



USDA-CSREES 2006 National Water Quality Conference

Effectiveness and Optimization of BMPs in Improving water quality from an agriculturally dominated watershed

The goal of this project is to quantify relations between water quality, and selection, timing, and spatial distribution of best management practices (BMPs) and conservation practices within a watershed primarily impacted by land-application of animal manure. We have collected detailed data on stream flow, water quality and history of conservation practices since 1991. Additional data related to field and reach scale studies are also available at various temporal scales.

This project integrates research, extension, and education through a stakeholder-guided process to measure, model, and predict water quality at various spatial and temporal scales. The project will also provide information to the producer effect of BMPs/conservation practices on watershed scale water quality. The project will integrate a GIS ecosystem model with a stakeholder-driven risk-based nutrient management decision process, using detailed economic and statistical analyses to optimize BMP selection with a goal of maximizing profit and minimizing watershed scale water quality degradation. This study is conducted in the Lincoln Lake watershed in the Ozark Highlands ecoregion of northwest Arkansas. The Ozark Highlands, like many other agricultural watersheds in US, has a long history of water conflicts within the agricultural sector and between agricultural and urban sectors. The project results will aid the regional extension specialists, state and federal agencies, and the agricultural producers in measuring and predicting water quality impacts of animal agriculture at watershed scale and in evaluating the impact of alternative BMPs and conservation practices on water quality. The project outcome will be expected to affect the policy decisions in the region to effectively manage water resources and will potentially lead to behavior changes related to BMP adoption, implementation, and management, in the watershed.

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