Quinnipiac River Watershed Integrated Pest\Crop Management Project

Success Stories

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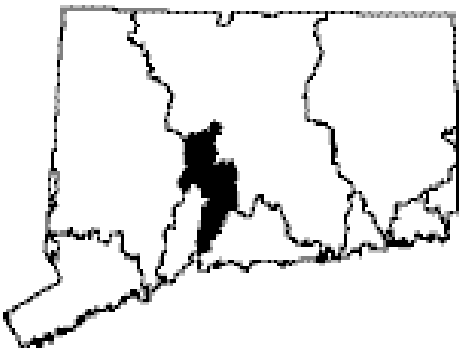
Connecticut Department of Environmental Protection, 79 Elm Street, Hartford, CT 06106-5127 -
Arthur J. Rocque, Jr., Commissioner

The Resource

The Quinnipiac River watershed is located in south-central Connecticut, comprising approximately 165 square miles, primarily in the municipalities of New Britain, Plainville, Southington, Cheshire, Meriden, Wallingford, Hamden, North Haven, and New Haven. The watershed also includes small areas of Farmington, Bristol, Wolcott, Prospect, North Branford, and East Haven. The mainstem of the Quinnipiac River flows for approximately 38 miles from its headwaters in Farmington to New Haven Harbor, where it enters Long Island Sound.



Quinnipiac River Watershed

Photo by Jude Boucher

A weather monitoring station demonstrated the use of weather data and a computer model (Tom-cast) to predict tomato diseases in North Haven.

The harbor is extremely productive, providing seed oysters for over half of Connecticut's total oyster harvest. Major tributaries are the Eightmile River, Tenmile River, Misery Brook, Harbor Brook, and the Muddy River. Land use in the Quinnipiac River watershed is typical of many urbanized, coastal watersheds in Connecticut. There is a diversity of land uses including vegetative land cover (44%), urban land use, which includes residential areas of varying density (31%), agricultural land (22%), and lakes/ponds (3%).

Nonpoint Source Pollution Nonpoint source (NPS) pollution is diffuse in nature, both in terms of its origin and in the manner in which it enters surface and ground waters. It results from a variety of human activities that take place over a wide geographic area. Pollutants usually find their way into waters in sudden surges, often in large quantities, and are associated with rainfall, thunderstorms, or snowmelt. NPS pollution generally results from land runoff, precipitation, atmospheric dry deposition, drainage, or seepage. Hydromodification – physical disturbance to a water resource caused by filling, draining, ditching, damming, or otherwise altering wetlands and stream courses – is also considered a nonpoint source problem.

Environmental Problems

Despite tremendous improvement over the past 30 years as a result of improved wastewater management, water quality goals for the Quinnipiac River are still not being met. In most river segments, the biological community is characterized by a general lack of sensitive species and a low degree of diversity, and water quality is poor during wet weather events. The primary cause of these impairments is nonpoint source pollution, including stormwater runoff, landfill leachate, water withdrawals, and dams, which impede anadromous fish passage (see **Nonpoint Source Pollution** sidebar). Despite improvements in wastewater management, compliance with industrial and municipal discharge permit limits also remains a problem.

Nonpoint source pollutants include nutrients and toxic substances such as pesticides. The Quinnipiac River watershed contains a number of commercial farms and green industry businesses, as well as areas with intensive turf management (lawns, athletic fields, and golf courses), where pesticides and fertilizer are used routinely. The Connecticut Department of Environmental Protection (CT DEP) has reported that pesticides accounted for the highest percentage of contaminated wells in the state between 1979-1988, and that pesticides were detected in 66% of CT DEP monitoring wells after "normal applications." Most of the agricultural sites monitored in these studies were used for field corn production, which relies primarily on herbicides. By comparison, more intensive forms of agriculture (e.g. vegetable, fruit, nursery and greenhouse production) use a broad array of herbicides, insecticides, fungicides and rodenticides. Overuse and misuse of pesticides may also adversely affect public health, safety, and food safety, and pose hazards to non-target organisms (e.g. honeybees).

Fertilizer contains nutrients such as phosphorous and nitrogen, which, in excessive amounts, can degrade water quality and aquatic habitat. Phosphorous is the limiting nutrient for fresh water (e.g., lakes, ponds, rivers, and streams), while nitrogen is the limiting nutrient for estuarine waters (e.g., Long Island Sound). Excessive amounts of these nutrients accelerate the growth of algae, which then die, sink to the bottom, and decompose, consuming the oxygen that fish and other aquatic life need to survive.

Photo by Lorraine Los

White sticky traps were used in orchards to monitor for insect pests such as tarnished plant bug and European apple sawfly.

The Solution

The Quinnipiac River watershed was selected by the CT DEP and U.S. Environmental Protection Agency (US EPA) to implement a model watershed management initiative. In 1997, these agencies joined with other watershed stakeholders, including municipalities, regional planning agencies, soil and water conservation districts, universities, water utilities, and the Quinnipiac River Watershed Association, to form the Quinnipiac River Watershed Partnership. As part of this initiative, the CT DEP awarded Section 319 funds to the University of Connecticut Cooperative Extension System (UConn/CES) to focus its Integrated Pest and Crop Management (IPM/ICM) technical assistance programs in the Quinnipiac River watershed (see **What is IPM/ICM**? sidebar).

The primary goal of the Quinnipiac River Watershed IPM/ICM Project was to reduce the use of pesticides and nutrients in agricultural crops, green industry (e.g. nurseries, greenhouses), and turfgrass areas, while maintaining or improving the quality of the crops and landscapes. This was accomplished by in-depth educational training programs that were offered to agricultural producers and green industry personnel

during the three growing seasons between 1997 and 1999. Educational programs were implemented for the following commodities: vegetables, fruits, greenhouses, turfgrass, nursery crops/landscapes, and field corn. Depending on the commodity, educational efforts consisted of on-site demonstration projects, individual and group training sessions, twilight meetings and season-long consultations. The key educational component was the Full-Season Field-Training program. UConn/CES staff provided clientele with in-field, hands-on IPM training throughout an entire growing season. Depending on the commodity, meetings were held weekly or as needed in the clients' fields, orchards, greenhouses or turfgrass sites. The intensive training was designed to provide individuals with the knowledge, methods, experience, and confidence needed to achieve continued effective IPM implementation.

The ICM aspects of the program provided recommendations for best management practices, particularly to reduce high environmental risk pesticides (e.g. those with high leaching potential) and excess nitrogen and other fertilizer applications. New Haven County Soil and Water Conservation District personnel conducted the soil sampling for the Presidedress Soil Nitrate Test (PSNT), also called the "June nitrate test." This soil test determines the level of nitrogen available in the soil for field corn and sweet corn. When recommendations are followed, excess nitrogen applications are reduced.

Results

From 1997-1999, 40 people representing 24 farms/greenhouses/nurseries, three turf management companies, the Town of North Haven (Departments of Public Works and Parks and Recreation) and Choate Rosemary Hall (a private school) participated in IPM/ICM training programs. Programs were offered for orchards, vegetables, greenhouses, field corn, turfgrass and nursery/landscaping. A total of 615 in-field IPM grower training sessions were conducted in the Quinnipiac River watershed during this period. On-site field training included topics such as: identification and monitoring of insect, disease and weed pests; identification and use of beneficial insects; implementation of cultural controls; use of economic/action thresholds; pest resistance and resistance management; pest management decision-making; proper selection of pesticides in relation to toxicity, leaching potential and compatibility with beneficial species; optimum treatment timing; and pesticide record-keeping.

As a result of these efforts, agricultural and green industry cooperators reduced pesticide applications by 63 percent (47,612 pounds of pesticide active ingredient) on 785 acres, nitrogen use by 32 percent (42,117 pounds) on 376 acres, and phosphate and potassium use by 47 percent (10,270 pounds each) on 79 acres in the watershed.

In addition to the in-depth field programs, UConn/CES staff conducted presentations at a variety of clientele meetings. A total of 11,240 people attended 144 presentations conducted by UConn IPM staff in 1997-1999. Forty-one of the presentations were given in the Quinnipiac River watershed area and were attended by 2,870 people.

What is IPM/ICM? Integrated pest management (IPM) is the coordinated use of pest and environmental information to design and implement pest control methods that are economically, environmentally and socially sound. IPM promotes prevention over remediation and advocates integration of at least two or more strategies to achieve long-term solutions. IPM uses methods such as crop or site scouting, pest trapping, action thresholds, pest resistant crop varieties, weather monitoring, cultural controls, biological controls, and precise timing and application of any needed pesticide treatments. With IPM, pesticides are used only when needed and when other control methods will not prevent economically important pest injuries. When pesticides are needed, the safest and most effective materials are selected. Integrated crop management (ICM) involves the application of these same concepts and practices to other aspects of crop and turf production, including nutrient management.

Future Plans

Growers and green industry operators in the Quinnipiac River watershed will need to continue IPM/ICM implementation on their own or with the help of private consultants. The UConn/CES continues to provide IPM/ICM technical assistance in other watersheds throughout the state based on the state's NPS Program priorities. Recent efforts by the UConn/CES focused on coastal watersheds in New Haven and Fairfield counties, while current and future programs will target other coastal watersheds in central Connecticut and the Thames River basin. Agricultural producers and turf managers throughout the state also will have access to IPM/ICM information through clientele meetings, newsletters, recorded "pest messages," and the UConn/CES IPM website .

Project Partners and Funding

This project was a combined effort by the UConn/CES IPM Program, the UConn Soil Testing Laboratory, the UConn Soils Specialist, the New Haven County Soil and Water Conservation District, the CT DEP, a private IPM consultant, and the 40 people from 29 farms/businesses/organizations who cooperated in the project. Funding was provided by the following organizations:

- $217,000 from EPA Clean Water Act Section 319 grants for 3 years
- $146,800 from the University of Connecticut Cooperative Extension System and Department of Plant Science for in-kind and technical services.

Section 319 of the Federal Clean Water act authorizes EPA to award grants to states and tribes to support their NPS management programs. The CTDEP passes through a portion of these funds to other state, regional and local government agency and non-government organization to implement programs and projects.

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UCONN, CT DEP and EPA websites
http://www.hort.uconn.edu./ipm/
http://dep.state.ct.us
http://www.epa.gov/owow/nps/education.html

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