

FINAL ABSTRACT for Conference: Resilience 2011: Resilience, Innovation, and Sustainability: Navigating the Complexities of Global Change. Second International Science and Policy Conference, Tempe Arizona. March 11- 16, Arizona State University

TITLE: A Framework for Facilitating Ecosystem Services-Based Decision-Making and the Development of Decision Support Tools

AUTHORS: Marilyn ten Brink¹, Ann Vega², Brian Dyson², Tom Stockton³, Tim Canfield⁴, and Patricia Bradley¹

¹U.S. Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Atlantic Ecology Division, Narragansett, RI USA

²U.S. Environmental Protection Agency, Office of Research and Development, National Risk Management Research Laboratory, Cincinnati, OH USA

³Neptune and Company, Inc., Los Alamos, NM USA

⁴U.S. Environmental Protection Agency, Office of Research and Development, National Risk Management Research Laboratory, Ada, OK USA

There is an increasing understanding that top-down regulatory and technology driven responses are not sufficient to address current and emerging environmental challenges such as climate change, sustainable communities, and environmental justice. The vast majority of environmental decisions are made without consideration of the roles that ecosystem services play or the complexity of trade-offs. Most decision-makers do not currently have access to useful or usable methods and approaches when they are presented with choices that will have significant ecosystem impacts. Such problems require ways to deeply understand the problem scientifically, economically, and socially, in order to develop sustainable solutions and foster effective environmental decision-making. A successful framework for decision-making depends on a systems-level analysis that can characterize the system, while being sensitive to the views of all interested parties, and that accounts for the uncertainties associated with proposed solutions in a comprehensive manner. The US EPA's Ecosystem Services Research Program (ESRP) Decision Support Framework (DSF) is a structured decision analysis framework with associated tools for enabling decision-makers to make better informed decisions within an ecosystem services context. The aim is to provide decision-makers with an understanding of probable effects of their planned decisions on social, economic and ecological systems; thus promoting more sustainable and systems-oriented solutions. Initial efforts focus on developing a support structure for land and resource use decision-makers at the local, state, tribal and regional scales, fostering integrated research, and promoting innovative solutions. These efforts include development of an open-source, web-based decision analysis framework called DASEES: Decision Analysis for a Sustainable Environment, Economy and Society. DASEES integrates guidance and decision support tools to implement a five step Bayesian decision process: 1) Understand the Context, 2) Define Objectives, 3) Develop Options, 4) Evaluate Options, and 5) Take Action (Implement and monitor).