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Book Review

Principles of Water Resources: History, Development, Management, and Policy
Thomas V. Cech
John Wiley & Sons, Inc., 2003, 480 pp., ISBN 0-471-43861-8

Water mixes and mingles with cultures and economies in complex and, often, controversial ways. Because of the complexity and controversy, books that attempt to introduce students and the public to the general topic of water resources are often deemed inadequate—the subject is too complex to describe adequately in one book. Tom Cech's description of water resources does not fall into this category, but rather excels in meeting its purpose—to explain 'water resources' to a wide audience.

The book blends the best of water education and modern textbook writing with a sound understanding of the science, technology and policy of water resources management. The author's experience in education and management results in a highly readable book that is both thorough and informative. Cech conveys an enthusiasm for water resources that literally jumps of each page.

The book begins (Chapter 1) by establishing a historical context from which to approach the study of water resources. The evolving use of water, along with the evolving technology to supply water, is briefly summarized for the period 3200 BC to the 1880s for various cultures around the world. The natural physical processes of water, including the hydrologic cycle, are presented next (Chapters 2–4) from a global perspective to the watershed level. The description includes such scientific concepts as the Blaney–Criddle method for estimating evapotranspiration and the Thiessen method to estimate precipitation over an area while also describing such concepts, in a balanced manner, as weather modification to enhance flows and groundwater mining. Simple word problems are presented, under 'Expert Analysis', to introduce the reader to the scientific dimensions of hydrology.

The physical infrastructure that controls and transports water to points of human use, e.g. cities and irrigated fields, is discussed in Chapters 5 and 6. Dams are described in a manner that reflects the benefits and 'costs', including environmental, of their development and use. Water law, and the agencies that implement the laws, are described in Chapters 7–9. The need to allocate water among competing interests is described, from the Code of Hammurabi to the Riparian and Prior Appropriation Doctrines. Twelve federal agencies, involved with the development, management and protection of water in the US, are described via brief overview, history and current policy issues confronting each agency. The array of local, regional, state and multi-state water agencies is described by category with examples to illustrate the roles these agencies play in water resoures management today.

Water quality, as a topic, is presented (Chapters 10 and 11) from the perspect-

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ive of the components that have an impact on human and ecosystem health, the treatment of water before it is distributed for human use, and treatment, again, before wastewater is discharged back to the environment.

Chapter 12 discusses the relationship between water and the health of our environment. Several case studies in this chapter address key points of conflict between the water needs of humans and the water needs of the environment. Chapter 13 expands on the concept of water conflicts, or water wars. Several conflicts, which have water as a major element, are presented in detail, including the Middle East. The book ends with a view toward the future of water resources management. A number of issues are identified as key to a successful water future for the Earth. The appendices provide conversion tables, instructions for reading topographic maps, and information on selected environmental organizations.

The book provides information about water at several levels, but its greatest strength is the balance between science and policy. The structure of the book provides a framework for presenting the balance. For example, the book employs numerous clarification features such as sidebars, 'A Closer Look' inserts, 'Policy Issue' discussions, Guest Essays, Expert Analysis (word problems), and Recommended Websites, strategically placed throughout. This imaginative and creative presentation of water information keeps the reader engaged. It is this use of complementary mechanisms for conveying water information that distinguishes the book from many others on the topic.

The book appears ideal for a junior or senior level college class, taught as a service course to majors from many disciplines. It is an excellent introduction to water resources and could be used without supplementary readings. The book is presented as a textbook and it meets that purpose extremely well. I would suggest that many professional water managers and instructors would, as I did, find the book interesting, especially from the perspective of examining how to relate water resources to the public. I highly recommend the book to anyone who wants to learn about, or to teach others about, water. Cech, with this book, clearly explains the complexity of water resources in a highly engaging and thorough manner.

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