

American Water Resources Association
2009 SUMMER SPECIALTY CONFERENCE
Adaptive Management of Water Resources II
June 29 – July 1, 2009
Snowbird, UT

Monday, June 29

1:30 PM – 3:00 PM

Session 7: Water Supply & Demand Adaptive Management I

1. The Process of Adapting to Droughts: Humans Connected Through Hydrology and History in the Bear River Basin of Idaho, Utah and Wyoming - Lisa Welsh, Utah State University, Logan, UT (co-authors: Joanna Endter-Wada, Theresa Selfa)

The Bear River Basin, which includes portions of Idaho, Utah, and Wyoming in the United States, has a dynamic history of human hydrologic adaptations in relation to a highly variable water supply. These adaptations are embedded in a geographical setting highly influenced by the legal, policy, and institutional contexts that govern the allocation of water in this generally arid region. In response to several years of drought and a historically low water year in 2004, water users in the Bear River Basin tested the efficacy of the “law of the river” and innovative agreements that they had negotiated in recent years to help mitigate impacts related to water shortages. Based on primary data gathered through in-depth interviews and participatory research, the authors report on an unfolding contemporary history of how people in the Bear River Basin have learned to deal with uncertainties and risks associated with both droughts and floods. Their story has important implications for our understanding of conflict and cooperation in water systems, management of transboundary waters, and the promotion of sustainable water resource governance.

2. Adaptive Management for Land and Water Resources in the Platte River Basin - Jerry Kenny, Platte River Recovery Implementation Program, Kearney, NE (co-author: Chad Smith)

The Platte River Recovery Implementation Program (Program) is the result of a Cooperative Agreement negotiating process that started in 1997 between the states of Colorado, Wyoming, and Nebraska; the Department of Interior; waters users; and conservation groups. The Program is intended to address issues related to the Endangered Species Act (ESA) and loss of habitat in the river in central Nebraska by managing certain land and water resources following the principles of adaptive management to provide benefits for four “target species”: the endangered whooping crane (*Grus americana*), interior least tern (*Sternula antillarum*), and pallid sturgeon (*Scaphirhynchus albus*); and the threatened piping plover (*Charadrius melodus*). The Program’s 13-year First Increment began in 2007 and is estimated, in 2005 dollars, to cost roughly \$320 million in 2005 dollars including \$187 million in cash and in-kind land and water shared equally between the federal government and the states. The Program has three main elements: • Increasing streamflows in the central Platte River during relevant time periods through re-timing and water conservation/supply projects; First Increment objective is to re-time and improve flows in the central Platte River to reduce shortages to target flows by an average of 130,000 to 150,000 acre-feet per year at Grand Island. • Enhancing, restoring, and protecting habitat lands for the target bird species; First Increment objective is to protect, restore, and maintain 10,000 acres of habitat. • Accommodating certain new water-related activities. Milestones related to these land and water goals will be met through implementation of the Program’s Adaptive Management Plan (AMP), which is focused on priority hypotheses developed jointly by numerous Program partners that reflect different interpretations of how river processes work and the best approach to meeting Program goals. Acquisition and management of Program lands and releases of Program water are already being guided by management objectives in the AMP and are being linked to data needs resulting from putting adaptive management actions on the ground. This approach embodies the “learning by doing” paradigm of adaptive management, focusing management, monitoring, and research on “need to know” results.

3. Salt Lake Countywide Water Quality Stewardship Plan - Karen Nichols, Stantec Consulting, Salt Lake City, UT (co-authors: Neil Stack, Kathlyn Collins, Jason Doll, Nicholas von Stackelberg)

The Salt Lake County watershed encompasses approximately 800 square miles, 27 sub-watersheds, 300 miles of river and streams and a population of over one million people. Salt Lake County sought to develop a Countywide water quality planning tool to provide a framework of goals and policies to foster water quality stewardship that would be consistent with EPA goals and representative of the needs of the local population. Early identification of four watershed functions and seven strategic targets, enabled Salt Lake County and stakeholders to develop a focused adaptive management plan based on a cycle of analyses of spatial data, consensus building, implementation and evaluation through monitoring. Stream Function Index: This science-based index was developed as a monitoring tool to measure the effectiveness of watershed management. The Index combines selected physical, biological and chemical parameters of the river and stream corridors. Over two years, the river and stream corridors were inspected and evaluated for 29 parameters to determine individual and combined metrics for the hydrology, habitat, water quality and social functions of each sub-watershed. GIS Spatial Analysis: As part of the sub-watershed characterizations, GIS data was used to analyze current conditions and projected future conditions. Land use, population, jurisdictions and authorities, hydrology, geomorphology, and water quality and other data were evaluated to identify current and future sources of pollutants within each sub-watershed in order to target policies, future studies and water quality improvement projects. Consensus: Sixteen municipalities, eleven state and federal land management and regulatory agencies, and over 20 recreational and non-profit groups participated in a structured stakeholder process. A public opinion poll provided data back to the stakeholders on the perception, use and knowledge of watershed issues. Long term stakeholder and public involvement was included in implementation. Implementation: Critical to successful adaptive management is the process of updating the plan. The WaQSP will be updated every six years, incorporating current population, land use, water quality, stream function data, and hydrological and social data. A six-year implementation plan, reflecting an investment of over three million dollars, was prepared based on the results of the first iteration of the WaQSP.

4. Managing Water Supply Operations to Maximize Efficiency and Sustain Habitat - Jamil Ibrahim, MWH, Sacramento, CA (co-authors: Patrick Dwyer, Ken Powers, Mike Nichols)

Efficient use of existing developed raw water supplies is a recognized goal of the Placer County Water Agency (PCWA). The East Loomis Basin Canal Efficiency Study (Study) was initiated by PCWA and the U.S. Army Corps of Engineers (USACE) to characterize the efficiency of the existing raw water delivery within the East Loomis Basin canal system, and to identify and evaluate alternatives for managing water supply operations that could improve the efficiency of raw water delivery. The basin is bounded by two streams designated as Critical Habitat for Central Valley steelhead, a federally listed as Threatened species, and recognized as primary production areas for anadromous fishes. The Study included watershed-scale water balance evaluations based on data collected from a network of 26 continuous-flow monitoring stations, seepage, habitat water demand, and customer use studies. An extensive and open stakeholder involvement process was conducted during the Study to help recognize, interpret, and manage important issues, and to assist in formulating alternatives to address these issues. The Study concluded that the East Loomis Basin canal system is operated quite efficiently. While some losses are inherent and unavoidable in an open canal system, other losses represent opportunities to conserve water. Conditions of existing aquatic and terrestrial resources in the study area are dependent on the canal system. While canal operations contribute to flows in basin streams year-round, canal system contributions dominate dry season flows. Alternatives that greatly reduce canal system losses would have significant adverse impacts on Critical Habitat for Central Valley steelhead. An alternative was recommended for implementation that would provide for reductions in water losses from the East Loomis Basin canal system at a very cost-efficient price without adversely affecting environmental resources in the study area. Planned implementation of the alternative recommended through the Study demonstrates PCWA's commitment to efficient and reasonable use of diverted water supplies and exemplifies environmental stewardship through adaptive management of water supply operations while continuing to support salmonid habitat.