



NONPOINT SOURCE SUCCESS STORY

Colorado

Reducing Selenium Impacts in a Segment of the Lower South Platte River

Waterbody Improved

The Lower South Platte River is susceptible to water quality impacts caused by selenium. Nonpoint sources of selenium in this area include erosion and agricultural irrigation drainage of cretaceous soils. In 2010, the Colorado Water Quality Control Commission (WQCC) added the mainstem of the Lower South Platte River—from the Weld County/Morgan County line to the Colorado/Nebraska border—to the Clean Water Act (CWA) section 303(d) list due to aquatic life impairments caused by selenium. Voluntary restoration efforts led by local producers to implement best management practices (BMPs) have reduced selenium loading to the river from irrigated cropland activities. Recent data show this segment of the Lower South Platte River now meets the selenium water quality standard; in 2020, the WQCC removed it from the CWA section 303(d) list of impaired waters.

Problem

The Lower South Platte River, from the Weld County/Morgan County line to the Colorado/Nebraska border (COSPLS01a and COSPLS01b) (Figure 1), is an important water resource protected for drinking water, aquatic life, recreation, and agriculture uses. Selenium (primarily from nonpoint sources) affected water quality and threatened aquatic life. Mobilized selenium can bioaccumulate through the food chain, sometimes reaching levels that are toxic to fish and wildlife and resulting in deformities in developing fish. Selenium pollution is commonly associated with agricultural irrigation activities that lead to selenium entering groundwater and surface water. The Lower South Platte watershed is irrigated through ditch delivery of diverted river water and alluvial irrigation wells in an area influenced by selenium-releasing Cretaceous deposits of Pierre Shales. Based on 2003–2008 data from the Lower South Platte River, the 85th percentile of selenium concentration was as high as 12.36 micrograms per liter ($\mu\text{g/L}$)—exceeding the standard of 4.6 $\mu\text{g/L}$. Therefore, based on the results of an assessment conducted, the WQCC added this segment of the South Platte River to Colorado's list of impaired waters in 2010.

Story Highlights

The Colorado Nonpoint Source (NPS) program has contributed to addressing statewide impacts from intensive agricultural activities on land underlain by selenium-laden shale, as is the case in the Lower South Platte basin. The basin's point source advancement provided only limited water quality improvements

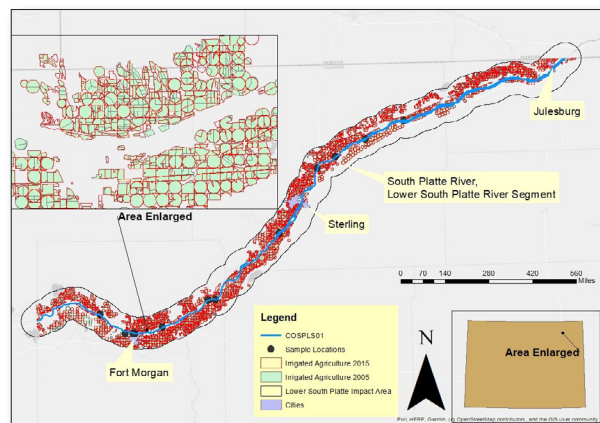


Figure 1. Map of the Lower South Platte River study area with overlaid 2005 and 2015 irrigated agriculture. As shown in the box at the top left, sprinkler pivot systems near Fort Morgan were installed in areas previously flood/furrow irrigated.

overall. The implementation of multiple NPS BMPs are considered to play a significant role in water quality improvements in the COSPLS01a and COSPLS01b segment as recommended by assessments and watershed plans. Watershed plans published in 2005 (for Beaver Creek, a Lower South Platte River tributary) and 2012 (for the Lower South Platte River) identified projects to address water quality concerns from irrigated croplands. Since then, local producers voluntarily implemented the recommended BMPs using Natural Resource Conservation Service (NRCS) funding (about \$28.4 million on the average in Colorado, annually) and the cost sharing that is required to receive NRCS assistance.

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