Development of Targets, Indicators, and a Management Model for Urban Streams: A Work in Progress

Introduction

Meaningful and attainable goals as well as measures of progress towards those goals can be key drivers of efforts to restore urban streams. The development of data models can be an important step in helping to set goals and to estimate the potential to attain aquatic life goals by addressing both habitat deficiencies and pollutant loads. The development of a model may also lead to useful measures of progress for urban restoration efforts.

On July 31, 2001 the USEPA issued the document "Guidance: Coordinating CSO Long-term Planning with Water Quality Standards Reviews". A table entitled "Developing a Refined Aquatic Life Designated Use System" describes processes for the development of categories of aquatic life uses and additional processes for the development of subcategories of aquatic life uses in urban settings. In addition, several major municipal water quality management agencies in Ohio are partnering with the regulatory agencies and the research community to develop a data model or models to provide a scientific basis for the development of an Ohio urban subcategory for aquatic life uses. Existing aquatic life criteria are seldom, if ever, attained in Ohio's urban dominated streams. This research effort will combine Ohio's rich biological data set with pollutant load data, and specific land use and stream corridor data. The focus will be small urban dominated watersheds -- generally less than 20 square miles of drainage area.

A conceptual management model has been developed to help provide an interpretation of the suggested guidance process and to guide the research effort. The conceptual model seeks to integrate the explanatory variables of land use impacts and load impacts with the dependent variable of biotic integrity. The potential use of such a model to explore the issue of trading between land use changes and pollution load reduction will be discussed. The model raises several questions for the research effort and for regulators working with urban subcategory criteria. For example, the model suggests a need to separately explore variables related to the watershed scale and those related to stream corridor characteristics. It also suggests there may be a case for urban criteria that vary with the condition of the landscape.

Using implications of the proposed concept model, this presentation will suggest approaches to compensate for the lack of reference condition data. For the proposed undertaking, ideal reference conditions would be represented by data from urban dominated streams in which controllable pollutant loads have been virtually eliminated. Drawing upon other past and current research efforts exploring the Ohio data set, this presentation will discuss data requirements for the research effort. The demands of the process outlined by the guidance document suggests that the creation of an urban subcategory will be a demanding task even for Ohio, which has a substantial biological data set.

In concluding, this presentation will provide a perspective on the potential value of a data model and subcategories of aquatic life in helping to achieve urban stream restoration at the local community level. The author concludes that even if a robust general data model can be developed, there will continue to be a substantial need for scientific inquiry into the process and issues of local watersheds. There will also be a large need for regulatory flexibility to deal with these unique scientific factors as well as the unique social processes that are involved in urban stream restoration efforts.

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