



Success Story – *Stormwater Management in Your Backyard*

Situation

In New Jersey, the Department of Environmental Protection (NJDEP) has recently released new stormwater management and permitting regulations. In the past, NJDEP's stormwater management rules only concentrated on controlling flooding from large storm events. These new rules focus not only on managing water quantity, but also on water quality and groundwater recharge. Although these new rules will significantly change the way New Jersey manages its stormwater runoff, the rules only apply to new development. This leaves the stormwater runoff impacts from existing developments to only be addressed through the new municipal stormwater permit rules and the implementation plans for the Total Maximum Daily Loads (TMDLs). The result will more than likely be voluntary programs that may have little hope for success unless significant resources can be allocated to support public outreach and education programs centered on progressive stormwater management at the community level. The Regional Water Coordination Program (RWCP), as part of its Watershed Management Initiative, has developed education and extension programs to address this issue. As a result of these programs, research needs have been identified, and projects have been initiated.

Actions

The Rutgers Cooperative Extension (RCE) Water Resources Program (WRP) is currently leading an effort to promote homeowner stewardship of sustainable practices and pollution prevention through its [*Stormwater Management in Your Backyard*](#) program. The following actions have been taken since the inception of the program in 2003:

- Outreach education materials were developed to promote backyard stormwater management statewide. The materials include a four lecture PowerPoint presentation, an abbreviated one lecture PowerPoint presentation, [*An Introduction to Rain Gardens*](#) leaflet which was originally developed by Cornell Cooperative Extension and adapted for use in New Jersey by the WRP, a [fact sheet](#) and a [design manual](#).
- The program was presented at the 8th Annual NPS Conference in the US Virgin Islands, and a poster was presented at the USDA CSREES Annual Water Quality Conference in Clearwater, Florida.
- The WRP has provided [*Stormwater Management in Your Backyard*](#) training to groups of Master Gardeners and/or Environmental Stewards in Middlesex County, Essex County, Cumberland County, the Rutgers Ecocomplex, and Duke Farms. Additionally, presentations have been given to landscapers, nursery growers, park and ground maintenance personnel on rain gardens, both as marketing opportunities and a linkage between aesthetics and newly imposed stormwater management requirements.

- The program was also adapted for incorporation into a middle school ecology curriculum. An eight week pilot program was conducted at the South Brunswick Middle School in New Jersey where 125 students were educated on the benefits of rain gardens. The students worked in design teams of four to five students to design rain gardens to treat runoff from various locations on the school property. At the end of the eight week program, the WRP program worked with the students to implement several of their designs. Furthermore, Betina Malhotra, a Rutgers Graduate School of Education Ph.D. candidate, conducted pre and post testing of the students to document their increase in science content knowledge and scientific reasoning abilities as part of the program.
- Thirty-one newly trained Union County Master Gardeners installed five demonstration rain gardens in public areas under the supervision of the RCE of Union County and the WRP. The rain garden projects involved close collaboration with county, municipal and school officials. They were installed in response to a recently developed regional stormwater management plan for the Robinson's Branch watershed by the WRP.
- The following new developments are currently underway in Union County:
 - An educational program about rain gardens for elementary school students will be offered at an elementary school and public library.
 - Evening educational programs for adults at the demonstration sites.
 - Educational events with demonstration site administrators (e.g., library manager, school principal, etc.).
 - Publicize the educational events through press coverage.
 - An educational poster about rain garden construction to be displayed at rain garden sites.
- The WRP provided technical assistance for the construction and maintenance of a demonstration rain garden in Middlesex County, New Jersey. The demonstration will manage water from a county building and will provide outreach education to local residents who visit the adjacent park and E.A.R.T.H. Education Center. This action was conducted in close collaboration with the RCE of Middlesex County with hopes that the programs underway in Union County will be adopted by Middlesex County.
- The WRP has provided technical assistance to a municipal consultant for several template rain garden designs. Many municipalities are drafting ordinances requiring backyard stormwater management to address state permit requirements.
- Bioretention system (or rain garden) design has been incorporated into the senior design class for Bioresource Engineering at Rutgers University. The class of 2006 developed rain garden designs for Highland Park as part of their sustainable community initiative. These designs were presented in EPA's P3 Design Competition in Washington DC in May 2006.
- Several research projects have spun out of the educational and extension program including laboratory experiments on the efficiency of bioretention systems to removal fecal coliform and experiments on the impact of compaction on pollutant removal abilities of bioretention systems.
- Two significant partnerships have been formed as part of this initiative. The USEPA Office of Research Development in Edison, New Jersey has entered into a Memorandum of Understanding with the WRP to have students work with USEPA on rain garden experiments and share resources. The second partnership is with New Jersey Sea Grant to help WRP expand our education and extension efforts on rain gardens throughout the state.

Impact

Over 260 landscapers, nursery operators, and parks/ground maintenance personnel were educated as part of the program. Additionally, over 180 Master Gardeners and Environmental Stewards were trained on the use and construction of rain gardens. The immediate result of this training was the construction of five demonstration gardens in Union County and one in Middlesex County. Based on New Jersey rainfall data, it is estimated that the five rain gardens in Union County will manage approximately 125,000 gallons of stormwater runoff per year. The WRP continues to be approached on a regular basis to assist various groups with rain garden programs. The training of these volunteers will allow us to reach more homeowners and have more of an impact. Furthermore, 125 middle school students were educated on the issues related to stormwater management and the use of rain gardens to mitigate stormwater runoff problems.

Regarding the research component of this initiative, Betina Malhotra received her doctorate in Education from Rutgers in May 2006, and Gregory Rusciano also received his master's degree in Bioresource Engineering in May 2006. James Moore is currently completing his master's thesis on his compaction work, and new laboratory experiments are scheduled to begin in August 2006.