



## Section 319

# NONPOINT SOURCE PROGRAM SUCCESS STORY

# Delaware

## Implementing Various Pollution Control and Restoration Practices Improves Water Quality in Noxontown Pond

### Waterbody Improved

Stormwater runoff from agricultural and urban areas contributed nonpoint source pollutants to Delaware's Noxontown Pond, prompting Delaware's Department of Natural Resources and Environmental Control (DNREC) to add the pond to the 1998 Clean Water Act (CWA) section 303(d) list for bacteria and nutrients. Watershed stakeholders provided technical assistance, installed agricultural best management practices (BMPs), implemented low impact development designs and restored streambanks. Bacteria levels declined, and DNREC removed the Noxontown Pond segment of the Appoquinimink watershed from the state's 2006 list of impaired waters for bacteria.

### Problem

Noxontown Pond covers approximately 158 acres near the headwaters of the 47-square-mile Appoquinimink River watershed, adjacent to the town of Townsend. The headwaters drain mostly agricultural lands and feed four major ponds, including Noxontown Pond. The 16-mile Appoquinimink River meanders through farmlands and wetlands in southern New Castle County and eventually flows into the Delaware Bay (Figure 1). It also contains three of the fastest growing towns in the state: Odessa, Townsend and Middletown.

Much of the watershed is actively cultivated; however, as development occurs south of the Chesapeake and Delaware Canal, farmland is being converted into suburban residential developments. Today, less than 9 percent of the watershed remains forested. Between 1992 and 2007, watershed impervious cover increased from 4 to 9 percent; it is projected to reach a maximum of 25 percent in the future.

Monitoring data collected in the late-1990s indicated that Noxontown Pond failed to meet the state's enterococcus bacteria numeric criterion, which requires that the annual geometric mean be less than 100 colony-forming units (CFU) per 100 milliliters (mL). The pond did not support its freshwater primary contact designated use, prompting the state in 1998 to add the pond to Delaware's CWA section 303(d) list of impaired waters for bacteria. The pond was also listed as impaired for nutrients in 1998.



Figure 1. Noxontown Pond is one of four major ponds in the watershed that flow into Appoquinimink River in northern Delaware.

In 2003 the U.S. Environmental Protection Agency developed a total maximum daily load (TMDL) to address the nutrients and dissolved oxygen impairments throughout the Appoquinimink watershed, which includes Noxontown Pond. The TMDL requires a 60 percent reduction in nitrogen and phosphorus. In 2006 DNREC also developed a bacteria TMDL for the Appoquinimink watershed, which required an 11–15 percent reduction in the nonpoint source bacteria load in freshwater areas.

## Project Highlights

The New Castle County Conservation District (NCCD) offered technical assistance to the farming community by providing nutrient management planning and cost-share funding for agricultural BMPs. NCCD also partnered with the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) to develop conservation plans and Environmental Quality Incentive Program (EQIP) contracts. Between 2000 and 2012, watershed partners worked with landowners to restore approximately 10 acres of wetlands, establish almost 4 acres of riparian buffers, plant 250 acres of cover crop, enroll 800 acres in conservation crop rotation, install 1,354 acres of irrigation water management and implement nutrient management plans on 2,326 acres.

In 2000, DNREC created an Appoquinimink Tributary Action Team to develop recommendations for meeting the TMDL goals. In 2004, as recommended by the Action Team, the nonprofit Appoquinimink River Association (ARA) was formed to help watershed partners implement water quality protection projects. Since then, ARA has provided important environmental education and outreach throughout the region. With help from ARA, Middletown passed an Environmental Protection Ordinance in 2007 to establish Riparian Buffer Area Conservation Districts to regulate uses, activities and development in areas adjacent to waterbodies in the Appoquinimink River watershed.

Delaware's USDA Conservation Reserve Enhancement Program (CREP) was established in 1999 to protect and enhance environmentally sensitive land and waters in the coastal plain geographic areas of the Delaware, Chesapeake and Inland Bays watersheds by establishing voluntary land retirement agreements with agricultural producers. To assist in CREP program development and implementation, in 1999 Delaware's Nonpoint Source Program committed CWA section 319 funds to create a full-time Delaware CREP Program Coordinator position. Between 1999 and 2012, the CREP Program Coordinator used the Delaware CREP to help install 19.4 acres of wildlife plantings, 54 acres of grass buffers, and numerous other conservation practices throughout the Appoquinimink River watershed.

## Results

For more than 10 years, watershed partners have implemented water quality protection and restoration efforts in the Appoquinimink River

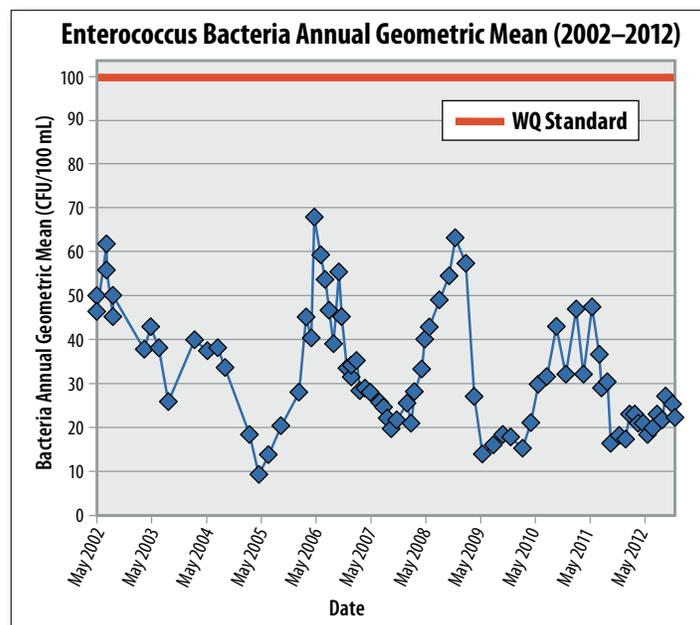


Figure 2. The annual geometric mean of enterococcus bacteria data for 2002–2012 show that Noxontown Pond meets the state's numeric bacteria criterion, which requires an annual geometric mean of less than 100 CFU/100 mL.

watershed that have helped to reduce bacteria in surface waters. Water quality monitoring data collected from Noxontown Pond (station 109131) in 2002–2012 showed that the enterococcus bacteria annual geometric means comply with the numeric criterion necessary to support the pond's freshwater primary contact recreation designated use (Figure 2). On the basis of these data, DNREC removed Noxontown Pond from the state's 2006 list of impaired waters for bacteria. Data show that Noxontown Pond water quality continues to meet the bacteria water quality standard. The pond remains listed as impaired for nutrients.

## Partners and Funding

Key partners were the NCCD, USDA NRCS, ARA and the Delaware Nonpoint Source Program. Approximately \$118,400 in federal CWA section 319 funds supported the costs of the Noxontown Pond projects. Additional funding was provided through the USDA EQIP and CREP, and Delaware's Conservation Cost Share program (which was provided through the NCCD). Because of the nature of the funding and enrollment procedures, much of the funding provided by watershed partners has been immeasurable.



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