



# NONPOINT SOURCE SUCCESS STORY

# Texas

## Implementing Conservation Practices and Conducting Watershed Outreach Improves Water Quality in the Lower Colorado River

### Waterbody Improved

The lower Colorado River is one of many rural water bodies listed as impaired on the 303(d) list due to elevated levels of *Escherichia coli* (*E. coli*) and Enterococcus bacteria. The Colorado River Tidal assessment unit (AU) was first listed in 2006, and the Colorado River Below La Grange AU was listed in 2014. The Texas State Soil and Water Conservation Board (TSSWCB) and its partners hosted numerous educational events for stakeholders to learn about their local water quality issues. These events also focused on the management of feral hogs, riparian areas, septic systems, livestock, and water wells. Many of these outreach events prompted landowners to begin participating in conservation programs. Through these combined efforts, water quality improved and two Colorado River AUs (1401\_01 and 1402\_02) were removed from the state's list of impaired waters.

### Problem

The Colorado River Below La Grange AU (1402\_02) and Colorado River Tidal AU (1401\_01) are within watersheds in southeast Texas that drain into Matagorda Bay (Figure 1). Most land in this rural area is used for cattle, rice, row crop, wildlife, and recreational operations. Most of the towns in this area have populations below 10,000 residents, except for Bay City in Matagorda County.

Water quality data collected in the Colorado River Tidal AU in 1998–2005 and the Colorado River Below La Grange AU in 2006–2013 showed that Enterococcus and *E. coli* bacteria levels exceeded the bacteria water quality standard for contact recreation, which is a geometric mean (geomean) of 126 colony-forming units (cfu) per 100 milliliters (mL). As a result, the Texas Commission on Environmental Quality (TCEQ) added the two AUs to the Clean Water Act (CWA) section 303(d) list of impaired waters: (1) the Colorado River Tidal AU in 2006 for Enterococcus and (2) the Colorado River Below La Grange AU in 2014 for *E. coli*.

### Story Highlights

The TSSWCB, Texas Water Resources Institute (TWRI), Texas A&M AgriLife Extension, Texas A&M AgriLife Research, and the Lower Colorado River Authority (LCRA) have been hosting education and outreach programs in these watersheds for years. These programs

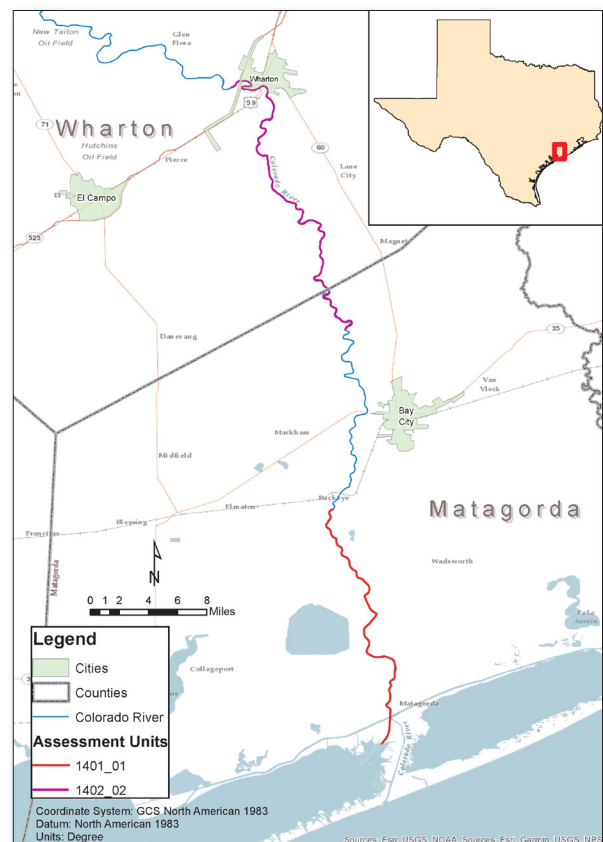


Figure 1. The Colorado River Tidal AU (AU 1401\_01) and the Colorado River Below La Grange AU (AU 1402\_02) are on the lower Colorado River in Southeast Texas.

**Table 1. Pre- and post-project monitoring data on the Colorado River Tidal and Colorado River Below La Grange AUs.**

Waterbody name	AU	Impairment	Unit	WQ standard	Pre-project	Post-project
Colorado River Tidal	1401_01	Enterococcus	cfu/100 mL	35	152	31
Colorado River Below La Grange	1401_02	<i>Escherichia coli</i>	cfu/100 mL	126	140	114

Notes: AU = assessment unit; cfu = colony-forming unit; mL = milliliter

focused on water quality, feral hog management, riparian area protection, livestock management, septic systems maintenance, and water well protection. The partners held field days during certain events to demonstrate conservation practices to landowners.

The TSSWCB partnered with the Colorado County, Wharton County, and Matagorda County soil and water conservation districts (SWCDs) to develop and implement 33 water quality management plans (WQMPs) in these counties' watersheds. The WQMPs were site-specific plans developed for grazing, rice, and row crop operations that covered over 14,700 acres. The conservation practices prescribed in these WQMPs included alternative water sources, prescribed grazing, cross-fencing, nutrient management, and grade stabilization structures. The U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) also worked with landowners to implement conservation practices using Environmental Quality Incentives Program funding on more than 10,000 acres in these watersheds. The conservation practices implemented included prescribed grazing, grass and range planting, nutrient management, grade stabilization structures, conservation cover, cross fence, water wells, livestock pipeline, water troughs, and ponds. Additionally, LCRA worked with three landowners to develop conservation plans on their operations through the LCRA Creekside Conservation Program.

## Results

Water quality has improved in the lower Colorado River (Figure 2). Monitoring data review showed that the long-term Enterococcus and *E. coli* geomeans meet the state water quality standard for contact recreation in portions of the Colorado River (Table 1). Data collected during 2006–2012 for AU 1401\_01 showed a geomean of 31.34 cfu/100 mL for Enterococcus. Data collected during 2009–2016 for AU 1402\_02 showed a geomean of 122.58 cfu/100 mL for *E. coli*. Consequently, these portions of the Colorado River were removed from the CWA section 303(d) list in



Figure 2. The Colorado River flows through Wharton County in southeast Texas.

2014 and 2018, respectively. The success of this effort can be attributed to increased stakeholder awareness due to educational programs focused on improving water quality and to conservation practices being implemented in these watersheds.

## Partners and Funding

TSSWCB partnered with local SWCDs, NRCS, Texas A&M AgriLife Extension, TWRI, Texas A&M AgriLife Research, and LCRA to host educational events for stakeholders. Over \$205,000 in U.S. Environmental Protection Agency CWA section 319(h) grant funds (provided by the TSSWCB), combined with more than \$136,000 in non-federal funds from TSSWCB, LCRA, TWRI, Texas A&M AgriLife Extension, Texas A&M AgriLife Research, and landowners, supported implementing conservation practices and delivering educational programs.

The Colorado County, Wharton County, and Matagorda County SWCDs worked with landowners to voluntarily implement conservation practices to enhance sustainable livestock production and improve soil and water resources. The TSSWCB and the NRCS worked with the SWCDs to provide \$124,462 in state funding and \$1,097,334 in federal Farm Bill funding to landowners as financial incentives to implement conservation practices and provide technical assistance in the Lower Colorado River watershed.



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