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Water Follies: Groundwater Pumping and the Fate of America's Fresh Waters, by Robert J. Glennon

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states for control of the Pecos. As a lawyer I had been involved in that lawsuit for 10 years from the late 1970s on. I wrote the book between 1990 and 2000, in the last ten years of the interminable water war. My book really deals with legendary New Mexico State Engineer Steve Reynolds and his inability at the end of his long career to keep up with the many changes that were coming to western water law. A man who always had known what to say in any circumstance, Reynolds had finally been silenced, first by a judge who wouldn't let him speak and then by death.

Like Reynolds at the end of his life, I found that I had nothing to say at the end of the book and when it came time to write the last chapter. I wanted to conclude with some real solutions to the awful problems created by *Texas v. New Mexico*, but I had none. I couldn't see a clear path ahead to some new Pecos River world. So instead of heading into that morass, I turned 90 degrees and headed off into my own confusion as a water lawyer and irrigation gardener. My last 10,000-word chapter expressed that personal confusion.

The UNM Press published the book, last chapter and all, this summer, the driest of all in 100 years. *High and Dry* got good reviews, but the critics especially liked that "surprising" (as one reviewer politely called it) last chapter. And now, reviewing the water books of others, I know why.

Having lived intimately with southwestern water for thirty years, I am confused about where we are and where we want to be. Such confusion reflects conflicting values, conflicted attitudes, many words, in lots of languages. Somewhere in that confusion lies the path to a new water myth for the desert southwest and the rest of the world. The torrent of words in a dry season, the flood of technical articles by economists exploring "sustainability," the plethora of new books this year mark this struggle to find a new language to describe our new situation. Write on.

REVIEWS

Water Follies: Groundwater Pumping and the Fate of America's Fresh Waters. By Robert J. Glennon (Washington, D.C.: Island Press, 2002) Pp. 314. $25.00 cloth.

The Tragedy of the Hidden Commons

What do fly fishing in Wisconsin, sight-seeing in San Antonio's River Walk, swimming in Massachusetts' Ipswich River, growing alfalfa in Nevada, building a vacation home in Florida, and bird watching in Southern Arizona have in common? All of these seemingly unrelated

activities are threatened by increasing reliance on groundwater. In a series of fascinating vignettes from all parts of the United States, Robert Glennon provides able testimony about the unintended consequences of largely unregulated groundwater mining. In his words,

> The excessive pumping of our aquifers has created an environmental catastrophe known only to a few scientists, a handful of water management experts, and those unfortunate enough to know the consequences.

What is excessive pumping? Sustained use or sustainability is a lofty but seemingly unobtainable goal for those who use, and those who try to regulate the use of, groundwater. Groundwater mining—where withdrawals exceed recharge—is the norm not only in the western United States but throughout the world including certain areas in the water rich eastern United States. In the semi-arid West, developers and land use planners may argue about whether the aquifer will yield a 40, or 70, or even a 100-year supply, but sustained use is not an option. Moreover, a careful consideration of the environmental impacts of prolonged pumping rarely occurs. Restricting withdrawals to the amount of recharge is thought to be ludicrous, unobtainable, or just plain silly.

Interestingly, the uninitiated and uninformed members of the public often assume that policies and laws governing groundwater are designed for sustainability. But they are sadly mistaken. A few years back, biologist Garret Hardin coined the phrase "the tragedy of the commons" to describe how the uncontrolled use of common-pool resources such as air, water, and public lands inevitably leads to overuse and degradation. For several years, Robert Glennon, the Morris K. Udall Professor of Law and Public Policy at The University of Arizona, has consistently talked and written about what might be called the tragedy of the hidden commons. Unlike other common-pool resources, groundwater supplies cannot be seen, the amount and quality of water in storage cannot be accurately measured, and the results of overuse often are hard to recognize. Not surprisingly, Glennon's topic does not make him the most popular person at water industry conferences, not only because he tends to support costly environmental protection but also because he seeks to challenge the basic paradigm of water laws and policies, the notion that surface and groundwater should be considered separately.

In 1990, Glennon caused a hubbub at the ten-year-reunion conference of Arizona's 1980 Groundwater Management Act, making headlines by claiming that the Act's goal of "safe yield" would not be achieved unless significant amounts of irrigated lands were acquired and taken out of production. In *Water Follies*, Glennon's chapter on the plight

of Arizona's San Pedro River is especially poignant and obviously based on first hand experience. The San Pedro River Basin, named by *Birder's Digest* as the premier bird watching site in the United States and by the Nature Conservancy as one of the Last Great Places in the Western Hemisphere, provides a core sample of the controversy between environmental protection of riparian habitat and urban growth dependent on groundwater. Moreover, the chapter shows the continued resistance of public officials to the notion that groundwater pumping several miles from a stream can, in fact, dry up the stream and devastate the riparian habitat.

Determined to spread the word to a larger audience, each chapter details the unfortunate environmental consequences of groundwater mining. In Wisconsin, for example, a blue ribbon trout stream is threatened by groundwater pumping proposals of the famous Perrier Company. Not content with simply presenting the facts of the particular case, Glennon provides enough contextual "zingers" to argue that this is not an isolated incident, but rather is a harbinger of things to come. We learn that Perrier—owned by the Nestle Corporation, the world's largest food and beverage company—bottles water under its own brand and hundreds of other brands including Arrowhead, Calistoga, Ozarka, and Poland Spring. And bottled water is big business with demand skyrocketing from 415 million gallons per year in 1978 to 5.4 billion gallons per year in 2001. How will Perrier produce the 43 billion 16-ounce bottles of fresh spring water demanded by about 60 percent of Americans? Simple, pump groundwater. Glennon details how Perrier's experts interpret the complex and not fully understood interaction between ground and surface water to satisfy themselves and persuade others that the proposed pumping will have little impact. Coupled with the allure of new jobs and an increased tax base, decision makers understandably go for the short-term economic benefits, preferring to deal with long-term costs if, and when, they arise. And this pattern is repeated wherever Glennon seems to look.

Glennon details how groundwater use produces devastating impacts not only in the semi-arid West but also in several eastern states including Georgia, Florida, Maine, and Massachusetts. Regardless of the legal regime that supposedly controls groundwater use, Glennon finds a consistent tendency to ignore hydrologic limits, which in turn leads to subsidence, riparian habitat destruction, depleted surface water flows, interstate conflict, and even international impacts such as the case of the Atlantic Salmon fisheries. Glennon's stories should be a clarion call to the environmental community. Less obviously, Glennon effectively destroys any notion that prior appropriation and riparian-based legal regimes are fundamentally different, at least with respect to controlling unintended consequences. Glennon is fond of describing programs to address the

consequences of reliance on groundwater as schemes that would make Rube Goldberg proud. Although his research is perhaps not rigorous, his message is forcefully conveyed.

At points, Glennon perhaps gets too caught up in the fervor of his mission. For example, he explains interstate water problems as the inevitable result of the greed of each state to hoard and use as much water as possible. Surely, the metaphor he uses, there is no honor among thieves, can't adequately capture the complex institutional and legal constructs of interstate water allocation, let alone the complex motivational forces of human behavior. Perhaps in recognition of his tendency to rely on polemics instead of analysis, Glennon spends the last two chapters trying to define the problems theoretically, primarily as an example of the tragedy of the commons. Interestingly, Glennon, who is often stereotyped as an environmentalist, finds hope in the use of markets. Regardless of location, he notes that groundwater is seen as a commodity but is highly undervalued. Using the example of the Australian lobster industry, he advocates the issuance of licenses for existing uses only. New uses are prohibited except to the extent that licenses are reallocated via market transactions. Applied to groundwater, new uses similarly could be prohibited but market mechanisms could be implemented to allow for reallocation. Hopefully, Glennon and others will develop these ideas more fully in future work.

Although Professor Glennon has some difficulty deciding whether his mission is to rally the troops, educate the public, or conduct public policy analysis, this is an important book. Like Mark Reisner's *Cadillac Desert*, the book provides an interesting and alarming exposé about how existing policies, programs, and uncertain scientific knowledge can be used to produce substantial profits, limited public benefits, and devastating environmental costs.

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Energy, the Environment, and Public Opinion. By Eric R.A.N. Smith. Lanham, MD: Rowman & Littlefield, 2002. Pp. 264. $72.00 cloth; $26.95 paper.

In *Energy, the Environment, and Public Opinion*, Eric R.A.N. Smith looks at the fragile interplay between energy policy, the environment, and public opinion. He explores this interplay by looking at the history of energy development and policy in the United States and tries to explain that history by using various types of public opinion studies.