

# Policy Breakout I

## Leader: Charlie Schweik

“Policy problems in eco-informatics and  
decision-making”

# What do we mean by “Policy problems in eco-informatics?” Does the below articulate it? What changes are needed?

Areas for discussion include (but are not limited to) problems that organizations (across all sectors, public, private and nonprofit) encounter because of their policies related to:

- (1) the provision (e.g., financing), production, and maintenance (e.g. data archiving) of eco-informatics tools and information;
- (2) the use (and possible abuse) of eco-informatics tools or information and their effectiveness;
- (3) the cross-organizational sharing or not sharing (e.g., privacy, confidentiality policies) (or lack thereof) of eco-informatics tools or information; and
- (4) the communication (or lack thereof) of environmental management decisions grounded upon eco-informatics-based analysis.

Ranking -- One point – there was hesitancy in our group to rank the top three for fear of dropping an important problem. We did it because of the afternoon’s sessions dependence on these for discussion, but the problems are often context sensitive

Areas for discussion include (but are not limited to) problems that organizations (across all sectors, public, private and nonprofit) encounter because of their policies related to:

1. the provision (e.g., financing), production, and maintenance (e.g. data archiving) of eco-informatics tools and information;
- Organizations may not be “addressing the user needs” problem adequately
  - We have a spectrum of users and we need to develop products that will support various user types and that are tailorable by the end user
  - User needs are a moving target
    - Needs develop in conjunction with technology
    - The users don’t necessarily know what they need or want
  - Unrealistic to believe that senior decision-makers will make decisions based solely on facts, tools and knowledge, even with perfect information

Areas for discussion include (but are not limited to) problems that organizations (across all sectors, public, private and nonprofit) encounter because of their policies related to:

2. The use (and possible abuse) of eco-informatics tools or information and their effectiveness;
  - How do you translate from uncertain scientific models to policy decisions that require a legal burden of proof?

In other words, how do you determine whether scientific evidence is enough and defensible to justify a policy decision when there is uncertainty in that data?

- How do you protect against users utilizing EI data at inappropriate spatial or temporal scales? E.g., the ecological fallacy problem – inference about an individual based on aggregated group data)

Areas for discussion include (but are not limited to) problems that organizations (across all sectors, public, private and nonprofit) encounter because of their policies related to:

3. The cross-organizational sharing or not sharing (e.g., privacy, confidentiality policies) (or lack thereof) of eco-informatics tools or information; and
  - The co-production problem in EI tool and information development. (Tragedy of the commons – organizations shirking)
    - Organizations don't want to absorb costs of contributing to the development of a common tool or EI
    - The problem of creating policies that balance the public good nature of EI information (and tools) against the need for private enterprises to make a living
    - Protection of sensitive public data (e.g., where last endangered orchid is)/ privacy issues
4. the communication (or lack thereof) of environmental management decisions grounded upon eco-informatics-based analysis.


# Data Presentation

Leader: Carol Hert

# Presentations: influenced by user and data

- **User**

- Needs
  - Task
  - Time
- Characteristics
  - Preferences
  - (Dis)abilities



How can it be manipulated?

- **Presentation**


- Software modalities
  - Suitability for each data type
  - Complexity of use
- Hardware media
  - Availability
  - Costs



How should it be displayed?

- **Data**

- Metadata
- Raw data
- Accuracy specs
- Prep/interp. methods
- Documentation
- Policies (privacy etc.)



What do I need to know?  
Who am I?



What should be displayed?

# Some important Data Presentation research questions

- **Info visualization**: automated info-to-medium allocation (what info is best in which medium?)
  - innate capabilities of medium/modality
  - which aspects of displays affect decision-making, and how?
- **Cross-visualization data cross-reference** ('where' is *this* datum in *that* presentation?)
  - Co-ref across maps, statistical charts, tabular reports, etc.
- **Reach 'back'** from presentation into supporting / defining information:
  - metadata, analysis procedures, documentation, ownership and distribution policies, accuracy/precision, etc.
  - all this cross-correlated around each datum
- Representing **time and change** (how did, and will, things evolve?)
- **New media** (3D, dynamic change, overlaying data and reality in media, display goggles, sonification...)
- **Definition of user** tasks/needs, characteristics, preferences...

# Data “gaps”

*“...the problems stemming from geographic data gaps between biodiversity-rich land areas and conservation-managed land areas and the potential impact of these data gaps on decision making which may rely on ecological and environment information...”*

Discussion: needs better problem definition, should be broadly focused on biodiversity, and consider geographic and thematic gaps

# Data Gaps Team

Lois Delcambre

Frank Biasi

Marie Denn

Doug Beard

Louis Sweeney

Andy Wilson

Kevin Gergely

# Data Gaps

## Breaking down/defining the problem

- Many needed data sets don't exist

(The need to protect/manage composition, structure and function at multiple spatial scales can require many types of data that don't now exist.)

- Existing data sets can also represent a data “gap”

(These data can be disjunct, needing manipulation, crosswalking to standardized types, and can have spatial and temporal gaps)

- Some data lack access

(i.e. unpublished data)

- Recent emphasis on adaptive management requires data

(plans and decision documents often specify monitoring requirements that are not followed up on, requiring data)

- Database of professionals/experts could be used to help fill data gaps

# Issues related to data “gaps”

- Managers and scientists have to evaluate the costs and benefits associated with decision making with existing data (higher uncertainty) or with data developed to fill data gaps (increased costs and time)
- Related to the point above, little is known about how managers and organizations deal with uncertainty.
- Also, data providers need to deal with interpreting uncertainty to managers, when they fill a data gap by combining data sets with different (or absent) validation/accuracy measures.
- A challenge will be in defining the appropriate level of generalization of data to combine data sets to meet management needs
- There is no aggregate valuation of data needs/priorities across agencies/stakeholders. Could explore economic valuation (i.e. futures markets) to prioritize.
- Mechanisms could be developed for evaluating and vetting citizen science

# BDEI3: Tools Breakout

## Participants...

- Bruce Bargmeier
- Mike Frame
- Janos Fulop
- Julia Jones
- Paul Klarin
- Eric Landis
- Gigi Sanchez
- Dawn Wright

# BDEI3: Tools Breakout

## Questions Related to Tools...

- How do you balance the issue of longer term grants (gather user feedback) vs. supporting decisions/deliverables short term.
- How do you get tools out there/marketing of the tool?
- So many tools exist, so many users – how do you know what’s good, bad, and ugly tools?
- How can data be effectively applied to other problems or uses when it wasn’t necessarily collected for that purpose?
- A need for tools to support decision makers, but also generalized tools. How do you create both in one tool?
- How do you deal with the issue of people asking the question, may not have “clue” what their real question is?
- How do you make tools used for a certain purpose, the “standard” for that purpose and community?
- How do you deal with the social science issues of tool usage, sharing, and adoption?
- How do you balance the lack of technological capabilities of certain groups?

# BDEI3: Tools Breakout

## Problems/Needs for Tools...

- Tools that support Transferability
- Ability to quickly, easily answer problems – present alternatives
- Support user needs at the onset of the tool development process
- Application of existing tools from other domains
- Tools that aid in the application of Legacy data
- Alerting tools (Recommender System for tools and data)
- General problem of trying to find data, computational resources (GRID computing)
- Suites of products/tools do not exist
- Word of Mouth (first time tried it, it worked for what I need, media)
- Tools to support metadata issues (creation, quality, accuracy, etc)
- Role of standards in tool development and adoption

# Indicators

Leader: Steve Young

Breakout Session I

Report to Group

# Indicators - Challenges

- What is an indicator? Public perception is varied; people talk passed each other
- If relevance of indicator is not well defined and communicated, value of indicator not valued
- There is a constituency that is afraid of environmental measures – its not like the weather! Balance between economics/growth and sustaining and enhancing environmental conditions
- Data gaps are still an issue with backing up indicators
- Environment is so complex – ecosystems/human health complexities
- What does the ecosystem do for me? No indicators that describe the services provided!

# Indicators - Interesting Examples

- Endangered Species – Death Valley Pupfish
  - Relationship with water pumping determined to be effecting the spawning. Simple indicator – water level!
- WA – Shellfish bed closures
  - Drill down on the data; closures based on real science
- Trans-boundary indicators for aquifers, etc. – Canada/Washington sharing and jointly acknowledge what is measured
- Queensland, Australia – children know all the indicators for when exposure probability is greatest; government publicizes indicators
  - Why? Area has greatest number of skin cancer occurrences

# Indicators - Opportunities

- When defining indicators be upfront about not being able to explain everything
- Indicators must mean something to public –social relevance
- Indicators should be reproducible, practical, cost-effective, responsive to what people care about, and mostly interpretable
- Establish a framework (interactive process) for sustainability to identify the data gaps as well as what data current exists
- Research project opportunity – what are the ecological indicators providing a service?