

Turning the Tide

on runoff pollution

Winter 2008

SC DHEC's Bureau of Water

Implementing LID Practices in Coastal South Carolina: The Oak Terrace Preserve Research Project

By Lisa Vandiver, USC / NOAA- Research Assistant

Low Impact Development (LID) practices (e.g. rain gardens, pervious concrete, and bioretention swales) are the new alternative to stormwater management techniques such as detention ponds; however, little is known about their efficiency along the Southeast coast. Subsequently developers and engineers are hesitant to implement their use as a management technique. SC Sea Grant Consortium and Hollings Marine Laboratory have provided funding for researchers from the University of South Carolina to evaluate the implementation of LID practices in a development (Oak Terrace Preserve) in North Charleston. Oak Terrace Preserve is a redevelopment project initiated by the City of North Charleston and the Noisette Company that is using a network of LID practices to promote the in-

filtration of stormwater, recharge groundwater sources, and retain pollutants. A perforated piping system connects all of the LID systems throughout the community which treats runoff from the homesites

LID practices, and LID maintenance requirements. This information will be disseminated among developers, engineers, planners, decision-makers, coastal resource managers, homeowners, and scientists to provide information that may assist in the implementation of LID practices in coastal communities.

Currently, researchers are utilizing groundwater wells, auto-samplers, and flow gages to characterize stormwater runoff during rain events to evaluate the performance and effectiveness of the LID systems. Demonstration workshops are slated for early 2008 to educate developers and engineers on LID installation techniques. Factsheets are also being developed to educate homeowners on the purpose and maintenance requirements of LID techniques which will assist in setting up a maintenance program to assure the longevity of LID practices.

For more information, contact Lisa Vandiver at Lisa.Vandiver@noaa.gov. You can also visit the Noisette website on the Oak Terrace Project at www.oakterracepreservesc.com. Research information can be found on SC Sea Grant's website at www.scseagrants.org.



This illustration is not to be used or reproduced without the permission of the Noisette Company.
LID practices are incorporated into the design of the property.

and the roads, while also providing an overflow system to prevent flooding during larger rain events. Rain gardens and pervious alleys will receive runoff from the homesites. Bioretention swales will primarily receive runoff from the roads and are designed to retain the first two inches of runoff. Any overflow from the bioretention swales will flow to pocket parks.

The research will provide a comprehensive analysis of the LID practices within Oak Terrace Preserve including: LID design, performance and effectiveness, economic comparison, obstacles to permitting, design, installation of the

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By Karen Fuss, Coastal Carolina University- Environmental Educator

Currently in its third year, the Coastal Waccamaw Stormwater Education Consortium has enjoyed success in helping northeastern South Carolina's small municipal separate storm sewer systems (SMS4s) meet their National Pollutant Discharge Elimination System (NPDES) Phase II permit requirements for public education & outreach (minimum control measure 1) and public involvement & participation (minimum control measure 2). The six regional agencies that jointly serve as core education providers to the member SMS4s include: Clemson University and their Carolina Clear Program; Coastal Carolina University's Waccamaw Watershed Academy; Murrells Inlet 2007; North Inlet-Winyah Bay National Estuarine Research Reserve Coastal Training Program and Community Education Program; South Carolina Sea Grant Consortium's Extension Program; and the Waccamaw Riverkeeper Program. Member SMS4 communities include: City of Conway, City of Myrtle Beach, City of North Myrtle Beach, Georgetown County, Horry County, and Town of Surfside Beach with Towns of Atlantic Beach and Briarcliffe Acres pending membership.

Public education and outreach on stormwater impacts is performed by the education providers. Custom-

ized stormwater education workshops are developed and presented for elected and appointed governmental officials and their staff as well as programs for the general public, the majority encompassing neighborhood associations. These programs focus on stormwater issues and solutions

CWSEC secured a \$14,000 grant from local Wal-Mart stores to create a demonstration and educational site utilizing stormwater BMPs at Socastee High School.

unique to each community. Public Service Announcements for radio and newspapers addressing regional stormwater issues and local television interviews have been utilized. Participation at regional festivals also helps to educate citizens.

Students of all ages along with their teachers are also among the target audiences for CWSEC. CWSEC's educators provide field trips, in-class experi-

ences and teacher workshops using a watershed approach to teach about runoff pollution. Most recently CWSEC secured a \$14,000 grant from local Wal-Mart stores to create a demonstration and educational site utilizing stormwater BMPs at Socastee High School in Horry County. Students, teachers and employees from Wal-Mart and Horry County Stormwater Department along with members of CWSEC will work together to install a rain garden and an infiltration swale at the school. CWSEC

education providers will provide stormwater information to be incorporated into the science curriculum, and aid the students in developing a monitoring study to determine the effectiveness of these stormwater management practices.

Additional examples of providing public involvement and par-

ticipation to the region includes the Waccamaw River Volunteer Water Quality Monitoring Program. Professional (e.g. contractors and engineers) involvement through technical training workshops on topics such as pervious concrete, high performance building, and erosion

prevention and sediment control continue to be offered. A multi-day Coastal Watershed Academy was held in Georgetown County in November 2007 for



Installation of a rain garden in Surfside Beach.

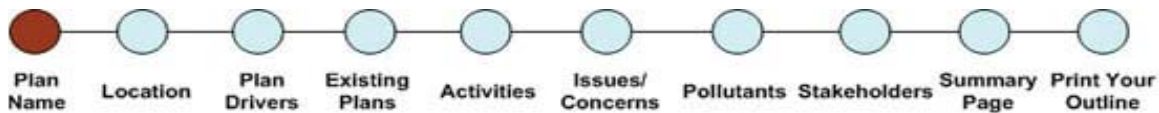
local government officials, natural resource professionals, and other professionals to provide training in water quality assessment and watershed management through seminars and field trips.

CWSEC is working within the Myrtle Beach Urbanized Area to increase the understanding of stormwater issues among a diverse group of stakeholders using a regional, watershed-based educational strategy. The core education service providers hope that their system for a collaborative regional approach to stormwater and watershed education will serve as a useful model for communities across the southeastern United States and beyond.

For more information, contact Karen Fuss, CWSEC Coordinator, Coastal Carolina University, Waccamaw Watershed Academy, kfuss@coastal.edu or (843)349-4058. Additionally, CWSEC maintains a website to distribute stormwater information. The current address is http://www.northinlet.sc.edu/training/stormwater_education/index.htm.



New Tool for Developing Watershed Plans



The US Environmental Protection Agency (EPA) has released a web-based tool to help organizations and watershed groups develop integrated Watershed plans. This tool, known as the Watershed Plan Builder, provides its user with a framework that will help identify and quantify specific causes and sources of water quality problems.

The Watershed Plan Builder is designed to follow EPA's Watershed Planning Handbook, which follows a six step watershed planning process.

These steps are:

- Building Partnerships
- Characterizing Your Watershed
- Setting Goals and Identifying Solutions
- Designing an Implementation Program
- Implementing the Watershed Plan
- Measuring Progress and Making Adjustments.

This interactive tool allows the user to continue to input data at any time during the process. The data is then used to connect the user to other agency and state programs in their watershed that could provide tools

to assist them in their efforts. Additional links to technical documents and other relevant information is also provided by the Plan Builder.

The goal of this tool is to help state and watershed groups save time and money during the planning process. It also gives its user a more complete comprehensive plan that will in turn help convince funders of its effectiveness along with targeting the specific problem in that watershed with direct solutions.

The Watershed Plan builder can be found at www.epa.gov/owow/watershedplanning.

Stormwater Update

Stormwater Permitting Update

By Arturo Ovalles, SC DHEC-Stormwater Permitting

By the time this newsletter reaches you, there will be a total of 57 Municipal Separate Storm Sewer Systems (MS4s) permitted under the NPDES Stormwater Program in the State of South Carolina. Three of them are Phase I, while the remaining 54 are Phase II MS4s. The premise of the NPDES Stormwater Program is to reduce pollutants to the Maximum Extent Practicable (MEP).

Phase I MS4s include: SC Department of Transportation (DOT), large, and Greenville and Richland Counties, both medium. The SC DOT permit has been effective since November 1, 2006. The medium MS4s are in the second five-year permit cycle. Greenville's permit has been in effect since July 1, 2007 and includes four small MS4s while Richland County's permit has been in effect since September 11, 2006 and includes two small MS4s.

Phase I MS4s are required to implement a stormwater manage-

ment plan (SWMP) addressing up to 11 elements. These elements are:

- Structural Controls and Stormwater Collection System Operation
- Areas of New Development and Significant Redevelopment
- Existing Roadways
- Flood Control Projects
- Municipal Waste Treatment, Storage, or Disposal Facilities,
- Pesticide, Herbicide, and Fertilizers (PHFs) Application
- Illicit Discharges and Improper Disposal
- Industrial Runoff
- Construction Site Runoff
- Public Education
- Extensive Monitoring Program

There are 54 small MS4s permitted under phase II of the program. These small MS4s are covered under the SC NPDES General Permit for Stormwater Discharges from Regulated Small MS4s. The permitted small MS4s are located in various urbanized areas of the state as follows: Charleston

(11), Greenville (6), Myrtle Beach (7), Charlotte-Rock Hill (4), Columbia (11), Spartanburg (7), Sumter (3), Aiken (1) and Florence (4). These coverages were granted between May and December of 2007.

Small MS4s must implement a SWMP that includes six minimum control measures (MCMs). These MCMs, which must also be implemented by large and medium MS4s, are:

- Public Education and Outreach on Storm Water Impacts
- Public Involvement/Participation,
- Illicit Discharge Detection and Elimination
- Construction Site Storm Water Runoff Control
- Post-Construction Storm Water Management in New Development and Redevelopment
- Pollution Prevention/Good House keeping for Municipal Operations

The second annual meeting for all MS4s has been scheduled on February 28, 2008. Screenings are

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being conducted around the State to assist the MS4s with compliance of their permit schedules. Documentation of activities is key. The Construction Site Stormwater Runoff Control and Post-Construction Stormwater Management in New Development and Redevelopment must be fully implemented not only for plan review but also for compliance and enforcement. The overall goal of the program is to improve water quality.

To learn more about SC's stormwater program, visit www.scdhec.gov/stormwater.

DID YOU KNOW

A typical city block generates 9 times more runoff than a forested area of the same size.

Impaired Shellfish Waters in Rural Coastal Zones: Sustainable Management & Outreach

By Lisa Hajjar, SC DHEC- OCRM

This project involves the sustainable management & outreach for impaired shellfish waters in rural counties. One goal of this project is to improve coordination and communications among other state and federal agencies, and county and municipal governments responsible for overseeing pollution prevention. The project involves collecting site information from small farm operations such as numbers & types of animals as well as the GPS location. The collection of data will also include identifying areas on septic systems by utilizing sewer line data from county or utility databases.

Sites will be evaluated based on proximity to receiving water bodies and shellfish harvesting waters. This threat analysis will

allow shellfish officers to increase activities, presence and investigations in priority areas. A targeted outreach message and management program will be developed for these rural areas and the agency will work with county and local governments to incorporate this information into their pollution prevention education.

This project is a collaborative effort between many divisions of SC DHEC including OCRM, Bureau of Water, Regions 7 and 8 Shellfish, and Bureau of Environmental Health. Outreach information will be developed in cooperation with local Resource Conservation & Development Council and Natural Resource Conservation Service offices.

For more information, contact Jason McMaster at mcmastjc@dhec.sc.gov.

RETURN SERVICE REQUESTED

E-MAIL: SALOMOCM@DHEC.SC.GOV

OFFICE: (803) 898-4187

EDITOR: CHERYL SALOMONE

COLUMBIA, SC 29201

2600 BULL STREET

SC DHEC

BUREAU OF WATER