



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** 2002KS7B

**Title:** Development of a Framework for a Coupled Hydrologic-Economic Modeling Tool

**Project Type:** Research

**Focus Categories:** Models, Water Quantity, Conservation

**Keywords:** Ogallala Aquifer, High Plains Aquifer, Groundwater, Agricultural Economics

**Start Date:** 03/01/2002

**End Date:** 02/28/2003

**Federal Funds:** \$41,487

**Non-Federal Matching Funds:** \$64,085

**Congressional District:** 2nd District

**Principal Investigators:**

David R. Steward  
Kansas State University

Jeffrey M. Peterson  
Kansas State University

**Abstract**

This project will initiate development of a coupled hydrologic-economic modeling tool. The goal is to develop a framework for linking hydrologic and economic models. This framework will be designed to enable a modeling tool to forecast the impact of groundwater management strategies on water availability and farm profits. This tool will help identify economically viable groundwater management strategies to sustain the important agricultural economy of rural western Kansas.

Hydrologic and economic models will be developed for the GMD4 Sheridan County Special Study Area in western Kansas. This study area has been identified in cooperation with Groundwater Management District #4, and GMD4 has agreed to collect and provide data for this modeling effort (see attached letter of collaboration). A hydrologic model will be developed for the area including wells and regional groundwater withdrawal. An economic model will also be developed to describe irrigation decisions. Both models will be run forward in time to predict the future hydrologic and economic conditions assuming groundwater management strategies and policy do not change.

The goal of constructing this model of groundwater flow and economic decisions is to develop understanding related to coupling hydrologic and economic models. This knowledge will be used to design data structures and the flow of data within a coupled model. It is expected that the final design that is developed for this project will enable future development of a coupled hydrologic-economic modeling tool, as part of a future project.

The data structures that are identified and designed for this project will be transferred to personnel in the state of Kansas who are constructing GIS-databases. This is expected to enable future hydrologic-economic models with GIS-support to interface directly with the state's databases.