Creating a Sense of Urgency

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Blue Revolution: Unmaking America's Water Crisis. Cynthia Barnett. Beacon Press, 2012. 296 pp., $16.00 (ISBN 9780807003282 paper).

Unquenchable: America's Water Crisis and What To Do about It. Robert Jerome Glennon. Island Press, 2010. 432 pp., illus. $19.95 (ISBN 9781597268165 paper).

Water Security: The Water–Food–Energy–Climate Nexus. The World Economic Forum Water Initiative, 2011. The Center for Resource Economics. 272 pp., illus. $30.00 (ISBN 9781597267366 paper).

> *The biggest challenge facing water managers in the United States is to convince the public that there is a problem.*
>
> Steve Robbins, General Manager of the Coachella Valley Water District (quoted in Glennon 2010, p. 78)

The need to convince the public of the reality of water supply problems has given rise to a steady stream of books delineating the dire crisis that we face if we do not take immediate and drastic action to change the way we use and manage water. Given that the most popular title among these books ranks below 17,000 on the Amazon bestseller list, reaching the public will be an uphill slog. Two worthy attempts to sound the alarm are the titles *Blue Revolution: Unmaking America's Water Crisis*, by Cynthia Barnett, and *Unquenchable: America's Water Crisis and What To Do about It*, by Robert Jerome Glennon. Both books are packed with interesting and well-researched anecdotes. A compelling narrative is essential to getting the public's attention, and in this, both books succeed. The devil, as always, is in the details.

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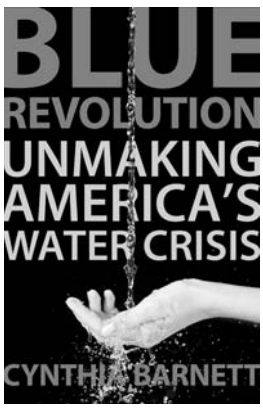
Blue Revolution, like most every other book about America's water crisis, opens by describing the increasingly profligate use of water in this country. "Power plants," Barnett states early in the discussion, "drink up more than any other sector of the economy." Readers might find themselves scratching their heads when, in the same paragraph, she asserts that "agricultural irrigation… is by far the largest drain on our aquifers and rivers." Which is it—power plants or agriculture? Confusion arises not from a gross error on Barnett's part but from the flawed notion that we "consume" water in the same sense that we consume oil or hamburgers. Our consumption of such commodities extracts their usefulness in a manner that modifies their chemistry and prohibits any possibility of easy reuse. By contrast, we relocate water, or we contaminate water, but we rarely consume water.



When we use water, what we are really consuming is the purity, accessibility, and utility of that water for other end uses. Power plants heat water. Agricultural use disperses water to the soil, atmosphere, and growing plants. *Blue Revolution* acknowledges this point, but it is more of an afterthought than a fundamental perspective. If we are to understand and address the looming challenge we face with respect to our water supplies, we need to strike the word *consumption* from our lexicon. Barnett states that the electricity consumed (per day) by the average American household requires 750 gallons of water to produce. But cooling power plants, flushing toilets, irrigating plants, and hydrating humans have radically different effects on water that cannot and should not be equated with one another.

Barnett does understand the fundamental disconnect between our use of water and the availability of sustainable supplies. Her compelling examples make this case eloquently. However, she asserts that the crisis can be solved by a new water ethic that is focused on respect for local water supplies. Although the water crisis has powerful moral implications, Barnett does not make a convincing case that an ethical movement will solve it. She cites Australia's response to its severe shortage of freshwater as a model for this new water ethic. A close reading of this section suggests that the motivator for dramatic changes in Australia's water management was the proximity of impending disaster rather than a moral awakening. The Australians have busied themselves by building desalination plants to avert this disaster. Radically changing lifestyles to reduce water consumption so that existing water supplies are sufficient would suggest the emergence of a water ethic, but adding desalination plants is a technological fix designed to reduce the need for difficult choices.

A lack of rigor in Barnett's moral premise is most evident when she bemoans the fact that only 11.5 percent of working engineers in the United States are women and suggests that a new water ethic might be achieved more quickly if this percentage were higher. Barnett then undercuts her own theory 20 pages later, when she describes how the Sisters of Charity

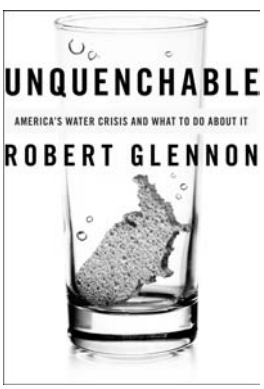
in San Antonio, Texas, which owns a critical section of the watershed of the San Antonio River, so mismanaged that land in the 1970s and 1980s that the river began to dry up. The Sisters resisted efforts to get them to change these practices until 2002, when they had a change of heart and committed themselves to protecting the river.

Water poses the ultimate crisis of the commons. The biggest free lunch on the planet is the endless supply of pure freshwater provided by the hydrologic cycle, and the chances that goodwill and good deeds alone will motivate people to let their lawns turn brown may be naive. Without an economic system that properly values that water, motivating the thoughtful use and conservation of water supplies is a daunting task. It would be wonderful if Barnett's water ethics could carry the day, but, again, mass public attention is key. Barnett is an effective preacher, but the majority of those reading this book are likely to be members of the choir.

The part of *Blue Revolution* that Barnett gets absolutely right is that solutions to the crisis of water must begin at a local level. No two water supplies are the same, and water needs vary dramatically from one community to the next. The long-term survival of any community depends on protecting water sources and withdrawing water at a rate that matches its renewal. Opportunities for creative conservation and reuse of water must work within the constraints of the purity of those supplies and the nature of local industry, agriculture, and climate.

In *Unquenchable*, Glennon, like Barnett, offers a parade of anecdotes to argue that we need urgent, fundamental changes in the way we use water in the United States. A lawyer by training, Glennon seems even more averse to thorough quantitative reasoning. Chapter 2 ("Wealth and the culture of water consumption") describes showerheads that deliver 80 gallons per minute, mountains in Georgia covered with artificial snow, the pumping of groundwater to fill reflecting ponds for wealthy homeowners in Wyoming and Montana, and the construction of a massive water park in Arizona. He then spends almost half of this chapter deriding the use of bottled water as "the epitome of luxury."

Bottled water is a convenient whipping boy, because it is one of the more visible misuses of resources related to water, but to choose it as the centerpiece for a discussion of our water crisis suggests a fundamental misunderstanding of the issue. Glennon derides the waste represented by the 8 billion gallons of bottled water that Americans consume each year, but this is a trivial quantity in the context of our annual water use. Agriculture alone averages this amount of water withdrawal in less than three *hours*. The problems with shipping large quantities of purified water around the country in tiny plastic bottles involve wasted fossil fuels and a contamination of the environment. It is a waste of petrochemicals to make the bottles, a waste of fossil fuels to drive them around, and a waste-management problem to ensure that as many bottles as possible are recycled.



Glennon's discussion of the relationship between water and energy is focused on the role of water in the extraction of fossil fuels and in the production of electricity. He also makes a reference to the impact of global warming on water resources. He does not explicitly mention the fact that all of our demands for water are really demands for energy, and he does not recognize the fact that energy is the single unifying theme in our quest for water at a quantity and a level of purity that is appropriate to our needs.

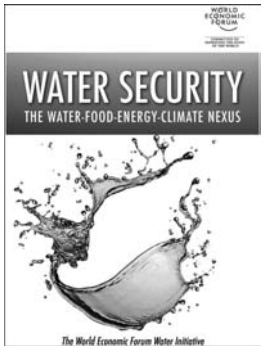
In his conclusion, Glennon's list of 16 recommendations ("A blueprint for reform") lacks a systematic approach to the problem of a water shortage. Some recommendations, such as "appreciating the critical role played by water in the economy," "creating market incentives," and "abandoning business as usual," are so vague as to have little meaning. Others, such as "separating storm water from sewer water" and "metering water use" are more specific and, although they are good, suggest that the author has taken on an agenda too broad to give his book focus.

Both Barnett and Glennon fail to fully understand that there is no water shortage. Our planet has few things in greater abundance than water. Our problem is that water is often unavailable in the place we need it and at the level of purity we require. If we distill this crisis to its essence, we do not have a water crisis at all. We have an energy crisis.

The hydrologic cycle consumes more energy than any other process on Earth. Primary energy currently used by all the humans on the planet over the course of a year would last a matter of hours if it were needed to power the mammoth engines of evaporation that produce Earth's supply of freshwater. The point is this: The energy required to generate freshwater is not directly reflected in what we pay for that water. This flaw in our economic system allows us to squander freshwater in the ways mentioned by both Glennon and Barnett. Our efforts to bend the hydrologic cycle to match our needs by purifying water and transporting it over vast distances all require energy. In the past, we have relied on energy and engineering to solve our water problems, but those options are disappearing just as our crisis appears to be accelerating.

A third book worth mentioning, in which the fundamental truth about water shortage is front and center, is entitled *Water Security: The Water–Food–Energy–Climate Nexus*. Heavy with statistics and scrubbed of anecdotes, this book understands the entwining issues. In many ways, it was written by water managers for

managers. Prepared for the World Economic Forum Water Initiative, it is a compendium of work by water experts in industry, academia, government, and nongovernment organizations. The project grew out of a realization on the part of the Forum's leaders that water is an essential element in all of the emerging world crises that the Forum was trying to address.



This brings us back to the challenge of convincing the public that there is a water crisis. Barnett and Glennon rely heavily on anecdote, because as any writer knows, anecdote sells. There is nothing wrong with this approach if the underlying logic is strong. The best book ever written on the American water crisis, Marc Reisner's *Cadillac Desert: The American West and Its Disappearing Water* (1986), is essentially one long anecdote about water in the American West. More than two decades after its publication, even after the author's untimely death, the book outsells and outshines all of the more recent competition.

Hovering below 400,000 on the Amazon bestseller list, *Water Security* utterly fails at the challenge of alerting the public. It is a book written by a committee, and it reads like one, but it gets the story right. Even its title makes the case that water, food, and energy are woven together inextricably to form the very web that sustains human existence. The disregard for sustainability inherent in the rate at which we pump freshwater from rivers, lakes, and aquifers around the country holds the potential to destroy this web. Taken together with our patterns of food and energy consumption, we seem to be on a track to disaster with increasingly fewer options for reversing course. And we are asleep at the switch.

These authors are trying to wake us up. At stake is nothing less than the survival of human civilization as we know it. Each of their books struggles to awaken us and start us on a path toward sustainability, using only the power of words and ideas. If we do not heed their words, crises will force change on us in ways that guarantee pain and disruption far more radical than those that might result from undertaking the changes these books propose. The challenge is getting our attention. The alarm is ringing. Is anyone listening?

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Robert D. Morris (drbobmorris@gmail.com) is an environmental epidemiologist and a leading researcher in the field of drinking water and health. He has taught at the Tufts University School of Medicine, at the Harvard University School of Public Health, and at the Medical College of Wisconsin and has served as an advisor to the Environmental Protection Agency, the Center for Disease Control, and the National Institutes of Health. His book is called The Blue Death: Disease, Disaster, and the Water We Drink *(2007).*