

Monitoring is Critical for Continued Improvement of Water Quality in the Steele Bayou Watershed

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Streams and rivers in the Yazoo River Basin in Mississippi, particularly the lower portion of the basin referred to as the Mississippi Delta, have been altered through intense agricultural activities and flood control measures. The result has been increases in sediment and nutrient loading to receiving waters. Modeling results implicate this region as a contributor to the hypoxic zone in the Gulf of Mexico (Alexander and others, 2008), and the Mississippi Department of Environmental Quality (MDEQ) has listed a large percentage of Delta waters as impaired on the section 303(d) List of Impaired Waters.

The Steele Bayou watershed (SBW) in the lower Mississippi Delta has been subjected to part of the altered land and water resources. Poor stream health in the SBW has been documented by several short-term studies, citing elevated concentrations of nutrients (Ashby et al 1991, Slack and Grantham 1991). The SBW watershed is listed on the MDEQ's section 303(d) List of Impaired Waters with causes of impairment being pesticides, organic enrichment/low dissolved oxygen, nutrients, and siltation.

In the SBW, like many other areas in the Delta, numerous large and small scale efforts by land owners and State and Federal cooperators to reduce sediment and nutrient loadings have been, and continue, to be carried out.

It is estimated that over \$15 million has been spent in the SBW, not factoring in unknown private dollars by landowners for various conservation practices. Major partners include the U.S. Army Corps of Engineers (USACE), the U.S. Department of Agriculture (USDA), the MDEQ, the Delta Farmers Advocating Resource Management (Delta FARM) and the U.S. Environmental Protection Agency (USEPA). It is estimated that Federal, State and private efforts, all combined, have resulted in up to 50 percent of the Steele Bayou watershed being treated with various conservation practices. In 2010, the Mississippi River Basin Initiative (MRBI) identified the Steele Bayou as one of four priority watersheds in Mississippi to receive funding for various conservation management practices over a 4-year period.



(Photo from Dan Prevost, Delta FARM)

Many land owners in the Delta, as well as water resource managers, understand the importance of striking a balance between human land uses and ecological health. Farmers have taken measures for decades to implement conservation practices that attempt to achieve this balance.



(Photo from Shane Stocks, USGS, MS Water Science Center)

In order to understand the resulting effects of efforts to improve water quality in the SBW, a comprehensive long-term monitoring program is critical.

However, the absence of a long-term monitoring program in the MS Delta and the SBW continues to be a barrier to answer many vital questions regarding stream health and downstream effects.

It is imperative to document resulting water quality conditions through collection of data at multiple environmental scales and over time in order to understand the extent of improvements.



Evidence of improvement in the SBW is scarce and based on limited scientific investigations (Killgore and others, 2008) and subjective observations, which merely provide snapshots of conditions.

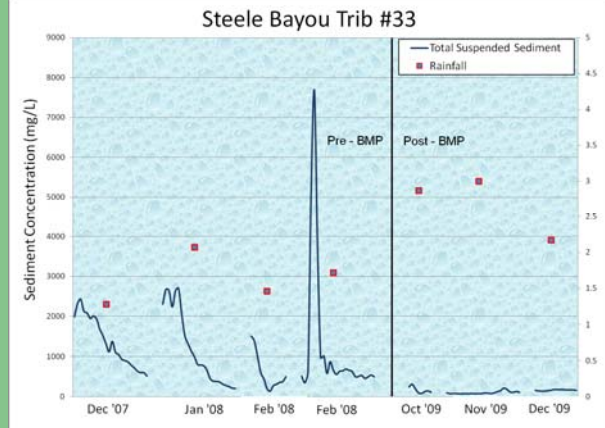
In 2004, the USEPA Region IV Administrator and officials from the USACE took a helicopter tour of the Delta, and it was visually observed that water clarity of the Steele Bayou was strikingly better than other larger rivers in the Delta.

(note: turbidity increases the reflectance of water, thus lower turbidity appears darker blue)

An intensive monitoring network was implemented in 2008 by leveraging several funding sources. This monitoring network is designed to evaluate conditions at three nested scales: edge of field, in-stream, and outlet of the watershed. The design will describe characteristics of a wide range of physical and chemical properties of water quality and will quantify the changes over time that result from the conservation measures that have been implemented.

In order to continue to provide valuable information for the public, resource managers and policy makers, continued funding of the monitoring program in the SBW is critical. Without the information and understanding that is provided by an adequate monitoring program it will be difficult, if not impossible to make informed decisions in the continuing effort to improve stream health in the SBW.

Continued funding of the current monitoring program in the SBW is critical.



Data from the SBW monitoring network will allow users to understand the results of past efforts on water quality as well as how future practices can further reduce nutrient and sediment loads and improve ecological health of these systems.

**For additional information see website:
<http://ms.water.usgs.gov/projects/319/SteeleBayou.html>**

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