WATER RESOURCES RESEARCH GRANT PROPOSAL

Title: A Preliminary Evaluation of the Effectiveness of Current BMPs in Controlling Stormwater Discharges from Small Construction Sites in the Valley and Ridge Physiographic Region and Developing Metrics to Assess the Effects of Discharge on Stream Communities

Focus Category: SED, WQL, ECL

Descriptors: erosion, erosion control, construction, sediments, fish communities, invertebrate communities, bioassessment

Duration: March 1, 1999 to February 29, 2000

Federal Funds:

- Total: $24,842
- Direct: $24,842
- Indirect: $0

Non-Federal Funds:

- Total: $56,093
- Direct: $31,559
- Indirect: $24,534

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Congressional District: VI

Water Problem and Need for Research

As population expansion and increasing development occur in the Southeast, stormwater runoff from construction sites has become an increasingly major contributor to siltation input into our streams and rivers. While large construction projects represent single major potential pollution sources and are usually more visible, smaller construction sites (usually future home sites

These objectives address the major water resource problems of Alabama (as recognized by the Water Resources Advisory Committee, 1992) of determining the effects of current, common BMPs on water quality, evaluating the impacts of erosion/sedimentation, and correlating sediment characteristics to geology, slope and land use. Further, the above

objectives are in accord with stated Southeastern Region water priorities (3/25/96) for the protection of water from degradation by non-point sources and soil erosion and the need for research on the ecological balance of aquatic communities.

Expected Results, Benefits, Information, etc.:

Data collected in this preliminary study will allow us to identify the physical site and rainfall characteristics that appear most likely to influence the effectiveness of in-place erosion control silt fences on small construction sites. Few studies have evaluated the field effectiveness of such BMPs, especially in the Valley and Ridge Physiographic Region (typical of upland and hilly terrain regions of much of northeast Alabama and a good portion of the Southeast). Our working hypothesis is that current BMPs are not very effective in this region of the country. The data obtained in this research project will be used to prepare a more comprehensive proposal to be submitted to the U.S. Environmental Protection Agency in which the assessment of other, potentially more effective, erosion control procedures would be included. Such information on field effectiveness and influencing factors would assist federal, state, and local regulatory agencies (who are charged with the protection of aquatic environments) in the selection of appropriate BMPs and the design of future erosion control systems. Additionally, improved erosion control methods would greatly benefit stream biological communities by improving water/habitat quality.

Bioassessment metrics calculated for streams receiving differing quantities of silt will allow for the preliminary identification of metrics most sensitive to variations in siltation. Our initial data will be used to strengthen a proposal to the U.S. EPA to support a more comprehensive screening of such metrics. The ultimate objective is the development and validation of metrics that permit a more refined discrimination between sites with varying levels of impairment. Ultimately, the confidence with which a judgment of biological conditions can be made using biocriteria depends upon the soundness and scientific validity of the metrics selected and tested. Metrics that are poorly defined or based on a flawed conceptual basis provide erroneous judgments with the potential for poor management decisions. The development of improved metrics will allow for an adequate assessment of the effects of runoff from construction sites. Ideally, such information would be useful in the selection and design of future BMPs.