



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: MS2601

Title: Spatial Pattern in Land Use: Its Role in Determining Surface Water Quality

Focus Categories: Surface Water, Conservation

Keywords: Land Use, Nonpoint Source, Water Quality, Surface Water, Forestry, Agriculture, Urban Growth, Landscape Ecology

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Non-Federal Matching Funds: \$37,582

Congressional District: Fifth

Principal Investigator:

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Abstract

Changes in land use on the outer coastal plain of south Mississippi have increased the volume of runoff and amount of nonpoint-source (NPS) pollution received by area streams with impacts on channel morphology, sediment loading, nutrient concentrations, water temperature, and dissolved oxygen concentration. As a result, stream water quality is often impaired around urban areas, failing to support many human uses and impacting natural stream communities.

The proposed work will draw connections between observed patterns of land use assessed by remote sensing and aspects of water quality and stream habitat character. Stream observations will be collected at the outflow of 26 matched stream basins and regressed on frequency of the dominant land use types measured in zones a. including the whole watershed, b. in concentric zones around the sample point, c. along the main stem, d. perpendicular to the main stem, and e. on low-order tributaries. Competing regression models will be compared and selected on the basis of their power in predicting quality of the water resource. Models will allow the water-quality impact of a particular land use change to be predicted before the fact, thereby offering a powerful planning tool for local governments in controlling NPS pollution. Such models speak directly to the formulation of appropriate Total Maximum Daily Loads, and would aid the Ms DEQ in meeting federal water quality standards.