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Arizona Water Policy: Management Innovations in an Urbanizing, Arid Region, edited by Bonnie G. Colby & Katharine L. Jacobs

Margaret J. Vick

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BOOK REVIEWS

Arizona Water Policy: Management Innovations in an Urbanizing, Arid Region. Edited by Bonnie G. Colby & Katharine L. Jacobs. Issues in Water Resource Policy Series Editor Ariel Dinar. Washington, DC: Resources for the Future, 2006. Pp. 270. \$65.00, hardback.

Arizona Water Policy: Management Innovations in an Urbanizing, Arid Region is a compilation of 15 essays by different experts on different topics related to Arizona water policy bound together by the same cover. This is the second book in a series examining water policy issues published by Resources for the Future (RFF). RFF publications are intended for an audience listed as “scholars, the media, advocacy groups, NGOs, professionals in business and government, and the public.”

The introductory chapter by the editors, “Water Management Challenges in an Arid Region, Key Policy Issues,” lists seven cross-cutting issues in Arizona water management; “growing demand and finite supplies; changing social values; safe yield versus sustainability; connecting land use and water supply planning; connecting water’s value and users’ costs; climate change and supply variability; and framing issues and making choices.” The introduction concludes, “This collection of essays by well-known water experts from over a dozen fields of expertise contains important lessons for all arid regions facing competing water demands.” While this is a good compilation of essays on Arizona water management, it falls short of addressing cross-cutting issues or providing important lessons for other arid regions.

After reading each essay, most of which could be stand-alone articles, I expected the concluding essay by the editors, titled “Lessons for Semiarid Regions Facing Growth and Competition for Water,” to pull this book together and explain the interrelationships among the physical characteristics of water supply (Chapters 4 and 5), the development and legal history (Chapters 2 and 3), issues of rural and urban water supply and demand (Chapters 11 and 12), and the effect of these issues on ecosystem sustainability (Chapters 7 and 8) by using the cross-cutting issues identified in the introductory chapter to inform the reader about the factors and circumstances that make the Arizona situation applicable to other “urbanizing, arid regions”—a tall order, but an expectation created by the editors. Instead, after a few bullet points on the benefits and lessons learned from the Groundwater Management Act, the final chapter summarizes the individual chapters, sometimes with verbatim excerpts. While a re-cap can be useful, this chapter is 16 pages long and set forth without the benefit of a single heading, sub-heading, page reference, or citation and, in some instances, overstates the conclusions

of the chapter authors. If a reader is looking for the "lessons for semiarid regions" or the "management innovations in an urbanizing, arid region," she will need to pull them from the text of the individual essays. This does not, however, lessen the value of the essays as a compilation of water policies within Arizona.

As indicated above, this series by RFF is directed to a wide range of audiences, which may limit the effectiveness of this book. In addition, the individual essays are not of a consistent style or caliber. A short review of individual essays illustrates this and will more fully inform potential readers about the usefulness of this book for their particular needs whether they be law, policy, or general reading.

- Chapter 4, "The Water Supply of Arizona: The Geographic Distribution of Availability and Patterns of Use" by three experts from the U.S. Geologic Survey and Chapter 5, "Drought, Climate Variability, and Implications for Water Supply and Management" by two climatologists and the co-editor Katharine Jacobs, provide technical information about Arizona water resources. Each chapter contains precise information, useful maps, and comparative charts leading to a final discussion about drought preparedness planning.

- Chapter 3, "Balancing Competing Interests: The History of State and Federal Water Laws," by Michael J. Pearce, former chief counsel of the Arizona Department of Water Resources, provides a clear, well-developed summary of the relationships among the different aspects of Arizona water law including the major cases, significant legislation, the Law of the River governing the use of the Colorado River, and the impact of federal laws on Arizona water policy including the Endangered Species Act. This chapter provides a concise reference and excellent background for the more specific subject matter chapters to follow. It concludes with a useful "Timeline of the Development of Arizona Water Law" beginning with the establishment of the Arizona territory in 1863 and ending with the 2004 Arizona Water Settlements Act.

- Chapter 7, "Sustaining People, Habitats, and Ecosystems: The Challenge of Integrating Water Policy and the Environment" by Patrick J. Graham, the Executive Director of the Nature Conservancy of Arizona, presents a bleak picture for ecosystem preservation and for the future of Arizona's natural diversity. The author points out that within Arizona the "freshwater systems...and their associated riparian habitats, support a disproportionately high number of species relative to their aerial extent" including "the highest densities of breeding birds found in North America." He then examines examples of dwindling habitat, threatened and endangered species, and the Herculean efforts to attempt to restore and maintain ecologically important regions of the state given the

Arizona water rights system, which favors depletion. The author suggests changes in Arizona water policy and strategies for preserving the ecosystems that rank Arizona "among the top five" states for natural diversity. Graham concludes with lessons learned in Arizona that may be useful to prevent such devastation in other arid regions.

- Chapter 8, "The Disconnect between Water Law and Hydrology" by University of Arizona law professor Robert Glennon, explains the Arizona water laws that have created the bleak circumstances described in Chapter 7. This is a concise explanation of the problems facing the state resulting from the disconnect between law and hydrologic reality, particularly the separation of groundwater from surface water law. "In Arizona, the legislature has failed to give the Arizona Department of Water Resources significant authority to regulate groundwater pumping in the rural parts of the state or to protect riparian habitat." After examining Arizona water law, the author looks at the effect of federal laws and the issues of Colorado River management and concludes that "it will take considerable political will to tackle the machinery of housing development and population growth and to craft policy reforms that require new developments to live with a sustainable supply of water. If Arizona's past is any guide, there is no reason to be optimistic."

- Chapter 9, "Protecting the Supply: Arizona's Water Quality Challenges," by Karen L. Smith and Charles G. Graf, two recent administrators within the Arizona Department of Environmental Quality, provides a thorough discussion of the existing water quality challenges and an informed projection of future issues. This chapter offers an analysis of the water quality challenges presented by the management of quantity, with specific concerns raised by the reliance on treated effluent.

- Chapter 10, "Implications of Federal Farm Policy and State Regulation on Agricultural Water Use," by George B. Frisvold, Paul N. Wilson, and Robert Needham, provides a somewhat different perspective on agricultural water use. "Because agriculture accounts for such a large share of Arizona's overall water consumption [estimated at 80 percent of withdrawals], changes in agricultural policy have profound implications for the state's task of balancing water supply and demand." This is a well referenced analysis of federal commodity and conservation programs and how changes in these programs alter cropping patterns and thereby impact water use within Arizona.

- Chapter 11, "Urban Growth and Water Supply," by James M. Holway, associate director of the Institute of Sustainability at Arizona State University, discusses the staggering growth within the urban areas of Arizona. This chapter provides an insightful look at the relationship between the management goals established under the Groundwater

Management Act and actual water use. Holway provides lessons learned in Arizona that may be applicable to other arid regions experiencing rapid urbanization. He also includes a to-do list for more effective water management within Arizona.

- Chapter 12, "Water Supply and Management in Rural Arizona," by the co-editors Katharine L. Jacobs and Linda S. Stitzer, highlights the different management issues faced by the increasing demand for water in the rural areas of the state. "There are essentially two Arizonas: the major metropolitan areas and irrigation districts, with multiple reliable sources of water, and the rest of the state, which has limited water supply alternatives and limited planning information." This is a policy discussion comparing the challenges in rural Arizona with the way increased demand for water has been addressed in urban areas. The authors provide a balanced account of policy considerations but are not precise in their discussion of legal principles.

The following chapters are discussed separately because of the different writing style, indicating potentially different readership, or because they warrant particular mention.

- Chapter 2, "Shaped by Water, An Arizona Historical Perspective," by Jack L. August and Grady Gammage, Jr., contains many interesting anecdotes from Arizona water history, which the authors characterize as dominated by an attitude of "us" versus "them" – the "us" being interests seeking to acquire or protect water resources for use within the state and "them" being everyone else from different water use sectors or jurisdictions. To explain this concept, the authors state, "The history of Arizona's struggles over the Colorado River illuminates another key aspect of the social and political traditions of the state: the tribal nature of water as a commodity." Perhaps a term other than "tribal" to describe the "us" in Arizona would have been more appropriate since the Native American tribes possessing 28 percent of the Arizona land area have always been viewed as "them" in Arizona water history.

- Chapter 6, "Water Transactions: Enhancing Supply Reliability during Drought," by Bonnie G. Colby, Dana R. Smith, and Katherine Pittenger, does not provide the information expected based on the title. The authors are not precise in their terminology, using "water transactions" and "water transfers" interchangeably without definition and without reference to the Arizona transfer and transportation statutes, including Arizona Revised Statutes, section 45-172 (Transfer of water rights; application; limitations' required consent), sections 45-541-547 (Transportation of groundwater), or sections 45-551-559 (Withdrawal of groundwater for transportation to Active Management Area). Though the text discusses the concepts contained in these statutes,

the failure to include the references is a serious omission and limits the usefulness of this chapter, particularly since there is a reference to Arizona Revised Statute section 45-544 (Transportation in areas not subject to active management; damages; Little Colorado River plateau and Parker groundwater basins; definitions), creating the impression that this is the only relevant statute.

- In Chapter 13, "Arizona's Recharge and Recovery Programs," Sharon B. Megdal describes the relationships among the Groundwater Management Act, the Arizona Administrative Rules for Assured and Adequate Water Supply, the Central Arizona Groundwater Replenishment District, and the Arizona Water Banking Authority. These entities, rules, and statutes are complex, and this chapter brings coherence to the relationships. However, like Chapter 12, the usefulness of the information is limited by the omission of citations to the code or to the rules. Assured water supply and adequate water supply are statutorily defined terms. Reference to the statutes alerts the reader to this fact in addition to permitting the reader ready access to the material that may be difficult to obtain since the adequate water supply requirements are enforced through real estate subdivision reporting the requirements for which are contained Arizona Revised Statutes sections 9-463 and 11-806 in addition to the water code.

- Chapter 14, "Tribal Water Claims and Settlements within Regional Water Management," is by Dana R. Smith, a recent research assistant to co-editor and author of this chapter, Bonnie G. Colby. With so many experts on the topic of Indian water rights and water claims within the state including academics, attorneys, government officials, and current and former politicians, this reviewer questions the editor's decision to author this chapter herself. Doing so appears to limit the depth of discussion. This chapter presents an "outsiders" perspective of tribal water settlements, focusing on the benefits to non-Indian development. The chapter does not discuss the decreed rights to the Colorado River held by five Arizona tribes and limits the discussion to two of the eight tribal water settlements. The Chapter does not discuss the economic disparities between tribal communities and the rest of the state or the political and economic impetus to limit water development by tribes. It offers a simplistic explanation of the law of Indian water rights, including an attribution of legal principles to the *Winters* case that developed during 100 years of subsequent litigation. At a minimum, the authors should advise the reader of the limitations of this chapter to avoid creating the impression of complete coverage of the topic.

On the whole, *Arizona Water Policy: Management Innovations in an Urbanizing, Arid Region* is a useful resource as an overview of Arizona water policy and will remain in reach on this reviewer's bookcase even

though its value is limited by the omission of basic reference material. It is not the book to pull from the shelf for lessons applicable to other arid regions unless you are willing to take the time to evaluate each essay on its own merit and discern for yourself which management innovations in Arizona are applicable to other urbanizing, arid regions.

Margaret J. Vick

Margaret J. Vick, PLC, Tempe, Arizona
Associate, Institute for Sustainable Development
University of the Pacific McGeorge School of Law
Adjunct Professor of Transboundary Water Law
University of New Mexico School of Law

Hydrology and Water Law—Bridging the Gap. Edited by J. Wallace & P. Wouters. London: IWA Publishing, 2006. Pp. 360. \$140.00 hardcover.

Freshwater is a fundamental resource integral to all ecological and societal activities. After a century of development, the water sector has faced a number of serious challenges such as degradation and depletion of the resource; a sheer increase of actors competing for the same resource; and a lack of communication between scientists and the broad spectrum of water stakeholders including river basin communities, water policy experts, lawyers, and water resource managers. Against this background, the book by J. Wallace and P. Wouters comes up as a collection of case studies with an objective to demonstrate the successful and less successful examples of how water law, policy, and science interact in responding to these challenges in real basin management practices.

Integrated Water Resource Management (IWRM) has been introduced as a concept and a strategy for policy change in the water sector, taking over from the traditional understanding and practice of water resources development mainly directed at policy, legislative, and institutional changes on a sub-national, national, and international level. IWRM is bringing forward approaches, including participation, consultation, and inclusive political institutions, to enable the mediation of the conflicting interests of water users and agencies that manage water. Despite the abundance of literature on IWRM, achieving this goal is very difficult in practice. It is clear, however that water law must be considered as an integral part of the process.

Water law, particularly with its performance at the international level, has been relentlessly criticized in many circles for being vague, useless, and impotent. Yet, whenever a dispute arises at the local, national, or international level, water law has often been introduced as a panacea that can be used to design the framework for negotiations that will reach agreed settlements between competing stakeholders. It is also