

The RCE Water Resources Program is Coming to a County Office Near You



The Rutgers Cooperative Extension (RCE) Water Resources Program was created to help provide solutions to New Jersey's water resources problems. It is a multi-disciplinary program that integrates teaching, research, and extension and develops strong partnerships. As we enter our sixth year, this summer, we would like to take this opportunity to reach out to one of our most important clientele, the County Extension Agents. We hope to explore opportunities to work closely together and continue to fulfill the Land Grant Mission of providing solutions to the residents of New Jersey. This summer, Christopher Obropta, Ph.D., P.E. plans to visit each of the county offices. Dr. Obropta will meet with the County Faculty and Staff to discuss water related issues that they are facing. He will also explore opportunities for the RCE Water Resources Program to partner with county offices to address these issues.

Additionally, during these visits, Dr. Obropta will be discussing our on-going research and extension efforts in water resources. We hope this will spark some interest in the County Faculty and Staff on how we can work more closely together. Dr. Obropta will also discuss grant opportunities that we can pursue together to bring additional funds into the counties to enhance existing programming and/or create new programming. We believe that strong partnerships will be the key to obtaining a piece of the limited funds that are available for local, state, federal sources.

We are very excited about visiting the county offices. We hope these meetings will enhance collaboration between our program and the county offices. We believe in the Land Grant mission and believe that the Extension Specialists and County Agents need to work closely together to develop solutions to address our stakeholder needs.

Water Pages

Spring 2007
Edition

A Quarterly Newsletter Produced by the Rutgers Cooperative Research & Extension Water Resources Program: Creating Solutions for Water Quality Issues in NJ

RU Disconnected?

Urbanization of New Jersey has resulted in the replacement of undisturbed land and forests with impervious surfaces such as buildings, streets, sidewalks, and other hard surfaces. This has disrupted the natural hydrologic cycle, resulting in a decrease in stormwater infiltration and an increased runoff that causes stream bank erosion and scouring. This stormwater runoff also carries pollutants such as nutrients, pathogens, metals, total suspended solids and petroleum hydrocarbons to receiving waters of the state of New Jersey.

The Rutgers Cooperative Extension (RCE) Water Resources Program has developed a resource guide that discusses several strategies for addressing the impact of impervious surfaces, including disconnection, infiltration, and detention. This resource guide is intended to provide the reader with a general overview of these different strategies and to help the reader recognize opportunities that may exist on their property for implementing these different strategies. Finally, the resource guide directs the reader to a variety of resources on how to design and construct these practices.

The resource guide entitled "RU Disconnected? A Resource Guide to Addressing Stormwater Run Off from Impervious Surfaces" is now available on our website at www.water.rutgers.edu. The guide is currently in draft form and has been released for comment to stakeholders. Please feel free to download the guide. Comments and feedback are greatly appreciated. All comments and feedback should be sent to Christopher Obropta, Ph.D., P.E. at obropta@envsci.rutgers.edu.

Stream Visual Assessment Protocol (SVAP) Update

The Rutgers Cooperative Extension (RCE) Water Resources Program is pleased to announce the success of two recent training workshops that were held in March and May 2007 at the Holly House in New Brunswick.

Tim Dunne of the Natural Resources Conservation Service and co-author of the protocol was on-hand to provide participants with valuable information and a taste of field experience applying the SVAP tool. Tim Dunne, along with Katie Buckley, Greg Rusciano, Steve Yergeau, and Sean Walsh of the RCE Water Resources Program led field research teams to evaluate the condition of an aquatic ecosystem within a local stream.

SVAP was originally developed by the US Department of Agriculture and modified for New Jersey streams by Omni Environmental Corporation (Princeton, NJ) and RCE Water Resources Program. The SVAP tool assigns numeric value to stream conditions such as channel stability, riparian health, water appearance, nutrient enrichment, and access to floodplain. The information is also useful to prioritize streams for restoration, trash pick-ups, educational and awareness campaigns, and re-vegetation efforts.

To our knowledge, more than 700 stream reaches have been visually assessed with SVAP. Organization of data has been made easier with an online data entry system that can be imported to ArcGIS. This enables a spatial display of all SVAP data points, and allows for environmental data analysis. Watershed areas that have used SVAP to document stream conditions include Ramapo River, Pequannock River, Wanaque River, Pompton River, Strawbridge Lake Watershed, Pompeston River, Upper Salem River, Upper Cohansey River, Tenakill Brook, Musquapsink Brook, Musconetcong River, Neshanic, Raccoon Creek, Oldman's Creek, and others.

The workshops were made possible by RCE, New Jersey Sea Grant and the USDA CSREES Regional Water Coordination Program. For more information about this training program, please contact Greg Rusciano at greg.rusciano@rutgers.edu.

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Kicking Off Another Great Research Project with Funding from an USDA CSREES National Research Initiative Grant

The proposed study will use Microbial Source Tracking (MST) techniques to determine the relative contributions of small scale dairy operations to fecal contamination in small agricultural watersheds. Fecal pollution has the potential to negatively impact public health through the contamination of recreational, shellfish harvesting, and potable water supplies.

Often fecal coliform, a type of bacteria found in the intestinal tract of warm-blooded animals, is used as an indicator of fecal pollution. There are, however, uncertainties associated with this. Fecal coliform can be used to indicate the presence of fecal pollution but not identify its source(s). These sources can be, in general terms, stationary or transient within a given region. Stationary sources include migrating waterfowl such as Canada geese, Snow geese, and other wildlife. In many cases, transient sources cannot be quantified and are consequently not considered in Total Maximum Daily Load calculations.

Recently developed MST techniques have the ability to identify the origin of fecal pollution. The ability to differentiate between bovine and other sources will enable accurate predictions of loads to the river from small dairy operations and provide valuable information about the processes involved in the fate and transport of the pathogens contained in fecal contamination. Often agricultural sources are blamed for impairments of receiving waters this may be due to the fact that these sources are stationary and identifiable. Through this project the investigators hope to track the fecal contamination and determine the extent of the contribution of small scale dairy operations to fecal loads to the receiving waters of New Jersey.

Researchers from the Rutgers University Department of Environmental Sciences, the Rutgers University Biotech Center, and the Rutgers Cooperative Extension (RCE) Water Resources Program will build off of a recent project where Bacteroides were used to identify and quantify fecal sources in an agricultural watershed in southern New Jersey.



Snow Geese occupying a New Jersey farm

Notes from the Road: Stormwater Management in Your Backyard

Thanks to the financial support from the New Jersey Sea Grant and the Regional Water Quality Coordination Program, Christopher Obropta, Ph.D., P.E. (Assistant Extension Specialist in Water Resources) and Gregory Rusciano (Program Associate) have been busy in the last few months training new Master Gardeners and installing new demonstration Rain Gardens throughout New Jersey.

Dr. Obropta and Mr. Rusciano have been hitting the road to make sure that we address the needs of southern New Jersey. As such, we recently trained 50 Master Gardeners from Gloucester and Cumberland with our four hour training course entitled *Stormwater Management in Your Backyard*. The training program has already led to real results in the community. Master Gardeners of Gloucester County helped organize and conduct a watershed education program for about 357 third graders at Harrison Elementary School in Mullica Hill. Additionally, Master Gardeners of Cumberland County constructed a new demonstration rain garden at Wheaton Arts with our help. They are now ready to take on the responsibility of maintaining the site and coming up with rain garden designs for other areas within the county.

Dr. Obropta and Mr. Rusciano have also been busy in Monmouth and Union Counties. Over 70 Monmouth County Master Gardeners have been trained through the *Stormwater Management in Your Backyard* program. As a result, they have already prepared designs for a soon-to-be-constructed demonstration rain garden at the County Ag Building in Freehold. In Union County, Master Gardeners organized a demonstration rain garden construction project and workshop at the Springfield Municipal Building. The project was a success and involved additional participation from Mr. Rusciano, Madeline Flahive DiNardo (Union County Agricultural Agent, and the Springfield Public Works Department.

The photos and address of these new projects will be posted on the Water Resources website (<http://www.water.rutgers.edu>.) Real beneficial impacts in the local communities will continue to be the goal as we move forward. To contact the county office near you visit: <http://njaes.rutgers.edu/county/default.asp>.



Madeline DiNardo, Union County Agricultural Agent, and Greg Rusciano, Water Resources Program Associate, conduct a live rain garden demonstration workshop to an audience of about 20 outside the Springfield Municipal Annex in Springfield, NJ.

Regional Stormwater Management Plans for Troy Brook and Robinsons Branch-DONE!

The Rutgers Cooperative Extension (RCE) Water Resources Program has just completed regional stormwater management plans for the Troy Brook and Robinson's Branch Watersheds. The Troy Brook is a tributary to the Whippany River in Morris County. Its watershed is 16 square miles in size and is mainly comprised of portions of Parsippany-Troy Hills Township, Hanover Township, and the Borough of Mountain Lakes. The Robinson's Branch is a tributary to the Rahway River in Union and Middlesex Counties. Its watershed is 22 square miles in size and contains portions of ten municipalities including: Rahway, Westfield, Scotch Plains, Plainfield, Edison, Woodbridge, Clark, Cranford, Fanwood, and Garwood. Over the last three years the Water Resources Program has worked with local stakeholder groups in both watersheds to develop Regional Stormwater Management Plans that address the specific issues related to flooding, water quality and groundwater recharge. These plans contain a characterization and assessment of the watershed, which includes a review of existing water quality data, hydrologic and hydraulic modeling, stream visual assessments, a review of existing engineering drawings and studies, a Geographic Information System (GIS), and nonpoint source runoff modeling. Each plan also includes water quality and water quantity objectives. The plans then identify drainage area-specific design and performance standards that will meet objectives and provide a selection of stormwater management measures necessary to achieve the objectives. The plans also recommend educational programs for use within the watershed. Finally, the plans contain strategies for implementing and evaluating its overall effectiveness.

The substance of these Regional Stormwater Management Plans is contained in the selection of stormwater management measures to achieve the goals of the plan. This part of the plan has been divided into a Plan A and a Plan B. Plan A defines the regulatory actions that will be adopted into the Areawide Water Quality Plan and is entitled "Applicable Provisions." Plan B identifies and priorities specific management projects that are recommended for implementation to mitigate stormwater impacts and is entitled "Supplemental Provisions." Plan A contains new ordinances and changes to existing ordinances for each municipality to adopt. Plan A also requires municipalities to focus additional educational efforts on promoting groundwater recharge through the disconnection of impervious surfaces and infiltrating the runoff from the two-year design storm. Finally, Plan A requires the inspection and cleaning of key catch basins within each municipality.

Plan B recommends educational programming that can be used to achieve the water quality and water quantity objectives. Plan B also discusses the creation of stormwater utilities and how these utilities can be used in these watersheds. Pathogen track down and biological stressor identification are also recommended in Plan B. Finally, Plan B identifies specific projects within each municipality. Each project is ranked, the type of best management practice is described, the cost of each practice is presented, the pollutant load reduction that is expected to be achieved by each BMP is given, and the water quantity that each BMP is expected to recharge is provided. Additionally, the permitting needs are given for each recommended practice, as well as potential funding sources.

The recommendations made in Plan B are more unique to the specific watershed that the plan addresses. During the earlier stages of the Characterization and Assessment of these watersheds, issues that are specific to the watershed are identified and projects intended to mitigate their impact are recommended. These projects have been quantified as to their impact on water quality, water quantity and groundwater recharge. Other aspects of implementing these projects were also addressed, such as cost, permits required and objectives that are met when the project is implemented. These specific recommendations can be utilized by the municipalities within the watershed as mitigation projects, or they may use them as steps toward more effective management of stormwater in their watershed.

These Regional Stormwater Management Plans are very comprehensive and contain solutions to the problems that are being faced in each of these watersheds. The next step is for the Lead Planning Agencies for each plan (the Whippany River Watershed Management Group of the Troy Brook and the Union County Engineering Department for the Robinson's Branch) to formally submit these plans to NJDEP for adoption.

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