

## *Valuing Ground Water: Economic Concepts and Approaches*

by the Committee on Valuing Ground Water, Water Science and Technology Board, Commission on Geosciences, Environment, and Resources, National Research Council, National Academies Press, 1997, \$42.95.

Reviewed by **Gary C. Burchard, R.G.**  
– Metropolitan Domestic Water Improvement District, Tucson

I must admit I was a little afraid to even begin reading a book written by a committee of a board of a commission of a council. I was certain so many layers of bureaucracy would have watered down the report sufficiently to make it worthless. I am pleased to report that my prejudice was unwarranted. *Valuing Ground Water* is hardly intimidating, comprising less than 200 pages, including index and appendices, and it has value.

The book's executive summary provides a clue to one of its important lessons: "Ground water in the United States is usually considered as either an invaluable good or as a 'free' good." Thus, this book meets head-on the paradox formulated by Adam Smith, who noticed that diamonds have little true usefulness, yet cost much; while water, which is essential, costs little. This book focuses specifically on the economic value of groundwater.

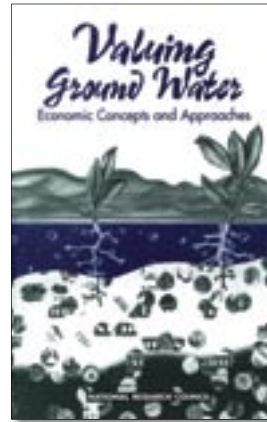
The book contains sections that cover groundwater resources, economic valuation, legal considerations, and case studies. Appendices contain a useful glossary of economic terms and a sample portion of a contingent valuation method questionnaire.

*Valuing Ground Water* provides a broad view of economic concepts as related to hydrology. For example, the total economic value (TEV) of groundwater includes not only the usual municipal, industrial, and agricultural (extractive) uses of groundwater that typically come to mind, but also in situ services such as buffering against surface water shortages, preventing or minimizing land subsidence, and providing base flow and thus habitat.

While reading this book, I felt I was being presented with a formal defense for valuing groundwater as an economic resource. Water utilities typically do not charge the full cost of the water they serve, but only charge for pumping, treating, and delivering water to their customers. True depreciation or consumptive costs of the water system are not passed on, and revenues do not pay for replacement of aging infrastructure. Because most city councils take pride in not raising water rates, our grandchildren will be saddled with the hefty costs of replacing worn-out delivery systems.

The authors of *Valuing Ground Water* point out that the picture for future generations is actually even worse. If groundwater is extracted faster than it is replenished, then an opportunity cost also exists: "Greater use of the resource today diminishes future opportunities for use. . . . Failure to take higher scarcity value of water into account will lead to extra costs to society by imposing extra scarcity on the future." Thus, the theme of intergenerational equity runs strongly through the book. Not only is increased scarcity of water resources imposed upon future generations, but also the costs associated with a depleted aquifer, including greater lift costs, deeper wells, and often lower-quality water.

The authors contend that adequate knowledge of a groundwater asset's true



value is necessary for proper allocation of water among various competing uses and for proper allocation of state and federal funds to clean up contaminated aquifers. Numerous economic valuation methods are objectively provided, including strengths and weaknesses for each. The authors also assert that successful groundwater valuation efforts will necessarily be interdisciplinary, involving economists, engineers, hydrologists, and often health and biological professionals.

This book is not, however, without its weak points. While the chapter on legal considerations is interesting and illustrates the legal effects on groundwater's value, the contents are not clearly tied to the valuation methods themselves. Secondly, the authors admit that few projects have been completed where groundwater TEV has been determined. Even the elucidating case studies can provide only conceptual illustrations of what could or should be done in various situations.

If you need a handbook or manual for completing groundwater valuations, this book is not for you. However, the authors clearly and effectively present valuation concepts and approaches, and offer well-reasoned arguments on why groundwater TEV has the potential to become the standard. I recommend *Valuing Ground Water* for water professionals in all sectors.

Visit [www.nas.edu/nrc](http://www.nas.edu/nrc). Contact Gary Burchard at [gburchard@metrowater.com](mailto:gburchard@metrowater.com).

The advertisement is for Errol L. Montgomery &amp; Associates, Inc. It features a green and white color scheme. On the left, there is a circular logo with a stylized 'E' and 'M'. To the right of the logo, the company name 'Errol L. Montgomery &amp; Associates, Inc.' is written in a large, bold, serif font. Below the name, the text 'Consultants in Hydrogeology' is written in a smaller, sans-serif font. Further down, there are three contact locations: Tucson, Arizona (520) 881.4912; Scottsdale, Arizona (480) 948.7747; and Santiago de Chile 011 (562) 246.4275. On the right side of the advertisement, there is a list of services: Recharge &amp; Recovery, Water Quality Compliance, Groundwater Resources Development, Contamination Assessment &amp; Remediation, Surface Water/Groundwater Interaction, Environmental Monitoring, and Mining Hydrology. At the bottom right, there is a circular image of a globe showing a landscape with a blue sky and a brown ground. The website address 'www.elmontgomery.com' is printed at the bottom center.