Peter L. Kallin, Ph.D., PWS, is a Senior Project Manager with over twenty five years experience in engineering and scientific project management. Dr. Kallin has a broad educational background with specific experience in physical oceanography, surface and groundwater hydrology, water quality modeling, contaminant fate and transport modeling, wetlands ecology and biogeochemistry, risk-based corrective action (RBCA), environmental impact assessment, and watershed management and restoration. He holds both a master's and doctorate in Civil and Environmental Engineering from Princeton University, two M.S degrees from the Naval Postgraduate School (Physical Oceanography and Systems Technology) and an A.B. (Biology) from Harvard. Additionally, he is a Distinguished Graduate of the Naval War College. Prior to joining Rutgers, Dr. Kallin was an environmental consultant at TRC Omni Environmental for seven years. Certified as a Professional Wetlands Scientist (PWS) by the Society of Wetlands Scientists, he designed and implemented numerous stormwater and wastewater treatment wetland projects, as well as other wetland and watershed restoration projects. He has been active in watershed management in both PA and NJ and has worked with numerous grassroots watershed associations, providing training in various aspects of watershed monitoring and assessment.

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CONFERENCE ANNOUCEMENT

The annual conference for the Regional Water Quality Coordination Project for New York, New Jersey, Puerto Rico and the Virgin Islands will be held in San Juan, Puerto Rico on June 15th and 16th.

Presentations will cover regional project initiatives with particular emphasis on animal waste management for small farms. Field trips will also be conducted.

For more information and to make travel arrangements, contact Yamil Toro at 787-767-8281.

The Water Resources Program stores presentations and project updates at the following website:

http://www.water.rutgers.edu

The EPA publishes a periodic report on the condition of the water-related environment, control of NPS, and the ecological management and restoration of watersheds:

http://www.epa.gov/OWOW/info/NewsNotes/

NJ AGRICULTURAL EXPERIMENT STATION
RUTGERS
COOPERATIVE RESEARCH & EXTENSION
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Water Pages

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

Spring 2006 Edition

Agricultural Water Security: A Nursey Production Case Study

NEW JERSEY AGRICULTURAL EXPERIMENT STATION
RUTGERS COOPERATIVE RESEARCH & EXTENSION

Agricultural water security (AWS) is described as the need to maintain adequate water supplies to meet the food and fiber needs of the expanding population by maximizing the efficiency of water use by farmers, ranchers, and rural and urbanizing communities (Dobrowolski and O'Neill, 2005). In September of 2004, the USDA's Deputy Undersecretary for Research, Education, and Economics (REE) hosted the Agricultural Water Security Listening Session. At this session, over 90 water resource experts from the public and private sectors participated in targeted sessions designed to identify strengths, opportunities, and gaps in current knowledge in the following key areas:

- Irrigation efficiency and management,
- Drought mitigation and preparedness,
- General water conservation,
- Rural/urban water reuse,
- Water marketing, distribution and allocation, and
- Biotechnology.

The results of this listening session were recently summarized and published by the USDA REE (available at: *www.csrees.usda.gov/nea/nre/pdfs/ree_water_security.pdf*).

To address some of the gaps identified at this listening session, the USDA's Cooperative State Research, Education, and Extension Service (CSREES) has recently established an Agricultural Water Security Initiative to create and enhance research, education, and extension programs funded by CSREES. This initiative is described in the CSREES Agricultural Water Security White Paper available at: (*www.csrees.usda.gov/newsroom/white_papers/ag_water_security.pdf*).

The AWS Initiative is intended to move the country towards a sustainable water use scenario by using a holistic, watershed/aquifer-based approach to issues in water supply, allocation, and distribution by taking advantage of CSREES' unique relationship with the existing infrastructure of the university system and the diversity of its research, education and extension missions.

Specific priority areas that CSREES will focus on are: Exploring new technologies and systems for the use of recycled/reuse water in agricultural, rural, and urbanizing watersheds, probing the human, social, and economic dimensions of agricultural water security (including water markets) with a focus on adoption-outreach and behavioral change, and discovering biotechnological improvements in water use efficiency of crop and horticultural plants to achieve greater "crop per drop."

The Rutgers Cooperative Research & Extension (RCRE) Water Resources Program will continue to pursue programs in these areas. The RCRE Water Resources Program recently participated in a listening session at the 2006 Emma Lausten Horticultural Symposium hosted at the Rutgers EcoComplex. Christopher C. Obropta, Ph.D., P.E. was part of a panel of experts that discussed concerns raised by New Jersey farmers and growers regarding water issues in agriculture. The RCRE Water Resources Program will be working to develop creative, cost effective solutions to the issues raised.

Specifically, one such innovation that the RCRE Water Resources Program has been involved in over the past two years is the tailwater recovery system. A tailwater recovery system is a planned irrigation system in which all facilities are utilized for the collection, storage, and transportation of irrigation tailwater for reuse (NRCS, 2001). In New Jersey, tailwater recovery systems are predominantly in use at nursery production facilities. Nursery production is now the fastest growing agricultural industry in New Jersey (USDA, 2005). Therefore, as the agricultural landscape changes in the state, so must the strategies to increase water use efficiency and to decrease environmental impact. The tailwater recovery system in New Jersey is now saving nursery growers millions of gallons of irrigation water each year. Requiring little maintenance, the tailwater recovery system is a positive step in water use efficiency and conservation. Over the past year, the RCRE Water Resources Program has modified the typical tailwater recovery system to include a bioretention pond. This bioretention pond works to remove nutrients from storm-related overflows through settling and plant uptake. With the addition of the bioretention system, the RCRE Water Resources Program has further decreased any potentially negative impact from the use of this reuse system. This effort has included the participation of several agencies including the NJDEP, the Cumberland-Salem Conservation District, and RCRE of Cumberland County and is a credit to the nursery grower's willingness to be proactive in water conservation.

For more information about this project, please contact Katie Buckley at *kbuckley@envsci.rutgers.edu* or Peter Kallin at *pkallin@aesop.rutgers.edu*.

Photo: Tailwater recovery pond.

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RUTGERS COOK COLLEGE

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

Announcing the Restore-a-Waterway Program

The Rutgers Cooperative Research & Extension (RCRE) Water Resources Program is pleased to announce its new technical service provider program Restore-a-Waterway. The program is jointly funded by the United States Department of Agriculture's (USDA) Cooperative State Research Education and Extension Service (CSREES), and the New Jersey Agricultural Experiment Station. The goal of the program is to provide technical assistance to citizen groups wanting to take action in restoring the quality of a waterway.

Citizen groups play an important role in the overall effort to improve New Jersey's water resources. The passion of citizens, which develops from their personal connection with their local environment, is what often drives the momentum towards improving waterways. However, some groups require assistance to bridge the gap between their current resources and those required to achieve a particular goal. Restore-a-Waterway can provide this assistance in a variety of ways depending upon the needs of a particular group, including:

- physical waterway characterizations,
- the development and implementation of quality assurance/quality control, chemical and biological monitoring plans,
- interpretation and analysis of data,
- identifying problems and sources of those problems within a watershed,
- designing solutions to mitigate the identified problems,
- securing funds to implement the designed solutions,
- implementing the solutions.

In addition to offering workshops to help educate citizen groups on these technical issues, Restore-a-Waterway will focus on working directly with groups to address their specific needs. The program recognizes that some citizen action groups may need all of these services while others may only need some of them. Many watershed groups within New Jersey have been conducting successful water monitoring programs for years. On the other hand, some might not be monitoring in a way that is useful for regulatory agencies, which is an important step towards actualizing solutions. The development of a quality assurance/quality control plan will result in accurate data that can be effectively used by regulatory decision makers. The implementation of solutions after monitoring and analysis is an important focus of this program. This often becomes the biggest challenge for citizen action groups, despite its significance to an improved environment.

The RCRE Water Resources Program has been providing technical assistance to several citizen action groups over the past three years: The Pompeston Creek Watershed Association, the Moorestown Environmental Advisory Committee, and the Rainbow Lakes Association. The hiring of new staff has made it possible to expand this effort by creating the Restore-a-Waterway program. If you are interested in participating in Restore-a-Waterway, please feel free to contact *Gregory Rusciano (greg.rusciano@rutgers.edu).*

Photo: A stream bank restoration for Third River in Bloomfield, NJ

Rutgers Leads the Way for New Jersey: Water Quality Trading in the Passaic

Approximately ¼ of New Jersey's population (i.e., two million people) lives in the non-tidal portion of the Passaic River basin. The watershed, which includes the Wanaque Reservoir, is a major source of drinking water for New Jersey residents both inside and outside the basin. As a result of excessive in-stream concentrations of total phosphorus, the New Jersey Department of Environmental Protection (NJDEP) is developing a Total Maximum Daily Load (TMDL) which will set phosphorus load allocations for point and nonpoint sources in the watershed. The most immediate impacts will fall on 24 of the largest wastewater treatment plants (WWTPs) in the basin. The traditional regulatory approach towards implementing the TMDL could require each affected WWTP to upgrade its phosphorus removal process to meet its target, which could be very expensive for the WWTPs involved.

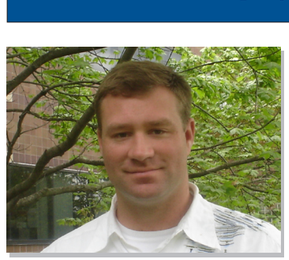
Water quality trading offers a cost-effective method to implement the TMDL. Trading is a watershed-based and market-based approach to meeting and exceeding water quality goals. Trading is based on the premise that sources in a watershed can face very different costs to control the same pollutant. The sources can either discharge under their limit and sell their 'credits,' or discharge over their limit and purchase 'credits.' The net effect will be to improve water quality in the watershed at a lower cost than making each individual pollutant source upgrade its equipment to comply.

Rutgers University is the recipient of funding from the USEPA Targeted Watershed Grant Program to develop a water quality trading program to implement the phosphorus TMDL for the non-tidal Passaic River watershed. The situation in the non-tidal Passaic River basin is a classic example of a watershed scenario where trading makes sense. Some WWTPs will find it more affordable to meet the anticipated phosphorus reductions than others. Moreover, the NJDEP and the WWTPs are open to trading as a win-win solution that will assuage a potentially conflict-ridden command and control approach.

In January 2006, a meeting of the project partners was held at Rutgers to discuss key science, policy, and economic issues associated with the project. Participants shared their knowledge about the watershed, examples of other water quality trading programs, wastewater treatment processes, water quality modeling, environmental economics, and environmental law. The next step is to identify and evaluate various trading scenarios. In parallel, a trading framework and permitting structure will be developed to ensure trades are made efficiently and with proper accountability.

The potential rewards are abundant because this is the first trading project in the state that will implement a TMDL. A successful trading program in the non-tidal Passaic River basin will serve as a model for other watersheds struggling to implement TMDLs. All of New Jersey stands to benefit as Rutgers leads the way with water quality trading in the non-tidal Passaic River basin. For more information on the Passaic trading project, go to *http://www.water.rutgers.edu/Projects/trading/WQTrading.htm.*

New Employees Join Team



Robert Miskewitz, Ph.D., a Senior Project Manager, has a background in water quality modeling, hydrodynamic modeling, fate and transport of airborne and aquatic environmental contaminants, statistical modeling of environmental systems, and contaminated sediment treatment technologies. He has Ph.D. and M.S. degrees in Environmental Engineering from Stevens Institute of Technology and a B.S. in Ecology from the Pennsylvania State University. Dr. Miskewitz gained experience in contaminated site assessment and hazardous waste treatment while working as a consultant for a private environmental consulting firm for three years. He then served as a Research Engineer at Stevens for five years. During this time he worked on several projects that investigated the fate and transport of water, sediments, and contaminants in the NY/NJ Harbor Estuary, effluent dilution from various coastal and estuarine outfalls, the effects of tidal marshland on the structure of the tides and tidal currents in the Hackensack Meadowlands, and fluxes of PCBs to the atmosphere from stabilized dredged sediment. He was also an instructor for E243 Probability and Statistics for Engineers at Stevens for three semesters.

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Gregory Rusciano received a B.S. in Bioresource Engineering (dual-degree, five-year) from Rutgers, The State University of New Jersey in 2004. He received his M.S. in Bioresource Engineering from Rutgers in 2006 with research focusing on watershed management planning and the performance efficiency of bioretention systems in removing fecal indicator bacteria from stormwater. Prior to becoming a Program Associate with the Water Resources Program, Gregory served as a Graduate Assistant with the Water Resources Program. He has assisted in several water resources related projects, including the analysis of water quality trading in the Raritan River Basin. Gregory also has served as a Student Intern with the Solid Waste Policy Group at Rutgers, assisting with projects in hazardous waste management and green purchasing. He also has experience working as an environmental field technician with a private consulting firm, assisting with groundwater remediation projects. As a Program Associate with the Water Resources Program, Gregory will be coordinating working groups in animal waste management on small farms, onsite wastewater treatment systems management, nutrient management, and watershed management across Region 2 (New Jersey, New York, Puerto Rico, and the US Virgin Islands), and he will be working with the Assistant Extension Specialist in Water Resources to build a strong integrated watershed management/water reuse/agricultural water management program in New Jersey.

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Jeffrey Potent, an Assistant Extension Specialist, serves as the USEPA Region 2/Land Grant University Liaison. Mr. Potent facilitates communication and collaboration among the four Land Grant Universities in Region 2 (i.e., Rutgers, Cornell, University of Puerto Rico, University of the Virgin Islands). From 2001 through 2005, Mr. Potent also served as the Regional Coordinator of the USDA Cooperative State Research, Education and Extension Service (CSREES), Regional Water Quality Program. For ten years he served with the New York City Department of Environmental Protection as the Pollution Prevention Program Manager. Mr. Potent was previously the Assistant Manger for International Telecommunications Planning with the ITT Corporation, and he holds a Masters Degree in Public Policy from the New School University.

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