ENCOURAGING LID THROUGH PUBLIC EDUCATION, OUTREACH AND INVOLVEMENT

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ABSTRACT. The Coastal Waccamaw Stormwater Education Consortium (CWSEC) assists northeastern South Carolina communities with meeting their National Pollutant Discharge Elimination System (NPDES) Stormwater Phase II permit requirements for public education, outreach and public involvement. Coordinated by Coastal Carolina University (CCU), CWSEC consists of six core education providers serving eight coastal SMS4s (small municipal separate storm sewer systems).

The consortium, now in its eighth contractual year, has been the primary source for education and outreach on low impact development (LID) in the region. Engaging people of all ages, in constructing LID demonstration projects has been one of the major means that CWSEC has been promoting LID implementation. In the absence of strong state requirements for LID, the educators and SMS4s view education and participation as valuable tools for employing these best management practices.

This paper introduces various LID projects that have been implemented in the Coastal Waccamaw region over the last several years. Working in partnership with Horry County Stormwater Department, educators involved a local middle school science club with constructing a wetland as a retrofit to a failed bioretention cell. Floating wetlands have been established throughout the region to educate local citizens about this alternative method to decreasing algal growth in stormwater ponds. Elected and appointed officials have been targeted with a half-day workshop called Stormwater on Wheels, where participants visit LID sites in the region via a bus tour. Numerous rain garden installations have been conducted at schools, public parks and buildings, and college and research institutions to provide demonstration sites and enable involvement of general public, students, professionals and staff. Technical training workshops for contractors, engineers and developers continue to be offered to promote utilizing LID in new construction and retrofit projects. Consortium members have been instrumental in developing outreach materials on LID practices for homeowners such as rainwater harvesting and building rain gardens. This array of activities demonstrates how CWSEC promotes LID through a comprehensive, regional educational effort in the absence of strict regulatory requirements.

INTRODUCTION AND BACKGROUND

The CWSEC educators work with local stormwater departments to identify and disseminate information and activities that are relevant and useful for diverse audiences and target specific, local stormwater pollutants. Over the last eight years, the core education providers have hosted demonstrations, installations, workshops and seminars on LID, and provided technical assistance to maintain the SC LID Atlas and to develop educational materials, including a LID manual.

Citizen involvement with LID installation projects is one approach to promoting LID implementation utilized by CWSEC. This type of public involvement engages residents of all ages in local projects that then become a permanent fixture in the community. While actively assisting with an installation, the participants gain knowledge about LID while also empowering these community members to teach others about LID and to incorporate best management practices at their homes and/or in their neighborhoods.

Since there are no current federal, state or local regulations requiring LID, consortium member SMS4s and educators believe that education and involvement is vital to getting more LID implemented throughout the Grand Strand area. Within the last few years, numerous installation projects using stormwater best management practices have been employed as educational and participatory opportunities for local citizens. Since CWSEC’s inception, consortium educators have incorporated clever outreach tools to tout and discuss LID to diverse audiences throughout northeastern South Carolina for many years.

According to Low Impact Development: A Guidebook for North Carolina – 2009 “… many local governments are taking steps to provide for LID in their jurisdictions.
A wide range of techniques are being applied; however, one commonality between them is apparent - communities are taking the first step toward promoting a development that does a better job of protecting water quality” (Perrin et al., 2009). CWSEC is utilizing various educational approaches within the region to help local governments prepare for and implement LID. Several core education providers and local stormwater staff are involved with creating a Coastal South Carolina LID manual. Educators are partnering with local stormwater departments to increase public awareness of LID installations in the area. Even though LID has not yet been implemented on a landscape scale in the Grand Strand, the individual LID devices that have been installed are still playing a role in watershed restoration as well as initial steps toward providing and requiring LID throughout the region.

PROJECT OBJECTIVES

CWSEC’s objectives for encouraging LID through public education, outreach and involvement are outlined below.
1. Collaborate with local SMS4s to promote and demonstrate local LID projects to general public and development community.
2. Provide opportunities for citizens to assist with LID installations.
3. Encourage residents and development professionals to utilize LID practices.
4. Empower elected and appointed officials to require these types of stormwater best management practices.

RECENT LID PROJECTS

**Constructed Wetland.** In spring 2012 Horry County Stormwater planned a retrofit of a failed bioretention cell located in front of a new county recreation center and library. Educators from CCU’s Waccamaw Watershed Academy involved Ocean Bay Middle School Science Club in this installation. Stormwater staff and educators began with a presentation for the students and club mentors to describe the problem of the existing rain garden, methods used to construct the wetland, and the benefits of the retrofit. At the site, the students and teachers helped in the removal of invasive cattails that would have crowded out the new plantings followed by a second visit to install the native wetland plants (Figure 1).

News coverage for the planting included the local newspaper, several television news stations, an interview with one of CCU’s educators and a 7th grade participant on CCU’s television show, and nationally online at the San Francisco Chronicle. To keep the students engaged after the planting, project partners held a sign contest with the winning 7th grade student’s text selected for educational signage at the wetland. In addition to the quote from the student, the sign describes the purpose of a stormwater wetland, includes photos before and during the planting, and lists the aquatic plants used at the site. The Ocean Bay Middle School teachers have also initiated routine student monitoring, e.g. water quality monitoring, of the site that will continue throughout the coming school years.

**Floating Wetlands.** Following the success of involving students and receiving a great deal of publicity for the stormwater wetland retrofit, CCU educators and Horry County Stormwater collaborated again with another LID project at a new county recreation center. The Horry County Parks and Recreation Department needed a way to control algae fed by fertilizer being placed on new ball fields. The stormwater department contracted with a regional nursery to provide floating wetlands for three, small retention ponds near the fields. This installation was turned into a “drop-in demonstration” for local home owner associations and residents by the education partners. Participants were encouraged to “drop-in” for the following: view the installation taking place (Figure 2); talk with the nursery owner and stormwater staff about the benefits of utilizing floating wetlands; visit a stormwater education exhibit booth; and talk to consortium educators to learn more about LID homeowner practices. Having a block of several hours when the public could visit rather than a half-day seminar received positive reviews from attendees and will be employed again when appropriate for future workshops.

In the past, several workshops led by Clemson University’s Carolina Clear and North Inlet – Winyah Bay National Estuarine Research Reserve (NI-WB NERR) Coastal Training Program also involved floating wetland and shorescaping installations. Targeted audiences
included the following: property managers; home owner associations; engineers; architects; landscapers; municipal staff and officials; and local citizens. Sites that have incorporated floating wetlands in the region include the City of Conway Marina; McLean Park in North Myrtle Beach; Futrell Park in Myrtle Beach; Palmetto Glen neighborhood in Horry County; and Magnolia Lake in Surfside Beach.

PAST LID PROJECTS

Stormwater on Wheels. In spring 2010 NI-WB NERR Coastal Training Program partnered with CCU and local stormwater departments to host an interactive, bus tour called Stormwater on Wheels. The goal of these workshops was to get elected and appointed officials as well as municipal and county staff to engage in field-based learning about LID practices in the region. Two regional tours showcasing different stormwater best management practices (BMPs) were developed with three bus tours having been completed thus far. A key component of success for these workshops was the involvement of the local stormwater managers and public works directors (Figure 3) who not only provided tremendous assistance in site selection and background information of the projects, but also shared this information with the group during the site visit. According to the evaluations of the participants, Stormwater on Wheels was very successful in teaching about LID and will continue to be offered in the future by CWSEC educators.

Technical Training. Over the years, education providers from NI-WB NERR Coastal Training Program, SC Sea Grant and Carolina Clear have collaborated to host several LID workshops for professionals such as stormwater staff, community planners, engineers, builders, developers, architects and educators as well as elected and appointed officials. These workshops have brought in professionals who have implemented LID in other regions outside of northeastern South Carolina, to discuss case studies specific to stormwater best management practices; demonstrate techniques such as pouring pervious concrete; and lead site visits to bioretention swales and cells, pervious surfaces, and other stormwater BMPs.

Rainwater Harvesting. Rainwater harvesting seminars and hands-on projects have been undertaken by several teams of consortium educators in the past. As a follow-up to involving students with a bioretention installation at Georgetown High School, CCU and NI-WB NERR educators worked with science and art students to create painted rain barrels using recycled soda syrup barrels (Figure 4).
The students then sold these to raise funds for their school. To target local decision makers, municipal and county staff, and landscaping professionals, NI-WB NERR Coastal Training Program, Carolina Clear, and Clemson Cooperative Extension hosted a seminar entitled “Rainwater Harvesting and Water-Smart Landscaping.” This half-day seminar introduced participants to the principles of rainwater harvesting and water-smart landscaping while demonstrating a large-scale cistern and irrigation system at the Conway Farmers Market in downtown Conway.

**Bioretention.** CWSEC member SMS4s and educators have been involved in many bioretention installations since spring 2008. Nine rain gardens were installed at local schools (Figure 5) over a two-year period with funding from regional Wal-Mart stores. The majority of the funding that the schools received from Wal-Mart went towards purchasing equipment to utilize the garden as an outdoor classroom and included water quality monitoring equipment, weather stations, gardening equipment, field guides, insect nets, binoculars and other supplies. Stormwater staff led the installations while educators worked with teachers and students to help with the plantings. Local stormwater departments have also been proactive in bioretention installations at government buildings so that they can serve as highly visible educational demonstration sites for the public. Additionally, consortium educational agencies including Clemson University, CCU, NI-WB NERR and Murrells Inlet 2020 have been instrumental in putting in rain gardens at or near their agencies’ regional offices.

**Outreach Materials.** Educational outreach materials have been designed and disseminated to teach a broader audience about LID practices used locally. The constructed wetland, floating wetland, and bioretention sites have signage describing the particular LID and its importance in protecting water quality. A comprehensive booklet containing information and a map on each site of the Stormwater on Wheels tour was distributed to all participants in addition to being available for download from CWSEC’s website (www.cwsec-sc.org). Rainwater harvesting and rain garden brochures, informational cards and manuals have been designed by Carolina Clear. These products allow residents to learn about specific LID systems even if they do not attend a workshop or seminar.

**DISCUSSION AND RECOMMENDATIONS**

Without state or local regulatory requirements for LID, CWSEC is taking the first steps to promoting LID through educational outreach and involvement activities. CWSEC’s approach aims to have the public, elected and appointed officials, and professionals see and learn more about LID practices throughout the region, in the hopes that these audiences will become more likely to implement LID. Utilizing and demonstrating a wide variety of LID stormwater best management practices offers homeowners and the development community a diverse array of choices for which types of LID can be installed. The consortium members expect that the increase in LID demonstration projects will spur movement toward codifying LID practices in local policy.

The consortium feels that its collaborative efforts among education providers and SMS4s are the best strategy to achieve LID implementation in northeastern South Carolina. Furthermore, education and involvement activities seem likely to empower elected and appointed officials to require these types of stormwater best management practices.

**LITERATURE CITED**


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*Figure 5. Burgess Elementary students receive planting assistance with their rain garden from local Wal-Mart employees.*