



## Section 319

# NONPOINT SOURCE PROGRAM SUCCESS STORY

# Louisiana

## Partners Cooperate to Improve Water Quality in Lake Arthur and Lower Mermentau River

### Waterbody Improved

In 1999 the Louisiana Department of Environmental Quality (LDEQ) added the Lake Arthur and Lower Mermentau River assessment unit (AU) to the state's court-ordered Clean Water Act (CWA) section 303(d) list of impaired waters for not meeting the fish and wildlife propagation (FWP) designated use. Suspected causes of impairment included low dissolved oxygen (DO) and high levels of total suspended solids (TSS), nutrients, turbidity, oil and grease, and ammonia from point and nonpoint sources of pollution. Landowners implemented agricultural best management practices (BMPs) to reduce pollutant loading within the watershed. Water quality improved, prompting LDEQ to remove the Lower Mermentau River and Lake Arthur AU from the state's list of impaired waters in 2010 for sediment/siltation, TSS, turbidity, and ammonia, and in 2012 for DO, nitrate/nitrite, and total phosphorus (TP).

### Problem

The Lower Mermentau River flows through Lake Arthur before entering Grand Lake in southern Louisiana. LDEQ classifies the tidally dominated estuarine waters of the Lake Arthur and Lower Mermentau River AU as basin subsegment 050402 (Figure 1). The predominant land uses in the AU's 29,200-acre watershed are rice crop (32 percent), water (20 percent), and pasture/hay fields (19.8 percent); the remaining uses are freshwater marsh, low- to medium-density development, and forests.

In the late 1990s, LDEQ's ambient water quality data indicated high concentrations of TSS, turbidity, and nutrients and low DO concentrations in the Lower Mermentau River and Lake Arthur. The DO criterion for the Lower Mermentau River is that no more than 10 percent of monthly samples may fall below 5.0 milligrams per liter (mg/L). In 1998 DO values remained below the state's criterion of 5.0 mg/L for seven months of the year; the lowest value, 2.37 mg/L, occurred in August. Although Louisiana does not currently have a numeric criterion for TSS, the U.S. Environmental Protection Agency (EPA) recommends a maximum TSS guideline of 29 mg/L to ensure support of the FWP use. LDEQ's ambient water quality data indicated that TSS values exceeded the guideline during June and November of 1998. Likewise, the state does not currently have numeric criteria for nutrients; it does, however, provide narrative criteria that require the naturally occurring range of nitrogen and phosphorus to be maintained using site-specific studies to establish limits for nutrients

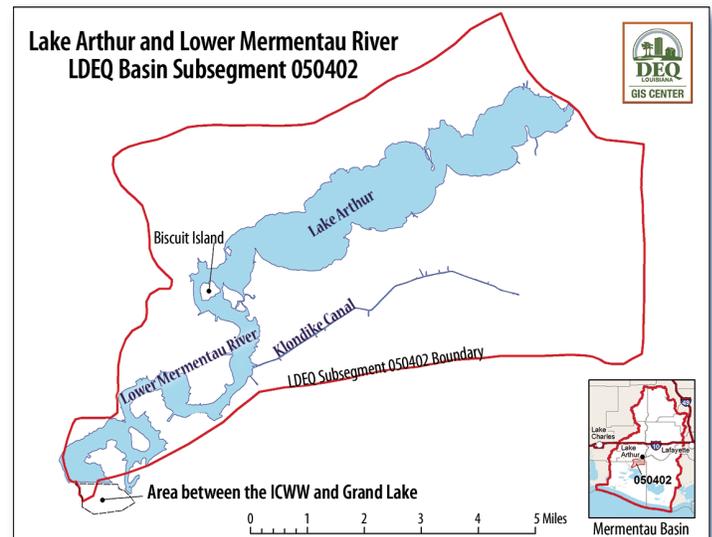


Figure 1. The Lake Arthur and Lower Mermentau River Basin Subsegment is in southern Louisiana.

to avoid aquatic growth that creates a public nuisance or interferes with designated water uses.

On the basis of these data and assessments, LDEQ added the Lake Arthur and Lower Mermentau River AU to the 1999 CWA section 303(d) list for failing to support its FWP designated use due to low DO and high TSS, nutrients, turbidity, oil and grease, and ammonia. The suspected sources of impairment included minor municipal point sources, crop production, petroleum activities, individual septic tanks, and flow alterations/modifications.

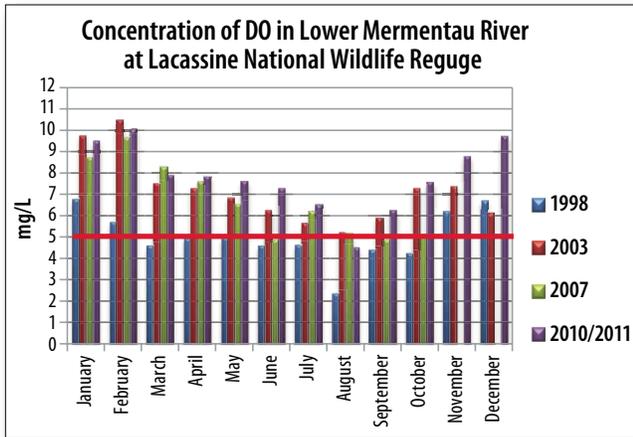


Figure 2. Dissolved oxygen concentrations in the lower Mermentau River have improved.

In 2001 EPA completed a total maximum daily load (TMDL) for turbidity, TSS, and siltation for the Mermentau River Basin, including the Lake Arthur and Lower Mermentau River AU. The TMDL identified fluvial erosion processes as the dominant contributor to high turbidity, TSS, and siltation levels. In 2002 EPA completed a TMDL for DO, nutrients, and ammonia in portions of the Lower Mermentau River Basin. This TMDL indicated that a 40 percent reduction in oxygen-demanding substances was necessary to meet the state's DO water quality standard. The TMDL indicated that DO would likely improve if nutrient concentrations were reduced.

## Project Highlights

From 2002 through 2011, the U.S. Department of Agriculture's (USDA's) Natural Resources Conservation Service (NRCS) partnered with watershed landowners to develop comprehensive resource management systems—plans that included sets of approved conservation practices necessary to achieve conservation goals. The practices included irrigation water management, residue and nutrient management, conservation crop rotation, grade stabilization structures, and wetland wildlife habitat management. Through USDA's ranking criteria, lands that drain directly to the Lower Mermentau River and Lake Arthur were prioritized for cost-share and technical assistance.

NRCS partnered with the Gulf Coast Soil and Water Conservation District (SWCD), Vermilion SWCD, and Jefferson Davis SWCD to provide technical and/or cost-share assistance to help Lower Mermentau/Lake Arthur watershed landowners implement

BMPs on approximately 2,645 acres: 1,551 acres on rice fields, 742 acres on crawfish operations, 193 acres on soybean fields, and 158 acres on pastures. The BMPs included residue management (seasonal) on approximately 1,307 acres, conservation crop rotation on 1,242 acres, irrigation water management on 1,711 acres, integrated pest management on 1,265 acres, nutrient management on 1,006 acres, wetland wildlife habitat on 884 acres, and prescribed grazing on 125 acres. Landowners often applied multiple BMPs on the same acreage.

Contracts with landowners will remain in place through 2018, so water quality should continue to improve. A watershed coordinator is working with stakeholders on a watershed implementation plan to continue activities and programs to improve water quality.

## Results

LDEQ collected water quality data in the Lower Mermentau River at Lake Arthur during four sampling periods: 1998, 2003, 2007, and 2010/2011. Between the 1998 and 2010/2011 sampling periods, average annual DO concentrations increased from 4.7 mg/L to 7.8 mg/L. In all but one month, DO levels during the 2010/2011 sampling period remained above 5.0 mg/L, thereby meeting the DO criterion necessary to fully support the Lower Mermentau River's FWP designated use (Figure 2). TSS values exceeded EPA's guideline maximum of 29 mg/L during June and November 1998, but they have remained below this level in all sampling periods since that time. Average annual TSS concentrations declined from 27.48 mg/L in 1998 to 12.29 mg/L in 2010/2011. In addition, monitoring data collected since 1998 show that average annual TP concentrations decreased from 0.27 mg/L in 1998 to 0.13 mg/L in 2010/2011. Based on these monitoring data, LDEQ removed the Lower Mermentau River and Lake Arthur AU from the state's list of impaired waters in 2010 for sediment/siltation, TSS, turbidity, and ammonia, and in 2012 for DO, nitrate/nitrite, and TP.

## Partners and Funding

NRCS, Gulf Coast SWCD, Jefferson Davis SWCD, Vermilion SWCD, and 23 landowners partnered to implement practices. NRCS provided approximately \$264,158 in USDA Farm Bill funds to implement both agricultural and pastureland BMPs. Louisiana Department of Agriculture and Forestry staff helped landowners implement practices. Partners applied \$85,800 in EPA CWA section 319 funds towards projects in this watershed.



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