



NONPOINT SOURCE SUCCESS STORY

Arkansas

Implementing Agricultural Best Management Practices Reduces Turbidity in the St. Francis River

Waterbodies Improved

Erosion from row crop fields led to high turbidity levels in Arkansas' St. Francis River. As a result, the Arkansas Department of Environmental Quality (ADEQ) added a 55.9-mile section and a 17.1-mile section of the St. Francis River to the state's 2006 Clean Water Act (CWA) section 303(d) list of impaired waters for turbidity. Watershed stakeholders implemented best management practices (BMPs) to reduce erosion of sediment from row crop fields. Turbidity levels on these two stream reaches declined, prompting ADEQ to remove them from the 2014 CWA section 303(d) list for turbidity impairment.

Problem

The St. Francis River begins in southeastern Missouri, flows across northeastern and east-central Arkansas, and empties into the Mississippi River near Helena, Arkansas. ADEQ has listed the St. Francis River as an Ecologically Sensitive Waterbody (ESW). The St. Francis River Basin is divided into three discrete ADEQ planning segments (5A, 5B, and 5C) based on hydrological characteristics, human activities, geographic characteristics, and other factors (Figure 1).

Erosion and siltation from agricultural row crop fields (Figure 2) contributed high levels of sediment to the river. ADEQ considers a stream reach in this planning segment (planning segment 5A) to be impaired by turbidity if more than 25 percent of all samples exceed 100 nephelometric turbidity units (NTU), based on 5 years of data before the assessment year. A 2006 ADEQ assessment found that stream reach 008 (55.9 miles long) and stream reach 009 (17.1 miles long) did not meet the water quality standard for turbidity. The 2006 assessment showed that 26 percent of the water samples from these two reaches exceeded 100 NTU for all flows, indicating that the river's aquatic life (fisheries) designated use was not being supported. Therefore, ADEQ added these two reaches to the state's 2006 CWA section 303(d) list of impaired waters for turbidity. ADEQ identified the source as agriculture.

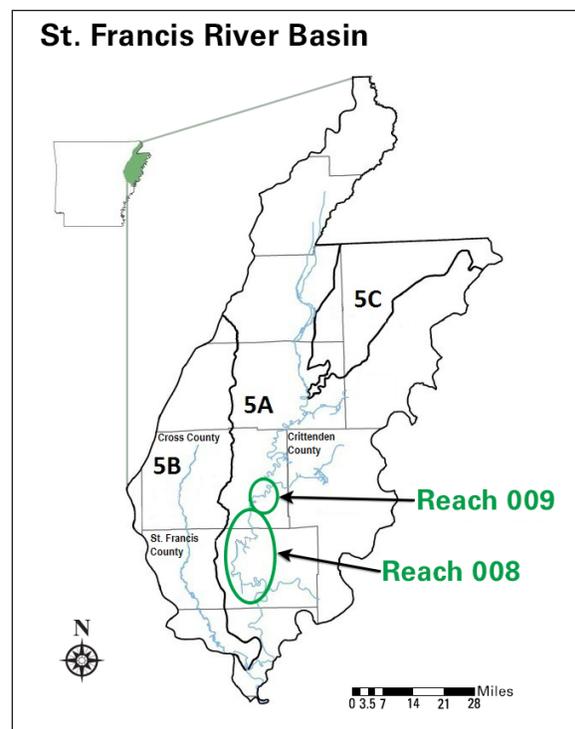


Figure 1. The St. Francis River Basin is in northeastern Arkansas and southeastern Missouri. The restored St. Francis River reaches (008 and 009) are in ADEQ planning segment 5A.



Figure 2. Erosion during agricultural runoff contributed sediment to the St. Francis River.

Project Highlights

In 2009 the Cross County Conservation District (CCCD), using CWA section 319 funds provided by the Arkansas Natural Resources Commission (ANRC), began offering financial and technical assistance to help landowners implement water control structure BMPs called drop pipes (Figure 3). The BMPs prevent sediment from leaving agricultural fields by controlling the rate, velocity, and volume of field runoff. Many landowners took advantage of this opportunity; they installed 108 water control structures along with 10,120 feet of water transfer pipeline. In 2004 the CCCD used CWA section 319 funds to purchase a no-till drill that could be used by landowners with small agricultural operations. No-tilling allows for planting seed into the previous year's crop residue without any tillage. The crop residue protects the soil and lessens the opportunity for erosion. From 2004 through 2009, landowners used the drill to reduce erosion on more than 5,400 acres.

In 2010 the Poinsett County Conservation District (PCCD) followed CCCD's lead and began providing financial and technical assistance to landowners to help implement water control structure BMPs. The PCCD implementation project, also supported by CWA section 319 funds from the ANRC, resulted in the addition of 287 water control structures on 63 different farms.



Figure 3. Landowners installed drop pipes that discharge runoff water directly into a waterbody to avoid erosion.

Results

ANRC and its local partners successfully reduced erosion from agricultural row crop sources through cost-effective targeting of CWA section 319 funds. As a result of the practices implemented in the watershed, turbidity levels have decreased. The 2014 ADEQ water quality assessment has shown that exceedances of the turbidity standard for all flows (100 NTU) declined to 23 percent in St. Francis River reaches 008 and 009. Therefore, ADEQ has removed both reaches from Arkansas' 2014 CWA section 303(d) list for turbidity impairment.

Partners and Funding

The following partners helped to restore these reaches of the St. Francis River: local landowners in the watershed, CCCD, PCCD, ANRC, ADEQ, the U.S. Department of Agriculture's Natural Resources Conservation Service, and the U.S. Environmental Protection Agency (EPA). ANRC provided EPA CWA section 319 funds to partners to support implementation projects.

The CCCD used \$439,964 in CWA section 319 funds to help purchase BMP materials. Local landowners also provided \$439,964 in cash match to purchase materials. The CCCD also used \$19,688 of CWA section 319 funds to purchase a no-till drill.

The PCCD used \$84,669 in CWA section 319 funds to help purchase BMP materials. Local landowners also provided \$84,669 in cash match to purchase materials.



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