Report for 2001CT601B: Rain Garden Demonstration and Workshop

There are no reported publications resulting from this project.

Report Follows:

1. Project number.

2. Title. **Rain Garden Demonstration & Workshop.**

3. Focus categories. EDU, NPP, SW, TRT, WQL, WQN

4. Key words. Storm water management, education, nonpoint source pollution, rain garden.

5. Duration (month/year to month/year). 3/01-2/02

6. Federal Funds. $7,000.

7. Non-Federal Funds. $13,852.

8. Principal investigator's names and university. John C. Clausen, John Alexopoulos, Laurie Giannotti, Michael Dietz, University of Connecticut

9. Congressional district. Second

10. Statement of critical regional or State water problems. In the U.S., nonpoint sources of pollution have been reported to result in use impairments in 37% of the rivers, 40% of the lakes, and 39% of estuary areas (U.S. EPA, 1998). Nationally, urban runoff and storm sewers are responsible for 13% of impaired rivers, 21% of impaired lakes, and 46% of impaired estuaries. In Connecticut, 28% of rivers, 36% of lake areas and 53% of estuary areas do not support drinking, fishing, and swimming uses. The primary causes of impairments in Connecticut are bacteria, PCBs, metals, oxygen demanding wastes, ammonia, nutrients, and habitat alteration (U.S. EPA, 1998). Sources of these pollutants include urban runoff and storm sewers, industrial discharges, municipal sewage treatment plants, and in-place contaminants. Hypoxia is a widespread problem in Long Island Sound (CT DEP, 1989; LISS, 1990). The Long Island Sound is a critical resource to the State which provides annually, a fishery for one million anglers and recreation for 20 million beach goers (Altobello, 1989).

Several practices have been recommended to reduce pollutants in storm water runoff (U.S. EPA, 1993). One such practice is the use of a rain garden, which is a small, shallow depression intended to treat the first flush of runoff from impervious surfaces (U.S. EPA, 1999). Although this practice is in use elsewhere, planning officials and design engineers in Connecticut are not aware of how to design and apply rain gardens to new and existing urban and suburban developments.

11. Statement of results or benefits. The proposed workshop will transfer relatively recent technology to an audience in Connecticut that is primarily responsible for planning and regulating the treatment of storm water runoff. This project will also support development of workshop materials and create a demonstration site at a central Connecticut location. The rain garden has numerous applications as a low technology best management practice in Connecticut and elsewhere.

12. Nature, scope, and objectives of the research.

The overall objective is to develop and conduct a one-day workshop on the design and construction of rain gardens for storm water treatment. A secondary objective would be to construct a demonstration rain garden at the Connecticut Cooperative Extension System Center in Haddam, CT

This workshop is needed because engineers and local officials are unaware of how to design and construct rain gardens and where they are applicable. The actual construction of a rain garden will give a demonstration site for future workshops.

13. Methods, procedures, and facilities.

A "rain garden" is a shallow depression intended to treat the first flush of runoff from impervious surfaces. Larger flows are diverted through or around the rain garden. This urban best management practice was developed in Maryland to provide bioretention of storm water pollutants (Prince George's County, 1993). Biological activity hastens a break down of contaminants into forms that selected herbs, shrubs and trees can take up. By diverting the first flush of contaminated runoff to a rain garden, fewer contaminants enter the storm water system, and the load to local water bodies can be lessened. An additional and important benefit of a rain garden is that 5% to 7% of runoff is infiltrated into the soil rather than contributing to overland flow.

A typical rain garden would be constructed to accept roof or parking lot runoff. A rain garden is usually a maximum of 15 cm (6 in) deep for ponding, has a sand bed over which is placed topsoil and mulch, and is planted with vegetation that can tolerate temporary standing water and fluctuating water levels. The size of a rain garden is determined as 5% to 7% of the drainage area times the "C" coefficient from the rational equation. The coefficient "C" varies with land use and soil types (Chow, 1964). For example, the "C" for asphalt ranges from 0.70 to 0.95, whereas the "C" for lawns ranges from 0.05 to 0.35, depending on the soil type and the slope. Most commonly, rain gardens have been applied in traffic islands in parking lots and on individual lots in residential neighborhoods.

A one-day workshop will be developed. The targeted audience will be local planning officials and engineering consulting firms. Instructors for the workshop will include the principal investigators as well as outside experts in rain garden design. A draft outline for the workshop is given below.

A workbook will be developed for workshop attendees that will assist participants in designing a rain garden with a focus on Connecticut conditions. The workshop will be conducted at the Haddam Cooperative Extension Center. The Center has a conference facility that can hold up to 155 attendees. Lunch can also be served in the conference facility.

A rain garden will be designed by the principal investigators for application at the Haddam Cooperative Extension Center. The rain garden will be mostly constructed prior to the workshop by a local contractor. However the actual planting of the rain garden will be completed by workshop participants at the end of the workshop.

13. Summary of the Information Transfer Activity.

The "Rain Garden Workshop" was held on October 3, 2002, in Haddam Connecticut. Approximately 63 people attended. The workshop consisted of six presentations related to the

purpose and design of rain gardens, and concluded with a demonstration. Handouts provided to the attendees included:

From the Prince George's County Department of Environmental Resources, Maryland:

* "Rain Gardens: The Natural Solution"
* "How Does Your Garden Grow?"
* "The Bioretention Manual"

From the University of Connecticut, Middlesex County Cooperative Extension Center:

* "Planting Design Suggestions"

The Workshop program is shown on the following page.

Rain Garden Workshop - October 3, 2002 - Haddam, Connecticut

Final Schedule

9:00 Introduction and get acquainted
Jack Clausen, Associate Professor
University of Connecticut
Department of Natural Resources Management and Engineering 1376 Storrs Rd. U-87, Storrs, CT 06269-4087
(860) 486-0139
john.clausen@uconn.edu

9:15 Introduction to rain gardens and bioretention
Derek Winogradoff, project manager
Prince George's County
Department of Environmental Resources
9400 Peppercorn Place, Suite 610
Largo, MD 20774
(301) 833-5903
dawinogradoff@co.pg.md.us

10:15 NEMO
Laurie Giannotti, NEMO Project CT Coordinator
Middlesex Extension Center
1066 Saybrook Rd. PO Box 70, Haddam, CT 06438
(860) 345-4511
laurie.gianotti@uconn.edu

10:30 Break

11:00 Rain Garden Design I - hydrology, size and location
Jack Clausen, University of Connecticut

12:00 Lunch (Provided)

1:00 Rain Garden Design II - Soils
Lisa Krall, Soil Scientist
USDA - Natural Resources Conservation Service
24 Hyde Ave. Vernon CT 06066
(860) 785-3881 x. 110
lisa.krall@ct.usda.gov

1:30 Rain Garden Design III - Plants
John Alexopoulos, Associate Professor
University of Connecticut
Department of Plant Science
1376 Storrs Rd, U-67, Storrs, CT 06269-4067
(860)486-1941

2:00 Rain Garden Design IV - Construction supervision
Team

2:30 Planting the Rain Garden