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science in ACTION

BUILDING A SCIENTIFIC FOUNDATION FOR SOUND ENVIRONMENTAL DECISIONS



ECOLOGICAL RESEARCH PROGRAM

ReVA TOOLS FOR ASSESSING IMPACTS OF ENVIRONMENTAL ACTIONS

Issue:

Ecosystems provide direct and indirect services to society, many of which are essential to human health and well-being. Since human activities affect ecosystem services such as clean air and water, fertile soil, and water drainage, environmental managers and local and state planners need tools to evaluate options and assess the impact of man-made changes to environmental resources. The Regional Vulnerability Assessment Program (ReVA) is designed by the U.S. Environmental Protection Agency's Office of Research and Development to help planners make informed decisions about the use of their ecosystems, among other applications.

Scientific Objective:

The purpose of ReVA is to
1) identify the types and sources of data useful for making informed planning decisions;

2) determine how best to process the resulting enormous amount of data; and 3) provide this information in a format that is accessible to those who need it, and flexible enough to accommodate differing purposes.

Application and Impact:

The ReVA program has developed a suite of web-based tools and tool kits that allow users to process vast quantities of information. The program has assisted planners in identifying where they need more information to make environmental decisions and aided researchers in setting priorities for conducting additional ecosystem research to improve assessment tools. ReVA has been used to:

Identify vulnerabilities: ReVA is used to assess vulnerability of environments that provide such services as clean water, clean air, and erosion control, but may be threatened by land use change or other man-made stressors.

Forecast consequences: ReVA is used to evaluate the potential consequences that arise from different possible actions such as building new highways or planning development to accommodate mass transit. ReVA allows development of forecasts that show the impacts of growth or change on the environment and the services provided by a particular ecosystem.

Evaluate options: Regional planners use the information garnered from ReVA to evaluate economic and quality of life tradeoffs associated with different environmental policies and to develop techniques to prioritize areas for ecological restoration.

ReVA was crucial to the success of the following projects:

2007 Multi-Pollutant Analysis toolkit: ReVA developed the first stage of an approach to study the vulnerability of human and

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ecological populations in the Southeast to toxic air pollutants from multiple sources.

2006 Environmental Decision Support Toolkit for SEQL:

ReVA partnered with state and local governments around Charlotte, N.C. and Rock Hill, S.C. on a method to assess future development for the region's Sustainable Environment for Quality of Life project.

<http://24.106.198.158/seqltoolkit/Welcome.jsp>

2004 Environmental Decision Support Toolkit for the Mid-Atlantic:

ReVA developed a means for decision makers in the Mid-Atlantic to evaluate potential changes to ecosystems in response to broad-scale changes that are already underway. It is being used by states and local EPA offices to develop integrated management decisions.

<http://amethyst.epa.gov/revatoolkit/Welcome.jsp>

References:

Smith, E.R.; O'Neill, R.V.; Wickham, J.D.; Jones, K.B.; Jackson, L.E.; Kilaru, J.V.; and Reuter, R.J. The US EPA's Regional Vulnerability Assessment Program: A Research Strategy for 2001-2006. U.S. Environmental Protection Agency, EPA/600/R-01/008, 2001.

Smith, E.R.; O'Neill, R.V.; Wickham, J.D. and Jones, K.B. EPA's Regional Vulnerability Assessment Program: Using Monitoring Data and Model Results to Target Actions. In: Wiersma, Bruce (ed.) Environmental Monitoring: a Reference Text. 2004, pp. 480-498.

For more information, visit:

www.epa.gov/reva

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