

Water Pages

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Edition

A Quarterly Newsletter Produced by the Rutgers Cooperative Extension Water Resources Program: Creating Solutions for Water Quality Issues in New Jersey

Bee Meadow Pond Shoreline Restoration Project



Lakes and impoundments are often incorporated into public parks to provide recreational opportunities for local residents. While these amenities have been an attractive feature in our communities, they have been threatened by water quality concerns. Bee Meadow Pond, one of three ponds located in Bee Meadow Park in Hanover Township, NJ, typifies such problems. The three ponds, which total 22.5 acres of the 89-acre park, are stocked for fishing, but boating and swimming are not allowed. Originally clay quarries used for brick works, the ponds have become an important water feature in the community. While deeper and larger than many ponds in New Jersey, the pond ecosystem is not viable due to decreasing water quality.

Although many factors contribute to the lower water quality, nonpoint source pollution from stormwater runoff and the increase in the resident Canada goose population have been identified as the cause of the degradation. In a partnership between Rutgers Cooperative Extension's Water Resources Program and TRC Omni Environmental Corporation, this project intends to address the surrounding land use to accomplish an increase in the water quality of the pond. The project goals include reducing nonpoint source pollution by utilizing innovative best management practice techniques to demonstrate shoreline restoration and stabilization, transferring riparian restoration technology to municipalities and providing educational opportunities that will build an understanding for the need to protect water resources in the Whippany River Watershed.

The restoration site is located at the lowest of the three lakes on the property. The lower pond is crossed by high tension wires and borders a major roadway and access to the park. Previously mowed to the edge of the water, the low grasses attract the resident Canada goose population. These geese eat constantly and can deposit significant contributions of phosphorus and fecal coliform, which contribute to the deterioration of water quality in the pond. The restoration seeks to achieve a habitat that supports native flora and fauna. With an increased buffer, stormwater will be filtered and therefore will not carry additional nutrients and sediment directly into the pond.

An all day re-vegetation event took place on October 8th with Dr. Christopher Obropta, Program Associates Sandra Goodrow and Fran Varacalli, and graduate and undergraduate students alike participating



in the planting of over 1,000 plants to an area of Bee Meadow Pond that had previously been mowed to the edge or eaten by the resident Canada goose population. With beautiful weather dominating the day, both aquatic and wet meadow vegetation were planted and the entire area was then protected by a three feet high goose fence. This step was required to allow the vegetation to reach maturity. Later in the week, the area was seeded with wildflower seed mixes that will complement the area. Once this native vegetation has grown to its potential, it will serve to stabilize the shoreline, which will decrease soil erosion. This vegetated zone will also serve to discourage waterfowl from approaching the water and will serve to support desirable native flora and fauna.



Bee Meadow Shoreline Pond Shoreline Restoration Project (continued)

To promote the natural characteristics of the landscape, landscape architect Jeremiah Bergstrom, from TRC Omni Environmental Corporation, focused the plan to use primarily native vegetation. Wet meadow plugs such as Beeblossom (*Gaura sp.*), Bee Balm (*Monarda didyma*) and White Obedient Plant (*Physostegia virginiana*) were planted alongside Inkberry Holly (*Ilex glabra*) and Mountain Laurel (*Kalmia latifolia*). Aquatic plants such as Soft Rush (*Juncus effusus*) and Arrowhead (*Sagittaria sp.*) will stabilize the pond's edges and will serve as a valuable aquatic habitat. With the addition of this vegetation, the expected benefits to the soil include a loss of compaction and an increase in the ability to infiltrate precipitation.

The entire restoration project is composed of two phases. The native planting that took place on October 8th addressed the first phase by establishing a 50-foot wide riparian buffer along 300 feet of shoreline near the entrance to Bee Meadow Park. The second phase will involve regrading and stabilizing approximately 500 feet of shoreline adjacent to the park entrance road, which will include a walkway along the road and informal access points to the pond using natural boulders.

Bee Meadow Park provides opportunities for environmental education and outdoor enjoyment. The efforts of the restoration participants should contribute to the enhanced water quality within the watershed. For more information on this project, please contact Sandra Goodrow at sgoodrow@envsci.rutgers.edu.

Rutgers Students Participate in National Competition

This May 2005, a team of junior and senior undergraduate Bioresource Engineering, Landscape Architecture and Human Ecology students from Rutgers will head to Washington, DC to present a design project in the *P3 Award: A Student Design Competition for Sustainability*. The competition, initiated and funded by the United States Environmental Protection Agency (USEPA), encourages teams of college students to integrate the concept of sustainability into their designs and research. "P3" stands for people, prosperity, and the planet which are the three pillars of sustainability. This is a concept that is an extension of its predecessor, "P2," or pollution prevention.

The Rutgers design team of Mikael Avery, Karan Bandhari, David Berry, John Donnelly, and Medea Villere will be joined by 65 other teams of students from colleges around the country whose projects range in everything from innovative fuel cell designs to green roofs. The Rutgers team project, entitled "Engineered Stormwater

Management in Low-Income Urban Communities," was originally developed and proposed to the USEPA by Assistant Professors Christopher Obropta, Jake Woland and Karen O'Neil and graduate student Gregory Rusciano, who serve as project advisors to the team. It is now up to the student team members to bring the project to life by using the technical skills they learned over the past few years. "I am excited that my Bioresource Engineering students will work together with students of other disciplines for their design project," says Dr. Obropta. "It is very similar to what they will be experiencing once they begin working in the environmental field."

The Rutgers team will design structural stormwater best management practices (BMPs) for areas that are not traditionally considered ideal candidates for BMPs because of the constraints of an ultra-urban landscape. As a result of these constraints, inner-city residents are not able to experience the greening and beautification benefits that come with stormwater BMPs. The project will attempt to overcome this phenomenon through innovative design plans and outreach to local communities and stakeholders. The Seth Boyden Housing Complex, a low-income residential community in the Weequahic section of Newark, New Jersey is the focus of the design project.

For more information on this project, please contact Gregory Rusciano at greg.rusciano@rutgers.edu or visit <http://es.epa.gov/ncer/p3/index.html>.



Photo of a site considered for restoration in the courtyard surrounding the Seth Boyden Apartments in the Weequahic section of Newark, NJ.

LOG ON

The Water Resources Program is happy to share our new website. Keep checking for new updates and information. <http://water.rutgers.edu>

Three Mini-Grants Awarded through USDA-CSREES

Through the USDA-CSREES Region 2, Regional Water Quality Program, three mini-grant projects were awarded to Rutgers Cooperative Extension staff in January 2003. The program awarded \$5,000 for each project to promote collaboration on water quality research and extension among the land grant universities and their partners in USEPA Region 2: New York, New Jersey, Puerto Rico and the US Virgin Islands. As a partner in the Regional Water Quality Program, the Water Resources Program tracks the progress of these projects.

The first grant recipients, William J. Bamka, County Agricultural Agent of Burlington County, and Christopher C. Obropta, Ph.D., P.E., Assistant Extension Specialist, are conducting an examination of soil nutrient variability in horse pastures. There are a significant number of small horse farms in New Jersey, and under current regulations these farms are not required to have a nutrient management plan. There is concern that soil nutrient levels may accumulate to levels capable of contributing to non-point source pollution through surface runoff or leaching. This project will determine if soil nutrient composition in horse pastures varies by animal usage of pasture areas through soil sampling and tracking animal usage areas. Once this information is gathered, it will also be used to determine if trends exist that would suggest the targeting of best management practices (BMP's) to certain portions on the horse pastures. The Rutgers Equine Center horse farm is being used to conduct the research.

To date, horse pasture areas have been designated, and Global Positioning System (GPS) mapping of the pastures has formed the basis for soil sampling of the pastures. Individual soil samples were collected for nutrient analysis by the Rutgers Soil Testing Laboratory. Maps have been prepared to present the findings of these results. A comparison of the variation of traditional average representative soil sampling was conducted. Another round of soil samples were collected and analyzed to get an average representation of soil characteristics. Data from the two sampling methods have been analyzed, and map preparation is in progress. In addition, preliminary results have been presented as a poster at the Northeast Branch of the American Society of Agronomy's Annual meeting in July 2004 and also at the regional Extension equine pasture management classes held throughout the state.

The second grant was awarded to Jan Larson, Resource Management Program Associate of Ocean County, and Gef Flimlin, Marine Extension Agent of Ocean County, to implement the Nonpoint Education for Municipal Officials (NEMO) Program within the Barnegat Bay Watershed.

The heart of the NEMO PowerPoint education program is an analysis of impervious land cover, which is an indicator of the potential for water degradation. The NEMO program contrasts current levels of

impervious surfaces (e.g., roofs, asphalt, and concrete) with projected future levels of impervious surfaces estimated from a zoning-based "build-out" analysis. This gives local land use officials a look into the future of their town, not in conventional terms of population growth or building densities, but in terms of the health of their waterways and the Barnegat Bay. The project serves as a catalyst for change by enabling local officials to better incorporate water resource protection into their decision-making.

The grant money was used to deliver the NEMO PowerPoint education program to five municipalities in Barnegat Bay. The initial five presentations were well received and successful. As a result of the successful pilot demonstration program, the Ocean County Board of Chosen Freeholders subsequently committed funding for NEMO to be delivered to all the other municipalities within the watershed. During this same period, the Barnegat Bay National Estuary Program also funded Rutgers Institute for Marine and Coastal Studies (IMCS) to conduct municipal roundtable events to educate municipal officials and their professional staff about nonpoint source pollution and the Phase II regulations. Several roundtable events have been conducted, and the feedback from these events has assisted in the development of the NEMO program for Barnegat Bay Watershed. A collaborative partnership project has evolved between RCE Ocean County, Dr. Christopher C. Obropta, and the Center for Remote Sensing and Spatial Analysis (CRSSA) to provide a NEMO PowerPoint education program that includes Phase II. The target audience will include municipal decision-makers who have been unable to attend the roundtable events; traditionally these individuals have day jobs. During the next few months, the NEMO Demonstration Project Program will be delivered in the evening in each town hall, and it will include an extensive resource notebook for each town to help local officials educate the public about nonpoint source pollution. The presentations are expected to attract a large audience because the timing is coincident with implementation of the Phase II regulations, and towns are seeking cost-effective ways to fulfill the public outreach education requirement embodied in the regulations.

The third grant was awarded to David Lee, County Agricultural Agent of Salem County, Michael Westendorf, Associate Extension Specialist, Marie Banasiak, Programs Assistant of Salem County, and Rodger Jany, South Jersey Field Crop Coordinator, to research Animal Waste and Water Quality. The project has tested the nutrient levels and pathogen population in four critical areas of the impaired region of Salem River. Nutrient analyses were conducted on four participating bovine farms and four equine farms in this region of the watershed. The aggregate results from the nutrient analyses of the farms will be compared to the nutrient levels in the watershed. Educational meetings for agriculture landowners will be scheduled to present the results of the study. We plan to report more about this project in the next edition of Water Pages.

The projects are intended to conclude within the next six months, and the results will be posted on the Regional Water Quality web site at <http://rwqp.rutgers.edu/>. For more information about these projects, please contact Fran Varacalli at fvaracalli@envsci.rutgers.edu.

FACT SHEET UPDATE

The Water Resources Program has prepared the following Rutgers Cooperative Extension Fact Sheets:

- Point-Nonpoint Source Water Quality Trading Program for New Jersey, FS529*
- Drinking Water Standards, FS433*
- Drinking Water: What Tests Do I Need?, FS434*
- Where to Get Your Drinking Water Tested in New Jersey: A List of State Certified Water Testing Laboratories by County, FS343*

The Water Resources Program has a number of Fact Sheets currently under review for publication:

- New Jersey's Stormwater Regulations*
- Watershed Assessment*
- Onsite Wastewater Treatment Systems: The Maintenance and Care of Your Septic System*
- Onsite Wastewater Treatment Systems: Accessorizing Your Septic System*

Onsite Wastewater Treatment Systems: Alternative Technologies

Onsite Wastewater Treatment Systems: Five Levels of Protection

The following Fact Sheets are currently being prepared by the Water Resources Program for review:

Onsite Wastewater Treatment Systems: Operating Permits

Pond and Lake Management Part I: Dealing with Aquatic Plants

Pond and Lake Management Part II: Preventing and Managing Algal Blooms

Pond and Lake Management Part III: Reducing Shoreline Erosion and Removing Sediments

Pond and Lake Management Part IV: Controlling Geese and Other Pests

Breeding Grounds for the Mosquito: A New Understanding to an Old Problem

Municipal Stormwater Management Planning



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