

Coastal Waccamaw Stormwater Education Consortium
A Regional Education Strategy

Draft Outline

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I. Introduction

Population growth, residential and industrial development, and the resulting changes to the landscape have led to stormwater quality and quantity concerns throughout South Carolina. As an education consortium, we recognize that control of stormwater pollution is most effectively implemented when people and organizations understand the impact of polluted runoff, its sources, and the actions they can take to control it. To effectively manage such issues, stormwater professionals are finding it necessary to develop community support through education and outreach. This need arises not only from the regulatory requirements of EPA Phase II Stormwater rules, but also from the recognition that local decision makers, citizens, and elected officials will require more than a rudimentary grasp of stormwater pollution concerns in order to make and support effective decisions related to stormwater issues.

In order to address these educational needs in a coordinated fashion, the Coastal Waccamaw Stormwater Education Consortium (CWSEC) was formed in June 2004. It is the overarching goal of the CWSEC to develop and implement effective, outcomes-based stormwater education and outreach programs that will not only meet the federal requirements, but also satisfy the needs of the community that they serve.

A. Justification and Motivation

The effects of polluted storm water runoff are subtle and not well understood by much of the public. Pollutants are often not highly visible and come from a variety of diffuse sources. It may be difficult for the myriad of citizens and public officials to understand how their actions can lead to degraded local rivers and lakes. Research shows, however, that once people understand the consequences of their actions, they are more receptive to new information and are more likely to change their behavior.

At a federal regulatory level, the US EPA requires educational programs as part of its NPDES (National Pollution Discharge Elimination System) Stormwater Program. Until 2003, this program was restricted to large and medium MS4s. Effective 2003, regulated small MS4s (municipal stormwater sewer systems) now fall under the NPDES Stormwater Program as per its Phase II Rule. In the Waccamaw region, seven entities have been designated as regulated small MS4s. No medium or large MS4s are currently present.

The state of South Carolina has elected to develop a general permit for its regulated small MS4s. The details of this general permit are still being resolved, with final approval expected in late 2004. In anticipation of the availability of this general permit,, many regulatory agencies are very supportive of local efforts to move forward toward satisfying the spirit of the new NPDES Stormwater Program for regulated small MS4s.. This will ensure that local MS4s are ready to implement the requirements of the general permit once it is approved. The first two minimum control measures in the Phase II rule require (1) public stormwater education and outreach, and (2) public involvement in stormwater management. The consortium proposes to assist with the development, delivery and assessment of a suite of educational and outreach strategies that will help meet these minimum control measures, including the transfer and delivery of existing educational tools, the design of new educational tools, and the coordination of volunteer monitoring efforts. The latter might also help meet the third minimum control measure of illicit discharge detection.

The Coastal Waccamaw Stormwater Education Consortium seeks to maximize the efficiency of stormwater education efforts in the northeastern coastal region of South Carolina (Georgetown

and Horry Counties) by coordinating regional education programs within the watershed. The founding partners of the Consortium are:

- Clemson University's Extension Service's Carolina Clear Program
<http://carolinaclear.clemson.edu/>
- Coastal Carolina University's Waccamaw Watershed Academy
www.coastal.edu/wwa/
- North Inlet-Winyah Bay Estuarine Research Reserve's Coastal Training Program
www.northinlet.sc.edu/training
- SC Sea Grant Consortium's Extension Program
www.scseagrant.org
- Waccamaw Riverkeeper™ Program
www.winyahrivers.org

B. Background

Many human activities cause pollutants to be deposited on land and directly into waterways. Those deposited on land can eventually be washed into the waterways as part of stormwater runoff. This transfer of pollutants is largest when stormwater has no chance to percolate into the soil and thus is forced to run directly into rivers, streams, lakes, ponds and wetlands. Impervious surfaces, such as pavements and rooftops, prevent stormwater from percolating into the soils. As a result, water quality tends to be poor in areas with large amounts of impervious surface cover.

Fortunately, techniques have been developed to mitigate the negative effect of impervious cover. Some of these techniques are structural; they require installation of special treatment devices or architectural design. Other techniques are non-structural, such as educational efforts aimed at behavioral changes. The goal of the structural techniques is to retain stormwater as close to its point of origin as possible. These techniques include Stormwater Best Management Practices, and Low Impact or Better Site Design principles. Education efforts include demonstrating how the general public contributes to polluted runoff and learning techniques and practices to minimize those impacts.

Given projected growth rates and attendant increases in impervious cover in the Waccamaw region, we are at a critical juncture and we need to make careful choices in how we continue to develop land. Encouragingly, a number of scientific studies have demonstrated that the consistent use of best management practices can prevent significant environmental impacts even in the presence of high (>15%) percent impervious surface coverage. We need to explore options for minimizing impervious surfaces and for dealing with the impacts of the impervious surfaces we must live with. The CWSEC seeks to assist local communities in this endeavor

C. Synopsis of Previous and Ongoing Educational Efforts

The following is a brief summary of educational activities conducted by one or more of the founding CWSEC partners.

(1) In November, 2003 the North Inlet-Winyah Bay CTP and Coastal Carolina University's Burroughs and Chapin Center for Marine and Wetland Studies co-hosted a two-part series on watershed planning and protection. SC DHEC – Office of Ocean and Coastal Resource Management, SC Sea Grant Consortium, the SC Coastal Conservation League, and Coastal Carolina E. Craig Wall School of Business Administration were the central partners for these

events; watershed experts from the Center for Watershed Protection (CPW) helped plan and facilitate the events, adding cohesion and continuity to the series.

(2) The first part of series- *Stormwater Management in Context: Exploring the Technical Tools of Watershed Protection*- was held at Kimbel Center on Hobcaw Barony on November 7, 2003. A diverse group of over 50 decision makers—including municipal and county planners, engineering consultants, developers, landscape architects, public works officials, representatives from local non-profits, and coastal scientists—attended. The day's presentations reviewed watershed fundamentals and the technical tools of watershed protection with a focus on stormwater management and Better Site Design.

(3) The second event in the series- *Coastal Development and Watershed Planning: Collaborative Problem Solving to Protect Water Resources*- was held at Coastal Carolina University's Burroughs and Chapin Center for Marine and Wetland Studies. About 100 coastal decision makers came together to focus on the balance between local growth and protection of local water resources. Sessions included scientific talks and a panel discussion about identifying and overcoming local obstacles to watershed management.

The agenda included afternoon breakout sessions on 3 topics:

- Developing watershed management plans.
- Local stormwater management strategies.
- Implementing Better Site Design strategies.

Each of these sessions generated fundamental consensus statements and enhanced our collective momentum.

(4) On July 15th, the NI-WB Coastal Training Program, Coastal Carolina University's Waccamaw Watershed Academy, Horry County Stormwater Department, and the USDA's Natural Resource Conservation Service hosted a half-day technical training entitled: *Designing Constructed Wetlands for Stormwater Management*. This training event, which was held in Conway, SC, was attended by about 30 local civil engineers and landscape architects. A follow-up technical work session has been slated for November 10, 2004.

Agendas for these four events, all presentations, transcripts from discussion and breakout sessions, and a diverse suite of reference tools are available through the CTP website:

www.northinlet.sc.edu/training/training_events.htm

(5) Volunteer monitoring of water quality supervised by CCU's Waccamaw Watershed Academy. This monitoring has focused on water quality in the local rivers, wetlands, tidal creeks and surf zone. A new initiative is targeted at monitoring harmful marine algal blooms in concert with NOAA's Southeastern Plankton Monitoring Network.

(6) The Waccamaw Riverkeeper conducts local stakeholder meetings for information dispersal. He has also organized volunteer squadrons to patrol local rivers, monitoring visually for environmental and other problems.

(7) The South Carolina Nonpoint Education for Municipal Officials (NEMO) program was designed and implemented around a simple goal: develop a program to educate elected and appointed local officials about the impacts of land use on water quality AND about options available to them for addressing those issues. Local officials including councils, planning commissions, planning staff, and many others play a significant role in the direction taken by a town or county towards growth and development. The SC NEMO Pilot Project addressed these

issues in the Waccamaw watershed, targeting officials in Georgetown and Horry counties. Since 1999, over fifteen (15) different presentations and workshops have been conducted locally.

(8) The Waccamaw watershed served as the pilot area for development and implementation of SC Coast-A-Syst (Coastal Home Assessment System). Coast-A-Syst was designed to help homeowners in coastal regions protect surface and ground water quality. The program was singled out and developed in recognition of the special significance of South Carolina's coastal resources and the role they play in the state's economy, environmental health and overall quality of life. Coast-A-Syst encourages individuals to take responsibility for and to correct water quality impairments caused by their own activities. Since 2001, Coast-A-Syst has sponsored demonstration projects, workshops, and presentations throughout Horry and Georgetown counties.

(9) Carolina Yards and Neighborhoods (CYN) is a Clemson University Cooperative Extension Service program designed to assist and guide South Carolina homeowners in conserving water in the landscape and in making positive changes in the environmental quality of their yards, neighborhoods and surrounding waterways by implementing the principles of Environmental Landscape Management. In 2003, over 1,500 people were involved in CYN along the coast.

II. Coastal Waccamaw Stormwater Education Consortium Goal

Develop and implement effective, outcomes-based stormwater education and outreach programs that will meet federal requirements and satisfy the environmental and economic needs of the community that they serve.

Operational Objectives:

- *Educate* the citizens, decision makers, and local officials within the Waccamaw Watershed and coastal areas in Georgetown and Horry Counties about stormwater issues and impacts;
- *Inform* stakeholders about actions that they can take to address these issues and minimize these impacts;
- *Create* a model for collaborative regional or watershed-based stormwater education that can be presented and applied throughout the state and beyond;
- *Facilitate* compliance with existing (NPDES Stormwater Program Phase II Rule for regulated small MS4s) and future regulatory requirements by making local educational resources and service providers available;
- *Develop* a cohesive regional stormwater education plan that capitalizes on local training resources and meets the needs of local MS4s;
- *Seek* formal buy-in through the development of official resolutions with local MS4s who choose to participate in the SEC;
- *Encourage* community behavior change towards environmental quality improvement through stormwater education;
- *Involve* citizens, etc., in stormwater management using a volunteer-based monitoring program;
- *Facilitate* illicit discharge detection using a volunteer-based monitoring program
- *Support* development of watershed management plans for subwatersheds in the Waccamaw Basin.

III. Strategy and Scope for Implementation of Stormwater Education Plan

A primary objective of the Coastal Waccamaw Stormwater Education Consortium (CWSEC) is the consolidation of regional educational providers for the Waccamaw Watershed. Specific providers, their corresponding audiences, and potential partners are identified in this document. The Consortium intends to plan outreach to all sectors of local communities in order to ensure that the regional stormwater plan is as comprehensive as possible. Effective stormwater management requires cooperation and communication among a diverse set of stakeholders. The consortium is focused on ensuring that as many regional stakeholder groups as possible are involved.

A. Education Providers

Table 1 identifies providers and programs of stormwater education efforts and resources in the coastal Waccamaw area of South Carolina. A key step for the consortium will be to partner with key stakeholders (Appendix A) in order to deliver stormwater education to the appropriate audience(s). Education providers will also work with stakeholders to facilitate public involvement in the development, implementation, and review of their stormwater management programs.

B. Audience Targeting

Public outreach and participation efforts described in Table 1 are intended to help the local MS4s meet the requirements for NPDES Stormwater Program Phase II Rule. This outreach effort should make every effort to reach and engage all economic and ethnic groups and all technical levels, including civil engineers, landscapers, developers, municipal officials and staff. Home and property owners associations, neighborhood architecture review boards, churches, and other community groups are likely to be key audiences among the general public. Audiences meriting special consideration include minority and disadvantaged communities, children, and those commercial, industrial, and institutional entities that are likely to have significant stormwater impacts. **Note: a prioritized list of target audiences was drafted during the second meeting of the CWSEC and can be found online /www.northinlet.sc.edu/training/stormwater_education/index.htm.*

C. Program Strategies to Maximize Efficiency and Accessibility

The CWSEC encompasses a broad spectrum of outreach strategies for stormwater education. In order to develop a reasonable and effective strategy for information dissemination that meets the specific needs of a given audience, the education program shall:

- Provide a forum that fosters the formation of partnerships among recipients to minimize work/costs.
- Prioritize regional education needs to most efficiently target use of limited resources.
- Adopt a consolidated regional approach toward education, including prioritization of action plans due to the limited amount of resources available to deliver stormwater education.
- Coordinate outreach materials across the region to avoid conflicts in message.

The appropriate programs will be delivered in a time and a place that is convenient and accessible for the general public and will be delivered in a timely fashion to meet NPDES Phase II requirements for a given MS4.

D. Employing a Phased and Iterative Approach

Stormwater-related issues are not discrete challenges that can be solved and forgotten. Thus, planning stormwater education must be adaptive and on-going. While long term planning is essential, just as critical is the development of work and implementation plans for one to three year time frames whose specificity reflects their time horizon. The CWSEC members and

education providers recognize the need for master planning that consists of cumulative prioritization of audience and training topics; we also recognize that these goals and priorities must be approached in a systematic and phased manner and that annual work plans need not encompass the entire scope of the Consortium's education mission. In particular, CWSEC intends to phase-in priority activities over its first few years. Assessment information will be used to support an adaptive planning strategy, by addressing issues identified by stakeholders and service providers.

IV. Evaluation and Reporting

A. Evaluation Criteria

Each program delivered under the CWSEC umbrella must have an attached mechanism for measuring success. Depending on the scale and scope of the stormwater education program, an appropriate evaluation may rely on one or more of the following:

- Track the number and, if applicable, the percentages of a client base that participated in the program
- Develop pre- and post-program surveys for an evaluation of the quality of information dissemination
- Track use of web resources
- Develop metrics for outcome-based results and changes in community behavior

B. Accountability

Summarizing the goals, methods, and successes of the stormwater education program is critical for evaluating and improving educational efforts as well as to meet the NPDES Stormwater Program requirements. Toward this aim, the CWSEC should:

- Provide summary statistics for training attendees
- Document evaluation survey results and the use of web resources
- Craft activities and assessments in a fashion that facilitates reporting in NPDES Stormwater Program required format
- Develop a database for maintaining reporting documentation, possibly through the web-based interface

Table 1. Summary of Stormwater Education Providers and Programs in the Coastal Waccamaw Area.

Provider	Programs	Services/ Foci
Clemson University Clemson, SC Contact: Cal Sawyer	Carolina Clear programs	Public education and involvement activities intended to satisfy the education outreach minimum control measures of the NPDES Phase II regulations
Coastal Carolina University Conway, SC Contact: Susan Libes	Waccamaw Watershed Academy	Development of watershed management plans
		Web-based information clearinghouse with GIS data presented in ARC IMS format
		Volunteer monitoring/illicit discharge detection
	Undergraduate and Masters programs in Marine and Wetland Studies	Formal higher education
	Continuing education programs	Continuing Education Credits available for local professionals
	Informal education (pre and post college) programs	Done in conjunction with county school districts and Life Long Learning Society
North Inlet-Winyah Bay (NI-WB) National Estuarine Research Reserve (NERR) Georgetown, SC Contact: Jeff Pollack	Coastal Training Program	Customized, science-based/ technical training on coastal issues for local decision-makers, with a focus on municipal and county government officials
	Community Education Program	K-12 and general public environmental education with a focus on coastal ecology and watershed concepts.
SC Sea Grant Extension Charleston, SC Contact: Dan Hitchcock	Nonpoint Education for Municipal Officials (NEMO)	Stormwater-related education for local government officials
	Home-A-Syst; Coast-A-Syst	Homeowner and recreational user education and awareness

Appendix A: Regional Stakeholders

Consortium Members (Potential Funding Agent?)

**Note: every attempt s being made to maintain the CWSEC as a free or bare-bones coordinating body rather than an independent entity with overhead and operational costs*

- Horry County (Tom Garigen, Stormwater Manager)*
- City of Conway (Fred Akel, Public Works)*
- City of Myrtle Beach (Steve Moore, Stormwater Manager)*
- City of North Myrtle Beach (Kevin Blayton, City Engineer)*
- SCDHEC OCRM (Joe Fersner)*
- Georgetown County (Jeff McNesby and Ed Huemphner, Department of Public Works)*

Potential Agency Partners

- SC DHEC Watershed Manager (Stephen Wall)
- SC DHEC Waterwatch Manager (Meredith Barkley)
- SC DHEC Public Health (Septic Tank Program)
- South Carolina Department of Education, State Education and Environment Roundtable (SEER) – [Edward Falco, Environmental Education Consultant, Environment as an Integrating Context for Learning (EIC program)].
- SC Sea Grant Consortium: River and Beach Sweep
- SC DNR
- US FWS
- Georgetown and Horry Citizen Stormwater Stakeholder Groups
- County school districts (Waccamaw Science and Math Hub)

Potential Education/ Outreach Partners

- Palmetto Pride
- Keep America Beautiful
- Waccamaw Regional Council of Governments
- USACOE (outreach program? Elizabeth Jackson)
- Utilities: Santee Cooper, GSWSA, Solid Waste Authority, SC DOT(?)
- Surfrider Foundation.
- SC Coastal Conservation League, Sierra Club, Audubon, Wildlife Action, etc.
- CCU's outreach campuses at Waites Island, Litchfield (Linda Ketron) and Georgetown
- Greenways and Bikeways Associations
- Other regional MS-4 communities (permittees) including Andrews, Loris, Surfside, Briarcliffe Acres, Atlantic Beach,
- Murrells Inlet 2007
- Association of Homeowner's Associations
- 4-H Camps
- Girl and Boy Scout Troops
- Religious community groups