



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** 2002KY7B

**Title:** Linking land use to water quality in the Muddy Creek subbasin, Kentucky River Watershed

**Project Type:** Education

**Focus Categories:** Management and Planning, Water Quality, Education

**Keywords:** watershed planning, geographic information systems, non point pollution

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

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

**Federal Funds:** \$17,840

**Non-Federal Matching Funds:** \$57,170

**Congressional District:** Sixth

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**Abstract**

The purpose of this project is to investigate whether watershed data currently collected by regulatory and other agencies is sufficient to characterize the relationship between land use and water quality in a 4th order watershed. The study area is the Muddy Creek subbasin of the Kentucky River Watershed, which the 2000 Watershed Assessment Report identifies as a "high risk" subbasin of the Kentucky River Basin. Threats to water quality in the Muddy Creek include identified pathogens from agricultural sources or ineffective septic systems, potential cumulative downstream stormwater impacts from expanding suburban development, and proximity to the U.S. Army Bluegrass Depot which is a storage facility for conventional and chemical weapons including nerve gas.

The study will employ a unique multi-stage interdisciplinary approach involving three different undergraduate classes taught by three different faculty in subsequent semesters, each focusing on water quality and watershed management: "Environmental Land Use Planning" (Spring 2002), "Environmental Chemistry for Teachers" (Summer 2002), and "Environmental Geochemistry" (Fall 2002). The spatial and temporal data collected at each stage will be assembled and analyzed in an integrated GIS to investigate land-use/ water quality linkages.

The projects' training potential is extensive. In addition to the experience gained by the two student assistants funded under the proposal, more than 40 ECU students will be exposed to water quality testing and watershed planning over the course of the project. Because one of the associated courses is directed at in-service K-12 teachers, the "trickle-down" training potential is even greater, as these teachers incorporate local water quality monitoring into their curricula throughout the state. The GIS work will be accomplished with the help of an advanced undergraduate research assistant who will gain experience in all facets of creating and maintaining a GIS project, as well as in a wide range of GIS and statistical analytical techniques. As the GIS analysis is developed, demonstration modules will be prepared and used in the three classes involved in this project to teach GIS analytical and data visualization techniques.