**WaterSim: A Study of Water-related Decision-making Under Uncertainty**

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**ABSTRACT**

The Decision Center for a Desert City (DCDC) has developed an interactive model designed to facilitate decision-maker interactions around long-term water supply and demand in Maricopa County, Arizona. The model titled, “DCDC WaterSim” is designed for interactive display and serves as a boundary object to inform water-related decision-making on issues of long-term sustainability in central Arizona.

The WaterSim project employs perspectives from modeling, geography, anthropology, and psychology to understand the process of decision-making under uncertainty. The research objectives are designed to (1) determine the extent to which stakeholders can use the model for decision-making, (2) elicit feedback from stakeholders to reconfigure the model, (3) examine stakeholder decisions around Arizona water decisions and decision-making, and (4) examine the decision-making dynamics that foster the expression of dissent and the building of consensus.

The data collection consists of a series of 12 focus group held at the Decision Theater at Arizona State University. The focus group sessions were held with three kinds of water decision-making groups: policymakers, data analysts, and consultants. Focus group discussions were collected in audio and video format, and transcribed into text form. Once the transcripts have been coded, the researchers will use a variety of text analysis methods to analyze the data, yielding themes that transcend the data. Coding of these transcripts fall across five major themes related to the interface of science and policy: (1) the model’s credibility, saliency, and legitimacy, (2) the reconciliation of supply and demand, (3) uncertainty, and (4) modernity.

**DATA COLLECTION**

Water experts are recruited to participate in a 90 minute focus group whereby they interact with the DCDC WaterSim model (Figure 1).

Using a trained facilitator, participants are presented with the model in a scripted format and demonstrating 12 different scenarios.

Then, the participants are asked to respond to a personal survey with demographic information and three follow-up questions about the model and presentation.

1. How relevant is the model to your needs as a decision-maker or the needs of decision-makers in your work?
2. What is your opinion of the scientific adequacy and the technical information presented in this model?
3. Do you think that the information presented here is fair, unbiased, and respectful of stakeholder values?

Finally, there is a group discussion of the three questions to elicit more information related to WaterSim and to allow the observation of interactions between the different water experts.

The design of this study seeks to involve water experts in the development a water model that seeks to better integrate science and policy as well as exploring the local rhetoric and cognitive processes involved in expert decision making and resource management.

**CONCLUSION**

The DCDC seeks to refine a framework for understanding the effectiveness of social and political systems that link knowledge into action. The model serves as a boundary object and consequence of a type of knowledge system that can inform water policies and issues for long-term sustainability in central Arizona.

The interaction of participants with WaterSim serves two main functions. First, the participation enables insight into the extent to which types of knowledge systems and cognitive processes are involved in discussions of water issues and policy. Second, the model enables feedback of stakeholder groups in the data creating a transparent and useful policy.