

# ADAPTING EDUCATIONAL SERVICES TO MEET LOCAL NEEDS IN THE SECOND NPDES PHASE II PERMIT CYCLE: CASE STUDY OF THE COASTAL WACCAMAW STORMWATER EDUCATION CONSORTIUM

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**Abstract.** The Coastal Waccamaw Stormwater Education Consortium (CWSEC) has completed its fifth contract year to help northeastern South Carolina communities meet their National Pollutant Discharge Elimination System (NPDES) Phase II permit requirements for minimum control measure 1, public education and outreach, and minimum control measure 2, public involvement. Coordinated by Coastal Carolina University, CWSEC consists of five core education providers serving eight coastal small MS4s (municipal separate storm sewer systems). CWSEC's mission is to develop and implement effective, results-oriented stormwater education and outreach programs to meet federal requirements and satisfy local environmental and economic needs.

CWSEC works with regional stormwater managers and South Carolina Department of Health and Environmental Control (SCDHEC) to help the local MS4s meet or exceed the permit conditions required by SCDHEC. Activities are led by the education providers and, with MS4 guidance, are tailored to the needs of each MS4 for both minimum control measures 1 and 2. Program activities for the CWSEC member MS4s have greatly diversified and grown since it began in 2005. CWSEC conducted a needs assessment in December 2009 to strategize for the second NPDES Phase II 5-year permit cycle.

Current CWSEC activities for minimum control measure 1, public education and outreach, include: stormwater education workshops for local officials, property and home owner associations and property management companies, and students; in-depth training sessions on specific stormwater best management practices; marketing on television, billboard and radio; and technical assistance for each MS4. CWSEC continues to also grow its public involvement and participation projects in order to fulfill minimum control measure 2

activities. River and beach sweep programs, rain garden installations at regional schools and public locations, and volunteer water quality programs have all expanded while a pilot storm drain marking program was launched in spring 2010.

Frequent communication among education providers and local MS4s is critical to CWSEC's effectiveness. Feedback from an initial needs assessment in October 2004 and a follow-up needs evaluation in December 2009 guides stormwater educational activities within the region. Overall, satisfaction among stormwater managers and staff and appointed officials with the educational services provided by the core educators was high. This satisfaction reassures educators that their services are positively addressing the needs of the MS4s; however, the findings also stress the fact that each community has unique needs and priorities that vary for target audiences and related activities. In other words, one size does not fit all. Therefore, it is crucial that education providers coordinate, communicate and involve each MS4 to continue to serve their needs for minimum control measures 1 and 2 in their respective communities.

## INTRODUCTION AND BACKGROUND

From its conception in May 2004, CWSEC set out to fulfill new federal Clean Water Act requirements associated with the NPDES Phase II Stormwater Program. Six small municipal separate storm sewer systems (MS4s) located within the Myrtle Beach Urbanized Area endorsed a coordinated approach to regional stormwater education, and participated in a needs assessment resulting in a Regional Stormwater Education Strategy and a Phased Education Work Plan. In July 2005, CWSEC was formally established and the CWSEC's Coordinator was hired. The Coordinator, who is also the Environmental

Educator at Coastal Carolina University's Waccamaw Watershed Academy, organizes five regional agencies who serve as core education providers for eight coastal communities. The five regional agencies working as core education providers to the member MS4s include: Clemson Public Service and Carolina Clear Program; Coastal Carolina University's Waccamaw Watershed Academy; North Inlet-Winyah Bay National Estuarine Research Reserve's Coastal Training and Public Education Programs; South Carolina Sea Grant Consortium; and Winyah Rivers Foundation's Waccamaw Riverkeeper®. CWSEC's organizational structure results in a synergy among the education providers, achieving greater productivity than if each provider worked separately. The member small MS4s include: City of Conway; City of North Myrtle Beach; City of Myrtle Beach; Georgetown County; Horry County; Town of Atlantic Beach; Town of Briarcliffe Acres; and Town of Surfside Beach. Each MS4 contributes a modest annual fee toward the salary of the Coordinator and operational costs.

#### COMMUNICATION EFFORTS

CWSEC works cooperatively with local stormwater managers and South Carolina Department of Health and Environmental Control (SCDHEC) to help the MS4s meet or exceed the permit conditions required by SCDHEC. Education providers tailor their activities to each community's needs with guidance from the local governments. As a result, educational programming for the member MS4s has greatly diversified and grown since the Consortium began in 2005.

As CWSEC continues to move forward with meeting specific and often unique needs of each locality, communication among the education providers and the MS4s has become critically important. Education providers host biannual business meetings, which often include topic-specific training, for stormwater managers and associated staff. Annual activity reports are generated from a searchable, interactive database updated by the education providers. Monthly CWSEC E-News keeps recipients informed with stormwater-related announcements, events and activities. Additionally, the Consortium maintains a website ([www.cwsec-sc.org](http://www.cwsec-sc.org)) to provide a wide range of stormwater educational materials for various audiences such as developers, contractors, homeowners, teachers and students.

A second needs assessment (first conducted in October 2004) in December 2009 elicited feedback from stormwater staff and appointed officials to guide future educational programming during the second 5-year NPDES Phase II permit cycle. Overall, respondents provided reassurance that educators are providing the

services needed by the MS4s; however, the findings also stress the importance that each community has specific needs and individual priorities vary greatly.

#### PUBLIC EDUCATION AND OUTREACH

CWSEC activities that address Minimum Control Measure 1, public education and outreach, include: stormwater education workshops for local officials, property and home owner associations and property management companies, and students; in-depth training sessions on specific stormwater best management practices; marketing on television, billboard and radio; and technical assistance for each MS4. The most recent needs assessment identified the following target audiences as the top three (listed from highest to lowest): general public; elected and appointed; and general staff.

Customized stormwater education workshops are developed and presented to county and municipal officials and staff that are tailored to the unique needs of each community. Local ordinances, stormwater management plans, and existing and/or planned stormwater best management practices are often discussed with the workshop participants. Though low attendance can be an obstacle to program success, effectiveness has been boosted by working and communicating closely with the stormwater staff, planning well in advance of the workshop, and heavy advertising to the council, committee and board members. Creation of new and diverse opportunities also helps with attendance by elected and appointed officials, and this was affirmed in the spring 2010 when Stormwater on Wheels, local low impact (LID) tours, were developed and filled with county and municipal officials and staff. Stormwater education seminars have been adapted for two additional target audiences prioritized in the needs assessment. Neighborhood association presentations also use a watershed approach to focus on the specific issues and concerns of the neighborhood, while offering recommendations to individual homeowners for dealing with stormwater problems and suggestions for community stormwater best management practices. Property managers of condominiums, hotels, apartment complexes, and housing neighborhoods are participating in half-day workshops that have expanded throughout the region. These seminars focus on identification and understanding of stormwater facilities and drainage systems and their associated maintenance plans, as well as pollution prevention techniques. Program evaluations show that presentations lasting two hours or less are most successful in terms of attendance and participation.

CWSEC educators provide opportunities for additional audiences through various outreach methods. Educational programming continues to target kindergarten

through twelfth grade and college age students through in-class presentations and field trips to local rivers, marsh systems and beaches. The most recent assessment revealed that the MS4s feel that these groups should be targeted with participation and involvement activities meeting requirements for Minimum Control Measure 2; however, the core education providers believe that it is important to educate these groups prior to or in conjunction with a participatory activity to promote both awareness and action. Technical training for professionals such as contractors, engineers and developers is also conducted. For example, high demand in 2009 led to development of a LID workshop targeting this audience. This full-day seminar, which will be repeated in fall 2010, included presentations and demonstrations of LID practices being used at Hobcaw Barony and facilities managed by North Inlet-Winyah Bay National Estuarine Research Reserve, University of South Carolina and Clemson University. Through Clemson University's Carolina Clear Program mass media efforts, the public is reached by television, radio and billboard public service announcements (PSAs) on stormwater issues and solutions. The regional stormwater staff ranked television and radio PSAs in the top three for effectiveness in meeting Minimum Control Measure 1.

Over the last 5 years, the core education providers have become more involved and integrated into local communities. An increase in technical assistance on water quality issues and grant writing collaboration has taken place. Several activity additions over the next 5 years for public education and outreach activities were suggested by the evaluators and include the following: video recording and webcasting of training programs sponsored by CWSEC; educating public about maintenance of BMPs in neighborhoods; touring of BMPs with elected officials; increasing training classes; and reporting on the effects of installed stormwater BMPs, e.g. rain gardens and pervious pavement.

## PUBLIC INVOLVEMENT AND PARTICIPATION

CWSEC continues to grow its public involvement and participation projects. River and beach sweep programs, rain garden installations at regional schools and public locations, and volunteer water quality programs have all expanded while a pilot storm drain marking program was recently launched. Program evaluations showed that the top three targeted audiences for Minimum Control Measure 2 included public; elected and appointed officials; K-12 and higher education students; with general staff, professionals and businesses ranking closely behind the top three.

River and beach sweep programs are being offered more frequently by different core education providers and also are serving to collect data on types of debris collected. The sweeps held in conjunction with the International Coastal Cleanup collect debris data for the Ocean Conservancy's International database. CWSEC members ranked this type of community clean-ups high for meeting public participation and involvement NPDES Phase II permit requirements.

Rain garden installations at schools and public locations expanded throughout the region. Since spring 2008, nine gardens at local schools have been constructed with grant funding from Wal-Mart totaling over \$55,000 with most of the funding going toward educational resources for monitoring and research activities for the schools. Rain gardens and other stormwater BMPs are also being added to public parks, county and municipal buildings/campuses, and college and research institutions to provide demonstration sites but also allow for general public, students, professionals, and staff involvement. Feedback from the needs assessment indicated that the group believes these are an effective method of meeting Minimum Control Measure 2 requirements and would like to see more demonstrations/installations in the future.

Two Coastal Carolina University undergraduate interns were hired for the 2009-2010 school year to develop and implement a pilot storm drain marking program in the region. This pilot study includes placing 500 adhesive plastic markers near storm drains in all of the MS4s in various high foot-traffic areas. The goals of the program are the following: engage community to change behaviors to reduce pollution entering water bodies; conduct research to investigate possible sources of pollution; and help stormwater departments educate locals about their services and detect heavily polluted areas. By the end of May 2010, approximately 200 markers had been distributed in locations such as Coastal Carolina University, Ocean Boulevard in Myrtle Beach, new urban area, downtown Conway and neighborhoods. The following groups have been involved with placement of the markers thus far: college and high school students, scout troops, and local Surfrider chapter. With the help of the local stormwater departments, a data sheet with information about each drain where a marker is placed was developed. Observational data is collected during the marking event, and then shared with the specific stormwater department. Expansion of the pilot program is being planned and will include the following goals: expand to sites throughout the region in each MS4; increase group participation; utilize the remaining markers and purchase additional ones; revisit marking sites to collect follow-up data; continue data collection at new sites; secure funding for sustainability of program; explore a partnership with regional Wal-Mart to mark in the entire

state of SC; and investigate expanding to private properties.

Volunteer water quality monitoring has been expanded to include sites of the Waccamaw River in North Carolina and estuary monitoring in Murrells Inlet. There are also plans for water quality sampling in stormwater ponds in the Town of Surfside Beach. Data on the monitoring is available online at [http://bcmw.coastal.edu/volunteermonitoring/wr/data\\_acc\\_ess.php](http://bcmw.coastal.edu/volunteermonitoring/wr/data_acc_ess.php) for the Waccamaw River and [http://bcmw.coastal.edu/volunteermonitoring/mi/data\\_acc\\_ess.php](http://bcmw.coastal.edu/volunteermonitoring/mi/data_acc_ess.php) for Murrells Inlet. One suggestion to expand the participation involvement actions over the second permit cycle is to teach homeowners to recognize and report activities affecting water quality.

## DISCUSSION AND RECOMMENDATIONS

Throughout the last five years many lessons have been learned and will be implemented in the coming years to best serve the local communities. In order to meet specific needs of MS4 communities while making the most of local resources, diversified and synergetic partnerships to tailor activities are required. Education providers must embed themselves within communities in order to gain a level of trust with MS4s. The core providers should share their skills as technical resources for their municipalities and counties. MS4s look to the various educational agencies to track and adapt to changing requirements from state and federal guidelines for Phase II communities to ensure that they are continuously meeting their NPDES Phase II permit requirements. Listening to the stormwater staff members and providing a forum for exchange among MS4s is essential for serving as a regional consortium. As CWSEC continues to help the local small MS4s meet the NPDES Phase II permit requirements for public education, outreach and involvement, the members hope that this collaborative, regional approach to stormwater and watershed education will serve as a useful model for other communities.