The Oregon Water Conference 2011: Evaluating and Managing Water Resources in a Climate of Uncertainty

Oregon State University – CH2M Hill Alumni Center – Corvallis, Oregon

OR Section, American Water Resources Association and OR Section, American Institute of Hydrology

Stream Restoration Session
Ivars Steinblums, Chair
Tuesday, May 24
9:30 AM – 12:15 PM

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Characterizing Collaboration in the Klamath River Basin, USA: An Exercise in Institutional Mapping

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ABSTRACT

The Klamath Basin Restoration Agreement (KBRA) and the Klamath Hydroelectric Settlement Agreement (KHSA) forged between Klamath River Basin stakeholder groups in California and Oregon, when successfully implemented, will lead to the largest dam removal project in history. After a decade of intense legal and social conflict among disparate interests in the river basin, this collaborative agreement between local irrigators, tribes, Federal regulators, and a large utility company represents a temporally challenging and spatially diverse social-ecological restoration initiative. Underlying the agreement is a complex set of collaborative initiatives and co-management institutions often working independently of one another to improve Basin water quality, among other goals. Theories related to the concept of adaptive governance may provide a useful framework for exploring the potential for uniting individual collaborative institutions under the vision of improved basin water quality. This paper describes the results of an institutional mapping exercise to identify and characterize existing approaches to water quality improvement and Clean Water Act implementation in the Klamath River Basin. The institutional mapping framework includes a detailed identification of collaborative activities, public stakeholders, regulatory agencies, and co-management institutions associated with efforts to improve water quality in various geographic and legal contexts. I provide a typology of governance approaches and institutions and consider the ways in which they might be integrated under the KBRA drawing on the suggested framework of adaptive governance.

Keywords: Institutional mapping; Klamath River; Dam removal; Adaptive governance

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Linkage Between Geomorphic and Biological Responses of a River to Dam Removal: a Case Study From the Chiloquin Dam on the Sprague River, Oregon.

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ABSTRACT

Chiloquin Dam, located on the Sprague River in southern Oregon, was removed in August of 2008. The processing of the sediment stored behind the dam (composed primarily of sand and fines) and the resulting bedform changes have been examined using repeat cross section surveys, yearly bathymetric surveys, and surface sediment characterization. Continuous suspended sediment concentrations have been estimated to inform a sediment budget over 3 years (1 year pre removal and 2 years post removal). These data allow for the description of spatial extents and longitudinal trends in sediment deposition. Repeat ground and bathymetric surveys are used for the quantification of uncertainty in field methods utilized and an understanding of how this uncertainty limits change detection. Invertebrate and habitat data have been collected using the EMAP protocol developed by the USEPA. Linkage between the river's processing of the sediment pulse and observed changes in invertebrate community composition and aquatic habitat metrics are explored.

Keywords: Chiloquin Dam; Sprague River; Dam removal.

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Economic Implications of Climate Change on Ecosystem Restoration Projects With a Beaver Case Study

Mark Buckley

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ABSTRACT

Climate change alters the biophysical and socioeconomic context for ecological restoration efforts in ways with and without precedence. New and changing conditions affect restoration project costs and expected benefits, including shifts in the overall goals and extent of society's demand for restoration. Climate change increases restoration project costs as temperature and precipitation patterns increase the expected frequency and severity of water shortages, while scarce ecosystem services can increase the demand for restoration projects. Increasing uncertainty and ignorance regarding future water availability heightens these concerns. As a case study example, I explain and quantify the potential impacts on the ecosystem structures and functions of dam-building beaver populations. I estimate the value of potential economic benefits of beaver restoration in the context of climate impacts on water availability for example watersheds in the Southwest and Northwest.

Keywords: Climate change; Beaver dams.

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Water Restoration Certificates™: Building a Bridge Between Urban Water Users and Flow Restoration Needs in the Rural West

Todd Reeve

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ABSTRACT

Across Oregon and other PNW states thousands of miles of rivers, streams and adjacent wetlands are chronically de-watered as a result of over-appropriated water rights. In Montana alone, chronic or periodic de-watering occurs in over 4,000 miles of streams across 381 different river or stream systems. The ecological harm resulting from this hydrologic modification is manifold. In many locations throughout the West, chronic low flows exacerbate water quality; severely restrict the movement and productivity of fisheries and wildlife populations; reduce the vigor and function of riparian communities; and limit human recreational opportunities.

In 2008 the Bonneville Environmental Foundation (BEF) began exploring the potential for a market-based approach to support voluntary, incentive-based flow restoration efforts. The result is BEF's Water Restoration Certificate™ Program - the first nationally marketed, voluntary environmental flow restoration program. The WRC program is built on the premise that private enterprise and the voluntary market can solve large-scale environmental challenges when society is empowered to both understand and directly address those challenges. WRCs offer an innovative, market-based solution that allows companies and individuals to take responsibility for their water use by restoring to the environment an amount of water equal their own consumptive use of water.

This presentation will showcase BEF's WRC Program and will elaborate on: the challenges and potential of voluntary, incentive-based programs; instream flow as an important expansion opportunity for ecosystem services; and how potential financial gains may be used to reinforce long-term ecosystem restoration activities.

Keywords: Flow restoration incentives; Bonneville Environmental Foundation

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The Life Cycle of Dams: An Analysis of Policy Change on the Rogue River, Oregon

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With the convergence of several economic, social, and environmental factors, dam removal has emerged as a feasible river management option. The Rogue River, located in southwest Oregon, is one of the few river basins in the United States to remove a number of large dams in quick succession. This paper will analyze the policy changes in the Rogue River Basin that led to the removals of the Savage Rapids and Gold Ray Dams. A Theoretical Framework for Policy Changes offered by Lowry (2003) is used to identify the type of policy change that occurred with the two dam removals. This framework takes into account broad external factors that affect policy shifts such as socioeconomic conditions and broad public opinion as well as political receptivity to changes and the physical complexity of changes. To identify these factors, an extensive review of public documents, public testimony and comment letters, and newspaper articles and letters-to-the editor was conducted as were interviews. Application of the framework reveals the role of coalitions and socioeconomic conditions as critical factors in altering the status quo in both the Savage Rapids and Gold Ray Dam removal decisions. As watershed managers, governmental agencies, and community leaders negotiate the uncertainties of a changing climate, economy, and environment, dam re-operations and removals will continue to take place and variation within actual policy changes will occur.

Keywords: Rogue River; Savage Rapids Dam; Gold Ray Dam.