Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

North Carolina

Tar-Pamlico Basin Agricultural Management Strategy Reduces Instream Nutrients

Waterbody Improved

Row crops and animal feeding operations in the Tar-Pamlico River Basin, one of three main feeders to the nation's second largest estuary—the Albemarle-Pamlico Sound—have led to excessive nutrients in the estuary, forcing it to be added to the state's 303(d) list for chlorophyll *a*. Through implementation of best management practices (BMPs) on agricultural lands, such as riparian buffer protection, reduced fertilizer use, and implementation of conservation tillage practices, North Carolina met its 30 percent nitrogen reduction goal ahead of schedule and impaired acreage in the estuary was reduced by 90 percent, allowing one section of the estuary to be removed from the 303(d) list for chlorophyll *a*.

Problem

In the mid-1980s, the Pamlico River estuary saw an increase in problems that pointed to excessive levels of nutrients in the water—harmful algal blooms, low oxygen levels, increased numbers of fish kills, and other symptoms of stress and disease. Row crops, confined animal feeding operations, and highly erodable soils were the culprits. The Pamlico River estuary was eventually placed on the 303(d) list for chlorophyll *a*, driven by excess nutrient concentrations contributed by agricultural runoff and point sources.

Area farmers installed water table control structures like the one shown here to address excess nutrients.

Project Highlights

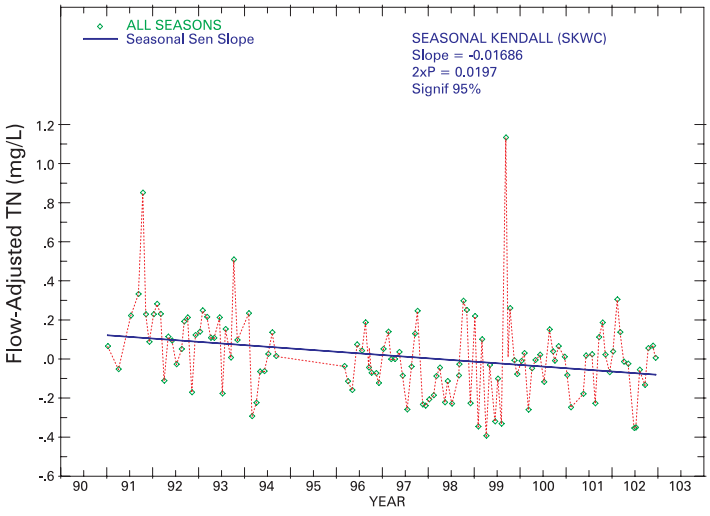
In response, the North Carolina Environmental Management Commission designated the Tar-Pamlico River Basin as "Nutrient Sensitive Waters" and called for a strategy to reduce nutrient inputs from around the basin. The strategy's first phase, which ran from 1990 through 1994, produced an innovative point source/nonpoint source trading program that allows point sources, such as wastewater treatment plants and industrial facilities, to achieve reductions in nutrient loading in more cost-effective ways. The group cap structure of the trading program has allowed the point source coalition to exceed its reduction targets so cost-effectively that nonpoint source trades have been unnecessary to date. The second phase established a plan to reduce nitrogen by 30 percent (from 1991 levels) and hold phosphorus loadings to 1991 levels based on estuarine conditions by 2006, implementing the targets set in the total maximum daily load (TMDL) for chlorophyll *a*. In addition to point sources, Phase II called on nonpoint sources to contribute to meeting these goals and established a set of nonpoint source rules addressing agriculture, urban stormwater, and fertilizer management across all land uses and called for riparian buffer protection. Between

1991 and 2003, farmers installed water control structures to treat 32,200 acres of cropland, buffers to treat 72,000 acres and planted scavenger crops on 81,500 acres. In addition, many farmers reduced fertilizer use and implemented conservation tilling practices to help meet the goal. The third phase of the nutrient strategy was adopted by the EMC effective April 14, 2005, setting an eight year clean-up deadline for the rest of the estuary by 2013.

Results

Agriculture met its 30 percent nitrogen reduction goal ahead of schedule. In fact, data from 2003 indicate a 45 percent reduction in nitrogen losses compared to 1991, mostly from decreasing fertilization rates. Progress is further reflected by samples taken at the Pamlico estuary's head showing an 18 percent in-stream reduction in nitrogen and a 33 percent instream decrease in phosphorus between 1991 and 2002, reflecting significant progress toward meeting the targets set in the TMDL. The installation of BMPs in the watershed has prevented more than 396,000 tons of soil from being washed away by erosion. As a result of watershed-wide efforts, impaired acreage in the estuary has been reduced by 90 percent (from 36,200 to 3,450 acres), and one segment of the Pamlico estuary has been removed from the 303(d) list for chlorophyll *a*.

Sampling at Pamlico Estuary



Samples reflect an 18 percent instream reduction in nitrogen.

Partners and Funding

Partners involved in the effort were North Carolina Division of Water Quality, Soil and Water Conservation Districts, North Carolina Division of Soil and Water Conservation, North Carolina Cooperative Extension, U.S. Department of Agriculture's Natural Resources Conservation Service, North Carolina Department of Agriculture, North Carolina Farm Bureau, North Carolina State University, and agricultural community and commodity groups. The North Carolina Environment Management Commission brought together stakeholder groups of affected parties and provided the participants with a chance to express differing viewpoints. Stakeholders involved in the process included environmental groups, municipalities, developers, businesses, and the public. The North Carolina Agriculture Cost Share Program, administered by the Division of Soil and Water Conservation (DSWC), contributed $12.5 million between 1992 and 2003. Another DSWC-administered program, the federal Conservation Reserve Enhancement Program, has obligated approximately $33.1 million in the Tar-Pamlico River Basin since 1998. Between 1995 and 2003, approximately $2.67 million in Clean Water Act section 319 expenditures supported a variety of nonpoint source projects in the Tar-Pamlico Basin, including BMP demonstration and implementation, technical assistance and education, GIS mapping, development and dissemination of accounting tools, and monitoring. As part of the Phase I Agreement, the area's Point Source Association both contributed funds and acquired a section 104(b)(3) grant for agricultural BMP implementation. The combined total of their contributions was $850,000 in nutrient-reducing BMPs in the basin.

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