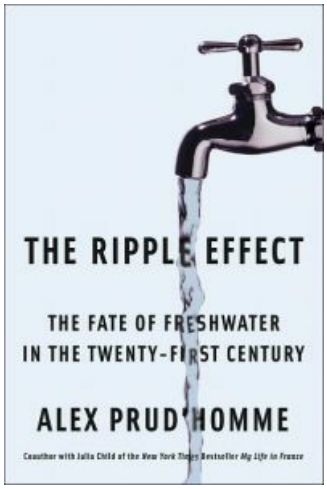

Book The Ripple Effect

The Fate of Freshwater in the Twenty-First Century

Alex Prud'homme
Scribner, 2011

Recommendation

The conventional wisdom about freshwater, at least in the affluent West, is hopelessly clouded by how easy it is to use all the water you want by simply turning on the tap. Alex Prud'homme, a longtime magazine journalist, says the days of reliable plenty are in jeopardy. He meticulously lays out the unpleasant facts, covering rampant pollution, moneyed interests seizing control of public resources, growing scarcity amid booming populations, and looming megafloods thanks to global warming. The book's strength lies in the portraits of the real people at the center of these topics, and that personal touch helps keep a tiny flame of optimism alive that these problems are ultimately human in scale and fixable. This facet is also a weakness in that the book reads like a series of earnest, long-form radio reports – dispatches that push a bony finger onto the pessimism button. Yet this important book stands a better chance than most of moving good people and governments into action. *BooksInShort* recommends it to green-minded industrialists, urban planners, big-vision lawmakers, future-focused engineers, technological innovators and anyone who wants to understand why that plastic bottle of water really isn't the answer.

Take-Aways

- The world is entering a period of reduced freshwater availability.
- The quality of American water resources is far worse than people generally realize.
- Agricultural runoff is the leading cause of water pollution, and much of it comes from industrial farming practices.
- Nitrogen overuse is every bit as serious as carbon emissions.
- Restrictions hamper the US Environmental Protection Agency to the point of ineffectiveness; the US must re-establish strong federal environmental leadership.
- Particularly in the western part of America, powerful interests seized control of water resources, often underhandedly.
- The US lacks a serious flood-control plan; many dams and levees are hazardous.
- Fracking, or blasting natural gas out of rock, uses masses of water, creates pollution and has unknown environmental consequences.
- About half the bottled water Americans drink annually comes right out of the tap.
- Desalination technology has improved and is becoming more popular. It is supplying water each day all over the world.

Summary

It's in the Water

The first years of the 21st century saw the dawning of a renewed environmental consciousness, spurred in part by evidence of climate change. Heightened concerns about water soon followed. Since the passage of the Clean Water Act of 1972, devastating things have happened to the quality and abundance of the United States' water supply. Add global pressures to that, and freshwater becomes the probable flashpoint of the century.

> "We...take water for granted. We pollute it unthinkingly, price it too cheaply and take too much of it from the environment too quickly – usually in the service of short-term gains."

Industrial pollution in particular threatens American water. The Greenpoint neighborhood of Brooklyn, New York, stands as a stark example of decades of poorly understood environmental impacts and lack of regulation. A gigantic oil-and-chemical spill (like "black mayonnaise") has fouled the groundwater and turned Newtown

Creek into a lifeless, chemical-soaked stream that locals now link to a high number of rare cancers. Authorities have removed millions of gallons from the site, but it's unlikely to ever be completely clean. A plant in Pittsfield, Massachusetts, dumped polychlorinated biphenyls (PCBs) into the Housatonic River for more than 40 years leaving it thoroughly contaminated. Mining operations in Butte, Montana, have left behind a red, toxic lake that is fatal to wildlife.

> "Water is a deceptively plain substance. Yet it is the basis for life."

An even more pervasive problem comes from storm water runoff, particularly from industrial farming facilities, the US's largest source of water pollution. Even though concentrated animal feeding operations continue to expand, the US barely regulates the runoff, which adds punishing amounts of E. coli, nitrogen and phosphorus to the waterways. A related difficulty is endemic to more aged cities, such as New York, which rely on old sewer systems to handle storm water runoff. These systems can suffer overflows that discharge raw sewage into outlying waters.

> "For much of the nation's history, Americans have fought over surface water...but most of those disputes have been settled; today, the biggest water wars are over groundwater."

The number and type of chemicals entering US waters are increasing. Culprits range from seizure medications to antibacterial soaps to manufactured estrogen, which scientists suspect of leading to alarming occurrences of "intersex" fish in West Virginia's Potomac River. Excessive nutrients from fertilizers cause oxygen-choking algal blooms – "dead zones" – in Chesapeake Bay on the east coast, devastating cherished sea life such as oysters and blue crabs. Such dead zones signal wide nitrogen pollution, an intruder as hazardous as the carbon emissions driving climate change. Altering this equation will be difficult. It's a tough political sell in farm country, and opponents have defanged the Environmental Protection Agency (EPA) to near uselessness. Yet some bright spots remain regarding other water problems, such as scarcity: In Orange County, California, an ambitious wastewater-purification plant supplies part of the water needs of 2.3 million people. Recycling becomes more urgent during straitened times for water supplies.

No Drop to Drink

Big, dry cities often have addressed their water scarcity problems by building huge pipes – like Manhattan's Tunnel No. 3 – to import water from more abundant places. Yet New York City's water-supply issues pale compared to those of a city like Perth, Australia, which residents might have to abandon because of continued drought. Climate change is likely to exacerbate the problem, as it already may be doing in the US Southwest, which may dry out permanently. "The Big Dry," Australia's intensely arid period of weather throughout the first decade of the 2000s, ruined agriculture and led to overdue changes in managing water allocations.

> "Aging infrastructure is a growing problem...but the decline has occurred largely out of sight, both literally and figuratively."

The history of the American West bears the scars of pipeline schemes, like a plan to redirect water from the Columbia River in the Northwest to the Southwest. Los Angeles emerged at the nexus of development pressure and resource allocation. It exists today because of a secret deal in the early 1900s to divert a lake more than 200 miles north and bring it to the growing town, a move that remains a point of rancor to the present day. The incident inspired the film *Chinatown*.

> "Thousands of industrial spills, many left over from a less regulated time, continue to poison groundwater, leak toxins into rivers and lakes, and impact human and environmental health."

Las Vegas planned to build a huge pipeline to suck water from rural Nevada valleys and send it south. However, drought dropped the level of Lake Mead, the huge reservoir that serves Las Vegas, to historic lows in 2010, shelving the city's proposal. Even structures like the Hoover Dam, which created Lake Mead, now draw harsh opposition in stark contrast to the glory days of the early officials (called "Water Buffaloes") who proposed and built Western dams. Though some politicians want more dams to shore up supply, critics suggest using developing technologies that consume less water and promote a less wasteful mind-set instead.

Futile Flood Fortifications

Climate change will cause short-term oversupplies of water, leading to floods. Most places lack a good preventative infrastructure. In 2009, a freak rainstorm following Atlanta's drought caused powerful floods. As the world warms, sea levels will rise, threatening an increasing number of coastal dwellers. Hurricanes will become more likely. Given New York's lack of flood defenses, surges from a big hurricane would bring the city to a halt, so some experts have suggested constructing giant flood barriers offshore.

> "The most basic problem for the EPA...is a lack of public support for pollution control."

Across the US, thousands of levees testify to the reality of a crumbling infrastructure. The Army Corps of Engineers, which often handles flood control, relied on levees along the lower Mississippi for decades. After the great flood of 1927, the Corps improved the infrastructure but did not start to assess the country's levees until after Hurricane Katrina's destructive breaches in 2005. Advocates of better US flood control call for reinvigorated, accountable federal leadership and for more green engineering, which involves restoring wetlands and shoring up barrier islands. These solutions are more sensible and cheaper than the Corps' previous attempts to master nature.

Engineering the Future

California's Sacramento Delta showcases critical issues that will emerge as freshwater dwindles. The region's agricultural interests, government and private industry are in conflict over water. The huge pumps that irrigate the delta's farms and send water hundreds of miles to Los Angeles – through intake valves and water diversions – have decimated the smelt and chinook salmon that supported a once vibrant fishing industry. Opponents also face off over a proposal to restore a section of the dammed-up San Joaquin River and to install a new, much larger dam nearby. Farmers dismiss as unrealistic suggestions that they choose crops and irrigation methods that are less water intensive, extending a decades-old stalemate. The solution may come down to managing extant water rather than figuring out ways to get it elsewhere.

> "Agricultural runoff is now the biggest single source of water pollution in America."

Meanwhile, entrepreneurs such as Texas oilman T. Boone Pickens have begun to treat water as a profitable commodity. Pickens discovered that his Texas ranch sat above the Ogallala Aquifer, the nation's biggest groundwater reservoir, which is now depleting at a fast rate. Federal officials crafted ideas to keep it from collapsing, but Pickens set up a water district to sell Ogallala water to the Dallas-Fort Worth metroplex 300 miles away.

> "We no longer have the luxury of ignoring our impact on water supplies. We must acknowledge the new hydrologic reality and adapt."

Pickens's plan reflects the "Big Water" business – private companies who handle water delivery, sewage treatment and infrastructure. These businesses argue that markets can save the world's freshwater from ruin, but opponents contend that human beings are entitled to water because it is basic to their existence. Big Water firms have endured scandal, such as the United Water debacle in Atlanta that sent the mayor to prison, and community protests over privatization, such as those in Germany, Argentina and Bolivia. Privatization now appears to be giving way to renewed municipalization of water supplies, but scarcity might someday reverse that trend.

> "Because we don't measure the water we use carefully, we use it thoughtlessly."

Farming is the world's largest consumer of water; the energy industry is second. Power-generation plants require water for cooling. Hydrofracking – blasting rock open with water and chemicals to release natural gas – generates pollution and is highly water intensive, using up to eight million gallons a day per well. Practitioners do not have to disclose the chemicals involved, thanks to a secret deal they cut with then-Vice President Dick Cheney in 2005. Oil companies also are eyeing shale rock in Colorado, where they could go after crude oil with a water-draining process that could endanger rural agriculture. In Alberta, huge tar sands deposits sparked a boom, but making synthetic crude requires gigantic amounts of water in an area with uncertain supplies.

> "To avoid a disastrous water-energy collision and promote a true water-energy nexus, federal officials will have to start managing the two resources together, as a holistic system."

Most bottled water comes in polyethylene terephthalate (PET) plastic bottles, which are oil-based products. Almost half of US bottled water (a $10.6 billion industry) is filtered tap water, but only recently have concerns about the industry's carbon footprint started to slow its growth. In Maine, activists have questioned a privately owned bottled water company's right to tap into the state's aquifers. Celebrity chefs Alice Waters and Mario Batali boycott bottled water. While other restaurateurs can't resist its profitability and convenience, perhaps bottled water will soon lose its cachet.

> "By 2025 as many as 3.4 billion people will face water scarcity."

Water also is at the heart of a controversial natural resources project in Alaska's Bristol Bay – the proposed Pebble Mine, which would extract an enormous lode of minerals from a pristine site near the US's largest salmon-spawning ground. The mine would need five giant dams for waste storage and 35 billion gallons of water a year, which could harm animal and human life. Mining in general has a poor environmental track record: Mineral extraction has polluted about 40% of Western watersheds, according to the EPA. Yet President George W. Bush lifted an oil-drilling ban in Bristol Bay that his father had imposed after the Exxon Valdez disaster, and President Barack Obama has now opened two other areas in Alaska to drilling for oil and natural gas.

Big Solutions

With water shortages a real possibility, efforts to find permanent sources have redoubled. Cloud seeding, a chemical process for inducing rain, has proven modestly successful under certain conditions. Much more promising is desalination technology, which uses reverse osmosis. About 70% of Saudi Arabia's freshwater comes from desalination plants. While some cities, such as Tampa, Florida, have encountered difficulties with their plants, the cost associated with building such operations has dropped, and the technology is winning more adherents.

> "Worldwide, a lack of water leads to low productivity, weak governments and violent protests that can spill across borders

Given the complexity of water-related problems, some big solutions are intriguing. Consider the idea of "flipping" the Mississippi by shipping floodwater to the dry states of the West. Opponents reject that "hard path" engineering approach and suggest a "soft path" method that allows the restoration of natural water systems and takes advantage of conservation tools like cisterns.

> "How will we use limited water supplies – for food, power or manufacturing – and what will the result be? Who makes these decisions; who benefits, and who doesn't...who controls the tap?"

Grappling with the troubled state of US water will require the rejuvenation of federal environmental and water laws, and the re-muscling of their enforcement agencies. In the post-Reagan era of business-friendly deregulation, industries have run roughshod over the water environment for profit. A stronger politics is needed, not just for regulatory power but to teach people how precious water is and why investing in it is so important.

> "There are no universal answers to the planet's water problems. But we can take concrete steps on the personal, local, national and global level to use water more wisely and sustainably."

Worldwide, a rising population and a growing preference for meat diets – which use far more water – will add to the strain. One hopeful model is Singapore's national ethos of well-controlled, centrally funded conservation and its thorough use of desalinated and purified wastewater, as well as old catchment technologies, to cut per capita daily water use. The US could follow its lead, at least in setting up a central water agency and bringing a high-level focus to flood control. A water-pricing system that charges higher rates above a free daily survival quotient would spur conservation, and reinvesting in water infrastructure would boost the economy.

Today, most people still take water as a given, a resource they can use and abuse. But those days are over. Citizens of the US and the world must reassess their relationship to water with a fresh respect so that society can manage it sustainably into the foreseeable future.

About the Author

Alex Prud'homme has written for *The New Yorker*, *Vanity Fair* and *Time*. He is the author of *My Life in France* (2006), a memoir of his great-aunt, Julia Child.