

COMPLEXITIES WITH TRANSBOUNDARY WATER RESOURCE MANAGEMENT: PROGRESS AND STUMBLING BLOCKS

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I frequently ask my students, “What is *wrong* with water? What makes the management of water resources so complex?” The answer is relatively simple. It moves! Try as we might, rivers and streams show little respect for manmade boundaries. Rivers crossing state lines may be subject to a new set of rules and those crossing international boundaries subject to an entirely different legal framework. Because water is a mobile resource and subject to great fluctuation, we have developed a complex system of both physical impoundments and various legal and institutional frameworks for allocating and controlling the resource. Both because of and in spite of our efforts, transboundary conflicts over both water allocation and water quality are numerous.

This topic is certainly not new to the readership of this journal and other *Update* issues have addressed similar topics. The goal of this issue is to give a broad overview of some of the complexities associated with transboundary water resource management. The articles in this issue will stress examples of continued stumbling blocks, but will also illustrate a few cases that may give us cause for cautious optimism.

The issue is divided into two sections. The articles in the first section provide background and insight on some of the general complexities associated with managing a transboundary resource system. The second set of articles includes several case study pieces illustrating some progress made in transboundary water resource management.¹

COMPLEXITIES

The first two pieces in this issue examine issues related to the legal constraints governing shared water resources. As rivers have little regard for jurisdictional boundaries, an interstate river or an international river is typically subject to varying sets of rules. The first paper in this special issue examines conflicts and tensions between federal and state laws in the United States. Federal laws will be a constant for interstate rivers, but state laws may be highly variable. The question of the

interface of state and federal laws is the focus of the first paper. Huffaker, et al. examine federal intervention in state water policy and illustrate the immense complexities involved. The second article in this issue examines international water law. McCaffrey provides an overview of the Convention on the Law of Non-Navigational Uses of International Watercourses. This paper provides both a summary of convention and a look at its potential future value.

Conflicts and disputes over water resources are certainly not restricted to state and federal governments. Interjurisdictional disputes can involve local governments, irrigation districts, and tribal interests. Mechanisms available to deal with these disputes are no less complicated. In the third article in this issue, Colby compares voluntary and compulsory water reallocation mechanisms used in the western United States for the resolution of transboundary environmental water conflicts. This paper outlines the necessary components of a successful strategy to resolve disputes over water and environmental quality. While the focus is on interjurisdictional disputes in the western United States, the insights are clearly valuable for international water disputes.

The final paper in the first section provides an overview of the risks and potential for international conflicts over water resources. Wolf examines security issues related to water resources with a focus on “human security” and environmental quality. He overviews the existing legal and institutional mechanisms available at the international level for dealing with water crisis and water conflict. These include legal principles, international institutions, international water treaties, and technical options. Examples provided suggest that geographic scale and intensity of conflict are inversely related. This paper suggests that while current legal and institutional capacities are limited, progress has been made. Some examples of progress are presented in the second section of this issue along with some highlights of continued difficulties.

¹ The invited articles in this issue were peer reviewed.

PROGRESS, POTENTIAL SOLUTIONS AND STUMBLING BLOCKS

The first two articles of this section present specific transboundary conflicts and potential solutions to those conflicts. The last three articles focus more generally on water allocation, trading, and markets as partial solutions.

The first article in this section examines the ongoing negotiations and water conflict in the southern United States between the states of Alabama, Georgia, and Florida. These states have been attempting to negotiate two interstate compacts for the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint River basins. The chief stumbling block has been an allocation formula for water use. While interstate allocation compacts have been frequently used in the western United States, these compacts would be the first allocation compacts in the eastern United States. This paper presents the issues and complexities and obstacles to successful negotiation. While progress has been made in getting many stakeholders involved and in data sharing, this article illustrates some of the large stumbling blocks that still exist.

The second article in this section examines the water dispute among the riparians of the Jordan River watershed. Albert discusses the Arab-Israeli dispute and assesses “unconventional” supplies, such as desalination, water imports and the reclamation of wastewater, for their relevance as potential solutions to this longstanding conflict. The geo-political character of the unconventional supplies and the potential environmental costs of wastewater reclamation are highlighted.

Finally, in this issue are three articles that are linked by the fact that they all discuss trading and water markets. Anderson and Landry present arguments for the use of water markets as a potential solution to water shortages. Their paper presents examples from around the world

where markets have been used successfully to resolve water shortages including water exports and interstate trading. Other examples highlight some of the potential difficulties with the development of water markets. While markets may be a potential solution to some problems, stumbling blocks such as the existence of tradable rights, political constraints, and inefficient prices prohibit well functioning markets in many places.

Roumasset and Smith examine the complexities associated with the efficient allocation of water over space and time. They present the case of two water districts on the Island of Oahu that share an aquifer. One of the two districts also has access to its own surface water supplies. They illustrate the concepts of efficient water allocation with two sources – a solution that is generalizable to other areas managing conjunctive use. They suggest water trading across districts and outline the necessary components for efficient water trading.

Yolles discusses recent progress in California water markets. This paper provides a history of water markets in California. He also provides a description of the current state of the market including a discussion of the for-profit companies and non-governmental organizations that have entered the market. Yolles provides an outline of existing obstacles and legislative and legal solutions. California has continually been at the forefront of water marketing with the implementation of the drought water bank with organizations such as CALFED. With all eyes on California, tracking the progress and continued stumbling blocks rounds out this issue on transboundary water resources.

While there are numerous cases, obstacles, and potential solutions that have not been mentioned in this issue, these papers illustrate some of the enormous complexities surrounding transboundary water resources management. These authors have also provided us with some key insights and have given us reason to be cautiously optimistic about the future.