

Structural and Cultural Effects on Oxbow Lake Water Quality. (S06-cullum162613-Poster)

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Abstract:

Water quality conditions in three oxbow lakes were examined from before and after Best Management Practices (BMPs) implementation within the Mississippi Delta. Experimental design called for the development of structural and cultural treatments to reduce sediment and associated pollutants entering watershed oxbow lakes. Three watersheds were selected and developed with different levels of BMPs. Changes in lake water quality and fisheries characteristics were used as measures of management success. Analyses of water quality prior to the implementation of BMPs indicated lakes that were stressed and ecologically damaged due to excessive in-flowing sediments. Significant improvements in water quality were realized through the use of cultural and structural BMPs. Sediments were decreased 34 to 59%, while Secchi visibility and chlorophyll generally increased. The most dramatic improvements in water quality occurred in the two watersheds that featured cultural practices and combinations of cultural and structural practices, respectively. Reducing suspended sediment concentrations in these oxbow lakes resulted in conditions favorable for phytoplankton production. Increases in phytoplankton production resulted in increased chlorophyll concentrations and higher concentrations of dissolved oxygen, leading to improved secondary productivity. Results further indicated that cultural BMPs may play the more vital role in improving lake water quality and are needed in addition to structural measures to ensure improved water quality in oxbow lakes receiving agricultural runoff.

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