

## Impacts of bioenergy crop production and climate change on sediment management strategy at the watershed scale

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## ABSTRACT

The objective of this study was to evaluate the potential impacts of both sediment management strategies and climate changes on sediment yield. The soil and water assessment tool (SWAT) model was applied to evaluate the changes in hydrologic components and sediment yield as well as the performance of sediment management strategies including bioenergy crop production in the Bogue Phalia River watershed in northwestern Mississippi. The SWAT model was calibrated and validated using streamflow and sediment yield data obtained from the U.S. Geological Survey gauge stations. To analyze the effectiveness of sediment management strategies under various scenarios, the calibrated SWAT model was applied with various sediment management strategies as well as climate change scenarios generated by using the LARS-WG stochastic weather generator. The results of this study indicate that although the implementation of terraces and contour farming is the effective strategies to reduce sediment yield under current weather conditions, growing switchgrass is the most appropriate strategy under the projected future periods. This study will help to develop the optimal sediment management strategy under various conditions in the study area, which can also be utilized in other similar watersheds in the country and abroad.

Keywords: Sediment; Best Management Practices; Climate change; Bioenergy; Soil and Water Assessment Tool (SWAT); LARS-WG

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