



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2003TN7B

Title: Evaluation of Pathogen Occurrence and Causation withing the Stock Creek Watershed (Knox County) as a Model for Watershed Restoration

Project Type: Research

Focus Categories: Water Quality, Surface Water, Non Point Pollution

Keywords: water quality, water quality management, pollution control, regulatory permits, watershed management, pollutants

Start Date: 03/01/2003

End Date: 02/28/2004

Federal Funds: \$34070.00

Matching Funds: \$61293.00

Congressional District: Tennessee 2nd

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Abstract: This proposal focuses on the Stock Creek Watershed, which is part of the Little River Watershed in Knox and Blount Counties. Stock Creek, which is on the 303(d) list because of elevated levels of pathogens, represents a small watershed that can serve as a ?research watershed? to explore and evaluate strategies for holistic approaches to watershed remediation. The principal goal is an evaluation of pathogen occurrence and causation within the creek that will eventually lead to the restoration of the Stock Creek Watershed. The project will test and demonstrate holistic watershed assessment protocols that can serve as a model for restoration of other impaired waterbodies. We will test innovative monitoring techniques to distinguish between human- and animal sources of pathogens, and evaluate the effectiveness of integrated stream assessment tools in watershed restoration. If successful, the project will achieve a secondary goal of using the process knowledge of the watershed to restore it to the condition fully supporting its designated uses, and lead to the removal of Stock Creek from the 303(d) list before a TMDL is required. The work proposed here is leveraged by activities of the Knoxville/Knox County Water Quality Forum (WQF), a multi-agency, multidisciplinary consortium of state and federal

agencies and the University of Tennessee (UT). The partnering agencies will participate in the assessment and restoration of the Stock Creek Watershed and jointly use the effort as a model for evaluation and remediation of other degraded waterbodies in Tennessee and states in the southeast region. This project will (1) devise and implement a monitoring plan to obtain information on water quality (water chemistry, pathogens, sediment load, biological integrity), (2) further develop biomolecular tools that will provide real-time data on levels of pathogen indicators and of pathogenic *E. coli* and that will directly help to (3) distinguish between human- and animal-derived pathogens, and potential ?pathogen reservoirs? which could be persistent sources of pathogen inputs to the Creek, and 4) the role of storm events, seasonal changes in hydrologic conditions, and groundwater inputs to water quality and pathogen levels. Working with partnering agencies, this information will be integrated with the IPSI and KGIS databases for the Stock Creek Watershed. The new fundamental knowledge of pollutant sources and watershed processes can be used by partnering agencies to develop recommendations for BMPs, and support efforts to obtain Grant Pool funds to perform the BMPs. The success of the integrated watershed remediation and management tools developed within this project can be demonstrated by the restoration of the Stock Creek Watershed to its designated uses, and its removal Stock Creek from the 303(d) list. The project includes three educational components that (1) increase awareness of the environmental water quality problems, (2) contribute to the education and training of students to raise their expertise about watershed protection solutions and enhance their awareness of management alternatives to reduce pollutant impacts, and (3) educate landowners to support voluntary cost-share programs to implement appropriate BMPs. The educational impacts of the proposal include high school and college students, as well as the residents of the Stock Creek Watershed.

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