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## Transboundary Freshwater Dispute Resolution: Theory, Practice, and Annotated References, by Heather L. Beach, Jesse Hamner, J. Joseph Hewitt, Edy Kaufman, Anja Kurki, Joe A. Oppenheimer, & Aaron T. Wolf

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## REVIEWS

*Transboundary Freshwater Dispute Resolution: Theory, Practice, and Annotated References.* By Heather L. Beach, Jesse Hamner, J. Joseph Hewitt, Edy Kaufman, Anja Kurki, Joe A. Oppenheimer, & Aaron T. Wolf. New York: United Nations University Press, 2001. Pp. 324. \$19.95 soft cover.

Water may be the leading environmental challenge of the next century according to this book and the American Academy of Arts and Sciences. To solve conflicts over water will, the book maintains, be central to secure international relations. If this is true, the topic of this book is of great significance to every region of the world: more than 200 international rivers worldwide cover more than one-half of the total land surface.

The authors state that their goal is to provide a comprehensive review of the relevant literatures on water disputes and on managing conflicts stemming from water quantity and quality problems around the world. Their additional aims are to promote an understanding of the etiology of disputes and to learn lessons to prevent future conflicts.

The number and affiliations of the authors, the number of pages of text (76) versus pages of appendices (case studies from the Danube to the Lesotho Highlands, treaty summaries, annotated literature, bibliography, for a total 248 pages) are an indicator of how well and to what extent the authors have met their goal. They have, but in a way that makes for a sometimes frustrating and fragmented reading experience.

The authors point out that few comprehensive and interdisciplinary analyses of international or transboundary surface water conflicts have been produced. They have in this volume gone a long way to fill the gaps in our knowledge of the subject matter. They approach their subject systematically and with several building blocks. The document is divided into several sections. Under a part labeled "Theory," they review the organizational and related literature on management of transboundary freshwater. Here the authors address alternative dispute resolution techniques (ADR), international water law, and integrative and institutional approaches and provide case study examples of solutions to disputes. They do not find adequate management capabilities in any of these places since "just as the flow of water ignores political boundaries, so too does its management strain the

capabilities of institutional boundaries." They note that treaties themselves, an obvious place for an international lawyer but not necessarily a policymaker or social scientist to look, contain useful information but are "largely undiscovered." (Yet even when known some legal principles have limited application, most likely because of their vagueness or complexity. The Helsinki Rules, which list at least 11 considerations in defining "reasonable and equitable" use of water, reportedly were used only once and even then not for a specific allocation of water.)

A chapter on the use of optimization and game theory addresses allocation and use of waters. Here the authors conclude that, no surprise to many but worth underscoring, it is necessary to identify the set of assumptions leading to suggestions of economic solutions. "Even with this identification in mind, one can still argue that economic principles are among the sufficient, but not the necessary, conditions for a dispute to be solved." For those who have hopes for international environmental cooperation it is reassuring to be reminded of Axelrod's argument: "A player who in an opening move acts generously and on a responding move acts cooperatively, never initiating attack, will outscore any other strategy, given time and averaging."

As we look to conflicts throughout the world, however, this set of circumstances does not seem to prevail. In chapter 4 (Part 3, Practice) the authors describe the background of some disputes and compare them along several analytical criteria; these include the extent of scientific agreement on the nature of the problem and the existence of institutions and preexisting authorities for redress. Here a description is offered on how the database of water related treaties was acquired and studied. It is of interest that the most difficult part of the coding was to determine the treaty's "principal focus." There are some surprising results: only one multilateral treaty exists among industrialized nations for allocation of a water source; allocation of compensation for land flooded by dam projects is common; and the next possible step in treaty development, based on increasingly sophisticated technology, may be the creation of mutually enforceable provisions.

The concept of environmental security is the subject matter of one chapter. This is an important contribution because a considerable part of the analysis of disputes in water can be, but perhaps should not be, put in the context of the vocal, often nasty, and widely followed debate on conflict linked environmental stress. The authors succinctly summarize competing positions on this topic. They also address the overarching problem of resource scarcity reviewing scholarship that focuses on oil, land, roads, fisheries, and the atmosphere. Interestingly, in light of the opening premise of the book, water conflicts are rarely heard in the International Court of Justice and "no all-out war has ever been

caused by water resources alone." Yet the work provides ample evidence that controversies over natural resources are implicated in much regional tension and raises questions about the potential political value of a leader's ability to provide social and physical infrastructure to sustain a region's resource base.

On the other side of the equation—where the environment can be a vehicle for promoting cooperation—the authors echo the views of many students of conflict resolution on the environment in general and water in particular. They conclude that although national sovereignty clearly emerges as an obstacle, "working across national lines could generate other types of collective identity, overlapping interests of domestic groups of different riparians, and adherence to other regional configurations."

The shorter treaty summaries—there are 80 pages of them, from the Amazon Basin to the Zambesi Basin—provide profile information: title, basins involved, monitoring capability, enforcement approach if any, information sharing, and related characteristics, each in a phrase or sentence of coded information. There are more detailed case studies of watersheds (the Danube, Euphrates, Jordan, the Ganges, Indus, the Mekong, the Nile, Plata, and Salween); aquifer systems (U.S.–Mexico and the West Bank [included with the Jordan watershed]); lakes (Aral Sea and the Great Lakes); and Engineering works (Lesothos Highlands). These vary in depth but each addresses the nature of the problem, its background, attempts at conflict management, and an outcome. The relative difficulty of resolving these types of challenges is reflected in the outcomes of two North American case studies. About the U.S.–Mexico shared aquifers: "despite the presence of an active authority for cooperative management, and despite relatively warm political relations and few riparians, negotiations have continued since 1973 without resolution." The International Joint Commission of Canada and the United States of America is exceptional in that it has "effectively and peacefully" managed the boundary waters of the two neighbors over more than 90 years, and resolved more than 130 disputes.

*Transboundary* is an exhaustive tome characterized by the wide-ranging expertise of its authors and the clarity of the description of the methods used for compilation. It has the strengths of a book written by so many people, across disciplines, from conflict management to cartography, but also its weaknesses. It could have been better edited; and clear editorial decisions on some of the matters eluded the group. For example there is an appendix that is labeled Treaty summaries ("There follows hard copy preview of computerized compilation of international water treaties...") that contains entries such as "Treaty of Peace with Italy, signed at Paris, on 10 February" and "01/12/1976 Segundo protocolo, 1947," with no other explanatory detail. And as to

the Annotated Literature Appendix, which is quite valuable if one is looking for help on a decision to read an already identified author, the editors are candid: "There was no systematic judgement made as to what would be included or excluded." This is explicitly a work in progress with the authors seeking suggestions of additional citations.

This is a valuable reference resource for scholars and policymakers. It is not a book that one reads, sherry in hand, next to the fireplace. And it uses an irritating set of acronyms throughout (TFWs, TFWDPs). Rather it is a work that will be pulled out again and again to assist with various tasks, ranging from completing an inventory or checking the background of a conflict to searching for systematic relations among types of environmental stress and some manifestations of conflict. Despite the rather ponderous organization of the book, its conclusions—those that others have also reached—are important: There is a rampant lack of consideration of water quality in deciding questions of water quantity. Rights allocations are not made sufficiently specific. Political power in decision making plays a disproportionate role and, as was commonplace a half decade ago but should have been less the case now, there is "a general neglect for environmental concerns in water-resources decision-making."

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*Desert Puma: Evolutionary Ecology and Conservation of an Enduring Carnivore.* By Kenneth A. Logan & Linda L. Sweenor. Washington, D.C.: Island Press, 2001. Pp. 463. \$70.00 hardcover, \$45.00 paper.

The authors' work launches a "flag-ship" study for the Hornocker Wildlife Institute and emerges as a landmark in puma research and conservation, an epic journey in the pursuit of knowledge of these illusive big cats. The ten-year study from 1985 to 1995 explores the secret life of desert pumas inhabiting the San Andres Mountains of New Mexico. This first long-term intensive study of pumas living in a desert environment becomes the largest investigation ever conducted on any single puma population. It encompasses about 9,780 total person days of field research, with capture and release of 241 individual pumas. Tracking the big cats year round by air and ground gives nearly 14,000 radiotelemetry locations, yet this is only a fraction of the total effort and material presented in this monograph.