance of LID and other practices. The partnership between UConn NEMO and the DEP has made this education possible and has served as a model around the country. By 2009, over 30 states have adopted the NEMO education model and have been promoting the use of LID and other alternative stormwater approaches. NEMO conducted two developer/contractor trainings, however it is clear that the next step is to provide further resources and educational opportunities for developers and contractors who have the opportunity to utilize these practices.

## **NPS Program Contact List**

CT DEP Nonpoint Source Coordinator	(860) 424-3730
US EPA Nonpoint Source Coordinator	(617) 918-1687

### **Other Nonpoint Source related programs:**

Aquifer Protection	(860) 424-3020
Council on Soil & Water Conservation	(860) 767-9594
Inland Water Resource Wetland Comm. Training	(860) 424-3706
Water Quality Monitoring	(860) 424-3020
Lakes Management	(860) 424-3020
Watershed Management & Coordination	(860) 424-3020
Stormwater Management	(860) 424-3018
Stormwater Data	(860) 424-3020
Permitting and Enforcement	(860) 424-3018
NRCS Water Quality Coordination	(860) 977-1543
Inland Fisheries Division	(860) 424-3474
Marine Fisheries Division	(860) 434-6043
Office of Long Island Sound Programs	(860) 424-3034

**This report was compiled and edited by Sarah Slack, CT DEP Student Intern, University of Connecticut.**