NONPOINT SOURCE SUCCESS STORY

Louisiana

Federal and State Agencies Rally Together to Reduce Total Dissolved Solids Concentrations in Bayou Nezpique

Waterbody Improved

Sediment and nutrient runoff from agricultural fields degraded water quality in Louisiana's Bayou Nezpique River. As a result, Louisiana added total dissolved solids (TDS) as a cause of impairment for Bayou Nezpique River on its 2008 Clean Water Act (CWA) section 303(d) list of impaired waters. Beginning in 2009, agricultural best management practices (BMPs) were installed in the Bayou Nezpique subsegment. These efforts decreased the sediment and nutrient loads entering the bayou, and resulted in the delisting of TDS as a cause of impairment in the Bayou Nezpique subsegment in 2010.

Problem

Bayou Nezpique, which is 65 miles long and has a drainage area of 611 square miles, empties into the Mermentau River in southwestern Louisiana. The bayou is in the prairie region of the state, where rice and crawfish farms have been a dominant part of the landscape for many generations. Bayou Nezpique flows through the parishes of Evangeline, Acadia, Allen, and Jefferson Davis. The segment is long and narrow with a variety of land uses, including evergreen and deciduous forest lands (53 percent), developed lands (6.5 percent), and agricultural lands. Primary agricultural cropland includes rice (19 percent) and pasture or hay (17 percent); other agricultural crops grown in the watershed include sweet potatoes, soybeans, sorghum, and sugar cane (Figure 1). Because of its relatively low relief, especially in the prairie and marsh areas, the region is characterized by poor drainage and annual backwater flooding of agricultural lands.

Agriculture is approximately 23 percent of the watershed and contributes a substantial portion of the nonpoint source load. The primary agricultural crop in the watershed is rice, alternated with either soybeans or crawfish. The rice fields are flooded in the fall for crawfish; in early spring, the farmers release the water and let the fields dry to allow soybeans to be planted.

Runoff from fields after recent tillage, fertilizer applications, and other field operations can contain higher levels of sediments and pollutants. In particular, planting activities during the wet weather

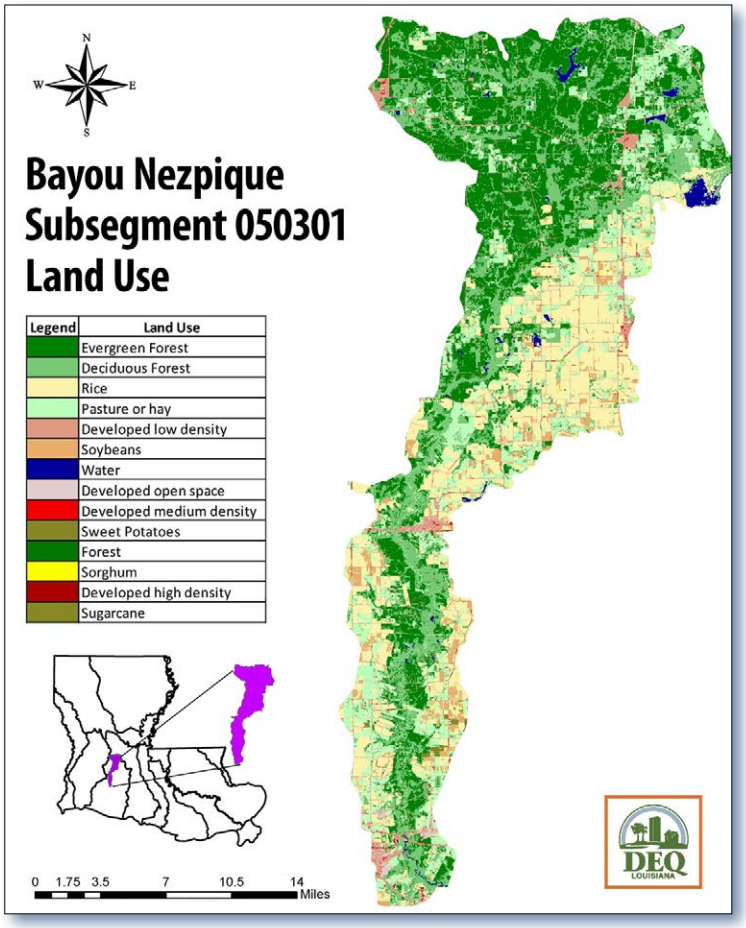

Figure 1. Bayou Nezpique is a relatively flat watershed in the prairie region of southwestern Louisiana. The predominant land uses in the watershed include forest and agriculture.

Figure 2. A farmer implements irrigation land leveling, which reshapes the land to a chosen grade and will permit uniform and efficient application of surface irrigation water without causing significant erosion.

season of late winter and early spring produce large volumes of very turbid water. The most significant source of TDS and sediment in this watershed is suspended solids in wet weather runoff.

Louisiana's standards for TDS require that 25 percent of yearly samples not exceed 260 parts per million (ppm). Monitoring data collected in 2003 showed that three samples out of twelve (25 percent) exceeded 260 ppm TDS, resulting in a violation of the TDS standard. On the basis of these data, the Louisiana Department of Environmental Quality (LDEQ) listed Bayou Nezpique as impaired for TDS on the state's 2008 integrated report, with agriculture identified as the source of impairment. A total maximum daily load was not developed for TDS.

Project Highlights

LDEQ worked along with the Louisiana Department of Agriculture and Forestry Office of Soil and Water Conservation (LDAF-OSWC) to implement agricultural practices in all but one of the 10 HUC-12 (12-digit hydrologic unit code) watersheds within the Bayou Nezpique subsegment. BMPs were implemented from 2009 until 2013 and included nutrient management (9,701 acres), conservation cover (297 acres), prescribed grazing (950 acres), crop rotation (9,810 acres), irrigation land leveling (5,240) (Figure 2), and riparian forest buffer (30 acres).

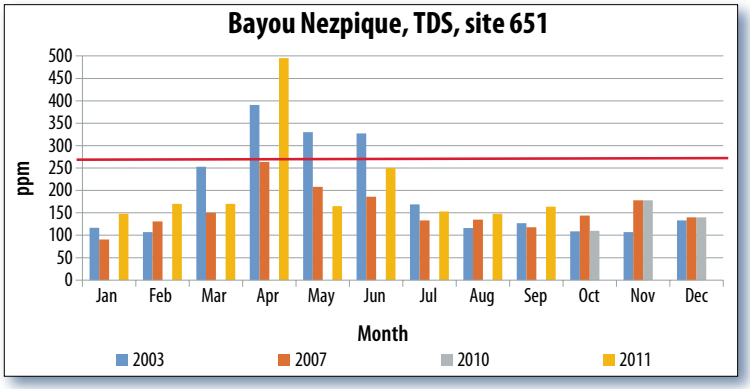

Figure 3. Total dissolved solids (TDS) data, 2003–2011.

Results

Monitoring data collected in 2011 showed that only one of twelve (8 percent) of samples exceeded the maximum allowable TDS concentration of 260 mg/L (Figure 3), which meets the TDS standard. Therefore, in 2010 Louisiana delisted TDS as a cause of impairment for the Bayou Nezpique.

Partners and Funding

The partners responsible for making this project a success include the U.S. Environmental Protection Agency, LDEQ, U.S. Department of Agriculture's Natural Resource Conservation Service (NRCS), and LDAF-OSWC. Soil and water conservation district (SWCD) funding for cost-share was provided by LDAF-OSWC through a cooperative conservation partnership initiative, funded through NRCS, which provided special funds for projects in the Bayou Nezpique area. LDAF also provided technical assistance through the SWCDs in the area. LDEQ works with the LDAF-OSWC to implement the agricultural portion of the Louisiana's Nonpoint Source Management Plan.

From 2009–2013, partners used $1,057,150 of CWA section 319 funds to sponsor cost sharing, monitoring and education projects. Within the Bayou Nezpique watershed, LDAF-OSWC and the Evangeline SWCD implemented BMPs using CWA section 319 Water Quality Protection Project grant funds awarded in 2008 (for the Evangeline Soil and Water Conservation Protection Project and the Calcasieu and Mermentau River Basin Coastal Prairie Cooperative Project).

U.S. Environmental Protection Agency
Office of Water
Washington, DC

EPA 841-F-15-001C
January 2015

For additional information contact:

Karen Vidrine
Louisiana Department of Environmental Quality
225-219-1208
Karen.Vidrine@la.gov