

**Joint Working Group and
Science Coordination Group
*Workshop on
Decision Making***

Context

- The NRC reports among other things that:
 - The effectiveness of the linkages between science and decision making should be examined
 - Constructive stakeholder engagement and interagency coordination are key elements of adaptive management
 - Little recent progress has been made in developing integrated hydrological ecologic and biogeochemical models to inform decision making and adaptive management
 - Improved species models and multi-objective decision analysis tools are needed

Background

- The Task Force held a workshop in February and identified two themes to improve the use of science in decision making and stakeholder engagement
- These two themes are:
 - Decision Making and
 - Decision Support Systems
- The Working Group and Science Coordination Group were asked to develop coordination actions for these two themes

Goal

- The purpose of the workshop is to identify coordination actions in support of the decision making and decision support system themes identified by the Task Force

Decision Making

- Owning the questions
- Stakeholder engagement
- Open and transparent decision making
 - Using science
 - Making and communicating decisions
 - Adaptive management, dealing with risk and uncertainty

Owning the Questions

- Owning the questions
 - Decision makers must own the questions, but the questions must be developed in concert with the scientific community
 - The Synthesis of Everglades Research and Ecosystem Services (SERES) project developed a set of key questions based on input from science managers, decision makers, and the public
 - The SERES questions will be considered as the starting point for developing a set of questions for the Task Force

Stakeholder Engagement

- The National Research Council (NRC) reports that an effective stakeholder process can improve the quality and credibility of decisions
- Best process regimes for stakeholder engagement should be identified and incorporated as appropriate
- The Task Force FACA exemption can contribute to an effective stakeholder process

Open and Transparent Decision Making

- Using science
 - The NRC recommends that the links between science and decision making should be examined
 - The NRC states that mechanisms need to be developed to clearly communicate decision–relevant science
 - The NRC recommends greater clarity and transparency for integrating science into decision making

Open and Transparent Decision Making

- Making and communicating decisions
 - The who, what, when and how of decision making needs to be transparent
 - This information needs to be clearly communicated

Open and Transparent Decision Making

- Adaptive Management (AM)
 - The NRC reports that effective stakeholder engagement and interagency coordination are key elements of AM
 - The NRC states that CERP has the foundations for AM and it's time to put theory into practice
 - Institutional process and momentum can be barriers to AM

Open and Transparent Decision Making

- Dealing with risk and uncertainty
 - Mechanisms need to be developed for making quality decisions in the absence of complete information

Decision Support Systems

- Faster modeling capabilities
- Integrated modeling
 - Interagency coordination
 - Open modeling framework
- Multi-criteria decision making tools

Faster Modeling Capabilities

- Inputs
 - Slowest aspect is getting input data in correct format to be readable by a model
 - Developing 'CERP Standard' for Everglades modeling community – many partner agencies involved
 - Remove unnecessary complexity that doesn't contribute to model outcomes
- Running models
 - Computationally intensive models can take a long time to run
 - Using distributed computing across a number of computers can make run times much quicker
 - Can do this at stakeholder workshops if needed

Integrated Modeling

- Interagency coordination
- Progress in the last two years:
 - Standard data formatting system and model development & review protocols
 - Ecological models are available and have been used in projects
 - Several additional eco models linked to hydro models are in development and review process
 - Tools have been developed and are available for data manipulation and visualization

Integrated Modeling

- Interagency coordination
 - Need standards to make collaborative modeling work across agencies (and individuals)
 - Need clear documentation of models and tools for users and collaborators to follow, use, and effectively improve
 - Need collaborative framework for streamlined model integration
 - e.g., vegetation/habitat/hydro models developed so they can feed into wildlife models and vice versa

Integrated Modeling

- Open modeling framework
 - Exposes code and rules that drive models and tools
 - Allows greater transparency
 - Allows continual improvement
 - e.g., other users/modelers can add new science
 - Changes get documented and put back in open framework for additional users/modelers
 - Effective for works in progress (to improve them) not just for finished/published products

Multi-Criteria Decision Making Tools

- Integration of many variables that go into decision making
 - e.g., indicators, ecosystem performance, cost
- Integrate risk and uncertainty
- Compare final scores from multiple management alternatives
 - Can also see scores of variables that comprise final scores
- Use tools across large regions or discrete management/restoration areas

Summary

- Need continual dialogue between decision makers and scientists to get the right questions answered
- Open and transparent processes are necessary both in decision making and development of supporting tools
- Decision making and tool development need to be coordinated efforts