

US EPA ARCHIVE DOCUMENT

Development of an Ecosystem Services Tools Database

Introduction to the Problem

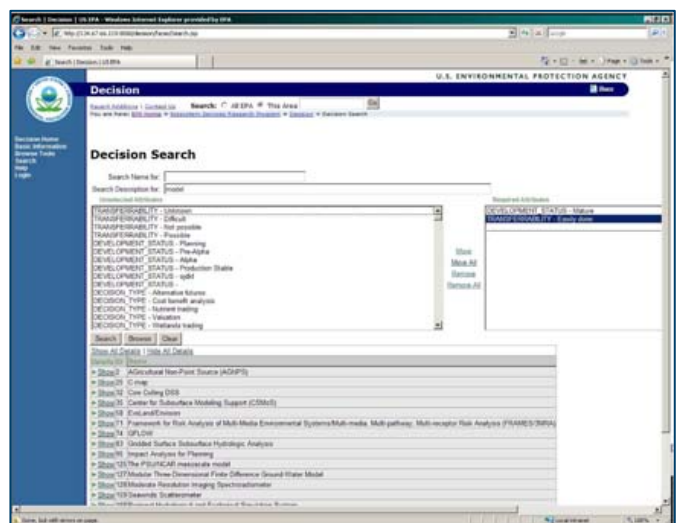
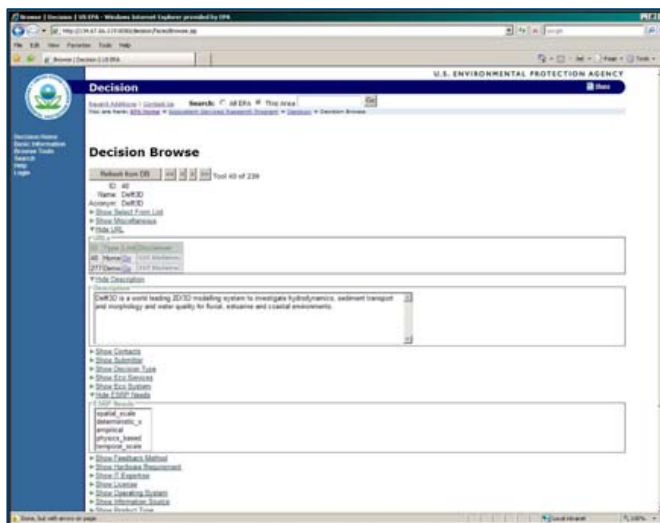
Planners and decision makers are challenged to consider not only direct market costs, but also ecological externalities. There is an increasing emphasis on ecosystem services in the context of human well-being; therefore, the valuation and accounting of ecosystem services is becoming an integral component of economic efficiency. (Costanza 2003, Millennium Ecosystem Assessment 2005)

Depending on the type of decision to be made, associated ecosystem services may be quantified by using a variety of approaches that could consider deterministic physical and chemical processes, known empirical relationships, and socioeconomic valuation methods. There are existing lists and directories that emphasize process modeling to evaluate results of water resources decisions, changes in mass and energy budgets, and other direct physical manipulations. These can be found on several governmental and nongovernmental websites.

In the context of decisions that affect ecosystem services in the more general sense, ecological externalities may be quantified using process models, but there may be tools and techniques that consider broader measures. The Ecosystem-Based Management Tools Network has developed a database of tools that consider bundled ecosystem services emphasizing coastal and marine systems. (NatureServe 2008) The database augments the scope of ecosystem services in the broad sense of decision support related to EPA's Ecosystem Services Research Program. (U.S. EPA 2009) There is a need to augment the scope of this and other tools databases to include ecosystem services in a broader sense.

Objectives

The objective is to provide an evolving searchable database of tools, approaches, and techniques that can be applied in analytic-deliberative decision support processes, accounting for improving decisions that may affect ecosystem services.



The National Risk Management Research Laboratory's mission is to advance scientific and engineering solutions that enable EPA and others to effectively manage current and future environmental risks.

NRMRL possesses unique strengths and capabilities and is dedicated to providing credible technological information and scientific solutions that support national priorities and protect human health and the environment.

Approach

The Ecosystem Services Tools database will be developed using the MySQL database management system. In fiscal year 2010, a user interface will be developed. It will allow users to build a query to find a list of tools that can help meet their decision-support needs based on a series of questions. These will include questions about the type of decision to be made, the category of tools needed, the temporal and special scales of interest, the amount and type of data available, the user's scientific background, and the type of ecosystem being considered.

Accomplishments to Date (October 2009)

The Ecosystem Services Tools database contains approximately 235 records; this number is increasing. The database was originally assembled using MS Access; it has now been migrated to MySQL, a more robust database management system. Work has begun on developing a Java user interface that will allow browsing and searching of tools.

Near-Future Tasks

During fiscal year 2010, work will continue on developing the user interface to the database. Tools will be continually added as they are developed.

References

U.S. EPA. (2009). Website: [Ecosystem Services Research Program](#).

NatureServe. (2008). Website: [Ecosystem-Based Management Tools Network](#).

Millennium Ecosystem Assessment. (2005). "Ecosystems and Human Well-Being: Opportunities and Challenges for Business and Industry." World Resources Institute, Washington, DC.

Costanza, R. (2003). "Social Goals and the Valuation of Natural Capital." *Environmental Monitoring and Assessment*, 86:19–23.

Investigators

David S. Burden
Timothy J. Canfield
Barton R. Faulkner

Collaborators

William Barrett
U.S. EPA
National Risk Management Research Laboratory
Cincinnati, OH 45268

Sarah Carr
NatureServe

Ann Vega
U.S. EPA
National Risk Management Research Laboratory
Cincinnati, OH 45268