



# NONPOINT SOURCE SUCCESS STORY

## Louisiana

### State and Federal Efforts Help Reduce Turbidity in Lake St. Joseph

#### Waterbody Improved

Runoff from agricultural fields in the Lake St. Joseph watershed caused a high sediment influx into the lake, resulting in the lake not meeting its designated use for fish and wildlife propagation (FWP). As a result, the Louisiana Department of Environmental Quality (LDEQ) added Lake St. Joseph to the state's 2002 Clean Water Act (CWA) section 303(d) list of impaired waters for turbidity. LDEQ and the Louisiana Department of Agriculture and Forestry (LDAF) began an initiative in 2006 assisting landowners in implementing best management practices (BMPs) to decrease sediment runoff primarily from corn, soybean and cotton fields. Water quality sampling verifies that the lake now meets the standard for turbidity; therefore, LDEQ is proposing to remove this parameter from the state's 2016 list of impaired waters.

#### Problem

The 14,000-acre Lake St. Joseph watershed is in Tensas Parish. The lake lies within an agricultural row crop area. Cotton, corn, wheat and soybeans are typically grown in close proximity to the lake (Figure 1). Production of these types of crops disturbs topsoil, transporting sediments via runoff during rainfall events into the lake. Increased agricultural activity around Lake St. Joseph over the past century has greatly accelerated its natural succession. The lake bottom consists of a deep layer of silt, with a depth at pool stage less than 3 feet in much of the lake.

Before construction of a water-control structure in Clark Bayou, the lake levels fluctuated naturally with backwater from spring floods flowing freely into the lake. However, the construction of the water-control structure eventually led to increased accumulation of sediments and an associated decrease in lake depth.

The lake's physical condition is now conducive to high summertime water temperatures and turbidity (planktonic and suspended sediments). The conditions limit the dissolved oxygen content in the water, causing most fish species to become stressed. Numerous fish kills have been attributed to these factors.

Turbidity is a standard measurement of suspended sediments in a stream. Louisiana's water quality standard for FWP for turbidity in Lake St. Joseph is 25 nephelometric turbidity units (NTU). The FWP criteria for turbidity requires that no more than 30 percent of samples collected on a monthly or near-monthly basis can exceed 25 NTU. All 12 ambient samples collected in 1999 indicated that the standard for

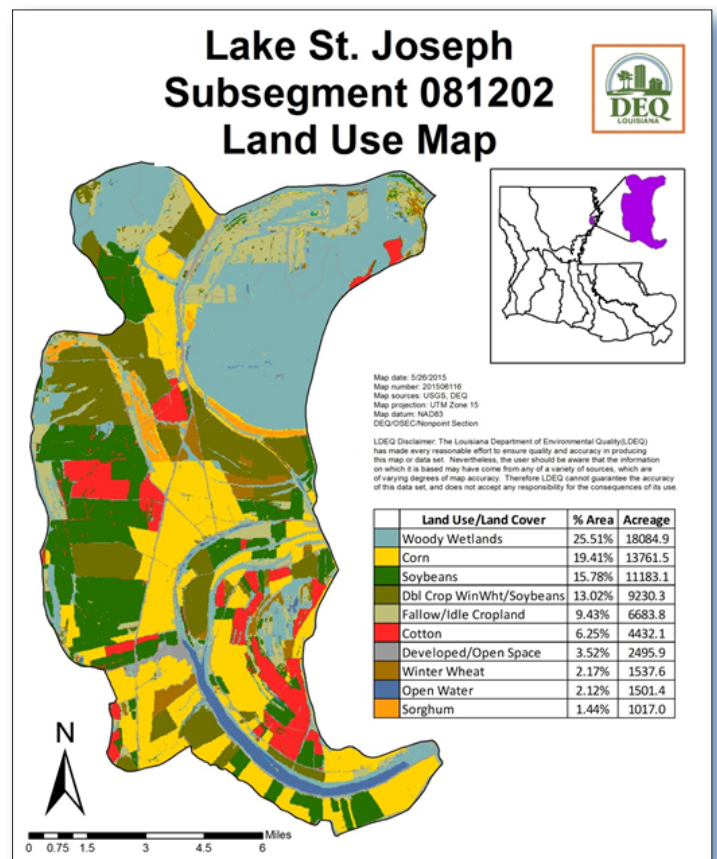


Figure 1. Lake St. Joseph watershed land use, eastern Louisiana.

turbidity was exceeded, prompting LDEQ to add Lake St. Joseph (LA081202\_00) to the state's 2002 CWA section 303(d) list of impaired waters. The suspected sources of impairment were listed as natural conditions and an unknown source.

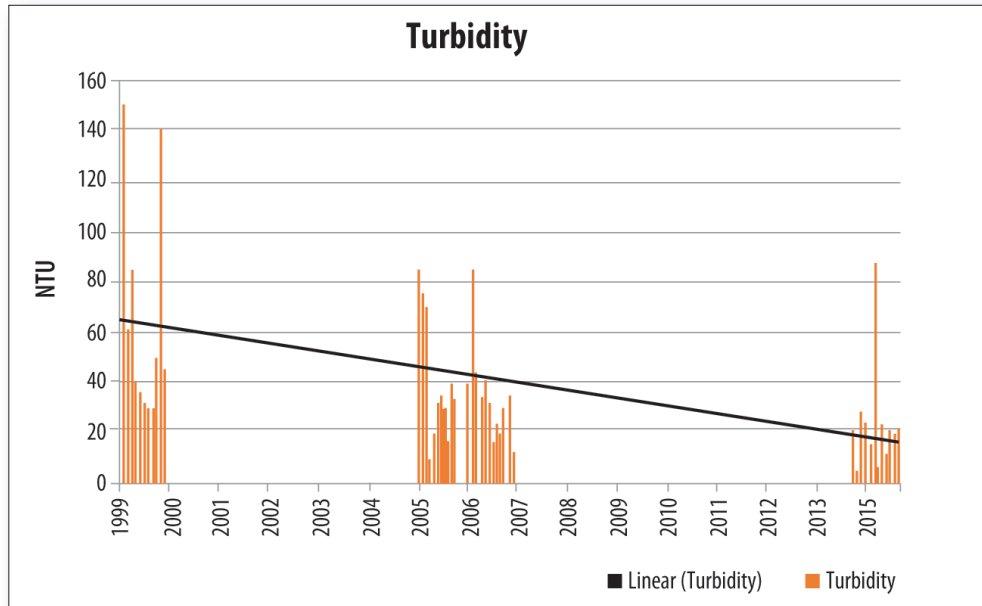


Figure 2. Turbidity concentrations in Lake St. Joseph have trended downward over time, thanks to long-term restoration efforts by multiple stakeholders.

## Project Highlights

LDEQ developed a watershed implementation plan (WIP) in 2004. Beginning in 2006, the U.S. Department of Agriculture’s Natural Resources Conservation Service (USDA-NRCS) provided cost share through the Farm Bill, helping landowners implement BMPs through the Environmental Quality Incentives Program. In 2012 LDEQ revised the WIP with additional available information.

LDEQ, LDAF and USDA-NRCS began a project in fiscal year 2012 using both CWA section 319 and Farm Bill funds in a focused effort to reduce nutrients and sediments. LDEQ provided funds to collect hydrologic and water quality baseline data for 1 year (February 2012–January 2013) to better understand the pollution sources and identify the substantial pathways for the pollutant load to the lake. The data gathered were used to determine critical areas for BMP implementation. LDAF and USDA-NRCS helped local landowners implement multiple agricultural BMPs, including conservation cover, conservation crop rotation, cover crops and irrigation water management on approximately 5,100 acres of the watershed. LDEQ continued sampling for an additional 2 years during implementation to monitor for water quality improvement.

## Results

Turbidity concentrations improved in Lake St. Joseph as a result of the BMP implementation (Figure 2). Average turbidity concentrations declined from 68.9 NTU in 1999 to 23.5 NTU for the 2013–2014 ambient sampling cycle. Only two of the 12 samples collected exceeded 25 NTU (a 16.7 percent exceedance rate), which meets the water quality standard. Therefore, Louisiana is proposing to remove the turbidity impairment for Lake St. Joseph’s FWP designated use from the state’s 2016 list of impaired waters.

## Partners and Funding

LDEQ and LDAF provided \$467,141 in CWA section 319 funds to the Louisiana State University AgCenter to support monitoring efforts and to help agriculture producers and landowners implement BMPs. A total of \$374,183 was obtained in matching funds. USDA-NRCS also provided \$691,444 in Farm Bill funds from 2006 to 2014. The Tensas–Concordia Soil and Water Conservation District has been a significant partner in the restoration effort.



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## For additional information contact:

**Michael Schooler, LDAF**  
318-435-6743 Ext. 122 • [mschooler@daf.state.la.us](mailto:mschooler@daf.state.la.us)  
**Karen Vidrine, LDEQ**  
225-219-1208 • [karen.vidrine@la.gov](mailto:karen.vidrine@la.gov)