

# Preface

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Water has always been a salient issue in the American West. Mark Twain's familiar summation that "whiskey is for drinkin', water is for fightin'" is an admittedly tired and overused saying, like many revered adages about western water. Yet it nonetheless underscores the notion that our interest in water often runs wider and deeper than the streams themselves – going beyond what even a rigorous classification of economic, environmental, and spiritual values in water can capture to include more basic concerns such as our safety, security, and regional identity, and what, in the final analysis, we are willing to accept as fair and appropriate in our laws, policies, and management regimes. Ultimately, most water issues are not merely about water; that's not why we fight. Rather, most water issues are about values, aspirations, expectations, and, perhaps more importantly, about fears and uncertainties. This common nucleus of concerns unites an otherwise unrelated set of complex and site-specific water issues.

Viewed in this light, water issues in the American West are not so different than those seen elsewhere in the world. To the contrary, many of the most pressing water management problems in the West have obvious international analogs. For example, the depletion of water resources is, sadly, a nearly universal theme. The Colorado and, in this period of extraordinary drought, the Rio Grande cannot maintain a continuous flow of water to the sea, a quality shared by the Nile in Egypt, the Ganges in Bangladesh, the Yellow in China, and the Amu Dar'ya and Syr Dar'ya in Central Asia. The steady decline of California's Salton Sea is mirrored by the ongoing demise of the Aral Sea, Dead Sea, Sea of Galilee, and Lake Chad, among others. Similarly, groundwater declines in the Central Valley and High Plains (for example, Ogallala region) are not fundamentally different than what is seen in northern China, parts of India, and thousands of other locales.

The water management environments of the West and many distant nations also share many similarities, as evidenced by the following question, asked and answered by Peter Gleick (2002, p. 1) of the Pacific Institute for Studies in Development, Environment, and Security:

What has a population of nearly 40 million people; an arid and semi-arid climate with mountainous areas where most of the rain falls; serious public opposition to new major dams; the vast majority of water consumed by irrigated agriculture,

much of it on subsidized, low-valued crops; inefficient domestic water use, with a large fraction going to water lawns; conflicts between environmental uses, agricultural uses, and domestic uses; and government planning agencies that haven't yet figured out how they will have to change to meet a changing world? The answer is South Africa. And the Lower Colorado River Basin. And California and Nevada combined. And the Jordan River in the Middle East.

In the American West, as elsewhere, population growth exacerbates longstanding problems of inappropriate water use and management, and underscores the need for improved institutional arrangements. In just the last quarter of the 20th century, the population of the West grew by approximately 32 per cent, compared to a national growth rate of 19 per cent (Case and Alward, 1997). While most of these new residents reside in Southern California, in terms of percentages, it is the states of the Interior West that are undergoing the most significant demographic shifts. Las Vegas, for example, grew by 83 per cent during the 1990s, pulling the State of Nevada to an overall growth rate of 66 per cent in that period (Census Bureau, 2001). These are figures more typically associated with developing nations. This trend is expected to continue; the Census Bureau expects the West to add about one million new residents per year over the next three decades (Census Bureau, 1997).

As Gleick (2002), and others, have noted, one consequence of this population growth is to reduce the amount of water available per capita to satisfy the full spectrum of human needs and desires. Globally in 1850, the freshwater theoretically available per capita was 43 000 cubic-meters/year; today, it is 8000 cubic-meters/year. While this is enough for even the profligate users of the United States (who average about 2000 cubic-meters/year), it is nonetheless a disturbing and inherently unsustainable trend. More people mean a greater need for food production, and thus, a need to continue devoting the lion's share of freshwater supplies globally to irrigated agriculture during a period in which economics and politics demand a reallocation of water to the municipal and environmental sectors.

Equally troubling is the prospect of global climate change, which may shrink the size of the freshwater resource available for human use, in some cases through reduced precipitation or increased evaporation, and perhaps more commonly in the West, through changes in the hydrologic cycle that make our water infrastructure less efficient (Frederick and Gleick, 1999). Under any reasonable future climate scenario, only a small fraction of total water resources will remain as practically available freshwater. As noted by the World Commission on Dams (2000, preface), 'less than 2.5 per cent of water is fresh, less than 33 per cent of fresh water is fluid, less than 1.7 per cent of fluid water runs in streams'. This quantity is only slightly malleable by engineering, technology, and heroic financial investments. Thus, if we are to balance our water budgets, we will need to get better at using what water

resources we have already developed, and in findings ways to moderate our growing collective thirst. This is the ubiquitous challenge of sustainable water management – from Angola to Arizona.

These similar challenges to sustainable water management are often overlooked and unappreciated within the water management community, for many reasons. Perhaps most importantly, water systems, and the managers of those systems, operate at local scales, and are largely immune from actions elsewhere. If events in South Africa, for example, are unlikely to ever create an operational problem for the Metropolitan Water District of Southern California, is there truly a compelling need for the huge California utility to look to this distant nation for insights, even if it faces challenges that, conceptually, are similar? This is a legitimate question. Also legitimate is the observation that the water managers of the American West have a different set of opportunities and constraints than many of their colleagues in other nations. This is perhaps most evident regarding the public health aspects of water management. For example, the World Health Organization estimated that for the year 2000 only 60 per cent of the world's population – but 100 per cent of North Americans – had access to water sanitation systems (Gleick et al., 2002, Table 5). Clearly it would be foolish to assume all water managers operate in similar environments.

Perhaps the most important contextual difference between the West and elsewhere is the legal regime for water allocation. Although not completely without precedent or international analog, western water law is clearly unusual. At the heart of this law is the doctrine of prior appropriation, based on a simple 'first come/first served' principle easily grasped by anyone who has ever waited in a queue. The system awards the right to use and consume public waters in the West to individual users such as farmers and cities based on a seniority system where the first users of a resource establish perpetual rights to continue that use year after year, with new users entitled only to the water left over after the first user takes their usual entitlement. Those with the oldest uses (*appropriations*) are termed *seniors*, and enjoy the piece of mind of receiving full water supplies in times of shortage while the *juniors*, the late-comers, take their chances. Much like other American institutions, it is a system based on winners and losers, rather than shared sacrifice, driven primarily by individualistic, *laissez-faire* decision processes rather than coordinated or centralized planning. As discussed throughout this book, this legal and administrative regime has many important subtleties and variations beyond this simplistic description; for example, the definition of 'beneficial' (that is, legally recognized) uses is ever-evolving, and the application of prior appropriation has not been extended across state lines, international borders, and to many groundwater reserves. Nonetheless, while these and related details are important and deserving of detailed exploration, it is ultimately

the most basic tenets of western water law that shape the political context within which all western water issues are addressed.

This cursory review of similarities and differences leads to a clear conclusion: while the contextual differences between the American West and other nations ensure that it is *not essential* to look abroad for water management insights and lessons, the strong similarities suggest that such an inquiry is likely to be *worthwhile*. This conclusion was given life in June 2002, when the University of Colorado's Natural Resources Law Center – in celebration of twenty years of western water research – focused its annual western water conference at a global scale. *Allocating and Managing Water for a Sustainable Future: Lessons from Around the World* featured approximately 70 international and domestic presenters, highlighting lessons from countries including Angola, Argentina, Australia, Austria, Bangladesh, Bolivia, Botswana, Brazil, Cambodia, Canada, Chile, China, Costa Rica, Cuba, France, Germany, Hungary, India, Israel (and the West Bank), Japan, Laos, Mexico, Namibia, Nepal, Pakistan, Slovakia, South Africa, Switzerland, Thailand, Turkey, United States and Vietnam. This book is a synthesis and outgrowth of that event, featuring chapters authored by key presenters and supplemented with materials from invited panelists, other presenters, and an extremely diverse and well-informed audience.

Chapter 1, authored by Jim Wescoat, heavily draws upon history and academic theory to explore the opportunities, arguments, and mechanisms for transferring lessons between the American West and foreign nations. While major agencies such as the United Nations and World Bank, and publications as diverse as *The Economist* and the *Christian Science Monitor*, race to proclaim water as *the* issue of the twenty-first century, it is important to realize the search for improved water management strategies has a long history. At one time, water managers in the West frequently sought insights from other regions, but the tradition in recent years has been merely to export, not import, lessons. Given the abundance of water problems in the West and the wealth of international innovations, and considered alongside the growing ease of international communication and travel, this American isolationism is troubling, and is certainly contrary to the spirit of this project.

Chapters 2 through 5 focus on four major substantive themes that currently challenge the western water management community, and how these issues are addressed in a variety of international settings. These discussions draw largely from the remarks and written submissions of an esteemed collection of conference panelists, namely Don Blackmore, Joachim Blatter, David Farrier, Bob Hitchcock, Jeff Jacobs, Marcus Moench, Miki Nakayama, Miguel Solanes, Robyn Stein, Marcos Terena, Julie Trottier, and Wang Xi.

In Chapter 2, Charles Howe and Helen Ingram look at the issue of water allocation (and reallocation), examining the relationship between market

mechanisms and government-based approaches. Globally, a market/commodity viewpoint of water has taken hold in many countries, prompted by and largely going beyond the initial western experimentation with water markets. As Howe and Ingram observe, the West continues to search for the appropriate role for markets within government water allocation systems, balancing concerns of economic efficiency with social goals of equity and the protection of public values.

The protection of public values is also a prominent theme permeating Chapters 3 and 4, authored jointly by David Getches and Sarah Van de Wetering. In Chapter 3, the challenge of environmental protection in the West is reviewed, noting the difficulty of recognizing public values within a legal regime based on private property rights and a commodity viewpoint of water. In Chapter 4, the protection of cultural values takes center stage, with a focus on indigenous water rights. In the American West, the judicial recognition of tribal rights has only rarely been translated into real benefits for native peoples, a pattern with, regrettably, many international analogs.

In Chapter 5, Aaron Wolf explores the significance of international and interstate rivers in promoting regional conflict and cooperation. In many parts of the world – especially the Middle East and Central Asia – it is widely feared that transboundary water conflicts will become increasingly common and violent, although a thorough review of history shows that tolerance, more so than active conflict or cooperation, is the most common trend. With water shortages increasingly characterizing the United States/Mexico border area, as well as several interstate regions, the vast international experience with transboundary water management is especially valuable.

Finally in Chapter 6, Lakshman Guruswamy and Dan Tarlock bring our attention back to the American West, and to the underlying management challenge of sustainability. The role of water management in sustainable development remains only partially defined on the global agenda – for example, the seminal report of the World Commission on Environment and Development (Brundtland Commission) devoted less than one of its 383 pages to water. Guruswamy and Tarlock take us considerably further, emphasizing the need for the West to build upon promising regional strategies for integrated watershed management and recasting the nature of water entitlements. Undoubtedly, these are conclusions of great importance and near universal relevance, even if the specific form of implementation varies from nation to nation.

Doug Kenney, Editor

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