



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** GA4701

**Title:** Agricultural Drought Assessment and Forecasting for the Southeastern United States

**Focus Categories:** Drought, Management and Planning, Agriculture

**Keywords:** Basinwide planning; Decision support systems; Irrigation assessment; Technical analysis for policy makers

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

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

**Federal Funds:** \$18,000

**Non-Federal Matching Funds:** \$38,271

**Congressional District:** 5th

**Principal Investigator:**

Aris P. Georgakakos

Professor, Georgia Institute of Technology

**Abstract**

Recent droughts have severely strained the water resources systems of Georgia and the southeastern U.S. Agriculture has been especially affected with over a billion dollars in lost crop production in Georgia in just two years. Exacerbating these circumstances is the co-location of intensive irrigation with river basins and aquifers that are stressed ecologically as well as with regard to water supply and water quality. The state government has responded with a program to compensate farmers to forego irrigation in years with a pre-forecast drought. However, methods for drought forecasting are uncertain, and the binary nature of the forecast ignores the complexity of irrigation dynamics.

A methodology is proposed for the purposes of agricultural drought assessment and forecasting for Georgia and neighboring states. A novel set of algorithms have been developed to determine crop yield response functions to irrigation. These algorithms use physiologically based crop models and rich in-put data sets and can be applied to southeastern U.S. crop production systems. Past work has included application of some of these techniques to determine regionally aggregated irrigation application and crop production. The proposed project will produce similar information with greater spatial and functional specificity. The project results will be integrated in a comprehensive water resources decision support system currently under development. The climate prediction, remote sensing, and meteorological database modules of that system will enhance the capabilities of the proposed agricultural planning methods.

Research products will include the planning methods to be developed, the encoding of these methods into the decision support system, sharing of assessment results with state authorities responsible for drought forecasting and routinely through the worldwide web, and a workshop to present methods and analysis to practitioners.