



WECO: Building Consensus for Watershed Solutions in the White Oak River Watershed

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Why Conduct Collaborative Watershed Planning?

In recent years, point source pollution (pollution from a single source such as a factory) has been effectively managed through the National Pollutant Discharge Elimination System (NPDES) of the U.S. Clean Water Act. Consequently, non-point source pollution (pollution arising from various sources) is now the primary focus of water quality management. The diffuse and diverse nature of non-point source pollutants provides an interesting challenge to protecting water quality. While parties in a watershed dispute may point the finger at one another, the responsibility for non-point source pollution can often be as diverse as the pollutant sources.

A watershed is all the land that drains to a particular body of water. A *watershed stakeholder* is anyone who can influence or be influenced by water quality in the watershed. This can include farmers, local governments, landowners, developers, foresters, fishermen, conservation groups, government agencies and others. Involving all the stakeholders in watershed management helps generate workable solutions to water quality problems. Local support is obtained from the major watershed interests. Since watersheds follow hydrologic rather than political boundaries, it is often necessary to involve multiple government jurisdictions. Collaborative planning actively involves stakeholders to identify problems and design solutions that are acceptable to all. It is an educational as well as a negotiation-based process which addresses conflicts, strengthens community ties, and builds partnerships.

Without the support of local stakeholders, watershed managers may find themselves in an uphill battle to win the support of local governments and communities when trying to implement a water quality protection plan. A community is much more likely to champion a watershed plan in which they have invested their own valuable time and energy. This article focuses on a North Carolina watershed group that is currently pursuing their own plan with the guidance and leadership of a program at NC State University.

The WECO Program

Watershed Education for Communities and Local Officials (WECO) is a NC Cooperative Extension program based out of NC State University's Department of Agricultural and Resource Economics. WECO has been refining its methods of watershed planning since its inception in 1996, when NCSU staff first convened a group of stakeholders in the White Oak River watershed. WECO's main objective is to improve water quality through education of citizens and government officials who live and work in the watershed. This involves three primary objectives: (a) delivering technical information and educational material on water quality; (b) facilitating collaborative partnerships at the watershed level between communities, local officials and state agencies; and (c) facilitating local stakeholder development of recommendations to improve water quality in their watershed.

Early on, WECO founders agreed that all projects should follow a defined set of prin-

principles: WECO projects must be locally-empowered and stakeholder based; must develop methods for sustainable, collaborative, community-based solutions; should partner with other state and local agencies to foster watershed-based solutions; must develop methods for the synthesis, integration, and application of multi-disciplinary scientific and technical information to support policy making; and should examine sustainability of policy alternatives by estimating economic costs and benefits.

The White Oak River Watershed Advisory Board

These tenets were first applied to WECO's original pilot watershed planning group, the White Oak River Watershed Advisory Board (WORAB). WORAB experienced early success when they developed recommendations to address potential impacts of a proposed highway expansion spanning the mouth of the White Oak River. As the watershed is located primarily in portions of three counties (Carteret, Onslow and Jones), the board's recommendations needed and received support from all three county commissioners' boards. Local support provided the justification needed for state and federal agencies to act upon WORAB's recommendations for managing water quality in the river. Ultimately, the North Carolina Department of Transportation redesigned the expansion to reduce the potential impacts of stormwater runoff to the river. Also, the board worked with the U.S. Army Corps of Engineers and U.S. Congressman Walter Jones to provide the Congressional Act needed to authorize a flow study in the river. The board continues to actively seek funding for this study.

After its early success, WORAB moved on to investigate a more complicated water quality problem: the increased closures of shellfish beds in the White Oak River due to elevated counts of fecal coliform bacteria. WORAB spent many hours studying and discussing this complex issue, one that is common to coastal communities throughout the country. Noting the recent high rate of urbanization in coastal North Carolina, WORAB chose to focus on urban stormwater runoff as a dominant contributor to bacterial contamination in the White Oak River. After being presented with an exhaus-

sive list of policy, educational, and engineering tools for addressing stormwater runoff, the board chose to pursue educational activities centered around stormwater best management practices (BMPs). BMPs are in-the-ground projects that slow down and treat stormwater runoff. In 2000, WECO staff delivered a presentation highlighting actions individuals can take to reduce stormwater runoff from their property to over 100 citizens at local civic clubs and homeowners associations.

Implementation of Planning Efforts

Supported by the board, WECO partnered with the NCSU College of Design, the town of Swansboro, the N.C. Shellfish Sanitation Division, and Duke University to obtain a three-year, \$300,000 EPA grant aimed at protecting and enhancing sensitive shellfish waters in two specific watershed areas. The study areas include Swansboro and Pettiford Creek, an estuarine tributary of the White Oak River. Demonstration BMPs are being installed in Swansboro in highly visible locations within the town. Accompanying educational signs will not only increase awareness of water quality issues facing the White Oak River but will also offer methods for alleviating the problems. In Pettiford Creek watershed, a project team is conducting research to identify likely non-point sources of pollution. Once these areas are identified, educational outreach and in-the-ground solutions to specific pollution problems will follow.

Town of Swansboro Demonstration Project

When Swansboro expressed interest in addressing stormwater runoff pollution in 1999, WECO approached town staff to ask if the town wanted to collaborate on an EPA grant application. After the grant was approved and funded, a team of professionals investigated various locations suggested by WORAB for potential BMPs. WECO compiled a list of selection criteria, and the team toured the sites to determine which potential BMPs ranked highest. Three projects emerged due to their highly visible public locations, and because they exhibited significant potential for reaching many locals and tourists visiting this "friendly little city by the sea." The projects selected included a rain garden at the Swansboro Town Hall, a rain garden at a town park

Table 1: BMPs selected in the Town of Swansboro

Project Site	Type of BMP	What it is
Swansboro Town Hall	Rain garden	A landscaped area designed to slow down stormwater running off Town Hall's roof, and to remove pollutants from the runoff
Ward Shore Town Park	Rain garden	A landscaped area designed to slow down stormwater running off of an adjacent road and residential area before it runs into the adjoining White Oak River
Municipal vacant lot	Permeable pavement	A paved parking lot that allows most of the stormwater to soak into the ground rather than run off into the White Oak River

adjacent to the White Oak River, and a permeable pavement site which the town had already intended to pave for parking (Table 1).

Following a WECO presentation demonstrating the potential benefits of the projects, the town commissioners passed a resolution supporting the construction of these three BMPs in March 2002. As of February 2003, the two rain gardens have been constructed with the oversight of the Department of Biological and Agricultural Engineering and the assistance of the Carteret County Cooperative Extension Horticulture agent and Master Gardeners. The third BMP site, the permeable pavement parking lot, is scheduled for construction in March 2003. Educational signs are being constructed to accompany the sites, and the White Oak River Watershed Advisory Board is planning to help coordinate a public unveiling of the demonstration sites in the spring.

Pettiford Creek Watershed

The Pettiford Creek Watershed portion of the project is by far the most comprehensive aspect of the EPA grant. The project is implemented through a partnership between WECO, the College of Design at NCSU, the Department of Biological and Agricultural Engineering at NCSU, Duke University Marine Lab, the N.C. Division of Shellfish Sanitation, and Carteret County Cooperative Extension. The project team is undertaking a number of activities to ultimately work towards reducing shellfish closures in Pettiford Creek.

These tasks include:

- *Water quality monitoring* - While Duke Marine Lab monitors the pollutants in the water of Pettiford Bay, NCSU partners have installed equipment to monitor stormwater flow coming off the land. Monitoring will help identify sources of pollutants and will help to determine any ultimate impacts of the project on Pettiford Creek and the shellfish beds.
- *A watershed survey* - Project partners and volunteers from WORAB, including a class of fifth graders, fanned out in neighborhoods within the watershed to collect information on land uses and water movement. Information they collected, such as the number of pets in the watershed, will help to identify potential activities that contribute to pollution.
- *Educational Outreach* - The survey results are being reviewed to direct an education program designed to change these polluting activities. Educational materials describing possible actions by residents to reduce bacterial loading to the watershed will be developed and distributed to watershed residents
- *Identifying pollutant-loading areas* - The College of Design is compiling the monitoring results, the watershed survey results, and land cover data to create maps that show potential pollutant-loading areas. WORAB will review the maps to determine areas to focus project

efforts.

- *Community Design Meeting* - Once a focus area is selected, the project team and WORAB will invite the community to a meeting where participants will help identify specific locations where BMPs may be constructed to reduce stormwater runoff and pollutants entering the creek.
- *BMP Construction* - The project team and WORAB will work with local residents to construct BMPs in locations where bacteria entering the shellfish beds can be reduced.

In the end, the EPA project will document a methodology for involving the community and a cadre of partners in identifying pollutant sources leading to shellfish bed closures, and implementing solutions to increase the amount of time that local shellfish resources are open for harvest.

Building on Successes

The White Oak River Watershed project was a successful model for the WECO program. As the program's first watershed planning and management effort, it is also the longest enduring community group. Following the WORAB model, WECO has convened four additional local watershed groups across North Carolina with the sponsorship of interested state agencies.

A study of watershed committees in Washington and California measured a group's success by the number of accomplishments achieved by that group. These include numbers of educational outreach and restoration projects as well as numbers of agreements

(Leach, etal). By these measures, WORAB is the most successful watershed group convened by WECO and will continue as a model for other communities in North Carolina seeking to improve their water resources.

For more information on WECO, please visit our web site at www.ces.ncsu.edu/WECO.

Reference

Leach, W.D., N.W. Pelkey, and P.A. Sabatier. *Stakeholder Partnerships as an Emergent Form of Collaborative Policymaking: Evaluation Criteria Applied to Watershed Management in California and Washington*, Presented at the National Workshop on Understanding Community-Based Collaboratives. Las Vegas, NV, August 7, 2001.

N.C. State Economist

Published bi-monthly by the Department of Agriculture and Resource Economics and the Cooperative Extension Service. Address correspondence to:

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