Collaborative Modeling as a Tool to Implement IWRM

A Symposium within the 2011 AWRA Summer Specialty Conference

June 27-29, 2011, Snowbird, UT

Purpose

Water professionals from around the world gathered for the Collaborative Modeling for Decision Support Symposium within the American Water Resources 2011 Summer Specialty Conference on Integrated Water Resource Management, June 27-29, in Snowbird Utah. The purposes of the event were to:

(1) Solidify and energize the existing Collaborative Modeling community and encourage progress on existing working groups;

(2) Expand our community to include other collaborative modelers, potential (next generation) practitioners, potential clients and sponsors, with particular focus on bridging to the international community and those working on IWRM;

(3) Share experiences, case studies, common themes and concerns; and

(4) Support development of UNESCO Guidelines on the use of Collaborative Modeling for IWRM.

This symposium followed successful community building and field-advancing workshops held in 2007 and 2009 (proceedings available at: www.computeraideddisputeresolution.us).

Agenda/Schedule

Symposium highlights included:

- A pre-conference training workshop in System Dynamics Modeling for IWRM
- A conference plenary that traced the development of the IWRM concept through history and posited collaborative modeling as way to infuse increased technical understanding within the political discussion about water management and values.
- Presentations that defined "Collaborative Modeling for Decision Support" and discussed efforts to develop UNESCO/IHP Guidelines for Collaborative Modeling to implement IWRM, shared Principles and Best Practices for Collaborative Modeling (developed through an ASCE/EWRI Task Committee), described current efforts toward evaluating the effectiveness of collaborative modeling, and discussed the use of Collaborative Modeling to implement the European Unions' Framework Directive on Water Resources.

- Nine Case study presentations where collaborative modeling has been used to implement IWRM across the world, focused on aspects of the linkages between integrated planning processes, stakeholder involvement and technical systems analysis. Examples were presented from Australia, Peru, Arizona, Washington/Idaho, Alberta, the Great Lakes, New Zealand, Iraq, and New England.
- A panel discussion to debate the compatibility and effectiveness of Collaborative Modeling as a means of achieving effective IWRM
- An evening social and signing and launch for the book "Converging Waters: Integrating Collaborative Modeling with Participatory Processes to Make Water Resources Decisions" (available at www.iwr.usace.army.mil/docs/maasswhite/Converging_Waters.pdf)
- Working group sessions the last morning of the conference that focused on ways to increase visibility and use of the Collaborative Modeling approach.

Results

How well did we achieve our objectives for the Symposium? The event provided multiple opportunities for networking stimulated excitement over the topic of collaborative modeling, and exposed a large set of water professionals to the concepts and applications of collaborative modeling. Three international guests, as well as five U.S.-led projects in international or trans-boundary settings, added perspectives on applying collaborative modeling in different institutional and cultural contexts. Hosting the Collaborative Modeling Symposium within the larger AWRA conference on IWRM expanded the interchange on collaborative modeling to a broad group of water managers. Side discussions enabled progress on established Collaborative Modeling working groups and projects, while the working session generated new working groups and planned activities. Presentations were all of high caliber and succeeded in focusing on how collaborative modeling fits within the IWRM context. Case study papers, session notes, and products from the working meeting will all contribute to the UNESCO Guidelines document that IWR is leading.

During discussions of the presentations, and in the Roundtable at the end of the first day, many ideas emerged. We summarize the major themes below:

- *Mock Models* - By definition, mock models are educational tools that describe the linkages between natural and human systems. In terms of water resources decision making, mock models offer a means to engage and build mutual understanding among potential stakeholders and help close the gaps between and among water resources decision makers and technical analysts.
- *How to Involve Decision Makers* - Despite the potential usefulness of models, the collaborative modeling process must not attempt to let models dictate the "optimal" solutions. Through the elicitation and evaluation of performance measures, the collaborative modeling process instead acknowledges a range of variables and can focus the collaborative decision making process by aiding in defining what people value. Executive sponsorship of the modeling process will increase the value of the process. For instance, check-in-points are a means to assure that decision makers needs are reflected in the analysis.

- *Nature of Collaboration & Participation* - Collaborative modeling empowers stakeholders to get involved in the decision making process. Despite the potential to involve multiple sectors, challenges exist. For instance, most water resources decisions occur at the local level; at this smaller scale, it may be difficult to engage disadvantaged groups. Since collaborative modeling explicitly considers multiple interests, decision makers must focus on the needs of the many rather than the needs of a few, allowing under-represented or disadvantaged groups more access.
- *Context of Decision Making* – In designing a collaborative modeling process, context matters – we must recognize the relevant time pressures. While some cases will evolve over decades, other cases will require a decision quickly. With less time pressure, decision makers may rely less on readily available information / models and instead develop an more comprehensive analysis process that incorporates more variables (e.g. social concerns).
- *Trust, Transparency, & Integrity of Process* - As an indicator of interest and concern from decision participants, performance measures have the ability to make values explicit. Yet, those who are making the decisions generally use different jargon from those who are implementing them. By incorporating a common vocabulary along with performance measures, decision participants can develop shared understanding and recognition of commonality.
- *Breadth of Projects & Problems* - In terms of the "scalability" of cumulative impacts, tools need to be brought down to the appropriate level where the impact occurs and then linked upward.
- *Building the Field* – To increase the use of collaborative modeling we need to offer more examples of cost-effective successes in more accessible and compelling formats. We need to better engage stakeholders and decision makers in designing & evaluating collaborative modeling processes.

Next Steps

The morning of the last day, four working groups focused on ways to increase visibility and use of the Collaborative Modeling approach and developed follow-on actions. These working groups are:

- Global water model for an International Audience
- Comparative Analysis – U.S. vs. Australia
- Guidelines for Collaborative Modeling Practitioners and Conveners
- Involving Decision Makers in CM More Effectively

Working Group Session summary notes

Attendees:

Bobby Jeffers	*Idaho National Labs & Washington State University*
Allyson Beall	*Washington State University*
Nuño Videira	*Universidade Nova de Lisboa, Portugal*
Austin Polebitski	*University of Massachusetts, Amherst*
Bill Werick	*Werick Creative Solutions*
Bill Young	*CSIRO, Australia*
Aleix Serrat-Capdevila	*ICIWaRM & University of Arizona*
Howard Passell	*Sandia National Labs*
Vince Tidwell	*Sandia National Labs*
Bill Michaud	*SRA International*
Megan Wiley Rivera	*Hydrologics, Inc.*
Marjan van den Belt	*Massey University, New Zealand*
Lisa Bourget	*Institute for Water Resources*
Stacy Langsdale	*Institute for Water Resources*
Mike Sheer	*Hydrologics, Inc.*
Dan Sheer	*Hydrologics, Inc.*
Brian Manwaring	*U.S. Institute for Environmental Conflict Resolution*
Jerry Sehlke	*Idaho National Labs*
Kim Ogren	*Oregon State University*
Julie Watson	*Oregon State University*
Hal Cardwell	*Institute for Water Resources*

The meeting began with about 30 minutes of brainstorming discussion topics, then four self-selected breakout groups formed and developed plans on topics of mutual interest.

Group 1: Marjan, Allyson, Vince, Howard: Global water model for an International Audience

Vision - Develop a simple global water model & present it at the World Water Forum, March 2012

- Build at the global scale, then drill down to regional level.
- Make a collaborative effort with others across the globe using FORIO to share/build model.
- Global Water Systems Project (Earth Systems Science – Global Change – Charles Vörösmarty) may serve as a good example of how to do this.

Group 2: Bill Y, Bill W, Aleix, Austin: Comparative Analysis – U.S. vs. Australia

- 999Establish a MOU between USACE & CSIRO (or identify if already existing through the USACE-Institute for Water Resources UNESCO center on International Center on Integrated Water Resources Management (ICIWaRM)).

- Hold a simple dialogue on when SVP/CMDS does not work.
- Address need for SVP to more deliberately engage decision makers. How can we bridge the collaborative process with the final decision?
- Project: Conduct *Virtual Flood Day* for Sacramento, California. Use CSIRO modeling tools to create high-end visual simulations.

Group 3: Hal, Dan S, Mike S, Brian: Guidelines for Collaborative Modeling Practitioners and Conveners (UNESCO SVP Guidelines document)

- Purpose: Develop guidelines that will help to organize the UNESCO guidelines on SVP, and perhaps convene a workshop at the GWP World Water Week, Stockholm, August 2011.
- Resulting guidance will help people do cross-check context with design; i.e., Are you setting up a relevant project?
- Fundamentals: Trust; Open, effective communication; Need to be heard; Common understanding of system; Appropriate stakeholders
- Must consider: Institutional context; catalyst for effort/motivation
- Identify interests & needs; Link to implementation; Link political actions to political models

Group 4: Megan, Bobby, Stacy, Nuño, Bill M: Involving Decision Makers in CM More Effectively

- Purpose: To define better ways to involve decision makers more effectively, so that CM processes have a positive impact/role in decision processes.
- Steps: (1) Must determine characteristics of *Context*: What is the *catalyst* for doing the study, and what is the study's *mandate*?
- (2) *How* do you effectively engage Stakeholders? Who are the decision makers? What are the decisions they make? Spheres of influence (note – "on the ground" stakeholders make the daily decisions that actually affect the system, so they are DM's too). Consider context – institutional frameworks.

Action items

- Define best practices for use in the UNESCO document on Shared Vision Planning for IWRM, by drawing on the case studies. [Cardwell, Mendoza, Langsdale]
- Resume steering committee with new working group leads [Langsdale, Cardwell]
- Special issue of JAWRA on Collaborative Modeling for IWRM [Langsdale]
- Post these notes to AWRA website, CADRe website & announce via networks [Langsdale, Cardwell]
- Request working groups (new and old) to define or redefine action items and target dates.