



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** 2002SC1B

**Title:** Using Remote Sensing and GIS Technology to Assess the Relationship of Land Cover to Watershed Impairment for the Saluda River Basin South Carolina

**Project Type:** Research

**Focus Categories:** Hydrology, Models, Non Point Pollution

**Keywords:** Watershed, water quality, land use, hyperspectral, GIS

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

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

**Federal Funds:** \$21,300

**Non-Federal Matching Funds:** \$43,057

**Congressional District:** 3rd

**Principal Investigator:**

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**Abstract**

Clean water and clean air are basic resources any community needs to support life and maintain living standards. As population and land use pressures increase, water quality dispute will become more common. Communities will come into conflict more and more on the issue of water quality with downstream communities accusing upstream cities of contamination. Such is already the case in the conflict between Greenwood and Greenville, SC. Both cities extract their drinking water from the Saluda River watershed and its tributaries. Greenville, the upstream city, has a protected municipal reservoir and high quality drinking water. Greenwood, the downstream city, takes its water from Lake Greenwood, which shows symptoms of impairment. While there is abundant research tying land use/land cover to water quality downstream, it becomes apparent in listening to disputes between communities that fundamental research does not translate to sound policy or even to informed debate

The proposed research seeks to provide a level of information targeted to the subject at hand. What is the status of current land cover/land use and how much have they changed? Are there any water quality problems, where are they located, and how serious are they? Do land cover and land cover change account for any watershed impairments? What has been the major cause or contributor to the problems? The objectives of the project are to extract land cover and land use information, assess watershed impairments and examine the their relationship based on a spatial approach.

Remote sensing technology and geographic information systems will be used for data collection, change detection, watershed impairment mapping, spatial analysis and modeling. Land cover and change information will be extracted from LANDSAT Thematic Mapper (TM) multispectral imagery and SpectraTech's hyperspectral imagery. Watershed impairments will be measured in terms of fecal coliform and excessive nutrient problems and multiple sources of data will be integrated into GIS for identifying and mapping impaired water bodies. The spatial relationship between water quality and land cover will be examined using geostatistical methods and existing data will be used to calibrate EPA's BASINS model.

This model will be used to quantitatively determine the possible impact of observed land cover change on water quality in the study area.