



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY *North Carolina*

Basin-wide Cleanup Effort Reduces Instream Nitrogen

Waterbody Improved Nitrogen runoff from crops, pasture, and animal feeding operations was a major contributor to frequent algal blooms, hypoxic conditions, and fish kills in the Neuse River, one of the three main feeders to the Albemarle-Pamlico Sound system. The agricultural community implemented best management practices (BMPs) such as buffers, contour planting, no-till planting, and creek fencing that resulted in a 42 percent decrease in nitrogen loading to the estuary, exceeding the 30 percent reduction goal called for in the total maximum daily load (TMDL). This reduction, combined with additional point source reductions, resulted in a 27 percent instream nitrogen reduction in the Neuse River just above the estuary.

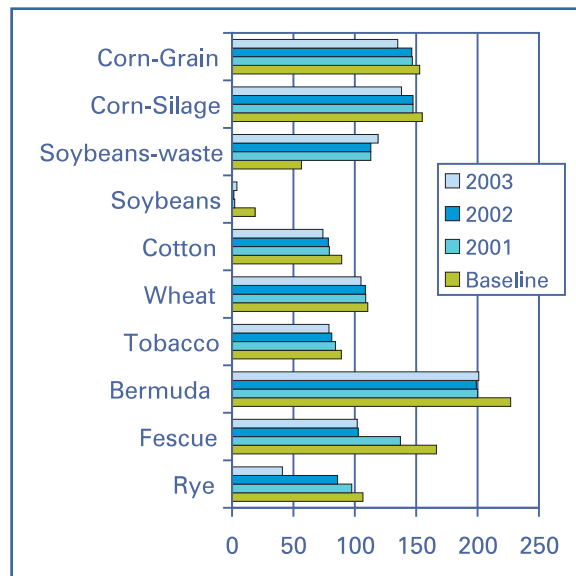
Problem

Water quality in the estuary of the 6,000-square-mile basin has been a concern for over a century. High nitrogen levels from agricultural runoff have contributed to frequent algal blooms, hypoxic conditions, and fish kills. In 1993 a North Carolina Division of Water Quality management plan for the basin recommended an accelerated schedule to reduce nitrogen from point and nonpoint sources. The Neuse River Basin was listed as impaired by nitrogen on the state's 303(d) list.

Project Highlights

In 1997 the North Carolina Environmental Management Commission (EMC) adopted the state's first mandatory plan to control both

Average Nitrogen Fertilization Rates



Decreased fertilizer use was one factor that led to a reduction in nitrogen levels.



Filter strips in the Neuse River Basin decrease nitrogen loads to the river.

point and nonpoint source pollution in the basin. The plan, backed by figures in the Neuse River TMDL, called for a mandatory 30 percent reduction in nitrogen from point, urban, and rural sources by 2003. The EMC worked with the appropriate nonpoint source agencies to target the implementation of BMPs to reduce

sediment and nutrient runoff throughout the basin. Between 1996 and 2003, half of the croplands enrolled in the program implemented BMPs such as buffers, contour planting, no-till planting, and creek fencing.

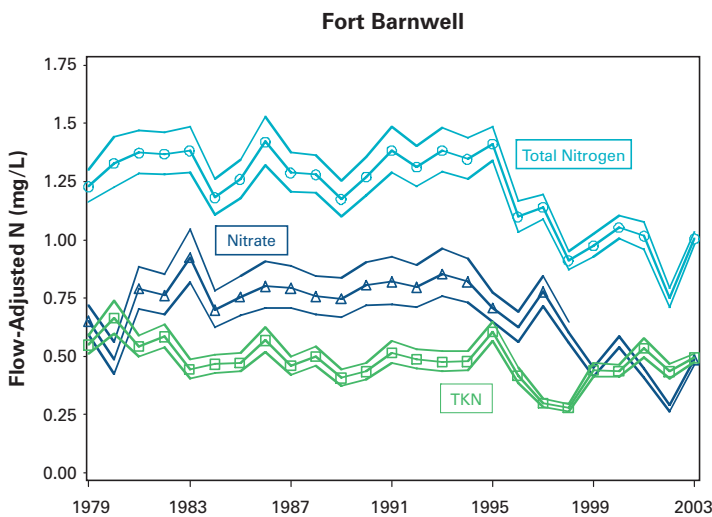
Results

Data for 2003 show that the Neuse agricultural community achieved a 42 percent nitrogen reduction, exceeding the 30 percent goal set by the EMC and Neuse River TMDL. A continuous monitoring system was established in the lower portion of the basin, near the Neuse estuary. Using flow-adjusted nitrogen concentrations, long-term nutrient data show a 27 percent instream nitrogen reduction in 2003 as compared to the average flow-adjusted concentrations from the 1991 to 1995 baseline. This decrease, along with point source reductions, was accomplished by installing BMPs, implementing fertilizer management plans, and removing cropland from production. The

new agricultural practices also led to lower phosphorus levels and slowed erosion, while farmers benefited from savings on fertilizer. The BMPs prevented more than 480,000 tons of soil from being washed away by erosion.

Partners and Funding

This basin-wide effort has brought together diverse interests from throughout the watershed. Project partners include the North Carolina Division of Water Quality, North Carolina Division of Soil and Water Conservation, Soil and Water Conservation Districts, North Carolina Cooperative Extension Service, North Carolina Farm Bureau, Duke University, Neuse River Foundation, U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), and local agricultural, environmental, and scientific communities. Funds were derived from governmental and non-governmental sources to pay for BMPs and technical assistance. Through 2002 more than \$12 million was committed to meeting project goals. The section 319 program provided more than \$1 million contributing directly to the installation of BMPs on farms and working with farmers to determine appropriate fertilizer rates. Additional project funding was provided by the NRCS Environmental Quality Incentives Program (\$4.7 million), North Carolina Agriculture Cost Share Program (\$3.2 million), Clean Water Management Trust Fund (\$2.7 million), and Pew Charitable Trust. Funding figures do not include the substantial costs incurred by Neuse Basin farmers.



Flow-adjusted total nitrogen concentrations at Fort Barnwell on the Neuse River from 1979 to 2003 showing a 27% decrease in concentration from 1991-1995 base period to 2003. *Dr. Craig A. Stow, University of South Carolina, 2004.*



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