

Eco-Informatics for Decision Making December 13-15, 2004 Workshop

Ecology and Environmental decision makers, at all levels of government (local, state, national and international) seek to integrate ecological, environmental, and policy information as they make decisions about resource management, oversight, and policy. Non-governmental organizations have similar goals. These decision makers work with information providers and data managers, and seek a wide variety of information sources, but little of the data used to produce the needed information was collected specifically for the decision making at hand. Thus, the decision maker is faced (often indirectly) with many information technology issues, including data gaps, [data integration](#), data presentation, and how to use or create appropriate indicators.

The informatics tools needed to solve environmental challenges (e.g., global climate change, emerging diseases, decreasing biodiversity, and waning resources) are currently being researched and developed under the rubric of eco-informatics. Most of these efforts, however, as articulated by researchers and agency representatives at workshops¹ sponsored by the National Science Foundation (NSF), National Aeronautics and Space Administration (NASA) and National Biological Information Infrastructure (NBII), focused on tools to help increase research productivity and increase the published availability of research data. This workshop will focus specifically on informatics tools to support ecological and environmental decision makers.

The workshop has its origins in an NSF Digital Government Conference (dg.o 2004²), where sixteen researchers³ participated in a lively conversation on future directions of eco-informatics, and extended the eco-informatics vision, defined at previous workshops, to support the needs of decision makers (e.g., policy makers and natural resource managers) in utilizing eco-informatics products more effectively.

The dg.o2004 discussion group⁴ agreed that a separate workshop should be held to articulate decision-maker needs regarding eco-informatics tools. The workshop will focus on how decision-makers, natural resource managers and others who rely on eco-informatics data might use that information more effectively. The workshop will also address past attempts (success and limitations) to utilize eco-informatics data for decision making.

Workshop speakers will present the state of the art in eco-informatics, as it currently relates to decision making, and participants will define the problem space and articulate relevant information technology issues relating to information integration, modeling and simulation, data quality, ontologies, human-centered issues such as training, technology transfer, best practices for information provision and use, and human-friendly software for decision makers and information providers.

In particular, the workshop will aim to take the following issues into consideration:

¹ See www.evergreen.edu/bdei.

² National Conference on Digital Government Research.

³ Other BoF Participants: Chaitan Baru, Stefan Falke, Bill Hodgkiss, Eric Landis, Maria Matevosyan, Peter McCartney, G.P. Patil, Sharon Shin, Charles Taillie, Bill Waltman, Jessie Wilbur. Special thanks to Val Gregg (NSF), Sue Stendebach (EPA) and Bruce Bargmeyer (LLBL), who contributed to formulating this BoF's agenda.

⁴ Birds of a Feather (BoF) roundtable discussion group at dg.o2004 conference in Seattle, Washington.

1. In addition to NSF program directors and research principal investigators, and USGS agency representatives, the **Environmental Protection Agency** was an active participant in planning and convening this BoF.⁵ NASA participants continue their interest and are kept informed.
2. Large agencies (in particular EPA) are no longer the sole sources of information critical to their mission. Mechanisms must be put in place so that data providers such as tribal, local and state governments can easily publish and extend key data sets and metadata.
3. Using the term “information providers”, rather than “data providers”, emphasizes that the value of both raw data sets and aggregate data products (e.g., results of statistical analysis and model output).
4. Stakeholders for ecology information products include not only scientific researchers, but also decision makers and the public, who should be included at the outset of further discussions. Eco-informatics researchers and developers generally have little understanding of how decision makers and the public might use information products, and do not understand their metadata needs.
5. Metadata ‘hurdle height’ should be considered when developing products and strategies to encourage wide participation by providers and to ensure that consumers have appropriate guidance over and above a caveat emptor for using information. A companion and perennial concern is that information be misused or abused.

The primary focus of the December Eco-Informatics Workshop will be identifying the customers of ecological information products (decision makers and the public, in particular) [and articulating their information needs, and relating those needs to the capabilities and interests of relevant research disciplines.](#)

Eco-informatics and ecology researchers, the EPA, BLM, the Forest Service and Non-Governmental Organizations (NGOs) such as The Nature Conservancy, as well as NSF, USGS and NASA, will be active participants, as well as a representative cross-section of customers – included at the outset to articulate information needs.

Outlining characteristics of sample projects that turn existing data products and information management tools into useful information products for these stakeholders would be another desired outcome of this workshop, along with a call for better understanding how all stakeholders (people) and eco-informatics (technology) actually use metadata, and how the quality of metadata and data could evolve over time, even after initial publication.

We envision 35 participants for this one and one-half day workshop. Those participants designated as report co-authors will stay an additional half day to write a preliminary workshop report. The workshop will be organized by Judy Cushing (The Evergreen State College) and Tyrone Wilson of NBII, USGS, and sponsored by the NSF Digital Government Program.

This workshop is scheduled in December in order to give the National Science Foundation time to prepare a Request for Proposals and make appropriate arrangements for subsequent review panels and the awarding of grants during 2005.

⁵ Ibid