

# Water Pages

Spring 2005  
Edition

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



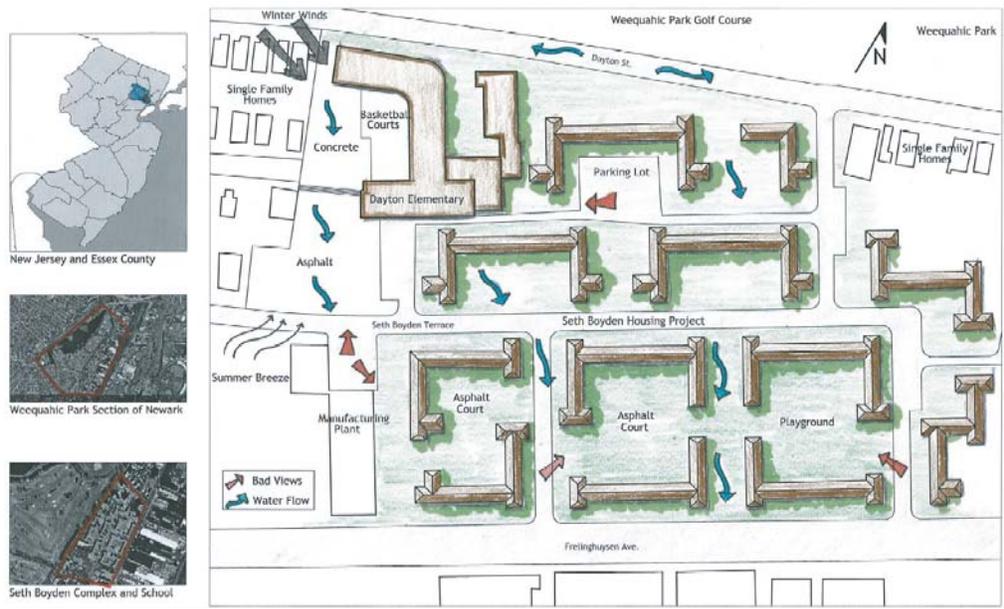
## RU Design Team Receives Honorable Mention in First Annual P3 Award Competition



On May 16, 2005, a team of junior and senior undergraduate Bioresource Engineering, Landscape Architecture and Human Ecology students from Rutgers went to Washington, DC to present their 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 Bhandari, David Berry, John Donnelly, Medea Villere, and Kristine Yates were 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'Neill and graduate student Gregory Rusciano, who served as project advisors to the team.

The student team members brought the project to life by using the technical skills they learned over the past few years. "I am excited that my Bioresource Engineering students had the opportunity to 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 designed 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

overcame this phenomenon through innovative design plans and outreach to local communities and stakeholders. The stakeholders included the Weequahic Park Association, Passaic Valley Sewerage Commissioners, and the Newark Public School District. The Dayton Elementary School and the Seth Boyden Housing Complex, a low-income residential community in the Weequahic section of Newark, New Jersey were the focus of the design project.



The first P3 award competition opened on May 16 with more than 400 university students from around the country, exhibiting their designs for a sustainable tomorrow. The competition culminated in an awards ceremony to highlight the six projects selected to receive the first annual P3 award, which features a \$75,000 project grant. Due to the large number of great projects, USEPA decided to award several honorable mentions, one of which Rutgers received. Although Rutgers University did not receive a cash award, hopes are high that funding will be made available by other sources to construct this very worthy project. For more information, go to "Senior Design" at [www.water.rutgers.edu](http://www.water.rutgers.edu) or contact Christopher Obropta at [obropta@envsci.rutgers.edu](mailto:obropta@envsci.rutgers.edu).

## Watershed Restoration Work in Two South Jersey Watersheds

The RCRE Water Resources Program has received funding from the New Jersey Department of Environmental Protection (NJDEP) to complete Watershed Restoration Plans for the Upper Salem River Watershed and the Upper Cohansey Watershed. Based upon the existing water quality monitoring data, the Upper Salem River is exceeding state water quality standards for phosphorus and fecal coliform and is therefore classified by the NJDEP as impaired. Additionally, the Upper Cohansey River is suffering from phosphorus, lead, pH, aquatic life and fecal coliform impairments. Ultimately, the goal of these projects is to improve the water quality of the Salem River and Cohansey River by developing Watershed Restoration Plans that when implemented, will bring the waterway into compliance with surface water quality standards for the pollutants listed above. These watershed-based plans will:

- identify the causes and sources that will need to be controlled to achieve the load reductions that are estimated as part of this watershed-based plan;
- estimate the load reductions expected for the management measures that are identified as part of this watershed-based plan;
- identify nonpoint pollution sources (NPS) management measures that will need to be implemented to achieve the load reductions estimated as part of this watershed-based plan;
- identify critical areas for the implementation of these NPS management measures;
- estimate the amounts of technical and financial assistance needed to implement the plan;
- identify potential sources of funding to implement each management measure that is identified in the plan;
- outline an informational/education plan to enhance public understanding of the project and encourage early and continued participation in implementing the plan;
- develop a ranking system to identify where resources should be targeted;
- provide a schedule for implementing the NPS management measures that are identified in the plan;
- outline a set of criteria that can be used to determine whether loading reductions are being achieved over time and if substantial progress is being made toward attaining water quality standards, and
- detail a monitoring component to evaluate the effectiveness of the implementation efforts over time.

To develop these plans, we are working closely with the Salem/Cumberland Soil Conservation District, RCRE of Salem County and RCRE of Cumberland County. Once completed, these plans will enable NJDEP and other granters to provide funds to these

watersheds to implement the plan recommendations. For more information about these projects, go to "Projects" at [www.water.rutgers.edu](http://www.water.rutgers.edu) or contact Christopher Obropta at [obropta@envsci.rutgers.edu](mailto:obropta@envsci.rutgers.edu).

## Teaching Middle School Students about Stormwater Management

Sean Walsh, a senior bioresource engineering student at Rutgers' Cook College teamed up with the Water Resources Program, Keith Thomas, a 7th - 8th grade science teacher at the Crossroads South Middle School in South Brunswick, and Betina Malhorta, a Rutgers University graduate student in Educational Psychology, to develop and evaluate the effectiveness of a stormwater management curriculum for middle school science classes. The stormwater management curriculum was centered on an established ecology unit taught at the school. By incorporating stormwater management into the ecology unit, a large number of students (i.e., approximately 130 students) and were provided with a unique educational experience.

The students were exposed to scientists and engineers currently working in the field of stormwater management via guest lectures about the basics of stormwater runoff and nonpoint source pollution and the physical, chemical, and biological monitoring of surface waters, as well as the design of best management practices to treat stormwater runoff. The students studied the biomass, the food web, and suspected chemical pollutants in a nearby stream, in the soils of the woods adjacent to the school property, and in the school's athletic fields as part of the unit.

Each of the five classes participating in the program was divided into six groups. Each group ultimately designed a rain garden to treat stormwater runoff, provide wildlife habitat for birds and butterflies, increase biomass, and enhance the aesthetics of the school property. The students presented their designs in class, and then the top ten



groups presented their designs to the Principal, Assistant Superintendent, and representatives from South Brunswick Township. The top ten designs were then incorporated into one rain garden that all five participating classes helped to

construct. At the conclusion of the unit, the students were issued a signed certificate thanking them for helping to design and construct stormwater controls at the South Brunswick Crossroads South Middle School and recognizing their successful completion of The Junior Environmental Stewards Program.

While the students were learning about ecology through stormwater management, Betina Malhorta, as part of her graduate work, was documenting the learning process of these 7th and 8th grade students to measure how well they learn using this constructivist model of instruction versus the more direct method of instruction given to the control group. Data were collected to determine the effectiveness of this unique educational experience. These data are currently being evaluated by Ms. Malhorta.



For more information about this project, please contact Christopher Obropta at [obropta@envsci.rutgers.edu](mailto:obropta@envsci.rutgers.edu).

### Third Annual Conference of the USDA-CSREES Water Coordination Program, May 24-25, 2005

Approximately 70 Land Grant University faculty members and administrators, management and staff from USEPA and other federal and state agencies and faculty from other academic institutions met at USEPA Region 2 in New York City for the annual conference of the USDA-CSREES Regional Water Coordination Program on May 24th and May 25, 2005. The purpose of the event was to explore water resource issues and workable solutions, drawing on the collective capabilities of the program partners and other involved organizations. The USDA-CSREES Regional Water Coordination Program is a partnership between Cornell University, Rutgers University, the University of Puerto Rico and the University of the Virgin Islands. Christopher Obropta, Josef Kardos, and Greg Rusciano from the Water Resources Program attended the conference.

The event kicked off with presentations by USEPA, USDA, and Rutgers University administration on the importance of the university and agency partnership to effectively manage water resources. This was followed by working sessions convened around the three initiatives of the regional program: Water Quality Trading, Onsite Wastewater Management, and Animal Waste Management. Presenters, panelists and the group at large discussed challenges, work to date and the next steps needed in each initiative area. Some of these action items/next steps are listed below.

#### Water Quality Trading

Region 2 has assembled a strong team of partners to

develop a water quality trading program for the Passaic River Basin. This group is currently waiting for a contract from USEPA to begin work on the Targeted Watershed Initiative Grant that they received last summer for the Passaic Project. There are also other on-going efforts in New Jersey to develop a point-nonpoint source trading project, possibly in the Raritan Basin. In New York, initial efforts have begun with the Upper Susquehanna Coalition and Cornell faculty to assess the feasibility of trading in the Upper Susquehanna Watershed and to support the Tributary Strategy currently under development as part of the Chesapeake Bay Program. In Puerto Rico, the PRASA Stewardship Program may uncover opportunities for trading to cost effectively improve water quality. The next steps are to continue to solicit funding for demonstration projects in the region. The expertise is clearly in place, but funding is required to move forward. Additionally, the Regional Project needs to continue to provide leadership in education of the stakeholders on water quality trading. Seminars and workshops will be offered in the future to share information and encourage efforts to assess trading feasibility in targeted geographic areas.

Additionally, the water quality trading initiative will benefit greatly from the work being conducted at Cornell and Rutgers in nutrient management and watershed management. As the Regional Project expands these focus areas over the next three years, a strong effort will be made to link the nutrient management and watershed management research to the water quality trading initiatives in the region.



#### Onsite Wastewater Management

As is the case with water quality trading, demonstration projects are needed to encourage stakeholders to move forward with onsite wastewater management programs. The Regional Project has conducted a strong educational effort throughout the Region including symposiums hosted with USEPA Region 2, training workshops, and educational seminars. Local government onsite management and education programs and the establishment of the New Jersey chapter of the National Onsite Wastewater Recycling Association (NOWRA) have been supported by the Regional Water Coordination Program. The next steps are to expand these educational efforts to reach more of the stakeholders and promote awareness of the onsite wastewater management issues. Additionally, the Land Grant Universities must continue to work with EPA and other stakeholders to develop demonstration projects within the region.

#### Animal Waste Management

Much effort in Region 2 has been made to help small farms address environmental issues, including animal waste management. The Regional Water Coordination Program has aided these efforts by funding

and helping to develop and promote demonstration projects in the region. Greater effort is needed to coordinate the work of the individual partners to develop a comprehensive program that can satisfy the needs of stakeholders in USEPA Region 2. The Land Grant Universities will develop extension workshops for animal waste management and deliver these workshops throughout the Region, including supporting USEPA Region 2 in hosting a staff training session for state and federal agency staff. Additionally, the University of Puerto Rico has begun developing an anaerobic digester demonstration site to test the feasibility of this manure management technology for smaller farms. Also, the University of Puerto Rico will work closely with the University of the Virgin Islands to develop a preliminary design for solid liquid separators in St. Thomas. These two demonstration projects will provide educational opportunities for the stakeholders in the islands.

For more information, please contact Christopher Obropta at [obropta@envsci.rutgers.edu](mailto:obropta@envsci.rutgers.edu) or visit <http://rwqp.rutgers.edu/>.



## MARK YOUR CALENDARS

July 22, 2005, 8:30 - 12:30 a.m., "Flood No More - A Symposium on Storm Water Management." Dr. Obropta will present "Regional Case Study: The Benefits of Working Together" along with other presenters focusing on stormwater management, flooding, and best management practices (BMPs). This symposium will take place at the Rutgers University EcoComplex facility and is sponsored by AMEC Earth & Environmental.

August 16, 2005, "Putting Communities in Charge: Stormwater" will be held at the Burlington County College Enterprise Center. This is the first of many seminars created by the NJ-EMO (Education for Municipal Officials) Network. Dr. Obropta will present "How can NJ-EMO help? Meeting Future Needs."

September 29th, 2005, MAC URISA Fall Meeting 2005 Meeting will take place at the Rutgers Eco-Complex in Bordentown, NJ. The topic of this meeting has yet to be decided.



Final View of the Tenafly Brook Stream Restoration Project at Tenafly Middle School, Tenafly, NJ, May 5, 2005.

This project was coordinated by the Watershed Management Area 5 (WMA 5) Watershed Ambassador. Native shrubs, trees, and ferns were planted by 120 students of the Tenafly Middle School, with help from RCRE Water Resources Program, RCRE Master Gardeners, the Hackensack Riverkeeper, and TRC Omni Environmental Corporation.



NJ AGRICULTURAL EXPERIMENT STATION  
**RUTGERS**  
COOPERATIVE RESEARCH & EXTENSION

RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY

88 Lipman Drive  
Martin Hall  
New Brunswick, NJ 08901-8525

Official Business

NONPROFIT ORG.  
U.S. POSTAGE  
PAID  
NEW BRUNSWICK, NJ  
PERMIT NO. 221