



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** AR3661

**Title:** Economics of water management to sustain irrigated agriculture in eastern Arkansas watersheds

**Focus Categories:** Surface Water, Models

**Keywords:** water quality and management, ground water, Surface water

**Start Date:** 03/01/2001

**End Date:** 02/28/2002

**Federal Funds:** \$16,000

**Non-Federal Matching Funds:** \$32,444

**Congressional Districts:** 2, 3, 4

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**Abstract**

Excessive ground water use for irrigation in eastern Arkansas has caused an increase in water quality problems as well as severe depletion of the Alluvial aquifer. Increased salinity or alkalinity in ground water used for irrigation reduces crop yields and damages soils. Nutrient, pesticide and sediment losses are other water quality problems that degrade the surface waters flowing out of Arkansas.

On-farm reservoirs, tail-water recovery systems and increased surface water use for irrigation have been identified as needed components to reduce the rate of ground water depletion and to help resolve water quality problems. A computerized decision model, MARORA, developed formerly to evaluate the conjunctive use of surface and ground water with on-farm reservoirs will be modified to include a water-soil quality frame-work. Risk analysis, including stochastic dominance approaches, will be used to evaluate alternative management practices on the basis of dual-objectives to maximize returns to crop production while minimizing economic and/or environmental risks. Research results of this water research project will be extended to public meetings to inform stakeholders concerned with ground water depletion and water quality in Arkansas.