



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2004MN54B

Title: Development of a Rapid Bioassessment Technique for Integrating Biological Data into TMDL Assessments in Urban Streams

Project Type: Research

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

Keywords: TMDL, Rapid Bioassessment Technique, Chironomidae, Urban Streams, Nutrients

Start Date: 03/01/2004

End Date: 02/28/2005

Federal Funds: \$0

Non-Federal Matching Funds: \$44,197

Congressional District: 5 (= Minneapolis)

Principal Investigator:

Leonard Charles Ferrington Jr.

Abstract

The Federal Pollution Control Act Amendments of 1972 (PL 92-500), as supplemented by the Clean Water Act of 1977 and the Water Quality Act of 1987 (in conjunction with more recent amendments) serve as the foundation for protecting the quality of our surface waters. Present-day implementation of Section 303d of the Clean Water Act focuses on ambient water quality standards, and requires states (1) to identify surface waters not meeting ambient water quality standards appropriate for their designated use categories and (2) to define the pollutants and their sources that are responsible for non-attainment of the ambient water quality standards. Section 303d further requires states to establish Total Maximum Daily Loads (TMDL) for pollutants impairing the surface waters and to develop strategies for reducing both point and non-point sources of the pollutants in order for the non-attaining waterbodies to meet ambient water quality standards.

Biological data are typically integrated into the above process as “front-end” input, being used (1) to assist in development of designated use categories and (2) in monitoring efforts to ensure that ambient water quality standards are met. However, prediction of biological responses resulting from attainment of a TMDL is not a fundamental element

of the TMDL process. In a recent overview of the TMDL approach to water quality management, the National Academy of Sciences (2000) made several recommendations for integration of biological data into the TMDL process. Among the recommendations, the report states “EPA should promote the development of models that can more effectively link environmental stressors (and control actions) to biological responses” and “Monitoring and data collection programs need to be coordinated with anticipated water quality and TMDL modeling requirements”.

This proposal represents a broad-based study to develop and refine a rapid bioassessment technique for integrating biological data into a current TMDL study of Minnehaha Creek, an urban stream in Hennepin county, Minnesota. Rapid bioassessment protocols developed from this proposed research will be tested for broader effectiveness on a local scale in several urban streams of the Minneapolis/Saint Paul metropolitan area in Dakota, Ramsey, Washington and Carver counties, MN. Analysis of results from a companion study based in several streams draining urbanizing watersheds of Baltimore, Maryland, will assess broader-scale application of the technique as a generalized model for integrating biological data into TMDL assessments of urban streams in major metropolitan areas on across the United States.