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BOOK NOTES

Barbara Cosens, *The Columbia River Treaty Revisited: Transboundary River Governance In the Face of Uncertainty*, Oregon State University Press (2012); 455 pp; ISBN 978-0870716911; paperback.

In 1964, after nearly twenty years of negotiation, Canada and the United States began implementing the Columbia River Treaty (“CRT”) in an effort to control floodwaters and harness the energy potential of the Columbia River. Barbara Cosens's edited collection of essays, *The Columbia River Treaty Revisited*, examines the past, present, and future implications of the CRT in the face of flood-control provisions expiring in 2024. Cosens's book grew out of a University of Idaho College of Law Natural Resources and Energy Symposium in 2009, and it is part of a project of the University Consortium on Columbia River Governance. The editor's goals for this multi-disciplinary text were to stimulate discussion about the treaty's viability, to predict changes, and to determine whether modifications are necessary. In light of the treaty's ten-year notification requirement for amendment or termination of the treaty, Cosens's book presents a variety of viewpoints to consider in reexamining the CRT's ability to provide amenable solutions for the numerous stakeholders in the Columbia River Basin.

Cosens's book is organized around the idea of uncertainty and the authors focus on several factors that could contribute to rapid ecological, economic, and social changes and create more competition for a water resource that transcends jurisdictional and national borders. These factors include (i) changing societal values, (ii) the empowerment of local communities, (iii) the changing viability of anadromous fish populations, (iv) climate change, and (v) mounting population and energy demands. The authors examine these factors using a variety of methodologies, revealing divergent opinions that are likely analogous to the discussions that took place prior to the CRT's enactment.

Part I of the book provides a historical analysis of the Columbia River and the CRT itself. The authors in this section look at the CRT's implementation and the subsequent social changes that resulted in changing local values. As James Barton and Kelvin Ketchum describe, the Columbia River Basin covers 259,500 square miles, fifteen percent of which are in Canada. It spans seven states, British Columbia, aboriginal lands of the First Nations in Canada, and fifteen Native American reservations in the United States. Because of its vast drainage basin, contributor Anthony G. White views the river as a product of both physical and political geography: the earth's composition, including the Rocky Mountains, gives the river its power and volume, while regulations divide its resources and dictate who can use it and within what limits.

As Mary L. Pearson points out, the Columbia River has long been a locus of economic and technological activity. Commercial fishing and canneries began setting up shop in 1866, and the United States Army Corps of Engineers began building locks at the Cascades in 1896. It was the 1948 flood, however,

that was the turning point for the river, because it revealed a dearth of storage capacity to collect runoff and prevent flooding. Thus, as Barton and Ketchum point out, the need for flood control via storage became vital to the region. The best storage sites, however, were located in Canada, necessitating a transboundary agreement.

The largest obstacle in completing the CRT was a perceived inequity of benefits. All of the new dams were in British Columbia, but the bulk of hydro-power and flood control benefits flowed to the United States. The CRT represented a solution to this perceived inequity by dividing the benefits between the United States and British Columbia and allowing the province to sell its surplus power. As Jeremy Mouat opines, in many ways the CRT became a model for other regions facing similar issues with transboundary resource management.

Only in its proper historical context, however, can one truly understand the CRT. Thus, one must view the CRT within the larger pursuit to transform the Columbia River from a natural river into a managed water resource for the purposes of economic efficiency and wealth maximization. The CRT is a product of its time and reflected societal values and water development programs of the period. As Paul W. Hirt and Adam M. Sowards argue, any new changes to the treaty must balance efficiency and equity to more accurately reflect contemporary values surrounding the river.

Matthew McKinney judges the CRT by both contemporary and historical standards, viewing the treaty as a success if measured by the goal of flood protection. However, CRT negotiations in 1964 never addressed the health of salmon fisheries and local participation of affected communities. Thus, a more contemporary focus on salmon fisheries and local sentiment can reflect recent societal and political changes in the basin.

Garry Merkel and Mary L. Pearson examine these societal and political changes from the viewpoint of First Nations members. Both authors discuss the cultural and economic importance of fish to the indigenous populations of the Columbia River Basin, who historically lived on or near rivers. Salmon shaped these societies, and depletion due to CRT implementation accordingly resulted in a reshaping of the societal framework. Both authors seek a political and ecological solution to preserving indigenous culture through a renegotiation of the CRT that involves local communities. Merkel and Pearson predicted the legal recognition of tribes and treaties in both the United States and Canada suggests a more inclusive process of negotiation will occur if the countries revisit the CRT.

Part II uses a scientific approach to examine two major ecological changes in the Columbia River. The first major change is in the health of anadromous fish and the political inertia preventing efforts to address declining fish populations. As Chris Peery points out, the Columbia River is central to the region's ecology and is one of the most regulated and developed rivers in the world. Peery argues humans must be aware that they are part of the ecosystem and their behavior influences biological processes. For example, the Grand Coulee Dam brought energy to the region but also blocked salmon migration and decimated salmon populations. CRT stakeholders must carefully consider this type of influence over biological processes, Peery posits, if and when Canada and the United States renegotiate the treaty.

In his essay, Carmen Thomas Morse discusses ongoing litigation over salmon recovery and the operation of federal dams. Although a variety of contributing factors exist, Morse argues that hydropower dams are the major factor in fisheries depletion. Any renegotiation of the CRT, therefore, must recognize these competing policy and ecological issues and find a way to reconcile them.

The other major ecological change discussed in this section is climate change. The CRT can account for the river's seasonal and year-to-year variation in water levels. Climate change, however, is beyond predictable variation and historical behavior. Anne Nolin, Eric Sproles, and Aimee Brown examine the effects of climate change on artificial storage in the region. While snowpack provides natural storage and regulates summer flows, climate change may reduce the amount of snow and water in the region. Therefore, the authors argue, current artificial storage is insufficient because the CRT provides a framework for high flow, but not low flow, management. The authors therefore call for more comprehensive models and snowpack measurement that can allow water managers to make quick and critical decisions in times of change.

Parts III and IV look at the future of transboundary cooperation in the face of uncertainty—namely, population change and increased energy demand. As Cosens points out in her introduction, hydropower is the main source of energy for the region and has grown in importance because of a lack of other options. Additionally, the region has experienced a variety of social and ecological changes since the CRT's enactment. Therefore, as Chris W. Sanderson argues, the treaty is a useful model for transboundary cooperation, but is no longer equipped to resolve the concerns of its various stakeholders.

Craig W. Thomas views the CRT's inability to resolve the concerns of various stakeholders as an institutional issue. He identifies bureaucracies, politically appointed commissions, and collaborative partnerships as the types of decision-making institutions that govern water resources in the Columbia River Basin. Although these institutions have advantages, they also have limitations that, if ameliorated, could provide solutions for resolving the concerns of various stakeholders. Thomas provides a two-pronged solution to the institutional issue. First, he calls for the decentralization of bureaucracies. This type of reform, premised on local involvement and decision-making, would allow for more institutional flexibility and adaptability that could be capable of addressing rapid changes in the Columbia River Basin. Second, Thomas seeks the creation of new institutions to link local collaborative partnerships to prevent overlapping activities and to coordinate communication between localities.

Overall, *The Columbia River Treaty Revisited* calls for CRT stakeholders to learn from the lessons of the past and create changes to the treaty that more accurately reflect contemporary social and ecological trends. One major trend is the recognition and involvement of local communities at the negotiation-table. Another trend is greater recognition of ecological and cultural impacts like fisheries depletion and the corresponding impact on native and local communities.

If reconsidered correctly, the CRT can reconcile competing interests and be a model for transboundary water agreements. One can only hope, given the nature of political treaties and the variety of social values attached to the Columbia River, that any renegotiation of the treaty leaves no stakeholder high and dry.

Garrett Davey

Douglas S. Kenney and Robert Wilkinson, Editors, *The Water-Energy Nexus in the American West*, Edward Elgar, Northampton, MA (2011); 274 pp; \$42.75; ISBN 978-0-85793-769-8; softcover.

Robert Wilkinson is an Associate Professor at the University of California Santa Barbara and also an advisor to businesses, non-profits, and governments on energy and water policy. Douglas Kenney directs the Western Water Policy Program at the University of Colorado Law School's Natural Resources Law Center. Mr. Kenney also writes about and advises governmental organizations on water related issues.

Mr. Wilkinson and Mr. Kenney teamed up to put together *The Water-Energy Nexus in the American West*, a collection of essays that seeks to inform the general public and to give decision-makers a solid footing in the law, economics, and science that connects water and energy use in the western United States. The book is organized into four parts: Introduction and Overview; Water for Energy; Energy for Water; and Solutions: Examples of Ways Forward.

Part One, "Introduction and Overview," consists of Chapters One and Two. Chapter One explores the links between energy and water. For example, energy systems and primarily electricity generation account for the largest water use in the United States. Furthermore, the transportation of water consumes nearly twenty percent of all the electricity used in California. Chapter One posits that integrating water and energy management can vastly increase the economic efficiency of both systems by reducing capital and operating costs. These efficiencies would lead to lower tax burdens and improve a community's quality of life through increased environmental stewardship and integrated management style requirements. Chapter Two analyzes how petrochemical, electrical, and biofuel production degrades natural riparian environments. The Chapter concludes that conserving both water and energy will increase efficiency and foster healthier river systems.

Part Two, "Water for Energy," covers Chapters Three through Seven. Chapter Three addresses coal. Generally, a coal mine uses water to suppress dust generated during mining operations. That water can damage ecosystems by increasing the acidity in the streams that capture coal-mining runoff. Once mined, coal-fired power plants create electricity by boiling pure water in a closed loop system to produce steam and pressure, which spin turbines to produce electricity. Electricity generation accounts for ninety percent of all domestically mined coal. The generation plant uses a local water source to condense the steam back into water via a heat exchanger. This cooling process seriously impacts local water resources by increasing water temperatures downstream from the power plant. In order to avoid raising a stream's temperature, the power plant must permanently consume larger quantities of water in order to condense