

Fall 2004

Water Follies: Groundwater Pumping and the Fate of America's Fresh Waters [Review of book by Robert Glennon]

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Recommended Citation

Robert Haskell Abrams, review of *Water Follies: Groundwater Pumping and the Fate of America's Fresh Waters*, by Robert Glennon, 46 *Ariz. L. Rev.* 473 (2004)

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BOOK REVIEW

WATER FOLLIES: GROUNDWATER PUMPING AND THE FATE OF AMERICA'S FRESH WATERS, BY ROBERT GLENNON[†]

Reviewed by Robert Haskell Abrams*

This is a fun book to read.¹ Most books of this genre decry a serious environmental problem and seek to influence a particular legal response to it. Those books tend to be long on details and heavy-handed in their advocacy. Many operate on the premise that the solution being presented requires an active effort at persuasion to convince the reader of the proposal's worth. This book is better: it tells fascinating stories, weaves together a series of poignant vignettes, and guides the reader to the desired conclusion implied by the book's title—America's water law in relation to groundwater pumping is sheer folly.

This book review will try to avoid telling too much about the individual stories that Professor Glennon has made the focus of *Water Follies*.² They should be read and enjoyed in precisely the way he presents them. Instead, this review

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1. ROBERT GLENNON, *WATER FOLLIES: GROUNDWATER PUMPING AND THE FATE OF AMERICA'S FRESH WATERS* (Island Press 2002) [hereinafter *WATER FOLLIES*].

2. These include tales of lakes and rivers dried, drying, or manipulated by groundwater extraction (Crooked Lake (Fla.), the Santa Cruz River (Ariz.), the Upper San Pedro River (Ariz.), the San Antonio River (Tex.), and the Ipswich River (Mc.)). These also include resource use conflicts from Maine and Minnesota (irrigation), California (sprawl), and Arizona and Nevada (mining), all of which put private developmental interests ahead of public and ecological interests.

will try to address a topic that the book chose to lay aside: how water law in the United States, particularly groundwater law, developed in ways that generate the abhorrent real world results that Professor Glennon so ably criticizes by showing them for what they are—failed governance of a common pool resource.

For those not familiar with the subject that goes by the heading of water law, understanding the accomplishment of this book can be aided by reciting a few basics of the field. Water law, in the main, is the law of water allocation and use. Accordingly, its principal elements address matters of legal rights of water use that are usually conceived of as a subset of property law. To be sure, there are times when water quality and environmental law influence water rights,³ but the bulk of the decisions and doctrines are concerned with putting water to use.⁴ Water law becomes de facto environmental law when the uses made of water so affect the environment that the riparian ecosystem is altered by the change in water flow. This book examines cases falling in that latter category, and injects one additional element—the particular use of water that is most problematic is the pumping of groundwater rather than the direct withdrawal of and use of water from surface streams.

Water Follies, in many of its examples, explores the results of an anomaly of Anglo-American water law. Historically, groundwater and surface water were governed by separate systems of legal entitlement. Moreover, the more traditional groundwater legal regime did not hold groundwater users responsible for the consequences to others of the groundwater use. This lack of accountability was strongly influenced by the absence of precise knowledge of hydrogeology. The inherited English cases thought it unfair to assign liability to groundwater users for harm that occurred to others, either groundwater users or surface water users, when the pathways of subterranean water movement were considered unknowable. In the most famous early case on groundwater law, *Acton v. Blundell*,⁵ the English court said:

But in the case of a well, sunk by a proprietor in his own land, the water which feeds it from a neighboring soil, does not flow openly in the sight of the neighboring proprietor, but through the hidden veins of the earth beneath its surface: no man can tell what changes these underground sources have undergone in the progress of time: it may well be, that it is only of yesterday's date, that they first took the course and direction which enabled them to supply the well: again, no proprietor knows what portion of water is taken from

3. See, e.g., *Game & Fish Comm'n v. Farmers Irrigation Co.*, 426 P.2d 562 (1967) (junior appropriator could not pollute stream to detriment of downstream senior); *Silvery Minnow v. Keyes*, 333 F.3d 1109 (10th Cir. 2003) (Endangered Species Act limits deliveries of water to which users hold state law water rights), *vacated as moot*, 355 F.3d 1215 (10th Cir. 2004) (stating due to change in climatic conditions that rendered injunction superfluous).

4. See generally, e.g., JOSEPH L. SAX, BARTON H. THOMPSON, JR., JOHN D. LESHY, & ROBERT H. ABRAMS, *LEGAL CONTROL OF WATER RESOURCES: CASES AND MATERIALS* (3d ed. 2000) (devoting nine of ten chapters devoted to allocation and use, one chapter to pollution and water quality). [Hereinafter SAX 3d ed.].

5. 152 Eng. Rep. 1223 (Ex. Chamb. 1843).

beneath his own soil: how much he gives originally, or how much he transmits only, or how much he receives: *on the contrary, until the well is sunk, and the water collected by draining into it, there cannot properly be said, with reference to the well, to be any flow of water at all.*⁶

This same reasoning can be seen in a fairly typical Nineteenth Century case from Connecticut, where the court, in denying relief to a plaintiff whose well stopped flowing after defendant, a neighbor, opened his own well nearby:

Besides, no man is bound to know that a neighbour's well is supplied, by water percolating in his own soil; and he ought not, therefore, to be held to lose his rights, by such continued enjoyment [of the water found in his parcel]. He cannot know that the first well requires any other than the natural and common use of water under the surface; nor can he know from whence that water comes; nor by what means it appears in one place or the other; nor which of the persons who first or afterwards opens the earth, encroaches upon the right of the other. The law has not yet extended beyond *open running* streams.

Nor can any light be obtained from the law of surface streams. Such streams are recognized as *private property*: and their use is regulated by principles of obvious equity and necessity. Their *nature* is defined; their *progress* over the surface *seen, and known, and uniform*. They are not in the secret places of the earth, and a part of it; nor is there any secrecy in the influences which move them. As soon as they appear and pass over the surface, they assume a distinct character, and are subject to the great law of gravitation. The purchaser of land knows what he purchases, and what control he can exercise over such a stream, and what are the rights of those above and below him. Each may use them as the common atmosphere; but none can injuriously interrupt their progress, or render them unfit for common use.⁷

Reflecting upon the old cases, several things become clear about the early American groundwater law. First, it was premised on a lack of knowledge of the movement of subterranean water. Should science advance beyond that point, rethinking groundwater would be in order. This is a rather easy postulate to adduce, but one that has seldom come about easily. Second, the passage comparing surface water law, where there is a rule of liability for a surface water user's unreasonable interference with correlative rights of other surface water users, contrasts sharply with the traditional English groundwater law that served as the foundation of groundwater law in the United States. Groundwater law in this country started as a "no liability" rule that is, in essence, a rule of capture. Whatever a landowner could capture would be available to that landowner for use without liability. Not surprisingly, as a property concept, this rule came to be known as the "Absolute Ownership Doctrine."

6. *Id.* at 1233.

7. *Roath v. Driscoll*, 20 Conn. 533, 541–42 (1850) (*emphasis in original*).

Of these two historic starting points, the total non-liability rule gave way to change more quickly than did the recognition of improved hydrologic knowledge. In fact, the move away from absolute ownership to other doctrines that more equitably distributed the use of groundwater has become almost total.⁸ By the late Nineteenth Century, several states had modified the absolute ownership rule of capture, to a more limited rule of capture that is rather misleadingly referred to as the “American Reasonable Use Rule.” Most of the states in the American East today follow this rule, as do a number of Western states. The rule, despite its title, remains a non-liability rule so long as the water is used for a reasonable use (in the sense of utility, not comparative reasonableness) on a tract that overlies the aquifer from which the water is drawn. Thus, the American Reasonable Use Rule places limits on wasteful or deliberately malicious use of water and, more tellingly, a limitation on the situs of use of groundwater. Fundamentally, however, the American Reasonable Use Rule remains a rule of capture, in most settings, and it remains a doctrine that itself imposes no liability on a groundwater user for most harms caused, whether to other users of the aquifer, overlying landowners threatened with subsidence, or riparians on hydrologically linked streams.

Still later in history, a number of states moved to rules for groundwater that were more like the law of surface water riparian rights—a rule of sharing that barred unreasonable use in the comparative sense of what is reasonable—depriving co-riparians of their ability to make a correlative use of the water. This doctrine, when it limits situs of use to the overlying land is called the Correlative Rights Doctrine,⁹ and when it dispenses with the overlying tract limitation is called the Restatement (2d) of Torts Reasonable Use Rule.¹⁰ Finally, a few Western states have adopted a version of prior appropriation to govern groundwater. Here too, while the possibility of limitations on groundwater use arises from the move away from a rule of capture, these doctrines are intended to govern the allocation of groundwater among competing users of the groundwater supply—these rules do not, without further development, address the concerns of other users of the resource base, such as surface water users.

Integration of groundwater and surface water has been quite slow to occur despite the fact that by the middle of the Twentieth Century the science of hydrogeology was far beyond its infancy. Change rarely occurred despite the fact that the old groundwater law was historically premised on lack of knowledge of the movement of subterranean water. Two states, Colorado and New Mexico, can be considered the pioneers in integrating the two branches of their water law. Despite their similarity as arid Western states the means by which they integrated

8. According to a recent treatise, only Texas and five Eastern states (Connecticut, Louisiana, Maine, Rhode Island, and Vermont) remain absolute ownership jurisdictions. See A. DAN TARLOCK, *LAW OF WATER RIGHTS AND RESOURCES* § 4:6 (2003).

9. The principal example of correlative rights is in California, which adopted the position in *Katz v. Walkinshaw*, 74 P. 766 (Cal. 1903). As an adjunct to that basic allocative principle, if the use on overlying tracts does not exhaust the sustainable supply of the groundwater, “surplus” groundwater may be exported off the overlying tracts under a system of prior appropriation.

10. RESTATEMENT (SECOND) OF TORTS, § 858 (1979).

groundwater law and surface water law are as disparate as is possible. Colorado solves the integration problem by defining most groundwater that is hydrologically related to surface water as tributary groundwater in which rights must be perfected as part of the surface water prior appropriation system.¹¹ New Mexico solves the problem by considering interference by any junior in time water users (groundwater or surface water) with any existing senior water users (groundwater or surface water), as an interference with a senior right that is subject to curtailment under the ordinary operation of prior appropriation law.¹² While such laws are hardly a guarantee that there will be no "water follies" within their borders,¹³ those laws are at least a guarantee that contemporary water allocation law starts with a hydrologically integrated picture of the water resource base upon which drafts are going to be made.

Realizing that interrelated ground and surface waters have not been legally integrated in most states, and that groundwater law has only partially escaped its rule of capture roots, the patterns established by cases such as *Acton v. Blundell* and *Roath v. Driscoll* help explain the legal problems at the core of several of the stories in Professor Glennon's book. If groundwater can be pumped with relative impunity, eventually surface water-dependent uses can be put at risk.¹⁴ In defense of the old legal status quo, one should note that, for many decades, the effects of this disintegration of groundwater and surface water law (even in hydrologically linked waters) was minimal because the technology did not support large-scale groundwater withdrawals. This overstates the lack of conflicts, but not by so large a margin as to require anything more than the gradual adjustment of groundwater law that did occur—creating some rules of liability among groundwater users *inter sese*.

As technology changed, however, particularly with the invention in 1937 of the high-speed centrifugal pump, having two independent bodies of law governing what is, in varying degrees, a unitary resource, created a certainty of conflict and confusion when competing users of hydrologically linked groundwater and surface water clashed. *Water Follies* picks up at this point and in a variety of settings shows how the doctrines of water law are leading to egregiously bad results in cases that compellingly demand a better outcome.

11. See JOSEPH L. SAX, ROBERT H. ABRAMS & BARTON H. THOMPSON, JR., *LEGAL CONTROL OF WATER RESOURCES* 456–60 (2d ed. 1991).

12. See *City of Albuquerque v. Reynolds*, 379 P.2d 73 (N.M. 1962).

13. Both states, as prior appropriation states, historically allowed (perhaps even unintentionally encouraged) the de-watering of streams. Protection of minimum stream flows is now possible under the law of both states. That is a modern development and does not override vested senior rights.

14. Over-pumping of groundwater can cause harms in addition to depleting surface flows. The most acute of these harms is land subsidence, either through compaction of the now drained aquifer under the weight of overlying strata, or in the sinkhole phenomenon where the aquifer material is easily eroded (as with karst formations) and the material inside the earth is literally removed, causing whatever is above to fall in! Additionally, coastal aquifers that are too vigorously pumped can lose their ability to repel neighboring salt water and become contaminated and of no use as water supply.

Professor Glennon's questioning of and implicit attacks on the lack of integration of the legal regimes that govern groundwater and surface water are neither radical nor previously undiscovered in the academic literature. For example, Professor Peter Davis in 1972 published a very thorough account of the lack of consistency of legal approach to the interaction of wells and streams, and advocated for greater integration of the legal rules governing groundwater and surface streams.¹⁵ That theme, the lack of consistency and affirmative non-integration of groundwater and stream water law has been repeated in most of the teaching texts on the subject.¹⁶ Nevertheless, without Professor Glennon's deft touch in *Water Follies*, that point has remained well out of popular reach, and therefore has seldom been carefully or systematically corrected.¹⁷

Professor Glennon, although he generally eschews technical legal analysis in the book, concludes with a series of eight suggestions for states to follow in the future.¹⁸ These are as follows:

Craft water conservation standards;

Establish minimum stream flows that are protected against pumping depletions as well as surface diversion depletions;

- Eliminate unregulated pumping;
- Tax any groundwater withdrawal from a location proximate to a surface watercourse;
- Collect groundwater withdrawal data, registering all wells and requiring permits for all new wells;
- Require that all new or increased pumping be accompanied by mitigation of adverse environmental impacts;
- Use financial incentives to influence water consuming behavior; and
- Require small public interest dedications of water in all water rights transfers.

Even a cursory glance at the list discloses that the strategy is attuned to the simple fact that most water law is state law, and that most control of water

15. Peter Davis, *Well and Streams: Relationship at Law*, 37 MO. L. REV. 189, 195 (1972).

16. See, e.g., SAX 3d ed., *supra* note 4, at 397-409.

17. A partial explanation for the lack of a broad response is that each state's laws of groundwater and surface water are state law, and over the two centuries since the founding of the nation, a considerable degree of variation in state laws has arisen. There are two dominant water law regimes for surface water (riparianism and prior appropriation), and five for groundwater: absolute ownership, American reasonable use, correlative rights, Restatement reasonable use, and prior appropriation. See, e.g., SAX 3d ed., *supra* note 4, at 364-65. This considerable divergence tends to undercut the transferability of steps taken in any one jurisdiction as a precedent for adoption in another.

18. WATER FOLLIES, *supra* note 1, at 217-22.

resources is a responsibility of the state in American jurisprudence. Professor Glennon, however, has strategies that involve the federal government and individuals as well. For the federal government, he advocates funding projects that reward states that promote environmental protection by regulating groundwater withdrawals.¹⁹ For individuals, he recommends a reexamination and selective reformation of consumption choices as well as citizen involvement for those who are so inclined.²⁰ These are all sound suggestions that together would have a revolutionary impact, if they can be implemented.

The feasibility of Professor Glennon's suggestions is not discussed in *Water Follies*. Skeptics would argue that it is a pipe dream to expect such changes in the face of concerted opposition that is sure to come from those whose economic success is predicated on a foundation of existing groundwater law and the "rights" it has established. The skeptics may be correct, but there are reasons to think that their influence will fade. First, one point of note is the stir caused by the publication of *Water Follies* itself. Professor Glennon has made dozens of appearances around the country promoting the book, not merely as promotion, but in response to demand for the book and its ideas. As a reader, the book makes you want to do something about the situations it describes. Public opinion counts in these matters, and if irresponsible water use under archaic laws is viewed as inimical to a widely shared public interest, legislatures will, over time, rediscover their roles as public trustees, and eventually respond accordingly. Given a bit of momentum, a state or two at first, other states may follow along in making their water laws more rational.

When the law is askew, when the public interest is not well served, events that are small can become catalytic. Consider in this light the efforts of Perrier, now Nestle Waters of North America, Inc. ("Nestle"), to open a spring water bottling plant in the western part of Michigan's Lower Peninsula. *Water Follies* touches on this example, but the story there was barely underway at the time the book was published. Spring water bottling is one of the framing examples that Professor Glennon uses for the book. The meteoric rise in the consumption of bottled water in the United States has led to a very profitable industry, whose economics are, as Professor Glennon explains, very favorable for water producers and bottlers.²¹ They pay for purchasing land, but not water, and they are not required to bear any of the externalized costs of the impact that their activities have on the watershed from which they take the water.²²

In *Water Follies*, Professor Glennon reviews in detail how such withdrawals for bottled spring water can affect treasured resources, such as the trout fishery of the Mecan River in Wisconsin.²³ One result of the decision of Nestle to abandon that project in response to public opposition was that Nestle

19. *Id.* at 223.

20. *Id.* at 223-24.

21. *Id.* at 1-3.

22. Nestle, it should be noted, voluntarily put several hundred thousand dollars into a watershed restoration trust fund, internalizing at least some of (and arguably more than) its share of the impact costs associated with its Mecosta County, Michigan groundwater withdrawal.

23. WATER FOLLIES, *supra* note 1, at 3-9.

moved on to seek other water sources. After Perrier identified a site in Michigan, then-governor John Engler led the effort to attract the project, providing Nestle with \$12 million in various incentives to locate the plant in Mecosta County, Michigan.²⁴ To be sure, the circumstances of the Michigan operation and the Wisconsin proposal are not identical; they have some things in common and others not. The prime differentiator is that the effects of pumping in the Michigan case are limited to a small effluent stream²⁵ named “Dead Stream” (along with connected wetlands) and the effects are felt only in the upper reaches of the West Branch of the Little Muskegon River. This is a lovely area, but it is not among the most highly prized trout streams in the state, nor were there any claimed significant impacts on the region’s fishery resources.

In the Dead Stream case, a group of neighbors and concerned citizens sued to enjoin the pumping on a variety of grounds, including the common law.²⁶ Judge Lawrence C. Root, after carefully sifting through the evidence including hotly debated expert testimony on flow and harm to the stream and the surrounding wetlands, found (among other things) that the pumping would harm the rights of riparians along Dead Stream by reducing its flow. As Judge Root correctly noted, the case was one of first impression in Michigan, posing the question of whether interference with riparian rights caused by pumping of hydrologically linked groundwater could be enjoined. Judge Root was in uncharted territory, for not only is there no Michigan law to apply, there is little in the decisions of other states that squarely or thoughtfully address the groundwater-streamwater interface.²⁷ The harms to Dead Stream, the surrounding wetlands, and the surface water ecosystem generally, are not very great.²⁸ Nestle had received permits from the Michigan Department of Environmental Quality (MDEQ) and the County Health Department allowing it to pump and bottle the groundwater. Judge Root determined that the riparians are entitled to as much (and perhaps even more) protection from drafts on the stream made by groundwater pumping as they would receive from drafts on the stream made by surface water diversions.²⁹

This simple sounding decision eradicated centuries of disintegration of groundwater law and surface water law. Having found that the amount of harm constituted an unreasonable interference with the rights of the riparians, an injunction was issued—and with the injunction came a legal jolt. Suddenly, the Nestle plant was out of business, despite the appearance that Nestle had taken the

24. *Id.* at 11.

25. Effluent streams are streams that are fed by groundwater (sometimes called gaining streams).

26. Mich. Citizens for Water Conservation v. Nestle Waters N. Am., Inc., Case No. 01-14563-CE (Mecosta Cty. (Mich.) Cir. Ct.) Nov. 25, 2003. [hereinafter cited as *Mich. Citizens Case.*] (Copy on file with Arizona Law Review).

27. See generally SAX 3d ed., *supra* note 4, at 404–09. See also Collens v. New Canaan Water Co., 234 A.2d 825 (Conn. 1967).

28. The point here is not to get involved in the question whether the harms are sufficient to constitute impairment of riparian rights, but rather to ensure that the pumping proposed in this case is not viewed as one of Professor Glennon’s examples of unusually harmful pumping allowed to continue by a legal regime that leaves pumpers largely unregulated.

29. *Mich. Citizens Case*, *supra* note 26, at 48.

right steps in advance.³⁰ Alarm bells sounded all over the state. Major groundwater users in particular feared that their pumping could be subject to injunction in similar circumstances. The state, suffering through a very sluggish economic period, was alarmed that the jobs associated with the Nestle operation might be lost even though there appeared to be only a small resource impact involved. The rules of water allocation that were so long neglected in the world's water-richest state³¹ suddenly became a hot topic among political leaders, businesses, the media, and the public.

Then something else happened—although the *Michigan Citizens* decision had cast a cloud over groundwater-dependent activities, surface water users began to realize that they would suffer great uncertainty and risk loss of rights if the decision is reversed. A return to the virtual immunity of groundwater users from liability correspondingly means that the state's surface water-using community, including major industrial users who rely on surface streams for both source water and effluent disposal, can have "their water"³² usurped by the pumpers.

A catalytic event? Perhaps. Interestingly, just months before the Perrier/Nestle decision, a bill that would move the state towards comprehensive and proactive groundwater regulation had been watered down (no pun intended) to a modest registration and technical study law to appease the Michigan Farm Bureau.³³ The *Michigan Citizens* decision, however, has ushered in a different response: a new consensus that includes politically powerful interests such as the manufacturing community and municipalities is emerging that favors reliable groundwater and stream water regulation and permitting. They understand that absent legislative intervention, either of two scenarios is possible, and both of them are bad—if *Michigan Citizens* stands, reliance on groundwater sources is undermined; if *Michigan Citizens* is reversed and Nestle is immunized against the injunction by a higher court returning to independent groundwater and surface water regimes, surface water rights are jeopardized.

Will this lead to enactment of laws that follow Professor Glennon's suggestions? Possibly. Far more confidently, one can predict that the days of pumping with legalized immunity from liability for harms caused to surface water

30. The permit granted was not the only one found to be necessary for the activity by the court. Nevertheless, the court found the granting of the permit was based on admittedly incorrect information supplied to the agency, and that therefore under the Michigan Environmental Protection Act, MICH. COMP. LAWS § 324.1704, the permit (even if it might act as a shield to some forms of action) was not one here. *Mich. Citizens Case*, *supra* note 26, at 51.

31. The Great Lakes hold one-fifth of the world's fresh water and, as Michiganders are quick to tell, Michigan ("the Great Lakes State") is riparian to Lakes Superior, Michigan, Huron, and Erie.

32. In Michigan, as in most states, the water, of course, belongs to the state, not the users, and is held in trust for the people. *See* MICH. CONST. art. IV, § 52.

33. *See* Andy Guy, *A Tide of Influence Swamps Groundwater Protections*, at <http://www.mlui.org/landwater>; *see also* Noah Hall, *Michigan Enacts New Laws Regarding Water Use*, ABA WATER RESOURCES COMMITTEE NEWSLETTER, Feb. 2004, at 15, <http://www.abanet.org/envirom/committees/waterresources/newsletter/feb04/waterres0204.pdf>.

uses are nearly over in Michigan. Should they choose to read it, members of the Michigan legislature will find *Water Follies* more useful and more enjoyable reading than most sources available to them. It is certain to alter their thinking about the water law landscape in which they are legislating.