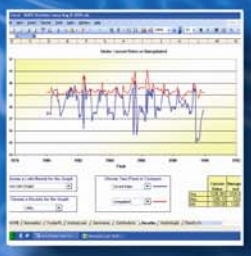
Shared Vision Planning

September 2009

Analysis of Process Issues in Shared Vision Planning Cases

09-R-05



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Shared Vision Planning

The Shared Vision Planning program at the Institute for Water Resources (IWR) uses an innovative, collaborative approach to solve water resources management issues. It integrates traditional water resources planning methods, structured public participation, and collaborative computer modeling into a multifaceted planning process. This program is unique because it emphasizes public involvement in water resources management and the use of collectively developed computer models along with tried-and-true Corps planning principles.

Shared Vision Planning aims to improve the economic, environmental and social outcomes of water management decisions. By involving stakeholders throughout the planning process, the Shared Vision Planning process can facilitate a common understanding of a natural resource system and help stakeholders reach a management consensus that satisfies multiple interests. Shared Vision Planning allows IWR scientists to work directly with stakeholders to find acceptable solutions to issues surrounding the management of water resources.

Collaborating for Improved Water Resources Management

Through its Shared Vision Planning Program, IWR is applying the principles of public involvement and collaborative computer modeling to a series of water resources management case studies across the United States. Analyses, documents, and an enhanced web presence are being developed to impart the method and lessons of Shared Vision Planning to the wider planning community. All of these initiatives are designed to help planners and stakeholders use a collaborative approach to natural resources management.

By recognizing the importance of multiple stakeholder interests and the value of innovative technological support, Shared Vision Planning can make a positive impact on the current and future management of our nation's water resources. The Shared Vision Planning Program at IWR is developing partnerships with other organizations to more effectively implement this approach. The Program has already helped numerous stakeholders in previous projects to find acceptable water management solutions, and IWR looks forward to the continued spread and success of this planning approach.

For further information on the Shared Vision Planning program, please contact Hal Cardwell, 703-428-9071, Hal.E.Cardwell@usace.army.mil.

To learn more, please visit the Shared Vision Planning web site: www.sharedvisionplanning.us

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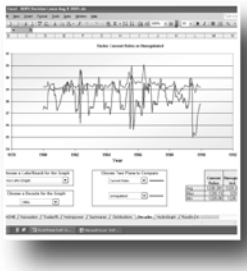

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EXECUTIVE SUMMARY

This report presents the results of a brief study. The study had three objectives: (1) to take stock in the current Shared Vision Planning (SVP) case study literature in how much process issues are addressed; (2) to draw insights, as available from the current body of literature on SVP; and (3) to provide guidance to future case study authors to ensure that the process issues are given appropriate attention.

Cases were selected from the existing literature and included the following:

- ACT-ACF Basins Shared Vision Planning
- Boston Metropolitan Studies
- Cedar and Green Rivers
- Gila River
- James River Drought Preparedness
- James River Shared Vision Planning
- Kanawha River
- Lake Ontario – St. Lawrence River
- Lake Powell/Lake Mead
- Los Angeles Urban Watershed
- Marais des Cygnes – Osage
- Middle Rio Grande
- Mississippi Headwaters
- North Branch Potomac River
- Northern California Drought Preparedness
- Pacific Northwest Climate Change
- Rappahannock River
- Snake Plain Aquifer
- Susquehanna River Basin Studies (Conowingo Pond)
- Upper Rio Grande River
- Willamette River

For each of these cases, the following process issues are summarized: Who were the decision makers that participated? Why did the team decide to use a model? What mechanisms were used to engage stakeholders? Was the process successful? In the cases that had limited success, what were the major obstacles?

This review found several points related to discerning when SVP is appropriate and what format it should take. Regarding the use of models, models clearly add value in cases where there is a highly complex system, or when there is great value in being able to evaluate alternatives or scenarios rapidly. Also, model credibility can be fostered by participation in model development, but is not the only means. Regarding stakeholder participation, cases with high potential controversy frequently offer stakeholder participation opportunities in addition to technical working groups. Advisory groups have been the most common way to resolve the tension between the need for technical expertise and the need for transparency and opportunities to participate.

Future case study authors should address the motivations on the use and design of the SVP process, as well as how and to what extent stakeholders were involved in model development, analysis, and decision making. Complete guidance is included in Appendix B.

PURPOSE AND SCOPE

Shared Vision Planning, which is the intersection of computer models developed in a collaborative process for the purposes on water resources planning and management, is a relatively new field that has evolved over recent decades. To date, much of the case study literature regarding Shared Vision Planning (or other forms of Computer-Aided Dispute Resolution) focuses on the characteristics of the newly developed computer model, the technical analysis, and the evaluation of alternatives. However, to support propagation of this method, it is just as important to communicate the characteristics of the *process*, or the series of activities conducted to support involving stakeholders, building a model, and reaching a conclusion (such as building consensus). This report begins to fill this gap by identifying what process information is available in a selection of published Shared Vision Planning cases and then generating insights from these results.

There are two purposes to this study: First, to the extent possible given the limitations of data availability in the literature, this report will provide insights regarding under what conditions Shared Vision Planning is most beneficial, and what characteristics of the process are critical for achieving desired outcomes. Of particular interest are the types and mechanisms for stakeholder involvement in developing and using the model. What kind of involvement is required to build credibility and trust in the model? Does a more accessible modeling platform increase the ability of stakeholders to participate? Does the amount and type of stakeholder involvement correlated to political acceptance of the study teams recommendations? These are all high-level questions that are difficult to measure directly with a limited pool of cases. This report assesses what information is readily available as a first step toward shedding light on these questions.

Second, after reviewing process issues in the case study literature and identifying gaps, this report will provide recommendations for future authors to include in their case study reports.

The process issues that this report addresses are:

1. Who were the decision makers that participated?
2. Why did the team decide to use a model?
3. What mechanisms were used to engage stakeholders?
4. Was the process successful?
5. In the cases that had limited success, what were the major obstacles?

This analysis focuses primarily on Shared Vision Planning or closely related cases. All 21 cases deal with issues in water resources planning and management between 1990 and the present. Most focus on water supply and/or drought planning. This analysis relied on documentation for information, so were selected from those case descriptions posted on the Institute for Water Resources (IWR)'s Shared Vision Planning website[1] or included in the Proceedings of the 2007 workshop on Computer-Aided Dispute Resolution.[2] A few additional cases were selected from a literature review prepared for IWR by CDM,[3] which provides a much broader look at the literature regarding use of computer modeling in water resources or environmental planning or decision making. Also, Creighton was involved in the James River Shared Vision Planning and Willamette River studies, so was able to supplement the documentation on these cases from his direct experience.

[1] www.svp.iwr.usace.army.mil

[2] Stephenson, K., L. Shabman, S. Langsdale, and H. Cardwell. (2007) Computer-Aided Dispute Resolution: Proceedings from the CADRe Workshop. Albuquerque, New Mexico, September 13-14, 2007. IWR Report 07-R-6. Institute for Water Resources. Alexandria, VA.

[3] Imwiko, A., J.C. Kiefer, W. J. Werick, H.E. Cardwell, and M.A. Lorie. (2007) *Literature Review of Computer-Aided Collaborative Decision Making*, IWR Report 2007-R-01. Institute for Water Resources. Alexandria, VA

BACKGROUND

What is Shared Vision Planning?

Shared Vision Planning is an entire water resources planning methodology that focuses strongly on the use of *Computer-Aided Dispute Resolution* (CADRe). CADRe is a general term for the class of tools that include numerous names, among them *Group Model Building*, *Computer-Aided Negotiation*, and *Mediated Modeling*. Most CADRe methodologies include the following characteristics:

(1) The focus is on using computer models as a tool for reaching a shared understanding of the complex problem;

(2) The models are built collaboratively, with the involvement of stakeholders; and

(3) The goal is to achieve agreement on a proposed course of action.

The methodology for Shared Vision Planning was originally applied to drought planning. It was first developed for the purposes of water supply planning on the Potomac River Basin during the early 1980's. In the early 1990's, researchers at IWR conducted a national study of four case studies collectively known as the "Drought Preparedness Studies."[4] This fomented the methodology into the "Drought Preparedness Method" or "DPS Method." However, since then the approach has been expanded to applications beyond drought planning, and IWR renamed the method "Shared Vision Planning."

IWR defines Shared Vision Planning as follows:

> Shared Vision Planning is a collaborative approach to formulating water management solutions that combines three disparate practices: 1) traditional water resources planning, 2) structured public participation and 3) collaborative computer modeling. Although each of these elements has been successfully applied, what makes Shared Vision Planning unique is the integration of traditional planning processes with structured public participation and collaborative computer modeling.[5]

Werick and Palmer provide somewhat greater detail:[6]

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[4] Werick, W.J., 1995. National Study of Water Management During Drought: The Report to U.S. Congress, September 1995, IWR Report 94-NDS-12.

[5] IWR Shared Vision Planning Website [www.svp.iwr.usace.army.mil]

[6] Werick, W. and R.N. Palmer. 2006. *When Should Shared Vision Planning Be Used?* unpublished paper [Available at: http://www.svp.iwr.usace.army.mil/docs/IsSharedVisionPlanningRightforYou.pdf]

"There are three essential attributes of Shared Vision Planning:

- A traditional planning process based on federal water planning principles, but expanded to address multiple decision makers and (in some cases) an operational and adaptive management phase;
- A rigorous but efficient form of public involvement called 'Circles of Influence' that is used to assure that the concerns of the public are addressed;
- The engagement of stakeholders, experts and decision makers in the development of a shared vision computer model that encompasses all the important impacts of possible decisions."

Stephenson and Shabman (2007)[7] suggest that there are several characteristics of how models are used in Shared Vision Planning that are unique. These include:

- Many planning or negotiation processes rely on existing knowledge, while Shared Vision Planning seeks to expand all participants' understanding of the situation.
- Shared Vision Planning could be categorized as a kind of joint fact finding or collaborative science, but is distinguished by its reliance on computer modeling as the primary tool for increasing shared knowledge.
- The fact that the models are created explicitly for a specific decision making or negotiation process is itself a distinguishing characteristic.
- In Shared Vision Planning, the technical models serve as the focal point for conversations, thus playing a role somewhat similar to the use of a single-text negotiating document (a technique used during mediation).

Process Assumptions in Shared Vision Planning

There are a number of major assumptions related to the how elements of the Shared Vision Planning process produce beneficial outcomes. In this analysis, we seek to verify and build upon these assumptions by identifying in more detail what characteristics of the process are critical for increasing benefits and improving the outcome. The foundational assumptions include:

[7] Stephenson, K., L. Shabman, 2007. Overview of Computer-Aided Dispute Resolution: Approach and Evaluation. *In* Computer-Aided Dispute Resolution: Proceedings from the CADRe Workshop. Albuquerque, New Mexico, September 13-14, 2007. IWR Report 07-R-6.

- During their participation in development of a model, stakeholders will develop a common understanding – a "shared vision" – of how the system operates, and the linkages between the many attributes and outputs of the system.
- The process of working together to build a model, or at least to verify its inner workings, will lead to increased understanding and discovery of each others' mutual interests and values.
- The process of working together will reduce relationship barriers (such as mistrust, lack of communication, and control issues).
- Transparency and participation in developing the model will increase trust and credibility for the model itself.
- If the model itself is trusted, many issues of "fact" (or "what is") can be agreed upon quickly, removing these issues from the negotiating table, and focusing attention on more critical issues of interests and values (or "what ought to be").[8]
- By collaboratively developing creative alternatives, participants increase the probability of finding a mutually acceptable solution or plan and develop a "shared vision" of the future.

[8] Lord, William B. "Conflict in Federal Water Resource Planning" *Water Resources Bulletin* 15 (October 1979) 5: 1226-1235.

PROCESS ISSUES DOCUMENTED

Ideally, this review of case studies could cover all aspects of how the processes were conducted, including what motivated the teams to use a Shared Vision Planning approach, who was engaged and how, and what were the outcomes. As anticipated, there are limitations on the information available in the literature. A number of these case studies did not address directly many of the important process issues. In some cases comments were made that “opportunities for stakeholder participation were provided” (or equivalent) without any description of the participatory process.

Given the information that was available, the following questions are addressed in this report:

1. Who were the decision makers that participated?
2. Why did the team decide to use a model?
3. What mechanisms were used to engage stakeholders?
4. Was the process successful?
5. In the cases that had limited success, what were the major obstacles?

ANALYSIS OF CASES

Cases Analyzed

Below is a list of the cases analyzed in this section, the approximate dates of the study, and the primary issues addressed in each study.

CASE	DATE OF STUDY	FOCUS OF STUDY
ACT-ACF Basins[9]	1994 - 1996	Management of water resources for an entire three-state region (Alabama, Florida and Georgia).
Boston Metropolitan Studies	Early 1990s	Water supply in the metropolitan Boston area. Issues included water quantity, water quality, environmental quality, and drought. Part of National Drought Study.
Cedar and Green Rivers	Early 1990s	Water shortages during drought conditions, issues around instream flows, dissolved oxygen, sufficient water to cover fertilized fish eggs. Part of National Drought Study.
Gila River	2005 - present	Regional water supply in arid New Mexico.
James River Drought Preparedness	Early 1990s	Water supply for five Virginia cities during drought conditions. Over-reliance on groundwater pumping producing saltwater intrusion. Part of National Drought Study.
James River Shared Vision Planning	Ongoing	Water supply in upper reaches of James River. Provide cumulative impacts context for regulatory decisions
Kanawha River	Early 1990s	Strike a better balance between water quality, lake boating, and whitewater rafting below Lake Summerville on the Gauley River. Part of National Drought Study.
Lake Ontario – St. Lawrence River	2000 - present	Design a new regulation plan to accommodate changing requirements of stakeholders

[9] Alabama-Coosa-Tallapoosa-Apalachiola-Chattahoochie-Flint Basins Shared Vision Planning.

CASE	DATE OF STUDY	FOCUS OF STUDY
Lake Powell/Lake Mead	2005 – 2006	Allocation of Colorado River Water for consumptive use, hydropower, and environmental purposes
Los Angeles Urban Watershed	1999 - 2006	Development of an Integrated Resources Plan to address issues related to water, wastewater, and runoff management.
Marais des Cygnes – Osage	Early 1990s	Drought preparedness study. Drought could produce significant impacts on municipal and industrial users in Kansas and Missouri, as well as impacts on power production and the recreation industry
Middle Rio Grande	2001 - 2002	Future water supply for three-county region
Mississippi Headwaters	2001 - present	Operating plan for Mississippi River Headwaters Reservoir system, taking into account tribal trust, flood control, environmental concerns, water quality, water supply, recreation, navigation and more.
North Branch Potomac River	2005 - present	Revised operating plans for upstream, reservoirs to address recreation (boating and fishing) and fish habitat issues.
Northern California Drought Preparedness	2004 - 2007	Drought preparedness for agricultural and urban uses in a Northern California County
Pacific Northwest Climate Change	2005 - 2007	How to institutionalize forecasts of global climate change into Pacific Northwest water resources system
Rappahannock River	2002 - 2006	Water allocation of the Rappahannock River to satisfy different consumptive and non-consumptive uses of the River now and for the future.
Snake Plain Aquifer	Ongoing	Conflict over conjunctive management of surface and groundwater resource under Idaho's appropriation doctrine.

CASE	DATE OF STUDY	FOCUS OF STUDY
Susquehanna River Basin Studies (Conowingo Pond)	2002 - 2006	Management plan for the Conowingo pond, a 14 mile-long interstate water body created by construction of the Conowingo dam on the Lower Susquehanna River.
Upper Rio Grande River	Ongoing	Instream flows and water rights on Rio Grande River.
Willamette River	Ongoing	Water quality (temperature); Temperature banking. Operations of Corps dams.

All these Shared Vision Planning cases deal with complex problems that have multiple issues and multiple interested parties, such that they cannot be solved by technical analysis alone. They involve longer term water planning or management rather than one specific decision, such as facility siting. Uncertainty (in the form of inter- or intra-annual variability, or climatic change) affects all of the cases. Nearly all of the cases specifically deal with water supply allocation and/or drought planning. These topics tend to make good candidates for this approach, because they tend to have the main characteristics of (1) multiple (often conflicting) demands on the resource, (2) deal with longer-term policy decisions, and (3) must manage variability and uncertainty.

Decision Makers

Who are the decision makers using Shared Vision Planning? A synopsis is provided below:

CASE	DECISION-MAKING ENTITIES
ACT-ACF Basins	Corps of Engineers, states of Georgia, Florida, and Alabama.
Boston Metropolitan Studies	New England Division of Corps; Massachusetts Water Resources Authority.
Cedar and Green Rivers	Corps of Engineers Seattle District, several Tribes, Cities of Seattle and Tacoma; Washington Dept of Ecology, Washington Department of Fisheries

CASE	DECISION-MAKING ENTITIES
Gila River	New Mexico Interstate Stream Commission; US Bureau of Reclamation (lead Federal agency); US Fish & Wildlife Service; Office of Governor, State Water Planning Group (SWPG).
James River Drought Preparedness	Corps of Engineers; Virginia Department of Natural Resources; regional/city water agencies
James River Shared Vision Planning	Corps of Engineers (lead entity); Virginia Department of Natural Resources; US Environmental Protection Agency, regional/city water agencies
Kanawha River	Corps of Engineers, West Virginia Department of Natural Resources; US Geological Survey; whitewater outfitters
Lake Ontario – St. Lawrence River	International Joint Commission, and study board appointed by the Commission
Lake Powell/Lake Mead	US Bureau of Reclamation in consultation with cooperating agencies
Los Angeles Urban Watershed	City of Los Angeles City Council; voters (bond issue)
Marais des Cygnes - Osage	Corps of Engineers Kansas District; Kansas Water Office; Missouri Department of Natural Resources
Middle Rio Grande	Model developed collaboratively by Sandia National Laboratories, Middle Rio Grande Water Assembly, State of New Mexico, University of New Mexico.
Mississippi Headwaters	Corps of Engineers St. Paul District; US Forest Service
North Branch Potomac River	Potomac River Commission and the three major DC area water suppliers: Fairfax County Water Authority, Washington Suburban Sanitary Commission, and the Baltimore District of the Army Corps of Engineers.
Northern California Drought Preparedness	El Dorado Irrigation District, El Dorado Water Agency. Other “official” participants included El Dorado County Board of Supervisors, County Water Agency, Grizzly Flats Community Service District, Georgetown Divide Water District.
Pacific Northwest Climate Change	King County and an array of local, state and Federal collaborating agencies

CASE	DECISION-MAKING ENTITIES
Rappahannock River	Rappahannock River Basin Commission, Corps of Engineers, US Environmental Protection Agency; US Fish & Wildlife Service
Snake Plain Aquifer	Idaho Water Resource Board/state legislature
Susquehanna River Basin Studies (Conowingo Pond)	Susquehanna River Basin Commission; Corps of Engineers, Excelon Generation, Federal Energy Regulatory Commission
Upper Rio Grande River	Model development decisions made by technical team for Upper Rio Grand Water Operations Model. Members are scientists and modelers from US Geological Survey; Corps of Engineers, US Bureau of Reclamation; New Mexico Interstate Stream Commission
Willamette River	USACE, Sandia. Originally expected Willamette Partnership to serve as policy group, but they declined.

It is clear from this review that, at this stage, the users of Shared Vision Planning are governmental agencies who operate in a decision-making environment in which no single agency has final decision making authority and competing authorities exist between and within levels of government. Agencies that build or operate water supply systems are at the table, but regulatory agencies also have a seat at the decision making table.

These cases show that when agencies must make decisions involving numerous agencies and stakeholders, they tend to assemble all affected interests having some measure of decision making authority and create a process in which they can participate. Shared Vision Planning provides a vehicle to manage the decision making process in this complex political reality.

Why Modeling is Used

A key question that this analysis seeks to provide insight on is when and under what conditions Shared Vision Planning will add sufficient value to justify its use. Regrettably, this review of these cases does not answer that question entirely, as only a few of the written cases provide much detail on why the collaborative component of Shared Vision Planning was used. It is somewhat easier to ascertain why a decision was made to utilize a computer model, as shown in the table below:

CASE	WHY MODELING WAS USED
ACT-ACF Basins	In circumstances of high conflict, to replicate the entire water resource system of region. Ability to evaluate alternatives and use model to formulate alternatives.
Boston Metropolitan Studies	To derive sufficient information about performance to be able to identify "triggers" resulting in changes in management actions. To determine the cost effectiveness of current and future demand management measures.
Cedar and Green Rivers	To speed up the annual refill planning cycle by developing a tool that allows for quick evaluation of alternatives. No existing tool permitted testing of system sensitivity to different instream flow targets.
Gila River	To assist with making decisions about how to allocate $66-127 million in funding for water supply projects. No existing models in this planning area.
James River Drought Preparedness	To simulate present conditions and alternative plans for coping with drought vulnerability – but ultimately decision made not to proceed with model building.
James River Shared Vision Planning	Provide a cumulative impacts context for regulatory decisions. Potential for future use of the model for water supply planning studies - but so far no implemented decision to proceed with model building
Kanawha River	Explore the linkages between river operations and a large number of "outputs" such as whitewater rafting, recreation, navigation and hydropower.
Lake Ontario – St. Lawrence River	To prepare for promulgation of new rules for regulation of Lake Ontario (current planning involved constant deviations from the written plan). Test alternative regulation plans to support development of alternative plans for decision making by Joint Commission
Lake Powell/Lake Mead	Develop a faster, less complicated way to screen and evaluate alternatives in a high conflict situation.
Los Angeles Urban Watershed	Public support was essential. Need to see the linkages between alternative water supply, wastewater management and runoff management actions

CASE	WHY MODELING WAS USED
Lower Susquehanna River	Ability to evaluate the impact of alternative operating rules on multiple uses including anadramous fish flows, power generation, and water supply.
Marais des Cygnes - Osage	Acceptance of a model that could be used by Federal and state agencies to assess the impact of drought management actions upon municipal and industrial water service, recreation opportunities, hydropower generation, and agriculture
Middle Rio Grande	Quantitatively explore alternative water management strategies. Educate the public of the complexity of the regional water system; engage the public in decision making.
Mississippi Headwaters	Ability to evaluate system-wide operational plans.
North Branch Potomac River	Extend an existing well-trusted model to address the link between reservoir management and additional issues such as water temperatures (fish habitat) and economic development association with recreation (particularly boating).
Northern California Drought Preparedness	Public interest in participation in evaluating alternative comprehensive drought preparedness plans.
Pacific Northwest Climate Change	Need to understand and get acceptance on the impact of global climate change on water demand, supplies and instream flows.
Potomac River Basin Water Supply	To understand water supply availability under different operational regimes in a highly complex system with divided jurisdictional control.
Rappahannock River	Get an agreed-model of the hydrology of the two main surface water systems in the Basin, including the impoundments and demands from residential, industrial and commercial uses.
Snake Plain Aquifer	To be able to model combined surface water/ground water system to prepare for development of a comprehensive aquifer management plan.
Susquehanna River Basin Studies (Conowingo Pond)	To formulate and evaluate alternatives using an existing model (OASIS) developed previously with stakeholder participation

CASE	WHY MODELING WAS USED
Upper Rio Grande River	Develop decision tools for future public participation that permit rapid simulation of scenarios in anticipation of future use during adjudication of water rights.
Willamette River	Ability to link water quality (temperature) with recreation, economics, habitat, etc., with emphasis on rapid scenario screening

This synopsis provides more information about why people chose to use computer modeling than it does why they provided opportunities for stakeholder participation in model-building. The two reasons that appear most frequently for use of computer models are:

MOTIVATIONS FOR STAKEHOLDER INVOLVEMENT

Elizabeth Bourget, who oversaw the Lake Ontario studies for the International Joint Commission, reports in personal correspondence that some of the motivations for stakeholder involvement in those studies included: (1) To ensure that the concerns of primary stakeholders are reflected in/addressed by the model; (2) To ensure that the model presents outcomes in such a way that stakeholders can see how it impacts their concerns; (3) To increase understanding of the resources and the complexities of the issue; and (4) To engage stakeholders in contributing ideas for testing. Bourget reports that engaging stakeholders in generating alternatives sometimes led to creative solutions not identified by modelers, and also led to stakeholders willingly discarding pet ides when the results of the model runs were not as expected or desired.

1. *The ability to portray the linkages between elements of extremely complex systems.*

In a majority of cases, the motivation for using computer modeling was to be able to develop plans or make decisions about highly complex systems with competing elements. In some cases the motivation was to simultaneously evaluate two or more elements of a system that previously had been evaluated in isolation from each other – for example, evaluating both freshwater and wastewater supplies, or surface water, runoff and groundwater. Computer modeling provided an opportunity to incorporate all the complexity of the system yet evaluate performance of the system in a timely manner.

2. *The ability to simulate alternative plans or scenarios in very short periods of time.*

Another major motivation for computer modeling was the ability to speed up or shorten the time needed to evaluate scenarios or plans. In three cases, there were already existing models, but

so much time was spent waiting for results from these models that they were not useful for real-time decision making. The ability to simulate alternative plans or decisions in very short periods of time allows planners to perform numerous "what if…" exercises that are informative for decision makers and stakeholders. This increases the value of the model for shared education and open decision making.

Presumably the motivation for stakeholder involvement in model-building was the increased credibility for the model that would result. In several cases this was explicitly mentioned, but in most cases there was little discussion of the rationale for including stakeholders in model development. It would be useful for writers of case studies to focus more on this decision when describing future cases.

Stakeholder Involvement Mechanisms

One of the critical process issues for Shared Vision Planning is what kind of stakeholder involvement in the model-building process is necessary for a model to be considered adequate and credible. In many situations, neither stakeholders nor decision makers possess the technical expertise to develop a model, or to evaluate a model technically. So they are dependent on technical experts for model building. But, unless there is exceptional trust in the modelers, it is hard for stakeholders or decision makers to trust the model. Somehow there must be transparency to the process and opportunities for stakeholders to influence model development sufficient to build trust in the model itself.

Below is a quick synopsis of the various mechanisms used in the cases to provide this transparency and oversight:

CASE	COLLABORATIVE MECHANISMS
ACT-ACF Basins	Three circles of influence. First: modelers and planners (modeling team). Second: State water departments and natural resource agencies, electric power companies, city/municipal water agencies, lake managers and representatives from navigation industry. Third: Most interested members of the public, such as farmers, fishermen and technical experts from closely related studies. Modeling team held weekly teleconference meetings and one working meeting per month. Initial model demonstrated in a two-day workshop to over 80 stakeholders. Subsequent participation limited to modelers.
Boston Metropolitan Studies	Water supply citizen advisory committee.

CASE	COLLABORATIVE MECHANISMS
Cedar and Green Rivers	Annual "refill" meeting allows stakeholders to comment on plan for coming year in interagency working group meetings
Gila River	Cooperative Modeling Team includes representatives of each of the agencies, municipalities, irrigated agriculture, ranching and environmental groups. Bi-monthly meetings since 9/05 via web-teleconference. Quarterly face-to-face meetings.
James River Drought Preparedness	Stakeholders participated in a workshop in which model was used to simulate present conditions and alternative plans.
James River Shared Vision Planning	Multi-agency core team established; single public workshop held.
Kanawha River	Primary involvement tool was a workshop at which participants saw a model run to demonstrate the impacts of each alternative, then participated in an exercise to identify a preferred plan.
Lake Ontario – St. Lawrence River	Technical working groups established. Stakeholders permitted to participate in technical work groups. Public Interest Advisory Group established to consult with the general public and communicate the views of the general public to the Study Board. Two members of the advisory group are members of the Study Board.
Lake Powell/Lake Mead	Stakeholders (cooperating federal agencies, states, tribes, boundary commission and a consortium of environmental groups) participated in developing and evaluating alternatives as part of NEPA review. But only agencies involved in model development. Stakeholders involved in developing initial user requirements for a "lite" version of an existing model.
Los Angeles Urban Watershed	Steering Committee established representing major stakeholders. Advisory group established; Members of the Advisory Group participated in regular evening meetings over the three year period and had the opportunity to provide comments and suggestions for consideration by the Steering Group and the City. A total of ten sets of Advisory Group meetings were held in seven different areas throughout the City. Members also were expected to inform their colleagues in the organizations, companies, and/or agencies they represent about the major milestones and recommendations of the IRP efforts. Periodic newsletters sent to mailing list.

CASE	COLLABORATIVE MECHANISMS
Marais des Cygnes - Osage	Interstate Working Group
Middle Rio Grande	Stakeholders included Interstate Stream Commission, Mid-Region Council of Governments, city utilities and water cooperatives, federal/state agencies, Mid-Rio Grande Water Assembly, cooperative modeling team, and public. Participation ranged from one-time viewing of model to participation in model development, model review, and model utilization.
Mississippi Headwaters	Participation by Minnesota DNR, Ottertail Power and Minnesota Power. Leadership of the shared vision process reported to have been with local planners. Involvement in the working groups.
North Branch Potomac River	Established an advisory group consisting of local whitewater and fishing guides, individual boaters and fishermen, and representatives from state resource agencies. Nearly two years of quarterly meetings
Northern California Drought Preparedness	Drought Advisory Committee. Series of four workshops, with participants identifying tool requirements, scenarios and mitigation ideas. Interviews with purveyor staff and/or experts. Stakeholders included local agricultural growers, rafting/water recreational interests, land developers, community interest groups, and environmental groups.
Pacific Northwest Climate Change	County established a Climate Change Technical Committee of 25 members. The committee proved to be “self-selecting” in that all individuals involved in the regional planning process who desired to be on the committee were welcomed.
Rappahannock River Basin Commission	A series of meetings with stakeholders are reported to have been held to refine study’s model. Stakeholders included local utility directors, state, local and Federal government representatives, local environmental groups and a few interested private individuals.
Snake Plain Aquifer	During Framework Development: Extensive individual interviews and two public meetings held by Board. During Plan Development: Advisory Committee appointed by Water Board (32 stakeholder members and 7 agency participants). Joint meetings of advisory committee and interagency technical committee overseeing model development.

CASE	COLLABORATIVE MECHANISMS
Susquehanna River Basin Studies (Conowingo Pool)	Workgroup established to represent the interests of key stakeholders in the operation and use of the pond. Participation remained open to any interested party throughout the process, The Workgroup met several times a year. Other interested parties were kept apprised of the workgroup's progress.
Upper Rio Grande River	Cooperative modeling team formed, with representatives from United States Geological Survey (USGS), the Corps, Bureau of Reclamation, and the New Mexico Interstate Stream Commission. Bi-monthly meetings for approximately one year.
Willamette River	Modeling advisory group composed of technical experts recommended by groups in Willamette Partnership (WP). Modeling group meets quarterly. Stakeholders represented by the WP requested a limited role in the model development phase.

Dr. Robert Waldman developed the "Circles of Influence" concept of public involvement for the National Drought Study.[10] The study report (Werick and Whipple 1994) documents the concept as stakeholder involvement occurring in a series of concentric circles.[11] People within these circles are in regular communication with each other. Credibility is built first in the inner circles, and people in the inner circles communicate their belief in the adequacy of the model out to people in the outer circles. Over time, these circles have become defined as:

Circle A: Modelers
Circle B: Model users, reviewers
Circle C: Other interested parties
Circle D: Decision makers

In almost all the cases reported above there is a working group composed of modelers from federal and state agencies, including both water resource agencies and agencies managing or regulating environmental resources, such as the USFWS, EPA or state equivalents. This corresponds roughly with Circle A. Some of these working groups also include people who are not modelers, but are model users and reviewers (Circle B). Within these working groups there appears to be a high degree of collaboration, even consensus decision making.

[10] Personal communication with study leaders William Werick and Robert Brumbaugh.
[11] Werick, W.J. and W. Whipple, Jr., 1994., National Study of Water Management During Drought: Managing Water for Drought. September 1994. IWR Report 94-NDS-8. [Available at: www.svp.iwr.usace.army.mil/NDSStep1.cfm]

The cases above show considerable differences in how “other interested parties” (Circle C) are involved. In some cases there is almost no involvement beyond the “official” entities. In other cases, other interested parties are invited to be part of the working group. When that is not the case, the most frequent way of involving other interested parties is some sort of advisory group. In the most participatory processes (e.g. Los Angeles Urban Watershed and Northern California Drought Preparedness), there are public workshops or meetings in addition to both the technical working group and advisory group. In a few cases (e.g. Lake Mead), the public was not involved during model development, but was actively involved in evaluation and selection of a preferred option.

Clearly the term “stakeholder involvement” has different meanings in different studies. To some extent this may be a function of the nature of the study. For example, in the Upper Rio Grande study, the primary purpose of the study was to develop a decision support tool, and no specific decision was at stake except the tool itself. In the Willamette Case, stakeholders declined active involvement in model development, saying that they would be confident of the model if certain trusted modelers were included in the modeling team. In cases like the Los Angeles and Northern California studies, where public support was a critical outcome, the kinds of participation offered were much greater. The development of models to be used in immediate decision making is far more likely to create a demand for stakeholder involvement. In other cases, however, the differences in level of participation are not based on the nature of the study, but on the attitudes of the sponsoring agencies about how much involvement stakeholders should have in agency decision making.

An important area for future research is whether using more accessible modeling platforms increases the ability of stakeholders to participate in model-building. Some software platforms are more accessible than others, and this could be an important criterion if stakeholder participation is desired.

Another topic of considerable interest is whether the amount or kind of stakeholder involvement is correlated with ultimate political acceptance of conclusions reached in the study. In several cases (most notably the ACT-ACF study) political considerations ultimately blocked agreement by decision makers, despite apparent agreement at the level of modelers and involved stakeholders.

Reported Outcomes

Below is a synopsis of the reported outcome in each case:

CASE	REPORTED OUTCOME
ACT-ACF Basins	The states and Federal government created the first interstate water compacts in the southeast, which were signed by the president in 1997. The goal of the compacts (1 for ACT and 1 for ACF) were to create water allocation plans. However, after multiple extensions, both were allowed to expire in 2003 (ACF) & 2004 (ACT), by governors who were not in office during the SVP study. Litigation resumed thereafter. Droughts in 2007 & 2008 magnified conflicts but also created pressure for some sort of resolution.
Boston Metropolitan Studies	The model was used to examine the impact of drought management on system performance under four different scenarios. The model helped participants identify performance measures for a trigger-driven planning framework
Cedar and Green Rivers	Model "greatly facilitated" the process of establishing a refill strategy. Model was used to simulate a drought during a workshop with twenty water managers.
Gila River	Process has been responsible for building decision tools from the ground up. The resulting model addresses the principal water supply and water demand sectors within southwestern New Mexico.
James River Drought Preparedness	After exposure to model, stakeholders decided to protect status quo, although State of Virginia did develop a state water policy.
James River Shard Vision Planning	Initial workshop did not produce a commitment to proceed. Apparent decision has been reached subsequently to proceed with modeling the upper reaches of the Basin only.
Kanawha River	After viewing the results of model runs, participants in a workshop were able to agree on a preferred plan. The plan was implemented for a short period, but the drought ended. There was agreement that the plan would have saved millions of dollars had the drought continued.
Lake Ontario – St. Lawrence River	Decision has not yet been made. Participants agree that there was significant learning about the real drivers of the system.
Lake Powell/Lake Mead	First-ever consensus reached on operating rules. Model allowed evaluation of nearly 200 different scenarios. The newer "lite" version of the model and the full model are credible in the stakeholder community.

Los Angeles Urban Watershed	The study resulted in a broad consensus on a preferred alternative. There is an approved facilities plan and certified environmental document. Voters approved the bonds for capital improvements.
Marais des Cygnes - Osage	This drought study was suspended during extreme flooding conditions. Reportedly the process resulted in improved understanding and cooperation between states.
Middle Rio Grande	Model is actively used by the MRGWA and MRCOG to develop their water plan for the three-county region. Model contains two water budgets, one for surface water and one for groundwater, and incorporates 24 different water conservation strategies.
Mississippi Headwaters	Study not yet completed.
North Branch Potomac River	Advisory group was able to reach agreement on recommendations to the Corps.
Northern California Drought Preparedness	Consensus reached on drought plan. The model provided the shared framework upon which each of the legally constituted entities developed their individual drought preparedness plans.
Pacific Northwest Climate Change	Consensus of self-selecting advisory committee on each of 13 "Building Blocks" describing the major impacts associated with global climate change
Rappahannock River	Still underway. No outcomes reported.
Snake Plain Aquifer	Ongoing process, not yet complete.
Susquehanna River Basin Studies (Conowingo Pool)	Consensus on a preferred plan.
Upper Rio Grande River	Model successfully developed, but has not been used yet in a decision making or negotiation process.
Willamette River	Ongoing process, not yet complete.

Based on this synopsis:

- The Shared Vision Planning methodology has clearly proven to be of value but the definition of "success" varies from case to case. In some cases, success was simply the development of a credible model. In other

cases, success was the learning that took place using the model during evaluation of alternatives, and the increased likelihood of reaching a consensus decision. In other cases, success was broad public support for the proposed decision or plan. In the ACT-ACF case, there was acceptance of the model that was developed and it did provide a common view of the facts. Initially there was agreement on plans, but a few years later, disputes between the three new governors broke down negotiation of plans, and allowed the compacts to dissolve. So, while Shared Vision Planning is of value, there are limits on its ability to overcome political pressures and constraints.

- In most cases where there was extremely high potential controversy – Lake Ontario Levels, Los Angeles Urban Watershed, Snake River, Northern California Drought Preparedness – there was relatively high levels of stakeholder participation, over and beyond participation of technical staff of agencies. In all these cases, this apparently resulted in credibility for the model.
- In several cases – Lake Mead/Lake Powell and the Snake River Aquifer, a pre-existing model was used and there was little or no new model development. In both cases, the existing models were believed to be highly credible and had stakeholder involvement in their development. It can certainly be argued that it saves a great deal of time and expense if there is a credible "legacy" model than can be used. However, while this may meet the need for a credible model, the social learning that takes place during model development does not occur. If most major stakeholders were involved in development of the earlier model, then that learning may already have occurred. If there are significant new participants, however, they would not share that learning.

Issues/Problems

In a few cases there were issues or problems that arose in the course of the studies. These are summarized below:

CASE	ISSUES/PROBLEMS
ACT-ACF Study	Apparent agreement fell apart under extreme regional political pressures.
Cedar and Green Rivers	A major stakeholder was slow in reviewing his/her portion of the model.
Gila River	Resulted in successful tool development, but not yet used in decision making.

James River Drought Preparedness	Unwillingness to proceed with model development. Apparently satisfied with status quo.
James River Shared Vision Planning	Internal conflicts regarding strategies and mandates within Corps and between agencies on core team slowed project implementation; apparent disinterest by water distributors.
Lake Powell/Lake Mead	Stakeholder involvement in evaluating alternatives but not in model development; use of pre-existing model.
Kanawha River	Drought plan not implemented because drought ended.
Marais des Cygnes	Drought study ended due to flooding.
Pacific Northwest Climate Change	Process did not engage the public in developing the computer models, but did engage an advisory committee in identifying basic premises ("building blocks") and supervising the selection and use of existing climate change models.
Snake River Aquifer	Process used an existing model, developed over past 20 years, and recently updated by a committee of respected modelers representing federal and state agencies, universities, and private consultants.
Upper Rio Grande River	Model developed but not linked to a definable decision making process.
Willamette River	The stakeholder group expected to provide policy guidance deferred to technical experts and chose not to be involved.

The Cedar and Green River case study reports that decision making – although ultimately successful – was delayed for a time while a principal player, a major city, delayed its review of the portion of the model pertaining to it. There is no indication in the summary as to whether this delay was due to staffing limitations, competing priorities, or a political statement about the process.

Both the Gila River and Upper Rio Grande River cases are unique in that they were prepared in anticipation of future decision making, but are not currently in the service of any particular decision or planning effort. In the Gila Case, model building included some major stakeholders in addition to government agencies. In the Rio Grande case the participation in model-building was largely limited to technical staff of state or federal agencies. It's not clear whether the models will be accepted as credible when they are applied to an actual decision process. But it could be argued that because the models were developed without a link to a specific decision, they will be perceived as neutral of any bias.

The two James River cases seem to have gotten caught up in politics, first in state water politics, then in interagency and intra-agency politics. In the earlier case, it is reported that participants in a workshop concluded that they were satisfied with the status quo and there was no need for additional model building. There is some suggestion, however, that this workshop may have been one precipitating factor in the State of Virginia's development of a state water policy. The State's water policy is based on local control on water issues, and there seems to be some concern that modeling is part of or leads to more top-down water planning.

In the second James River case, the modeling seems to have gotten caught up in a lack of consensus in how or if to use modeling in the study. This lack of consensus was due to competing intra- and interagency interests and, as a result, local water districts have not expressed a strong interest in modeling. There appears to be an agreement now to proceed with modeling, but to concentrate solely on the upper reaches of the river, avoiding some of the issues downstream.

As noted earlier, two of the cases, the Lake Mead/Lake Powell Case and the Snake River Aquifer, relied heavily on pre-existing models. The question these cases raised was whether use of respected pre-existing models could result in equivalent credibility to collaboratively developing a new model.

The Willamette Modeling effort was started with an expectation that the a stakeholder group set up as part of a process to develop a mitigation market for water quality problems on the river would also provide policy guidance for the model-development process. However, when the committee overseeing the development of the water market was approached and invited to be a policy committee for model development, it declined. The model continues to be developed because it will have usefulness for annual decisions made by the Corps and cooperating agencies about the operations of the Willamette River System. Some of the stakeholders on the market-development committee did say that they did not have sufficient expertise to participate in model-building, but identified several technical experts whose judgment they valued. These technical experts have been included in the working group developing the model.

SUMMARY OF CONCLUSIONS

To summarize the conclusions reached above:

- Shared Vision Planning, to date, has been applied to complex problems involving multiple parties and issues, where there is uncertainty in the science and the focus is on longer-term management or policy (rather than on a one-time decision). All the case studies in this document focus

on either water supply planning, allocation, or drought planning. However, collaborative modeling has been applied to a number of other resource management and policy applications, so the approach is likely useful in other water resources applications that have the above characteristics.

- Models clearly add value in cases where there is a highly complex system, or when there is great value in being able to evaluate alternatives or scenarios rapidly.
- Some of the cases reviewed showed effective use of computer modeling, but had minimal stakeholder involvement in model-building, raising questions about whether they should be categorized as Shared Vision Planning.
- The basic premise that stakeholder participation in model building increases the credibility of the model appears to be borne out, but there are cases where this credibility seems to have developed even though there was only participation by technical staff of state and federal agencies.
- Those projects with the greatest potential for controversy were most likely to offer stakeholder participation opportunities in addition to technical working groups. This may have been, in part, in response to increased demand for participation, or a belief that greater controversy required broader participation.
- Advisory groups appear to be the most common way to resolve the tension between the need for technical expertise and the need for transparency/opportunities to participate. However, the descriptions of the ways in which the advisory groups worked often did not provide much guidance as to how much influence advisory groups had on decision making.

RECOMMENDATIONS

Next Steps

This effort contributes to characterizing in what circumstances Shared Vision Planning is most beneficial, and assessing what elements (or what extent of the elements) are most critical for producing the intended benefits and positive outcomes. By nature of the design of this study, particularly of the reliance on written documentation, the content and results are limited.

However, this study provides an initial cut at identifying cases that have used a Shared Vision Planning approach, and identifying what information is available. As a next step, interviews and surveys could supplement the information in this

report. Interviews with study leads or key participants from these past cases might provide insight as to why they chose to use Shared Vision Planning approach or to learn of updates on policy decisions. Also, once there is enough data on a sufficient number of cases, it would be useful to correlate (1) the level and kind of stakeholder involvement to the credibility and adequacy of the model; (2) the accessibility of the modeling platform to the stakeholders' ability to participate in the model building exercise; and (3) the level and type of stakeholder involvement to political acceptance of the recommendations. Building on this report with these next steps would provide useful insights toward developing best practices for applying Shared Vision Planning to future cases.

Recommendations for Future Case Study Authors

As discussed in the purpose of this document, there is a lack of focus on process issues in case study documents in the current body of literature. To fill this void, we recommend future authors specifically address the following questions. A more detailed list, as well as suggested interview questions is included in Appendix B (Documentation Methodology):

- What were the drivers for deciding to use Shared Vision Planning?
- How were decisions made about what level of stakeholder participation would be provided, and why?
- How did stakeholders engage in the model-building process?
- To what extent, and in what manner, were stakeholders involved in:
  - Identifying the requirements for the model?
  - Identifying the sub-models or technical resources/studies drawn upon to create linkages between sub-systems?
  - Identifying the alternatives/scenarios evaluated using the model?
- Was the credibility/adequacy of the model a significant issue, and what steps were taken to address this issue?
- Would the model have been equally credible without stakeholder participation in model development?
- What steps were taken (or should have been taken) to increase the likelihood that decisions would be implemented in the face of highly contentious, politically charged situations?
- What is the relationship between Shared Vision Planning and other kinds of joint fact-finding? Is the development of a computer model, for example, a more effective way of joint fact-finding than others? Does the high technical component of model-building create barriers to joint fact-finding?

APPENDIX A: CASE STUDIES

ACT-ACF (Apalachicola-Chattahoochee-Flint and Alabama-Coosa-Tallapoosa Basins) Study

http://www.svp.iwr.usace.army.mil/resCase.cfm

Issue: Management of all water resources in a three-state region. Assess existing and forecasted water resource needs, and develop appropriate mechanisms for implementing the plan.

Decision-Making Entities: Corps of Engineers, states of Georgia, Florida, and Alabama.

Stakeholder Involvement Process: Three circles of influence: First: modelers and planners (modeling team). Second: State water departments and natural resource agencies, electric power companies, city/municipal water agencies, lake managers and representatives from navigation industry. Third: Interested members of the public, such as farmers, fishermen and technical experts from closely related studies. Modeling team held weekly teleconference meetings and one working meeting per month. Initial model demonstrated in a two-day workshop to over 80 stakeholders. Subsequent participation limited to modelers.

Drivers for CADRe: Extreme conflict. Need to replicate entire water resource system of region. Ability to evaluate alternatives and use model to formulate alternatives.

Primary Objective: Resolve interstate competition for finite water supply.

Process Outcomes/Issues: The states and Federal government created the first interstate water compacts in the southeast, which were signed by the president in 1997. The goal of the compacts (1 for ACT and 1 for ACF) were to create water allocation plans. However, after multiple extensions, both were allowed to expire in 2003 (ACF) & 2004 (ACT), by governors who were not in office during the SVP study. Litigation resumed thereafter. Droughts in 2007 & 2008 magnified conflicts but also created pressure for some sort of resolution.

Boston Metropolitan Studies

http://www.svp.iwr.usace.army.mil/resCaseBMS.cfm

Issue: Water supply in the metropolitan Boston area. Issues included water quantity, water quality, environmental quality, and drought.

Decision-Making Entities: New England Division of Corps; Massachusetts Water Resources Authority.

Collaborative Mechanism: Water Supply Citizens Advisory Committee.

Drivers for CADRe: Inability to model alternative plans or identify triggers for planning.

Primary Objective: Develop trigger planning using a simulation of Mass. Water Resources Authority; determine the cost effectiveness of current and future demand management measures.

Process Outcomes/Issues: Model used to examine the impact of drought management on system performance and predict system performance under four different scenarios. Model helped participants identify performance measures for a trigger planning framework.

Cedar and Green Rivers

http://www.svp.iwr.usace.army.mil/resCaseCGR.cfm

Issue: Water shortages during drought conditions, problems with instream flows during drought conditions, dissolved oxygen, sufficient water to cover fertilized fish eggs.

Decision-Making Entities: Corps Seattle District, Tribes, City of Seattle, City of Tacoma, Washington Departments of Ecology and Fisheries.

Collaborative Mechanism: Annual “refill” meeting allows stakeholders to comment on plan for coming year in interagency working group meetings.

Drivers for CADRe: Development of annual refill strategy was very time-consuming, and didn’t permit quick analysis of scenarios and strategies. No mechanism for testing system sensitivity to different instream flow targets.

Primary Objective: Speed up the analysis needed to plan for the annual refill planning cycle, including the ability to test instream flow targets.

Process Outcomes/Issues: Model greatly facilitated the process of establishing a refill strategy. Model used to simulate a drought during a workshop with twenty water managers. City of Seattle slow in reviewing its portion of the model.

Gila River

http://www.svp.iwr.usace.army.mil/docs/SVP-2007-R-06.pdf pages 5.2 - 5.9

Issue: Regional water supply.

Decision-Making Entities: New Mexico Interstate Stream Commission (NMISC), Bureau of Reclamation (lead federal), USFWS, Governor's Office, State Water Planning Group (SWPG).

Collaborative Mechanism: Cooperative Modeling Team includes representatives of each of the agencies, municipalities, irrigated agriculture, ranching and environmental groups. Bi-monthly meetings since 9/05 via web-teleconference. Quarterly face-to-face meetings.

Drivers for CADRe: Arizona Water Settlements Act (2004) would make available $66-127 million to meet water supply demand in the Southwest Regional Planning Area of New Mexico. CADRe used to take advantage of this. No current water resource management of planning models in area.

Primary Objective: Develop a decision support tool that has broad acceptance across the science, decision-maker and stakeholder community.

Process Outcomes/Issues: CADRe process has been responsible for building decision tools from the ground up. The resulting model addresses the principal water supply and water demand sectors within southwestern New Mexico.

James River Drought Preparedness

http://www.svp.iwr.usace.army.mil/resCaseJR.cfm

Issue: Water supply for five Virginia cities during drought conditions. Over-reliance on groundwater pumping producing saltwater intrusion.

Decision-Making Entities: Norfolk District, Virginia DNR, city governments.

Collaborative Mechanisms: Stakeholders participated in a workshop in which model was used to simulate present conditions and alternative plans.

Drivers for CADRe: Decision made not to proceed with CADRe.

Primary Objective: Reduce urban drought vulnerability in a five-city region.

Process Outcomes/Issues: Status quo accepted. No new actions planned. State of Virginia did develop a state water policy

James River Shared Vision Planning

http://www.svp.iwr.usace.army.mil/resCaseJRi.cfm

Issue: Water supply in upper reaches of James River.

Decision-Making Entities: Corps Norfolk District, Virginia DNR, EPA, local water districts.

Collaborative Mechanism: Core team (agencies) established. Public workshop held.

Drivers for CADRe: Provide a context for assessing cumulative impacts of wetland permit decisions. Provide a model for water supply studies in James River Basin.

Primary Objective: Consensus model of river capacity and operations accepted by all parties.

Process Outcomes/Issues: Initial workshop did not produce a commitment to proceed. Internal conflicts among core team members have delayed progress. Apparent decision has been made to proceed with study limited to upper reaches of the basin.

Kanawha River

http://www.svp.iwr.usace.army.mil/resCaseKR.cfm

Issue: Strike a better balance between water quality, lake boating, and whitewater rafting below Lake Summerville on the Gauley River, a tributary to the Kanawha River.

Decision-Making Entities: Corps was the lead entity. Key stakeholders included West Virginia DNR, USGS, WV Geological Survey, whitewater outfitters.

Collaborative Mechanism: Circles A and B in the Kanawha included the Huntington District Corps of Engineers (planning and water control), the West Virginia Division of Water Resources, the U.S. Geological Survey, the West Virginia Geological Survey, and representatives from the whitewater outfitters. Circle “C” included natural and water resources departments from all three states, including departments of fisheries, the U.S. Fish and Wildlife Service, Trout Unlimited, the Isaak Walton League, regional councils of government, the National Weather Service, Offices of Emergency Service, the North Carolina Regional Council of Governments, the Kanawha Valley Chemical industry, and municipal water suppliers. Primary involvement tool was a workshop at which participants saw model run to demonstrate the impacts of each alternative, then participated in exercise to identify preferred plan.

Drivers for CADRe: Recent drought had resulted in cutting off whitewater runs (significant economic impact) dissolved oxygen dropped to unacceptable levels.

Primary Objective: Four objectives: Increase reliability of whitewater rafting, recreation opportunities, navigation, and hydropower generation.

Process Outcomes/Issues: During short-lived next drought period, agreement that the proposed operation would have saved millions had the drought continued.

Lake Ontario – St. Lawrence River Study

http://www.svp.iwr.usace.army.mil/resCaseLO.cfm

Issue: Design a new regulation plan to accommodate changing requirements of stakeholders.

Decision-Making Entities: International Joint Commission, Study Board appointed by the Commission.

Collaborative Mechanism: Technical working groups established. Stakeholders permitted to participate in technical work groups. Public Interest Advisory Group established to consult with the general public and communicate the views of the general public to the Study Board. Two members of the advisory group are members of the Study Board.

Drivers for CADRe: Commission plans to promulgate new rules for regulation of Lake Ontario levels. Current planning involved constant deviations from the written plan. Written plan did not work well except when water supplies matched base years.

Primary Objective: Test alternative regulation plans to support development of alternative plans for decision making by Joint Commission.

Primary Outcomes/Issues: Significant learning about the real drivers of the system. IJC may be able to implement a new regulation plan.

Lake Powell/Lake Mead

http://www.svp.iwr.usace.army.mil/docs/SVP-2007-R-06.pdf pages 5.16 – 5.20

Issue: Allocation of Colorado River Water for consumptive use, hydropower, and environmental purposes.

Decision-Makin Entities: Bureau of Reclamation in consultation with cooperating agencies.

Collaborative Mechanism: Stakeholders (cooperating federal agencies, states, tribes, boundary commission and a consortium of environmental groups) participated in developing and evaluating alternatives as part of NEPA review. But only agencies involved in model development. Stakeholders involved in developing initial user requirements for “lite” version of an existing model.

Drivers of CADRe: High conflict over Colorado River water. Reclamation directed to engage in a process to develop additional operation guidelines for Lower Basin shortage and operation of Lake Mead and Lake Powell. A credible model already existed but it was very complicated for use in screening alternatives.

Primary Objective: Develop a faster, less complicated way to screen and evaluate alternatives.

Process Outcomes/Issues: First-ever consensus reached on operating rules. Model was used in evaluating nearly 200 different scenarios. Both “lite” and the full version of the model are credible in the stakeholder community.

Los Angeles Urban Watershed

http://www.svp.iwr.usace.army.mil/docs/SVP-2007-R-06.pdf pages 5.33 – 5.39

Issue: Development of an Integrated Resources Plan to address issues related to water, wastewater, and runoff management.

Decision-Making Entities: City of Los Angeles City Council.

Collaborative Mechanism: Steering Committee established representing major stakeholders. Advisory group established. Members of the Advisory Group participated in regular evening meetings over the three year period and had the opportunity to provide comments and suggestions for consideration by the Steering Group and the City. A total of ten sets of Advisory Group meetings were held in seven different areas throughout the City. Members also were expected to inform their colleagues in the organizations, companies, and/or agencies they represent about the major milestones and recommendations of the IRP efforts. Periodic newsletters sent to mailing list.

Drivers for CADRe: Critical to get public support for plan and ultimately to approve bond issue. Multiple drivers for planning process included problems with reliability, water quality, rising costs, lawsuit, lack of trust, pending TMDLs.

Primary Objective: Phase 1: Get agreement on a future vision for the City. Phase 2: Develop a detailed facilities plan for wastewater and stormwater, as well as recycled water master plan, environmental impact report and financial plan.

Process Outcomes/Issues: Broad consensus on a preferred alternative. Approved facilities plan and certified environmental document. Settlement of pending lawsuit. Voter approval of bonds for capital improvements.

Marais des Cygnes – Osage

http://www.svp.iwr.usace.army.mil/resCaseMdC.cfm

Issue: A drought could produce significant impacts on municipal and industrial users in Kansas and Missouri, as well as impacts on power production and the recreation industry.

Decision-Making Entities: Corps Kansas City District, Kansas Water Office, Missouri DNR.

Collaborative Mechanism: None reported except for interstate working group.

Drivers for CADRe: Acceptance of a model that could be used by federal and state agencies.

Primary Objective: Create an Interstate working group to avoid interstate conflicts over water during a drought. Specific objectives: Increase reliability of municipal and industrial water service; increase the reliability of recreation opportunities; increase the reliability of hydropower generation; increase the dependability of agricultural produce.

Process Outcomes/Issues: Process suspended due to extreme flooding conditions. Improved understanding and cooperation between states, but no plan developed.

Middle Rio Grande

http://www.svp.iwr.usace.army.mil/docs/SVP-2007-R-06.pdf pages 5.2 – 5.9

Issue: Future water supply for three-county region.

Decision-Making Entities: Model developed collaboratively by Sandia National Laboratories, Middle Rio Grande Water Assembly, State of New Mexico, University of New Mexico.

Collaborative Mechanism: Stakeholders included Interstate Stream Commission, Mid-Region Council of Governments, city utilities and water cooperatives, federal/state agencies, Mid-Rio Grande Water Assembly, cooperative modeling team, and public. Participation ranged from one-time viewing of model to participation in model development, model review, and model utilization.

Drivers for CADRe: Quantitatively explore alternative water-management strategies, educate the public on the complexity of the regional water system, and engage the public in the decision making.

Primary Objective: Develop a water plan for a three-county region.

Process Outcomes/Issues: Model actively used by the MRGWA and MRCOG to develop their water plan for the three-county region. Model contains two water budgets, one for surface water and one for groundwater, and incorporates 24 different water conservation strategies.

Mississippi Headwaters Reservoir Operating Plan Evaluation (ROPE)

http://www.svp.iwr.usace.army.mil/resCase.cfm

Issue: Operating plan for Mississippi River Headwaters Reservoir system, taking into account tribal trust, flood control, environmental concerns, water quality, water supply, recreation, navigation and more.

Decision-Making Entities: St. Paul District, Army Corps of Engineers; US Forest Service.

Collaborative Mechanism: Participation by Minnesota DNR, Ottertail Power and Minnesota Power. Leadership of the shared vision process reported to have been with local planners. Involvement in the formation of working groups. Stakeholders include: Corps, non-federal dam operators, Mississippi Headwaters Board, the Mille Lacs Lake and Leech Lake Band of Ojibwe, US Fish & Wildlife, Minnesota Pollution Control Agency, and members of public. Workshops, newsletters and advisory committee.

Drivers for CADRe: Ability to evaluate a system-wide operational plan.

Primary Objective: Evaluate alternative plans and recommend a new operating plan for the Mississippi Headwater Reservoir system.

Process Outcomes/Issues: In progress.

North Branch Potomac River Basin

http://www.svp.iwr.usace.army.mil/resCase.cfm

Issue: Revised operating plans for upstream reservoirs to address recreation (boating and fishing) and fish habitat issues.

Decision-Making Entities: Upper Potomac River Commission and the three major DC area water suppliers: Fairfax County Water Authority, Washington Suburban Sanitary Commission, and the Baltimore District of the Army Corps of Engineers.

Collaborative Mechanism: Established an advisory group consisting of local whitewater and fishing guides, individual boaters and fishermen, and representatives from state resource agencies. Nearly two years of quarterly meetings.

Drivers for CADRe: Extend an existing well-trusted model to address the linkages between reservoir management and additional issues such as water temperatures (fish habitat) and economic development association with recreation (particularly boating).

Primary Objective: Provide recommendations to the Corps on reservoir release schedules that could address the advisory group's proposed objectives, focused primarily on recreation (boating and fishing) and fish habitat issues.

Process Outcomes/Issues: Advisory group was able to reach agreement on recommendations to the Corps.

Northern California Drought Preparedness

http://www.svp.iwr.usace.army.mil/docs/SVP-2007-R-06.pdf pages 5.50 – 5.56

Issue: Drought preparedness in a northern California County.

Decision-Making Entities: El Dorado Irrigation District, El Dorado Water Agency. Other "official" participants included El Dorado County Board of Supervisors, County Water Agency, Grizzly Flats Community Service District, Georgetown Divide Water District.

Collaborative Mechanism: Drought Advisory Committee. Series of four workshops, with participants identifying tool requirements, scenarios and mitigation ideas. Interviews with purveyor staff and/or experts. Stakeholders included local agricultural growers, rafting/water recreational interests, land developers, community interest groups, environmental groups, Chambers of Commerce, local planners, former elected and appointed officials, Resource Conservation District members, County Agricultural Council, former state hydrologist, climatologist.

Drivers for CADRe: Public interest in participation. Seven years of drought into the 1990s.

Primary Objective: Update drought and conservation plans and fund a comprehensive drought preparedness program.

Process Outcomes/Issues: Consensus reached on drought plan. The model provided the shared framework upon which each of the legally-constituted entities developed their individual drought preparedness plans.

Pacific Northwest Climate Change

http://www.svp.iwr.usace.army.mil/docs/SVP-2007-R-06.pdf pages 5.21 – 5.27

Issue: How to institutionalize forecasts of global climate change into Pacific Northwest water resources planning.

Decision-Making Entities: King County and an array of local, state and federal collaborating entities.

Collaborative Mechanism: County established a Climate Change Technical Committee of 25 members. The committee proved to be "self-selecting" in that all individuals involved in the regional planning process that desired to be on the committee were welcomed.

Drivers for CADRe: The need to develop an integrated approach to water management for Seattle/Tacoma areas taking into account anticipated impacts of Global Climate change.

Primary Objective: Get agreement on an assessment of the impacts of global climate change on water demand, water supplies and instream flows.

Process Outcomes/Issues: Committee produced a "climate change building blocks" document summarizing the major impacts associated with global climate change – consensus reached on each of the 13 Building Blocks.

Rappahannock River Basin Commission Water Supply Planning

http://www.svp.iwr.usace.army.mil/resCaseRR.cfm

Issue: Basin-wide water supply planning project, addressing consumptive and non-consumptive uses of the River.

Decision-Making Entities: Rappahannock River Basin Commission, Corps, EPA, USFWS.

Collaborative Mechanisms: A series of meetings with stakeholders are reported to have been held to refine study's model. Stakeholders included local utility directors, state, local and Federal government representatives, local environmental groups and a few interested private individuals.

Drivers for CADRe: River Basin Commission serves as the one place where local and regional agencies can discuss concerns about how water will be allocated in future. SVP believed to have better chance of resolving conflict.

Primary Objective: Model to map the hydrology of the two main surface water systems in the Basin, the impoundments and demands from residential, industrial, and commercial uses

Process Outcomes/Issue: No information reported. Still underway.

Snake Plain Aquifer Management

http://www.svp.iwr.usace.army.mil/docs/SVP-2007-R-06.pdf pages 5.28 - 5.32

Issue: Conflict over conjunctive management of surface and groundwater resource under Idaho's appropriation doctrine.

Decision-Making Entities: Idaho Water Resource Board/state legislature.

Collaborative Mechanism: During Framework Development: extensive individual interviews and two public meetings held by Board. During Plan Development: Advisory Committee appointed by Water Board (32 stakeholder members and 7 agency participants). Joint meetings of advisory committee and interagency technical committee overseeing model development.

Drivers for CADRe: State legislature asked the Water Resource Board to prepare a Comprehensive Aquifer Management Plan.

Primary Objective: Reformulation of an existing model for use in developing an aquifer management plan.

Primary Outcomes/Issue: Ongoing, process not yet complete.

Susquehanna River Basin Studies (Conowingo Pond)

http://www.svp.iwr.usace.army.mil/resCaseSRB.cfm

Issue: Management plan for the Conowingo pond, a 14 mile-long interstate water body created by construction of the Conowingo dam on the Lower Susquehanna River.

Decision-Making Entities: Susquehenna River Basin Commission, Excelon Generation, FERC.

Collaborative Mechanism: Workgroup established to represent the interests of key stakeholders in the operation and use of the pond. Participation remained open to any interested party throughout the process. The workgroup met several times a year. Other interested parties were kept apprised of the workgroup's progress.

Drivers for CADRe: During more severe low flow conditions, the available water becomes insufficient to meet all prescribed uses and required needs. During such periods it becomes impossible to meet FERC license requirements for operations of dams.

Primary Objective: Formulation and evaluation of alternatives using an existing model (OASIS) developed previously with stakeholder participation.
Process Outcomes/Issues: Consensus on a preferred plan.

Upper Rio Grande River

http://www.svp.iwr.usace.army.mil/resCase.cfm

Issue: Instream flows and water rights from Rio Grande River in an area where river water is used for flood irrigation, municipal water supply (pumped from aquifers linked to river water), and instream flows to support habitat and endangered species.

Decision-Making Entities: Model development decisions made by technical team for Upper Rio Grand Water Operations Model. Members are scientists and modelers from USGS, USACE, Bureau of Reclamation, New Mexico Interstate Stream Commission (NMISC).

Collaborative Mechanism: Cooperative modeling team formed, with representatives from United States Geological Survey (USGS), USACE, Bureau of Reclamation, and the NMISC. Bi-monthly meetings for approximately one year.

Drivers for CADRe: No current water driver. Model needed to support future water rights adjudication. Also instream flow requirements changing. Numerous credible water management tools already exist in this region.

Primary Objective: Rapid simulation of scenarios in anticipation of future use during adjudication of water rights.

Process Outcomes/Issues: Completed model integrates three existing groundwater models and one surface water model with a simple human behavioral model and a graphic, user-friendly user interface. The resulting tool runs 40-year simulations on a laptop computer in tens of seconds.

Willamette River

http://www.svp.iwr.usace.army.mil/docs/SVP-2007-R-06.pdf pages 5.2 – 5.9

Issue: Water quality (temperature), temperature banking.

Decision-Making Entities: USACE, Sandia. Originally expected Willamette Partnership to serve as policy group, but they declined.

Collaborative Mechanism: Modeling advisory group composed of technical experts recommended by groups in Willamette Partnership (WP). Modeling group meets quarterly. Stakeholders represented by the WP requested a limited role in the model development phase.

Drivers for CADRe: The key driver in this case study is a recently issued biological opinion that will require the USACE to undertake significant actions with regards to their current reservoir operations and impose discharge limits on local municipalities and pulp/paper industries. Opportunity to link model to temperature-banking system with EPA sponsorship.

Primary Objective: Develop a decision tool that links multiple factors such as water quality (including temperature), aquatic and terrestrial biological communities, and other concerns. Emphasis on rapid scenario screening.

Process Outcomes/Issues: Model developed but participation in its development limited to modelers and other technical experts, at request of an advisory group representing stakeholders.

APPENDIX B: DOCUMENTATION METHODOLOGY REPORT

DOCUMENTATION METHODOLOGY

James Creighton
January 2007

Background

The U.S. Army Corps of Engineers Institute for Water Resources (IWR) has issued a task order to Dr. James Creighton, Creighton & Creighton, Inc. to provide expertise on collaborative decision-making processes in support of the Corps' National Cooperative Modeling Demonstration Program (NCMDP) and Collaborative Planning and Management Program (CPMP). These programs are focused on methodological advances in computer-aided collaboration and assisted negotiations, and application of these approaches through demonstration studies. Demonstration studies include the Willamette Basin in Oregon, and the James River basin in Virginia.

Creighton's role will be to document the collaboration process on these two case studies, identify process issues that arise, and propose alternative techniques for either these studies or future uses of computer-aided collaboration and assisted negotiations. The final result will be two detailed case studies, looking at the collaboration process, coupled with recommendations for changes or improvements.

This report describes the methodology that will be employed to document the two cases.

Methodology

Two kinds of information need to be gathered:

- A straight-forward chronology of the steps in the process
- Evaluations from participants to get their perceptions of each of those steps

The primary methodology for gathering this information will be several rounds of interviews targeted at key project participants coupled with several rounds of questionnaires target at a broader audience of model users, validators, decision-makers, and interested public.

IWR has developed a concept called "circles of influence" to describe the different participants in processes such as these. The idea is that there is a set of interlocking teams of people ("circles") that play different roles, have differing

levels of involvement, and also have differing levels of influence. These differing teams are portrayed as a set of concentric circles. Those circles in the middle have the most intense involvement, and are likely to have the greatest influence. Outer circles have less personal involvement but also have somewhat more limited influence.

In both the Willamette and James River cases, these circles can best be described as:

Circle A: Model Building Team

Circle B: Model Users, Validators

Circle C: All Interested Parties

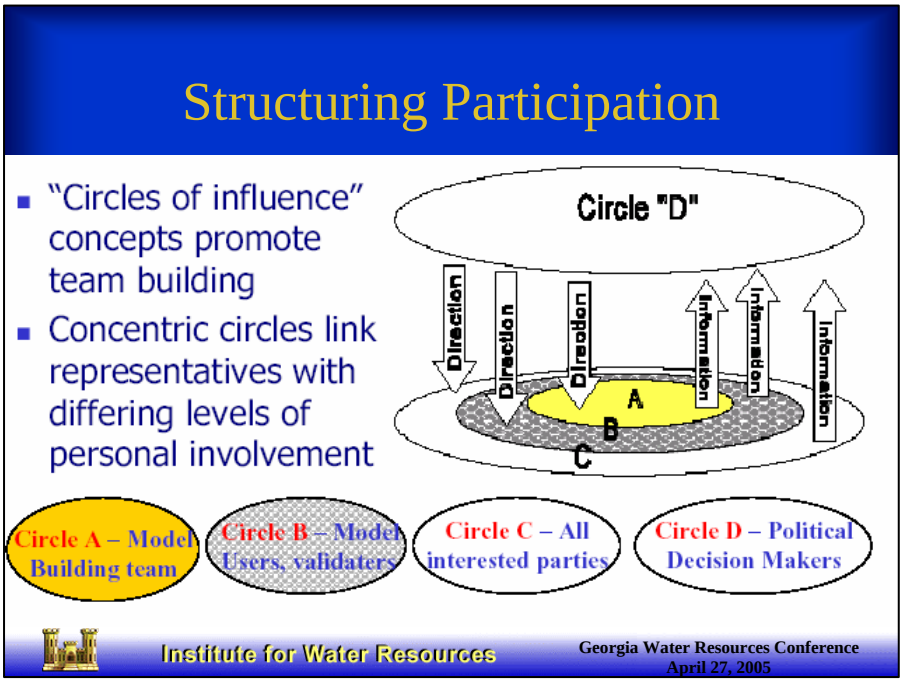
Circle D: Decision Makers

The Model Building Team consists of the technical experts who will actually construct the hydrologic models that will be developed in these two studies (Circle A). But the model-building effort is supported and surrounded by other technical experts who contribute expertise to the model builders, technical staff of agencies that may use the model for future decision making, and staff of organized stakeholders whose understanding of the model-building process is important for the credibility of the model (Circle B). People in Circle B may even be organized into some sort of steering committee that advises the model builders. Because results from the model may have an influence on future river operations, there is always a broader audience of individuals and groups that need to be kept informed of the model-building process in order for the model to retain credibility, and who may want to comment on the assumptions used in developing the model (Circle C). Finally, there is a group of decisionmakers, typically senior management of agencies making decisions that affect river operations, who may be using the model to evaluate alternatives in future decision making (Circle D). These decision makers need to be kept informed throughout the process, and may provide direction to the process from time to time.

The relationship between these circles of influence is shown in Figure 1.

In this study, interviews will be conducted with members of Circle A. Questionnaires will be sent to members of Circle B, and may be followed up with interviews where appropriate. Questionnaires will be distributed periodically to a selected sample of stakeholders from Circle C who are not directly involved in model building or validation to assess perceptions of the process. The purpose of periodic interviews and questionnaires is to identify process issues for the case studies, and catch process issues before they get larger so they can be acted upon.

Figure 1: The relationships between the circles of influence.



Circle A and Circle B are defined in Table 1.

Table 1: Role players in Circle A & B in the two case studies

	Willamette River	James River
Circle A: Model Builders	• Terry Buchholz, David Evans & Assoc. • Hal Cardwell, IWR • Vince Tidwell, Sandia • Tom Lowry, Sandia • Gillian Ockner, David Evans & Assoc.	• Hal Caldwell, IWR • Alexey Voinov, IWR • Bill Cox, Virginia Tech
Circle B Model Users, Validators	• David Primozich, Willamette Partnership • Matt Rea, Portland District, USACE • Other modelers [need names] • Other people from Willamette Partnership?	• Scott Kudlas & Terry Wagner, Virginia Dept. of Environmental Quality • Nick Kochuba, Norfolk District, USACE Regulatory Regina Poeske, US Environmental Protection Agency Region III

The key junctures for interviews and questionnaires - keyed to the Shared Vision Planning steps -- are:

- *Build a team and identify problems* -- Interviews with Circles A & B to create a baseline of expectations and identify process assumptions. Send questionnaire to selected Circle C.
- *Develop objective & metrics for evaluation* -- No interviews or questionnaires planned at this stage
- *Describe the status quo; what will the future look like if we do nothing* -- Interviews with Circles A. Questionnaire to Circle B. Probably no questionnaire to Circles C unless there is a high level of controversy during this step, or this step requires extended duration of time.
- *Formulate alternatives to the status quo* -- Interviews with Circles A; questionnaires distributed to Circles B and selected members of Circle C.
- Evaluate alternatives and develop team recommendations -- Interviews with Circles A; questionnaires distributed to Circles B and selected members of Circle C.
- *Institutionalize the project or plan* -- Final interviews with Circles A & B; Questionnaires distributed to Circles.
- *Exercise and update (adaptive management* -- Occurs after task order is completed.

Contents of Consultant Report

Creighton will produce a draft report addressing the following topics:

- Overview
  - Shared Vision Planning
  - Purpose of this study
  - Methodology used
- Willamette River Case
  - Description of the case
  - Description of process used
  - Process issues that arose
  - How process issues were resolved
  - Recommendations for addressing these process issues on future projects

- James River Case
    - Description of the case
    - Description of process used
    - Process issues that arose
    - How process issues were resolved
    - Recommendations for addressing these process issues on future projects
- Consultant Recommendations

QUESTIONS FOR INTERVIEWS

BUILD A TEAM AND IDENTIFY PROBLEMS

1) Please describe how the project came about.
2) How is decision-making allocated between agencies/sponsors/model developers?
3) How are tasks allocated between agencies/sponsors/developers?
4) How was agreement reached on the overall purposes/use of the model?
5) Is the ultimate use of the model linked to another decision-making process [e.g. TMDL, state plan, etc.]? Follow-up: How is it linked?
6) What are the basic steps/schedule for the process?
7) What unique challenges does the study face?
8) What level of stakeholder involvement is anticipated for model credibility?
9) How were potential stakeholders identified?
10) Are there different levels of involvement, e.g. core team, advisory group, policy group, etc.?
11) What mechanisms will be used to involve each of these levels during the process?
12) How have stakeholders influenced decision-making so far?

After DESCRIBE THE STATUS QUO

1) Please describe the major events since the last interview.
2) How were stakeholders involved in confirming the purpose of the model?
3) Did stakeholders confirm the purpose of the model?
4) How did stakeholders participate in identifying data sources/relationships/ assumptions used in the model? Which stakeholders?
5) How were stakeholders informed about how their questions will be addressed by the model?
6) Will the model be able to accommodate all the questions that stakeholders wanted answered? If not, were there any problems that occurred as a result of that?
7) How were stakeholders involved in characterizing the status quo and the assumptions used for the status quo?

8) Did stakeholders accept the characterization of the status quo and the assumptions used?

9) Did stakeholder participation add value?

After FORMULATE ALTERNATIVES TO THE STATUS QUO

1) Please describe the major events since the last interview.

2) How were stakeholders involved in formulating alternatives to the status quo?

3) What controversies arose over relationships/assumptions used, or the range of alternatives considered?

4) How were these controversies resolved?

5) Were stakeholders satisfied with the range of alternatives to be considered?

6) Do you believe that stakeholders consider the model to be credible?

7) Did any of the decision-makers participate during model development?

8) Do you believe the decision makers believe the model is credible?

After EVALUATE ALTERNATIVES AND DEVELOP TEAM RECOMMENDATIONS

1) Please describe the major events since the last interview.

2) What kinds of changes have been made in the model since the last interview/questionnaire?

3) What prompted those changes?

4) Were stakeholders involved in validating/testing the model? How? Which stakeholders?

5) Did stakeholder involvement impact the evaluation of alternatives?

6) Do you believe that stakeholders consider the model to be credible?

6) How was the model used in developing team recommendations?

7) How were decisions made within the team, e.g. by mutual agreement, voting, one agency deciding, etc.?

After INSTITUTIONALIZE THE PROJECT PLAN

1) Please describe the major events since the last interview/questionnaire.

2) Has the model been used for decision-making?

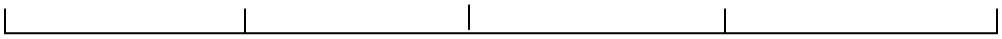
3) What was the nature of the decision being made?

4) Who was involved in making the decision?
5) How was the model used in the decision-making process?
6) How did the results from the model influence decisions?
7) What problems (if any) occurred during the workshop using the model?
8) What questions or challenges were raised about the model?
9) What did participants report they learned from using the model?
10) Was there a larger public participation process to review/comment on their decisions made by the decision-making group?
11) Will the model be used on a continuing basis? For what kind of decision-making processes?
12) Who (what institution) will house/maintain/update the model?

QUESTIONNAIRE

Please indicate with an X how well each statement below reflects your opinion.

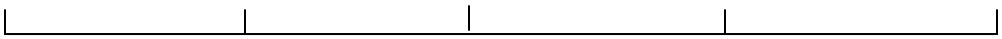
1) I believe that the _____ project seems to be going very well.



Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree

Please note any concerns about how the project is going:

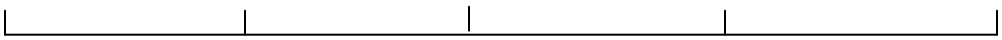
2) Participants in the process are representative of the key interests and concerns in the affected area.



Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree

Please note any problems with the representation of the key interests and concerns in the affected area:

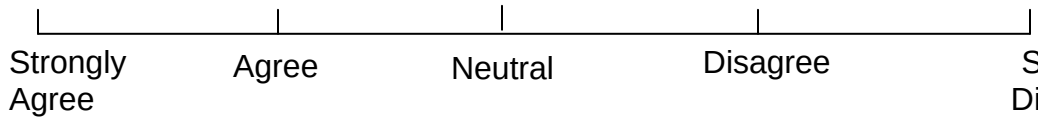
3) I have sufficient opportunity to present my ideas and raise questions.



Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree

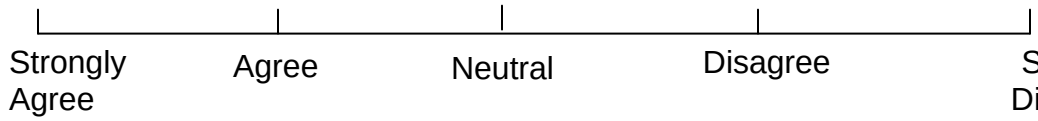
Please note any suggestions you have for better ways for you to present your ideas and raise questions:

4) The modelers are responsive to my concerns and questions.



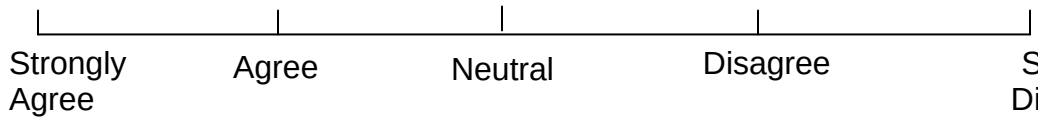
Please note any suggestions for what modelers can do to be more responsive to your concerns and questions:

5) I believe that the model will/does capture the key trends in the affected area



Please note any changes needed in the model to capture the key trends in the affected area:

6) I believe the outcome of this project will be extremely valuable.



Any other comments about the project or model?

PROCESS ISSUES

What would we want to know about a case to understand the process dynamics? The issues below are keyed to the steps in Shared Vision Planning.

STEPS IN SHARED VISION PLANNING

1. Build a team and identify problems
2. Develop objectives and metrics for evaluation
3. Describe the status quo; what will the future look like if we do nothing?
4. Formulate alternatives to the status quo
5. Evaluate alternatives and develop team recommendations
6. Institutionalize the project or plan
7. Exercise and update the plan (adaptive management)

Build a team and identify problems

- How was decision-making allocated between agencies/sponsors/model developers?
- How were tasks allocated between agencies/sponsors/developers?
- How was agreement reached on the overall purposes/use of the model?
- Was the ultimate use of the model linked to another decision-making process [e.g. TMDL, state plan, etc.]?
- What was the basic steps/schedule for the process?
- What unique challenges did the study face?
- What level of stakeholder involvement was anticipated for model credibility?

Develop objectives and metrics for evaluation

- How were potential stakeholders identified?
  - What interests/stakeholders needed to be consulted for the model to have credibility?
  - What interests/organizations needed to have an opportunity to review/comment upon the model for it to be credible?
  - What interests/organization need to be informed for the model to be credible?
- How were stakeholders involved in confirming the purpose of the model?
- Did stakeholders confirm the purpose of the model?

- What questions did stakeholders need answered by the model?
- Was the model able to accommodate stakeholder questions?
- How were stakeholders informed about how their questions were addressed?
- How satisfied were stakeholders with the involvement process?
- How did the stakeholder involvement influence decision-making during this step?

Describe the status quo; what will the future look like if we do nothing?

- How did stakeholders participate in identifying data sources/relationships/assumptions used in characterizing the status quo?
- Did their participation add value?
- What controversies arose over relations/assumptions used?
- How were these controversies resolved?

Formulate alternatives to the status quo

- What process was followed to get stakeholder input into the range of alternatives considered?
- Were stakeholders satisfied with the range of alternatives considered?
- Were stakeholders involved in validating/testing the model? How? Which stakeholders?
- Did stakeholder involvement impact the assessment of validity?
- Was the evaluation of alternatives part of another decision-making process [e.g. TMDL, state plan, etc.]?
- Who was involved in evaluating alternatives? In what forum?
- What did stakeholders report they learned from using the model?
- If the group participating in “what if” scenarios was a limited group, was there a larger public participation process to review/comment on their conclusions?
- How did the results from the model influence decisions?
- Was the “decision making group” able to reach an agreement? If not, what were the barriers to reaching agreement

Institutionalize the project or plan

- Was the model used in multiple decision-making processes? How? When?
- What problems did the group have using or understanding the results from the model?
- What problems arose in using the model that require changes?

- How did stakeholders participate in identifying and making those changes?
- What role did stakeholders play in reviewing changes once they were made?
- Will the model be used on a continuing basis? For what kind of decision-making processes?
- Who (what institution) will house/maintain/update the model?

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13. ABSTRACT (Maximum 200 words)

Much of the literature regarding Shared Vision Planning (or other forms of Computer-Aided Dispute Resolution) focuses on the characteristics of the computer model developed during the process, on related technical studies, and on and the evaluation of alternatives. This report looks instead at the process followed during Shared Vision Planning by analyzing the processes used in a number of published Shared Vision Planning cases. Of particular interest are the types and mechanisms for stakeholder involvement in developing and using the model.

The US Army Engineers Institute for Water Resources (IWR) is a proponent of Shared Vision Planning. This analysis focuses primarily on Shared Vision Planning cases posted on IWR's Shared Vision Planning website or included in the handout materials for a 2007 workshop on Computer-Aided Dispute Resolution. A few additional cases have been added from cases described in a literature review prepared for IWR by CDM, which provides a much broader look at the literature regarding use of computer modeling in planning or decision making.

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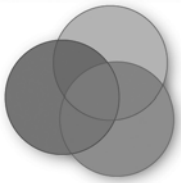

Shared Vision Planning

The History of Shared Vision Planning

The Shared Vision Planning approach began in response to the U.S. Army Corps of Engineers need to revise water management strategies on the Potomac River in the late 1970s. The Interstate Commission on the Potomac River Basin made public participation a key feature of its planning process to more effectively manage water supplies in the D.C. metro area.

In 1988, in response to severe droughts across the United States, the Corps undertook the National Study of Water Management During Drought (known as the National Drought Study) to examine and improve water management practices nationwide. The method developed in this project's case studies evolved into the planning approach now known as Shared Vision Planning. The "Drought Preparedness Method," as it was named during the National Drought Study, emphasized preparedness, stakeholder involvement, and the use of collaboratively developed computer models, which remain the core aspects of Shared Vision Planning today.

Shared Vision Planning and its particular method have been applied to a number of case studies since the National Drought Study, thereby refining the process and increasing Corps scientists' familiarity with it. The Lake Ontario-St. Lawrence River Study, the James River Basin Study, and the Rappahannock River Basin Commission Water Supply Planning Project are just a few of the projects that have benefited from the Corps use of Shared Vision Planning.

To further explain the concept and method of Shared Vision Planning, and educate the wider resources planning community, IWR has created a new Shared Vision Planning web site. We invite you to visit the site at http://www.sharedvisionplanning.us to learn more about this collaborative planning approach.

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