

EPA Grant Number: R-82868401

Subproject: 004

Center: The Atlantic Slope Consortium - Developing Ecological Indicators for Aquatic Ecosystems of the Atlantic Slope Region

Center Director: Robert Brooks

Title: Socioeconomic and Institutional Research

Investigators: James Shortle, Robert O'Connor, Ann Fisher, Jim Finley, James McElfish

Institution: Pennsylvania State University, Environmental Law Institute

EPA Project Officer: Barbara Levinson

Project Period: March 1, 2001 through February 28, 2006* (includes 1-year, no-cost, extension)

Research Category: Environmental Indicators

Objective

This is the fourth of four subprojects under the Atlantic Slope Consortium (ASC) center. The goal of this subproject is to provide scientific results that support the choice and communication of suites of environmental indicators that will be meaningful to and relevant for environmental managers and other intended audiences. Specific objectives are to examine: (a) human perceptual and attitudinal dimensions of the types of indicators that different audiences find useful, (2) risk communication methods for presenting indicator information, (3) institutional and jurisdictional obstacles to indicator use, (4) their value for environmental management, and (5) their relationships to socioeconomic indicators at multiple scales.

Progress Summary

Progress was focused in two main theme areas in 2004:

Human Dimensions of Environmental Indicators

To gain a basic understanding of how ecological indicators are differentially perceived and labeled by ecological scientists, policy makers, and the general public, we conducted facilitated interviews with each of these groups over the course of this project. We interviewed 46 policy makers (primarily state and federal officials involved in water quality decision-making), and found that properties of useful indicators vary by what they are being used for: setting priorities, regulatory enforcement, monitoring and assessment, or communication to stakeholder groups.

Because the ASC project is intended to link ecological assessments of well being with public perceptions, we sought to integrate biophysical data on water and watershed quality into our public assessments. An important first step in this area was to conduct focus groups with ecological scientists to gain an understanding of their terminology, their assessments of ecological quality, and the data they utilize to create these assessments. To this end we conducted focus groups with ecologists at PSU, VIMS, ECU, and SERC.

Further, to help us understand watershed specific environmental quality, threats to current conditions, use patterns, and terminology, we conducted focus groups with the general public in six watersheds across the region (a subsample of those selected to subsequently receive a mail

survey). These watersheds included Spring Creek, PA, Conodoguinet Creek, PA; Gunpowder Falls, MD; Southeast Creek, MD; James River, VA; and Ware River, VA. These watersheds represent a broad range of ecological and socioeconomic conditions. A total of 53 members of the general public participated in these groups. We found that water quality is recognized as generally important to quality of life, but that there is low public awareness of “conventional” indicator terminology and relatively poor recognition of interconnections between land use and water quality.

These focus groups provided the basis and “ground-truthing” for developing a mail survey that helped us to understand quality of life and how it relates to use and perceived ecological quality of local watershed conditions, as well as how watershed quality is valued economically and potentially threatened by multiple factors. This survey was developed and pilot tested in 2004, and is currently being implemented in eight watersheds in the Atlantic Slope Region. Several of these (Spring Creek, n=550 and Clearfield Creek, n=435) are nearing completion. Several others (Ware River, n=392 and Chickahominy River, n=560) are just underway, with mailings in 4 other watersheds still to be implemented during the summer of 2005. Data from these surveys will be compiled and analyzed by September 2005.

Institutional Issues in the Choice and Use of Water Quality Indicators

A second focal area for the Socioeconomic and Institutional Research working group has been an examination of the role of federal and state laws and institutions in shaping the choice and use of indicators. This theme was addressed collaboratively with researchers from the Environmental Law Institute (ELI) and other ASC institutions. A paper describing the results of this research has recently been accepted for publication in the Columbia Journal of Environmental Law.

Future Activities

The general population mail survey described above will be completed during the summer of 2005. Data entry and analysis will follow in time for inclusion of results in the ASC final report.

Publications

Borisova, T., J. S. Shortle, R.D. Horan, and D.G. Abler. 2005. The Value of Information for Water Quality Protection. *Water Resources Research* 41, Vol 6.

Marshall, E., and J. Shortle. 2005. Urban development impacts on ecosystems. In S. Goetz, J. Shortle, and J. Bergstrom Eds., *Land Use Problems and Conflicts: Causes, Consequences and Solutions*. Routledge Publishing.

McElfish, J. M., Jr. and L. M. Varnell. 2005. Designing Environmental Indicators for Use in Public Decisions. *Columbia Journal of Environmental Law*, Vol. 31, Issue 1 (Fall 2005). In press.

Jamro, E, R. Stedman, J. Shortle and others. Correspondences between perceived and measured environmental condition and environmental stressors. (in prep.)

Jamro, E, R. Stedman, J. Shortle and others. Communicating about water quality: matches and mismatches between expert and lay concepts of water quality and what they mean for community-based water quality programs. (in prep.)

Marshall, E., Y. Cai, and J. Shortle. The efficiency of quality of life provision in the Mid-Atlantic states. (in prep.)