



Title: Integrated Agricultural Management Systems for Improving Water Quality in Kansas

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State: KS **Region:** Heartland

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Theme: Watershed Management

Situation: Nonpoint source pollution is considered to be a major threat to surface water quality in Kansas and the Midwestern U.S. Runoff of pesticides, sediments and nutrients from agricultural land are regarded to be primary sources of contamination to Kansas's streams and lakes, but due to their diffuse nature, the sources remain difficult to identify. Adoption of management practices that reduce NPS contributions by producers, particularly in the most vulnerable areas of a watershed, will play a key role in meeting surface water quality goals, especially given limited resources.

Objectives: The project goal is to develop and apply a model that utilizes local, field-scale research knowledge to simulate the effects of nutrient, sediment and pesticide BMPs on water quality at the watershed scale and to use model outputs to identify areas within a pilot watershed that are most susceptible to NPS runoff. The intended outcome of this project is to work with stakeholders in a targeted pilot watershed to develop and deliver agricultural BMPs for reaching water quality goals.

Methods: The Soil and Water Assessment Tool (SWAT) model is being used to evaluate watershed conditions in the Lower Little Blue River Basin of Nebraska and Kansas. The SWAT model has been developed into a usable format and model outputs have been presented at water quality conferences and meetings within Kansas and the watershed.

Partnerships: The major partnership supported by this project has been the Blue River Compact, comprising various federal, state and local agencies in Kansas and Nebraska. Project investigators will also work with conservation districts, basin advisory committees and stakeholders to deliver BMP recommendations.

Research: This project was designed to expand field-scale research data to watershed scales using modeling approaches and GIS. This has been accomplished by cooperation between research and extension faculty in the Colleges of Agriculture and Engineering. Extension faculty surveyed producers about their management practices in the watershed, and this was incorporated into the model. Relationships with various agencies are being developed by Extension faculty to deliver model outputs. Teaching faculty will incorporate results of this project into university courses.

Resources: The major resources committed to this project to date have been faculty and staff time.

Results: After evaluation of BMPs, results will be presented to local conservation districts and basin advisory committees and developed into BMP recommendations with their inputs. Model outputs will also be assessed to determine areal susceptibility to NPS contribution and used to assist state and federal agencies for targeting conservation resources. We intend that the long-term outcome of this work will be a watershed citizenry educated about the water quality impacts of various management alternatives and better enabled to make informed decisions leading to improved water quality in the watershed.



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