

## Water and Climate in the Western United States

Edited by William M. Lewis Jr., University Press of Colorado, \$40.

Reviewed by *Jeanine Jones, P.E.* – California Department of Water Resources

This work comprises a series of seventeen articles coordinated by the Cooperative Institute for Research in Environmental Sciences at the University of Colorado at Boulder and sponsored by the National Oceanographic and Atmospheric Administration. Accordingly, Colorado-based authors and authors from academic and research backgrounds are predominantly represented. The book is organized into four main sections: climate variability and prediction; linkages between climate prediction and hydrology; water managers' responses to climate variability; and social perspectives on water resources management. A brief fifth section reviews and comments on the preceding sections.

This book went to press as Colorado was experiencing its single driest year of record – a coincidence that simultaneously highlights the importance of understanding



climate variability and the current poor state-of-the-art in predicting climate changes in sufficient detail to be useful to water managers. As the climate articles point out, extreme events – whether floods or droughts – are important in the arid west, with just a few storms literally having the ability to reclassify a year from dry to wet. Kelly Redmond of the University of Nevada's Desert Research Institute gives a good overview of selected factors influencing variability. He discusses the peril of hydrologic overconfidence resulting from our reliance on at best about 100 years of recorded data, as well as the corresponding need to develop longer-term indirect data sets through tools such as dendrochronology. Connie Woodhouse of the University of Colorado at Boulder provides

Colorado Front Range examples of use of dendrochronology to reconstruct long-term hydrologic records.

Multiple authors note the historical disconnect between local land use planning and water supply planning, and suggest that it is time to establish formal linkages between them. Acquiescing to this historical dichotomy is a risky proposition for those in rapidly developing areas faced with increasing competition for natural resources and climatic variability. California may

be alone in having taken initial steps to establish this linkage in state law. David Getches of the University of Colorado School of Law discusses some actions that western states have taken to deal with the water needs of rapidly growing urban populations, including agricultural to urban water transfers, water conservation programs, and state-level land use planning linked to growth management (in Oregon and Hawaii).

One point explicitly emphasized and implicit throughout the book is the shift in water resources management from use of capital outlay projects (such as the West's many U.S. Bureau of Reclamation projects) to the increased use of human capital. The authors point to an increased need to manage existing water resources more precisely and to devote more effort to understanding climate uncertainties and developing better climate models. Several authors, including Kathleen Miller and Steven Gloss, allude to the increased involvement of a broader cross section of societal interests in natural resources decision making, and stress the need to include historically underrepresented groups in the process. Demographic shifts and their implications are discussed. Examples of increasing disparities between rural and urban areas are highlighted with respect to the socioeconomic impacts of water transfers and to the different capabilities and problems presented by their drinking water treatment systems.

The book's final article describes conflicting themes in present-day natural resources management and concludes with an expression of hope that westerners can work together to develop a shared vision of water's societal role.

This book will be of interest to academic researchers and students of western water policy, and will be especially useful for persons interested in understanding the linkage between climatic and water management considerations. Those seeking an overview of current issues in climatic variability will find this a good introduction.

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